A PORK CONTRACT MARKET: AN INVESTIGATION INTO ATTITUDES ABOUT AND POSSIBILITIES OF SUCH A MARKET FOR SLAUGHTER HOGS

By

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ABSTRACT

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Most of the variation in price of slaughter hogs results from supply shifts. Lack of information about future prices leads to periodic over and under production. If better information about future prices were available, farmers could make production decisions that would more nearly equilibrate supply with demand at reasonable price levels. These informed decisions would decrease the large losses sometimes forced on farmers, and also decrease the outsize rents they receive at other times.

One way to increase the amount of information in the system would be to increase the amount of contracting. Farmers, knowledgeable of production costs, contracting with packers, knowledgeable about future demands, might start to generate a more efficient future price.

Such a contracting system already exists but it is a private treaty market and lacks many of the properties economists believe desirable in a market. A formal contract market which connects buyers and sellers electronically and is managed with the aid of a computer could give the contract market the accessibility and hence the competitiveness that it is currently lacking.

Daniel E. Kauffman

Fifty-one pork farmers in Michigan, Iowa and North Carolina were surveyed to find out their attitudes about such a market. Eight pork packer representatives in Wisconsin, Illinois, Michigan, Oklahoma and Ohio were interviewed. Several of the packers also had operations elsewhere.

Farmers, in general, said they would participate in such a formal contract market. Packers, for the most part, were skeptical of the idea but said they would consider participating in such a market.

From these interviews and a review of the way hog markets have developed, including recent electronic spot market developments, procedures for a way to institute a formal pork contract market were then put forward.

To my grandfather,

D. G. Yoder,

who, having sold hogs in 1918 for $20/cwt. and in 1933 for $3.60/cwt., knows something about price variation; and who in his ninetieth year still asks every day, "How's the market?"

ACKNOWLEDGEMENTS

Dissertation acknowledgements are often amusing. Writers sometimes recognize everyone but the family dog. Having now finished the process I understand the impulse to thank everyone you ever met. Like nearly all dissertations, this one contains no startling new ideas, but rather is made up of reformulations of the ideas of others. Hence I am very aware of how dependent we all are on those who have gone before us. A college professor of mine used to say, "Nobody ever had an original idea." All of us, save for the truly egomaniacal, recognize a germ of truth in the professor's aphorism.

The idea for this study came from the dissertation supervisor, James Shaffer, and without him it could not have been completed. He had the wisdom to know when to let me flounder and when to step in and say, "You need a little help here."

Further members of my committee, James Bonnen, John Ferris, Glenn Johnson and Norman Obst, all labored to disabuse me of mistaken economic notions and occasional lapses in writing judgement. I thank them, although at the time of the advice I did not always show that I appreciated it. But I eventually came to agree with much of it and thus incorporated it into the dissertation.

Appreciation is also expressed to the United States and Michigan Departments of Agriculture, which provided financing for this study. James Pearson, of USDA Agricultural Marketing Service, is thanked for his interest in this form of market coordination.

In particular, I wish to thank my wife, Janice. Bindery glue would not have touched the pages of this tome without her. It is traditional in these things to thank one's wife for her patience. Mine is thanked for her impatience. I appreciate her willingness to see that everything was formatted properly and that the graphs and such were where the table of contents listed them.

I also want to thank my son, Jacob, who gave up time that was rightfully his -- on the condition that when the last page was completed we would take him to Disney World.

Finally, I want to thank a couple of friends. Ed McLaughlin patiently listened to my ideas and then improved them as we talked. Jack McEowen allowed me, without complaint, to use our jointly owned micro-computer word processor for far more than my fair share of time.

Our dog, Muffy, had little or nothing to do with the process.

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CHAPTER I

THE PROBLEM

> Few people realize how much money is in hogs, how quickly and easily they can be raised with but little or no cash outlay.
>
> George Washington Carver
> Tuskeegee Institute, 1916

Investment and Price Variation:

Farmers just starting to sell hogs in the latter half of 1982 can not help but agree with Carver's sentiments on money. It is easy street. But forget the cash outlay part. A confinement facility can easily cost a million dollars.

But unfortunately for hog producers and to the good fortune of consumers, the high prices will not last. Any hog producer with a little experience can tell first time sellers that the good times are a sometimes thing. Hog prices in the latter part of 1982 were at historical nominal highs, but prices inevitably tumble. Any farmer that got into the business during that time period using borrowed capital, will just as inevitably face difficulty in meeting

the debt service charges when the income from hogs drops as the cycle turns down.

Historically returns to hog production have been better, on average, than most other forms of agricultural production. In the corn belt, hogs were called the "mortgage lifter." They still are tremendously profitable when the hog cycle hits high price periods like the latter of half of 1982. But production has changed significantly so that hogs are no longer easy to raise with little or no cash. The move to confinement production facilities, while cutting labor costs per unit of production, changed the way farmers can think about hogs. No longer are hogs the residual claimant on labor and no longer are they the orphan of a farmer's production plans. Hogs used to be turned in with the cows to clean up after them. And they were turned into the fields to "hog down" the corn. They were not the center of the farms plans. Hogs were farrowed in spring and fall only. They were taken care of with time that would not have been employed to advantage otherwise. If prices got too bad, farmers could just shut down their hog operations because there was not a big capital investment in their field-farrow operations.

But with the investment in confinement operations the balance between fixed and variable costs has been changed towards higher fixed costs. Those fixed assets require debt service that did not exist with the old field operations. Previously a farmer could just push the A-frame

or small quonset hut shelters, feeders and waterers to the fence row and wait out the bottom of the cycle. A farmer shutting down confinement operations may well be forced into bankruptcy and not be able to come back when the cycle turns up again. For instance, anyone driving across Iowa in the Summer of 1982 could notice many empty hog facilities even though hog prices made operations then quite profitable. And the amplitude of the hog cycle has gotten larger. Figure 1.1 shows the jag hog prices are on.

Figure 1.1.

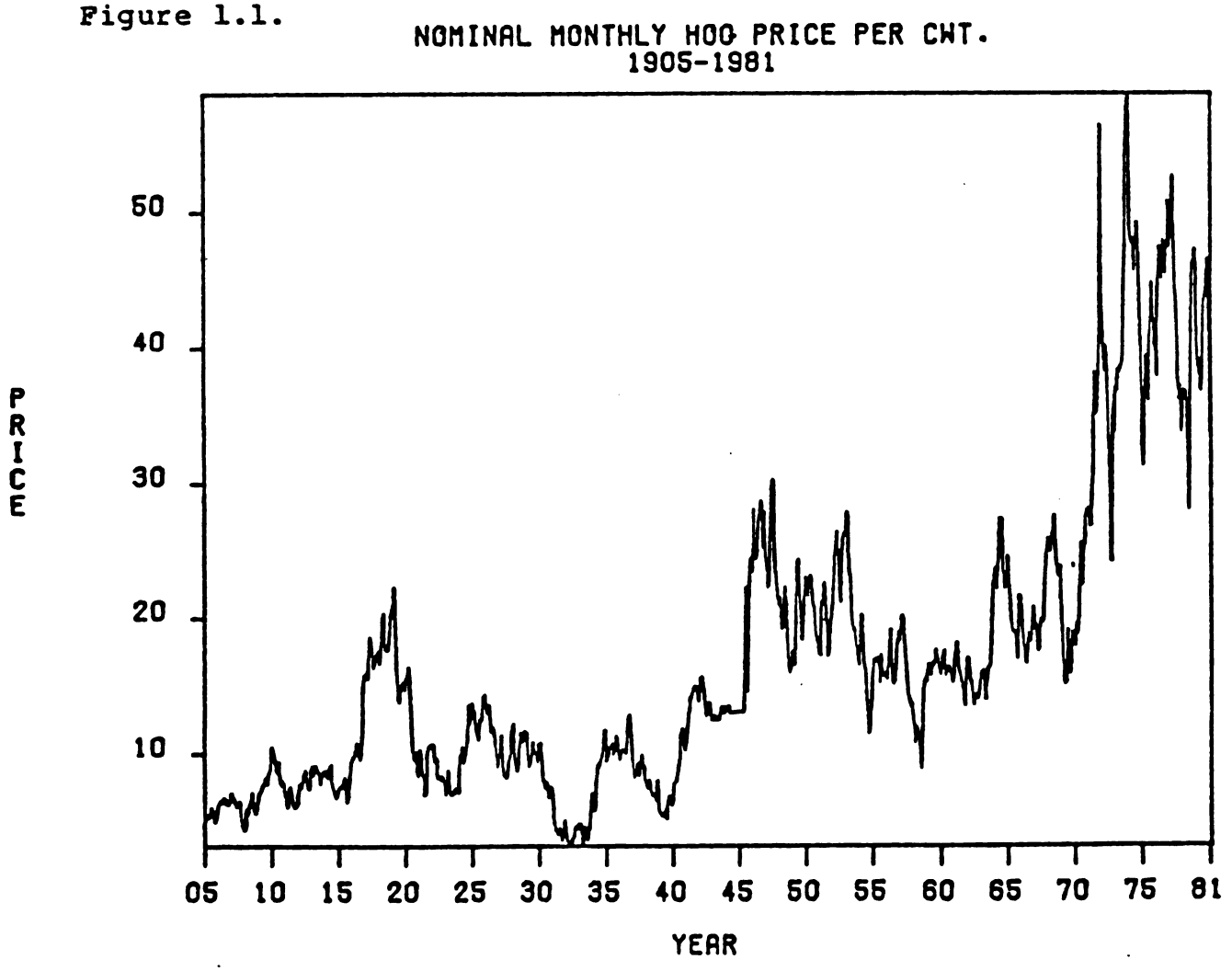


Figure 1.1 leaves little doubt about the increasing amplitude. Starting in about 1971, hog prices began violent fluctuations that made earlier cycles look anemic. In some markets prices in September of 1982 briefly topped sixty-seven dollars. In the Fall of 1982, hog producers who managed to survive 1981, were hauling money to the bank. Unfortunately, for many of them the money could not go into savings accounts, but rather had to pay off delinquent loans acquired during the previous two years of losses. But two year previous hog prices stood at twenty-eight dollars per cwt.

How profitable the business was at the 1982 peak can be judged by using figures from the National Hog Producers Association. If a top producer bought two dollar corn and financed the breeding stock and one-fourth of the operating expenses at eighteen per cent, the average cost of producing a hundred pounds of pork for a three thousand a year head operation is forty-four dollars, according to the Association. Thus, if that top producer could sell hogs for sixty-two dollars per cwt. for a year, a profit of $54,000 would result. But, if the twenty-eight dollar price held for a year, a loss of $48,000 would be produced.

This extreme variablility in prices, of course, produces much entry and exit from the business. Such moves, as noted, have become more costly as production has moved from field farrow operations to highly specialized confinement facilities.

Figure 1.1 does distort price fluctuations for several reasons. For one thing there are apples and oranges on the graph. A 1911 hog is a different product than that which is produced now. For hogs, like people, stout is out. In 1911 a hog produced approximately sixty pounds of lard; its contemporary a little less than thirteen pounds. Little wonder the turn of the century hog gave real meaning to the term porker.

But price signals then clearly showed that the market then desired the lard hog. In 1910 lard sold for $12.27 per cwt. and smoked picnics sold for $12.42 per cwt. At the turn of the century lard and picnics were about of equal value. In 1980 smoked picnics were bringing sixty-seven dollars and lard was worth about nineteen dollars. Although there is constant debate about whether farmers are currently producing the hog that the market wants, the above numbers certainly do show how price signals cause change in the type of animal produced.

Others will object to the graph because it is cast in terms of nominal dollars. Real dollars, of course, make the intertemporal comparisons fairer. But most of us have not learned to think completely in real dollars, although there is probably less money illusion now than several years ago.

Deflating the data would make for fairer intertemporal comparisons. But even with the deflation, there would be an increasing amplitude in the cycle, although not nearly as dramatic as in Figure 1.1.

Organization of Research:

This research will detail the price instability existant in the pork subsector and examine a mechanism for reducing the instability. The remainder of Chapter I will further examine the instability and explain a proposed contracting mechanism for dealing with it. Chapter II will look at how the subsector came to its current structure and what that means for future subsector changes. Chapter III will detail in cursory fashion how the Futures Market might affect the proposed contracting mechanism. Chapter IV will examine farmers' and packers' attitudes towards the contracting mechanism. Chapter V will detail how the contracting mechanism might best be instituted. Chapter VI will summarize the study and outline possible courses of action for USDA.

Planning Difficulties:

Farmers faced with such dramatic price variation and uncertainty as exists in the hog subsector, find production planning extremely difficult. Ivan Top, the current president of the Michigan Pork Producers Association, had planned a major expansion of his facilities last year. Plans were drawn and financing committed but he backed out at the last minute because of uncertainty about future prices. Top, of course, wishes he had those facilities producing hogs during 1982-83. It is doubtful that in 1984 he would be equally pleased with such an expansion because by then price will be taking another tumble.

Uncertainty, of course, is also endemic for packers. A few will claim that they can adequately control their margins. But it is a claim that should at least be looked at with jaded eye. At least it should if one takes to heart the variation in margins shown by USDA numbers in Figure 1.2.

Figure 1.2.

Packers' margins in late 1982 were being severely squeezed because of the high prices. When the price was thirty dollars per cwt. packers were making money the way

the farmers were in 1982. Not infrequently the American Meat Institute reports that another one of its members will close a pork packing plant.

This extreme price fluctuation has made planning difficult for packers. Explains Alan H. Beswick, vice president of Canada's largest meat packer, Gainers: "When I started in the business (in the early 1950's) I could write a book about what would happen for the next year. If the market moved 50 cents in a year people fell out of bed. It moved 60 cents this morning. Commodity prices are just so dynamic now. We often have a one day price movement that is larger than our margins."

This fluctuation helps neither the packer nor the farmer, according to Beswick. Beswick has tried to work on this problem with the industry. He has not met much success.

Supply Changes Responsible for Cycle:

The price fluctuation is primarily due to variations in supply rather than changes in demand. By plotting the yearly average price per cwt. and the annual per capita pork consumption one can visually fit a demand curve to the coordinates. A similar plotting of spring farrowings, a very good indication of supply, on price leaves no clear picture. From that data one can not visually fit a supply curve (Ferris, 1982).

The reasons for the stability almost jump out at you if demand is specified as a function of the price of pork,

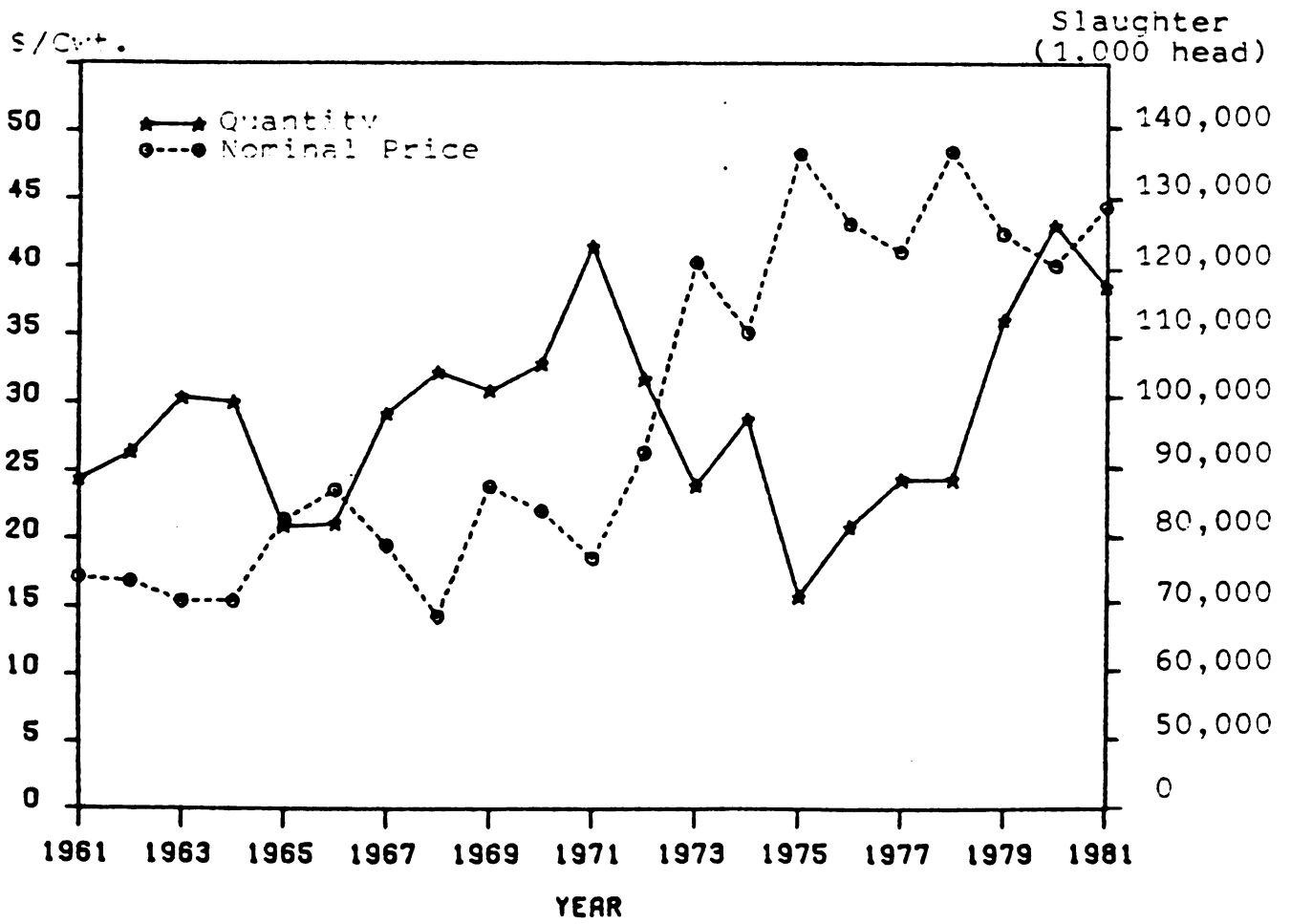
price of substitutes, population and implied tastes and preferences. Only price of substitutes is likely to change rapidly. And of course, as with nearly all consumption goods, there is no price uncertainty at the time of purchase. Consumers do not buy pork and months later find out how much it will cost.

Supply, on the other hand, is much more fickle for equally good reasons. If supply is primarily a function of price expectations, variable costs, and capital stock, one sees why the visual fit can not be performed. Corn and meal prices shift rapidly, particularly since the lessening of government grain support programs. Farmers, once committed to a capital stock, will produce even though that capital is not carrying its own cost (Edwards, 1958; Johnson and Quance, 1972). Because it is about ten months from breeding decision until a slaughter hog is ready for market, production, unlike consumption, can not be quickly reduced in the face of significant price change. While this is not a problem totally unique to agriculture, it is more severe there than most other places and it causes enormous problems.

Needless to say, demand is not always rock steady. Denis Gaydon, vice president of commodity procurement for Oscar Meyer, explained that it used to be if anyone could tell him the supply of hogs next year, with a great deal of accuracy he could tell you the price of hogs. This is not precisely the case any more but it is almost so. Any

competent analyst will tell you more attention is paid to projected hog numbers than any other variable. The inverse fluctuation of supply and price can be seen in Figure 1.3. Note the number of hogs slaughtered per year between 1961 and 1981. The high price farmers are receiving now is undoubtedly not because of demand changes but because of lack of production. Figure 1.3 shows how dramatically price varies inversely with production.

Figure 1.3. Relationship of Production and Price Per Cwt. 1967-1981



The stableness of demand for pork over time is indicated by the consistency of the demand, cross and income elasticities for pork. Chavas (1982) found the demand elasticities that are reported in Table 1.1.

Table 1.1. Demand Elasticities for Pork Over Time

	Poultry	Beef	Pork	Income
1970	.082	.216	-.734	.435
	(.016)*	(.051)	(.068)	(.092)
1971	.079	.217	-.727	.431
	(.015)	(.050)	(.063)	(.087)
1972	.070	.224	-.733	.439
	(.014)	(.048)	(.061)	(.083)
1973	.076	.203	-.685	.405
	(.014)	(.044)	(.053)	(.071)
1974	.076	.194	-.697	.427
	(.014)	(.044)	(.053)	(.070)
1975	.070	.177	-.718	.471
	(.013)	(.042)	(.050)	(.069)
1976	.069	.172	-.727	.485
	(.013)	(.042)	(.050)	(.068)
1977	.063	.202	-.704	.441
	(.013)	(.041)	(.048)	(.066)
1978	.063	.206	-.704	.434
	(.013)	(.040)	(.048)	(.064)
1979	.060	.216	-.714	.438
	(.013)	(.038)	(.047)	(.063)

*Standard errors are in parentheses.

Interestingly enough, Chavas (1982) did not find the same degree of stablity in beef or poultry subsectors and

suggests this may be a partial explanation for forecaster error in those areas.

So price fluctuations are still pretty much controlled by supply side variation which can not be shown to be strictly rational from a marginal analysis view point if one assumes accurate information about future prices. Of course, such accurate information is not available.

This is the familiar micro-macro problem. A price of sixty-two dollars cwt. makes capital expansion an unbearable temptation and one that should be yielded to if the price rise was going to be permanent. But everybody yielding causes an outward shift in supply, driving prices down. Those who, during the high prices, have only increased production by moving along their marginal cost curve, will not be hurt when the price falls. Those who have expanded to a new production function by adding plant capacity, will find their assets trapped in overproduction when the price falls (Johnson and Quance, 1972; Edwards, 1958).

That the cycle exists has long been known. More than one hundred years ago Samuel Brenner wrote that the rise and fall of hog prices is "for twenty years past . . . as alternately certain as the diurnal revolutions of the earth on it axis" (Breimyer, 1959).

In 1930, Ricci, Tinbergen and H. Schultz (Meadows, 1970) introduced the idea of the cobweb cycle to explain the fluctuation in hog prices and other agricultural

commodities in Germany. Ezekiel (1938) introduced it in the United States in 1938. Because of incorrect price forecasts, the theory held and farmers alternately over and under produced. According to the theory, farmers would look at current price, assume it was the price in the future, and make production plans accordingly. But while the cobweb cycle had a theoretical appeal, it did not really offer a satisfactory explanation of the cycle. It could not adequately explain the four year cycle that was thought to be in existence at the time of its introduction. If a farmer really completely based price expectations on the current period price, the results of those decisions should show up in a maximum of twenty-four rather than forty-eight months. The twenty-four month period would be ample time for a farmer to increase the size of the sow herd by deciding to raise additional gilts in the maternal breeding line and then in turn breed those gilts so as to produce slaughter hogs. This period could be even shorter if farmers just saved gilts for breeding rather than slaughtering them. Thus the cobweb theory could never quite justify the four year cycle because the biological delays just were not that long. Because the cobweb cycle made farmers out to be overly naive and could not really explain reality, it was severely criticized.

Nerlove (1958) put forth his distributed lag method of forming price expectations and it did not make farmers out to be quite so naive as the original cobweb model

required them to be. Nerlove's farmers formed their price expectations by using a weighted average of past prices. Almond (1965) later introduced the polynominal distributed lag which was a definite improvement over Nerlove's formulation in that it did not force the parameters of the model into a fixed relationship. But, even so, these polynominal distributed lags are entirely dependent on past prices and incorporate no future information.

Glenn Johnson (1960) and others have objected to this totally historical approach when theorizing about price expectation formation. Wrote Johnson:

> Do we really believe that next year's expected price is this year's expected price plus some proportion . . . of the difference between last year's actual and last year's expected price normal price regardless of wars, price support activities, inflations, economic collapse, changing foreign demand, strikes and institutional adjustments . . . (p. 26).

A number of studies have shown that farmers incorporate future information into expectation formation. Partenheimer in the Interstate Farm Management Study pointed this out (Johnson, et al., 1961), as did Kaldor and Heady (1952).

In research done for this study, farmers cited the futures market as the single most important element in their formation of price expectations. Hog futures did not even exist when Partenheimer and Kaldor and Heady reported the results of their works.

Lerohl (1965) subsequently showed that price forecasts could be improved by using both past prices and future information contained in USDA publications.

But while Lerohl's work was a substantial improvement over the strictly historical forecasts it remains difficult to use. That is because the USDA outlook information requires a degree of subjective interpretation. That, unfortunately, means different researchers can come to different conclusions about what the proper price expectation series is. Lerohl's method is thus difficult, but not intractable.

Other Attempts at Dealing with the Cycle:

There were early attempts to dampen the hog cycle that did not deal directly with expectation formation. Over and under production was not laid entirely at the feet of farmers' price expectations.

Another major contributor was fluctuations in the price of corn. The hog corn ratio became one of the tools for analysis. The Agricultural Adjustment Act of 1938, among other things, attempted to stablize the price of corn. One of the justifications for this was that a more stable corn price would lead to a dampening of the hog cycle. It did not happen. Dean and Heady (1958) found the intra and inter-seasonal price fluctuation somewhat larger after World War II than before. As recalled from Figure 1.1, it has become even more pronounced since.

Ideas about Stabilization:

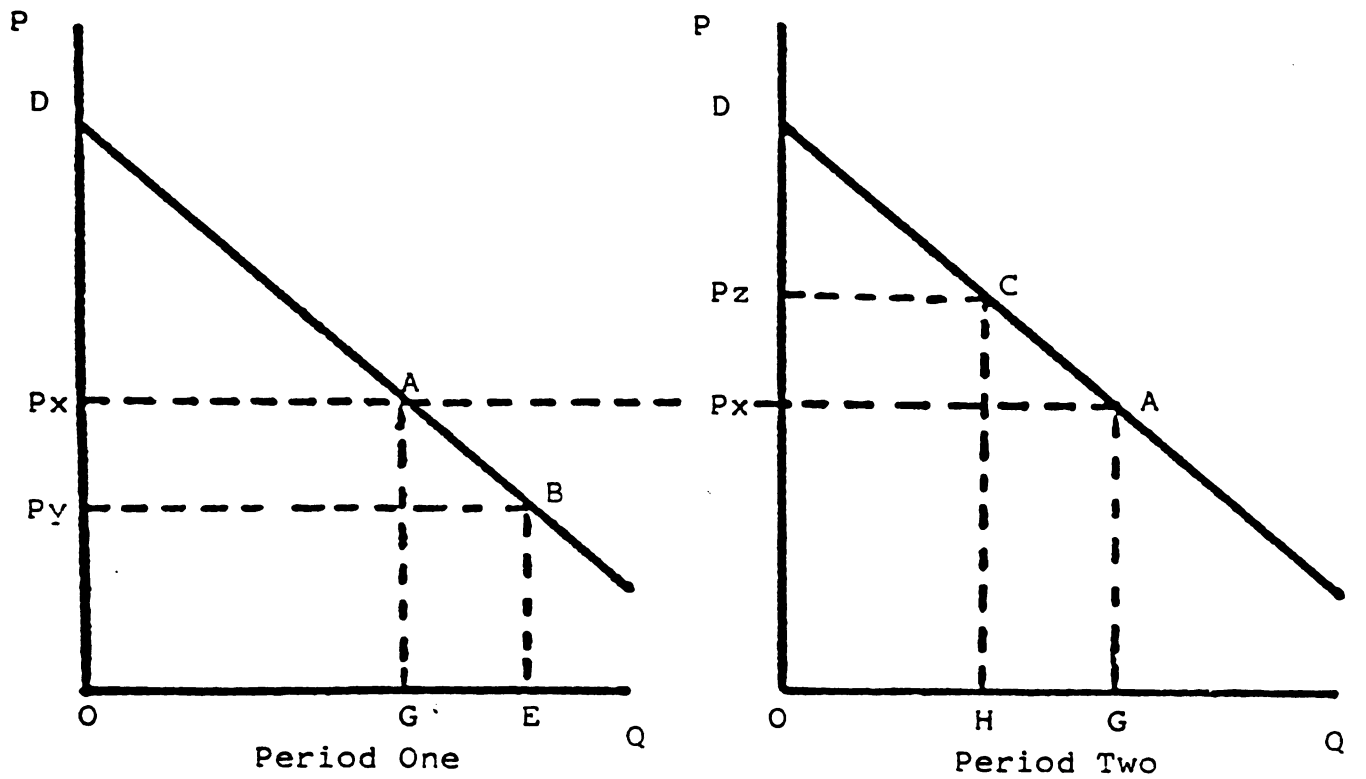
Planning, which Galbraith (1967) says is the reason large firms are successful, is extremely difficult in the

face of the price fluctuations detailed above. Most of the economics profession has assumed that such fluctuations do no one any good. But it is an assumption not accepted by everyone. Waugh (1944) first challenged the idea by demonstrating that consumers are worse off with stable prices. Oi (1961) followed with a similar analysis for suppliers. But Samuelson (1972) showed critical errors that both Waugh and Oi had made in their analyses. Samuelson, according to a footnote in his article, first saw that Waugh was not measuring consumer surplus correctly during World War II. He wrote a reply to Waugh's original article and it was accepted for publication in the Quarterly Journal of Economics. But the article was lost and Samuelson never redrafted it until the 1970's.

In Waugh's original article, he argued that consumer surplus was greater with unstable prices because the gain in surplus during low price periods is greater than the loss during high price periods. Waugh assumed that the mean of the unstable prices is the same as the constant stable price. Oi made similar arguments for producer surplus because of positively sloped supply curves. Waugh's essential argument is shown in Figure 1.4.

Figure 1.4.

Effects of Price Instability on the Consumer



As with all such consumer surplus arguments, Waugh is making the untenable assumption that marginal utilities are cardinal, independent and constant through time. Figure 1.4 shows demand in two periods where demand is constant. Waugh is also implicitily making the simplifing assumption that goods can be stored forward in time at zero cost or somehow borrowed backwards from the future on a costless basis.

Given these assumptions, Waugh argues that if price was unstable between Periods One and Two, Py in Period One and Pz in Period Two, the consumer would be better off than if price were stable for both periods at Px. (The mean of Py and Pz is equal to Px). Waugh argued that the gain in consumer surplus during the low price period is equal to the trapezoid PyPxAB and the loss during the high price period, when compared to the stable price, is the trapezoid PxPzCA.

Since the trapezoid gained during the low price period is larger than the one lost during the high price period, Waugh concluded the consumer is better off with price instablity. Oi made similar arguments for suppliers using positively sloped supply curves.

The fact the both men come to the same conclusion concerning instablity for both producers and consumers should have given pause. This must be Dr. Pangloss' best of all possible worlds if everyone gains from instability. Wrote Samuelson (1972):

> How wonderful it all is! The harm of producers in the first period is more than compensated by their gain in the second period; the harm done consumers in the second period is more than compensated by their gain in the first period. Oi and Waugh together are alledgedly two times as good . . . so good that we ought to destablize prices further, without limit (p. 490).

Samuelson used several approaches to show why Waugh and Oi are wrong. He noted that if they would have measured total utility or revenue, conclusions would have been different. Under the Samuelson approach total utility for

stable prices is ODAG (Period One) plus ODAG (Period Two). With unstable prices it is ODBE (Period One) plus ODCH (Period Two). From this it follows that total utility is greater with stable prices. This is because the gain from low prices, GABE, is less than the loss, HCAG, from high prices.

Thus Waugh and Samuelson come to exactly the opposite conclusion about the effects on the consumer because of price stability. Samuelson concludes the consumer is better off with stability. Waugh's mistake is because he ignores the opportunity cost in foregone goods because of the purchase price of the goods in question. Wrote Samuelson (1972):

> Arguing that way is tantamount to thinking that, whenever we raise the price of wheat (by making it scarce), we thereby raise in equivalent proportion the utility of the background good(s) on which the money spent on wheat could otherwise be spent. This is money illusion with a vengeance (illusion be it noted on the part of the economists observer, not on the part of the consumer) (p. 482)!

Samuelson concluded that the whole matter could be summed up in the following theorem:

> When a speculator unsuccessfully distorts the pattern of equilibrium to his own loss, all the others in the market gain. But they generally gain less than he loses.

Even before Samuelson's article, Massell (1969) had concluded that a true integration of the Waugh and Oi articles would lead to the conclusion that total welfare is increased with price stability. Turnovsky (1974) rightly pointed out that none of these analyses really dealt with

price uncertainty but rather with price variability. That is, although price was allowed to vary, at the time consumers and producers were making decisions they were certain of prices. This is an unrealistic assumption as far as most production decisions are concerned. When hog farmers make breeding decisions, they are uncertain of the price for which the hogs resulting from that decision can be sold. Turnovsky modified this unrealistic assumption so that firms made decisions on the basis of expected prices. He found that Massell's net gain in welfare outcome continued to hold.

But all these analyses began and possibly foundered by using the concept of producer and consumer surplus as a way of measuring outcomes. Dean and Collins (1967) contend that such surplus concepts can not really be utilized for operational measurement of welfare gains from stablization.

Additionally, when the question is looked at from the perspective of portfolio theory one would expect that if a firm faced higher risk its average return should be higher. Portfolio theory, pioneered by Harry Markowitz (Rosenburg and Rudd, 1977; Sharpe, 1970), states that return for a diversified investment is a function of the risk coefficient.

Thus Oi's (1961) profitable firms might be compared to Wall Street's high flying "go-go" funds of the 1960's and 1970's. Their managers bought high risk stocks. So

when the economy flew, the funds flew. But when the cycle dipped the funds crashed and a lot of fortunes disappeared.

Further, the Waugh, Oi, Samuelson et. al. arguments above all assumed that the mean of the unstable prices is equal to the stable price. D. G. Johnson (1947) contended stable prices would lead to a lower farm price. G. L. Johnson and Quance (1972) concluded that stable farm prices would lead to higher farm prices because assets would no longer be trapped in overproduction.

The controversy over the value of stablity continues. Robinson (1975), in an invited address to the AAEA, said, "In this profession there is a tendency to overvalue price stability as an objective of policy."

Robinson, a tendency man, added, "There has been a tendency in the profession to accept too uncritically the argument linking capital rationing to price uncertainty put foward so convincingly by D. Gale Johnson . . ."

Surely Robinson is wrong on this point. If higher risk does not require a higher return to attract capital, then a couple of economic's central tenants have to be revised.

Robinson thinks it is possible that farmers invest more in capital because of unstable prices. That is, during good years they sink all of the rent back into equipment to avoid taxes, etc. And, in this, Robinson is probably right.

For instance, Bill White, a producer in southwestern Michigan, raises most of the six thousand hogs he produces

each year in his field farrow operation. Field farrow is probably the most cost efficient method of operation in areas where the land is relatively cheap and the soil sandy. But White also has one of the newer style production buildings which he claims to own only because "we had a good year and it just happened that no land was available then so we had to put up a confinement building."

Robinson found the gains from agricultural price stablization as far as consumers were concerned to be so minimal as to not be worth the candle. Surely Samuelson's (1972) work refutes this on the consumer side.

And on the production side, Robinson must be substantially underestimating the benefits from price stabilization and reduced uncertainty. Regardless of where you come out on consumer or producer surplus one must conclude that capital would be allocated more correctly with stable prices and hence total output would be more rational. Robinson's analysis does not really account for capital waste caused by the price fluctuation. This topic will be dealt with more thoroughly later.

Profits Up without Increases in Sow Herds:

Hog prices have been at quite profitable levels since Spring 1982, and even by 1983 hogs numbers were not building the way one would normally expect. The September 1982 USDA Hog and Pigs report showed that market hogs in production were twelve per cent below the previous year and, even more

amazingly, the intended farrowings for December through February were four per cent behind that same period the previous year.

How can that be? Even with the high cost of money, price in 1943 clearly exceeded marginal costs so herds should have increased in size. There was a large expansion of the industry in 1978 and 1979. Much of this was in confinement facilities some of which were being underutilized in 1982 (Hurt, 1982). So, expansion of hog numbers could take place without a lot of money being loaned for capital expansion. But the loans have not been forthcoming.

Apparently agricultural bankers have been sitting on their hands when it comes to providing cash for expansion or operating loans. Extended hands in the recent past have not brought the expected rewards. There apparently are no separate data kept on loans to hog farmers but there is plenty of information which shows the reasons that at the end of 1982 bankers were reluctant to extend credit to farmers. Farmers, in general, were in trouble.

The American Bankers Association, November 1982, Agricultural Banker Special Report gave the following indications of declining ability of the farm sector to handle loans:

Table 1.2. Selected Indexes of Farm Loan Quality at Agricultural Banks

Mid Year	Overall Quality	Renewal	Refinance	Payment Rates	Delinquent Loans
1977	103	138	140	80	80
1978	122	123	136	99	98
1979	133	110	126	109	76
1980	101	140	144	83	112
1981	83	148	155	72	118
1982	46	173	159	37	141

It is not necessary to explain fully the construction of these indexes to see that for the last three years the numbers were moving in the wrong direction.

What is more the significant decline in land values in the Corn Belt, the heart of the hog production area, has reduced farmers' ability to pass financial ratio tests. Land values fell nineteen per cent between February 1980 and May 1982 (Jones, 1982). This decline put downward pressure on the net captial ratio and upward pressure on the leverage ratio, making farmers less desirable credit customers. Further, conversations with extenders of farm credit indicated that there is an almost universal increase of the standards for tests of creditworthiness for farmers. Higher standards, of course, mean less credit.

In the past, if commercial or Federal Farm Credit sources dried up, farmers could always turn to the Farmers Home Administration for loans. But with many of those loans currently in default and the administration not encouraging the extension of those types of loans, even credit from this "bank of last resort" has dried up.

Aggregate credit reports of hog farmers are not available so it can not be determined with accuracy how well farmers are doing. But it is certainly reasonable to hypothesize that farmers have not made normal production increases to the high hog prices because they have been unable to obtain credit to finance it. It may also be that the low in the cycle lasted so long that many farmers no longer look on hogs as a good way to make a profit. But with the hog subsector about the only agricultural sector making money in 1982, the lack of response will not long remain.

The profit potential in selling corn through hogs, rather than on the open market, is so attractive that hog raising is the easy choice between the two alternatives. If one takes a 1982 price of sixty-two dollars which was often available in the second half of 1982, the advantages of feeding hogs are obvious. If one assumes that 3.7 pounds of corn are needed to produce a pound of pork, that non-corn feed costs are about ten cents a pound, and that non-feed costs are about fourteen cents a pound, then corn can be sold for about $5.75 a bushel if farmers process the corn by converting it to pork.

If the alternative is to sell corn in the open market at $2.25 to $2.50 per bushel, Solomon's wisdom is not needed to make the decision between the two alternatives. While these numbers include no labor charges, neither a bank nor a farmer needs be prescient to know that for the near future hog production is attractive.

Bankers may have been burned in the past and have decided not to extend credit to some delinquent accounts. But consider what the banker will likely do in the case where a cash grain farmer has hog production facilities underutilized or vacant because of lack of operating capital. If that farmer is delinquent to the banker, there is a golden opportunity to give the farmer the chance to get even again and also improve the quality of the bank's loan portfolio.

Indeed, since most farmers know that the price increase is not permanent, they will not expand their capital plant. But it is rational to increase the units produced along their current marginal cost curve.

Capital that bankers will provide will allow the building of the breeding herd. Gilts that would have been sold will be held back for breeding. And about nine months from now their offspring will come to market. This will drive the price down. Prices remained strong longer than usual in 1982 and were predicted to continue well into 1983 and maybe even 1984. But there will eventually be a price break. As prices start to decline, farmers will become

discouraged and start to sell sows at a more rapid rate. This will depress prices even further, but eventually will lead to a decline in the number of slaughter hogs coming to market. The price will then start to rise and the process will start all over again.

It has been argued that cobweb theories make farmers out to be naive. The weakness of such theories has already been pointed out. But regardless of that issue, surely most farmers do not expect hog prices to remain indefinitely at the levels they were at when 1982 ended. But, with a price elasticity of demand for hogs currently estimated at somewhere between .4 and .6, a ten per cent increase in quantity produced will drive the real price down anywhere from seventeen to twenty-five per cent, all other things being equal. Thus not very many farmers have to make even slight mistakes in production responses in order to have major effects on the price.

This boom and bust cycle has led to tremendous fluctuations in income for Michigan pork producers. Large producers (more than two hundred litters annually) and medium producers (less than two hundred litters annually), who use the Michigan State University accounting system, have seen their profits vary as reported in Table 1.3. These numbers do not include payment for the farmer's labor, management or owned capital, and so overstate the profit.

Table 1.3. Net Profit (Income - Variable Cost - Changes in Inventory - Depreciation)

	1977	1978	1979	1980	1981
Large Hog Producers	$16,573	$112,819	$53,121	$38,919	$-3,697
Medium Hog Producers	6,534	40,984	16,456	20,815	-7,325

How does a hog producer make rational plans in the face of the numbers in Table 1.3? Perhaps the finite human mind can not really cope with such variance. This may explain the operating rules that call for capacity production regardless. Such rules, which will later be more fully explored, may not be optimal, but there apparently is enough slack in the system that such rules make survival and production possible in the face of extremely imperfect information.

The concern here is addressed only to year to year income variance. The intra-year variance reflects desirable properties. In fact, since demand for pork is seasonal and since production costs vary somewhat with weather, etc., it is desirable to have seasonal fluctuations. We are concerned, however, with the variation between years to the extent that variation reflects lack of information in the system which, in turn, implies poor planning and poor use of plants. Of course, some of that variation reflects changes in costs of inputs. There is nothing that

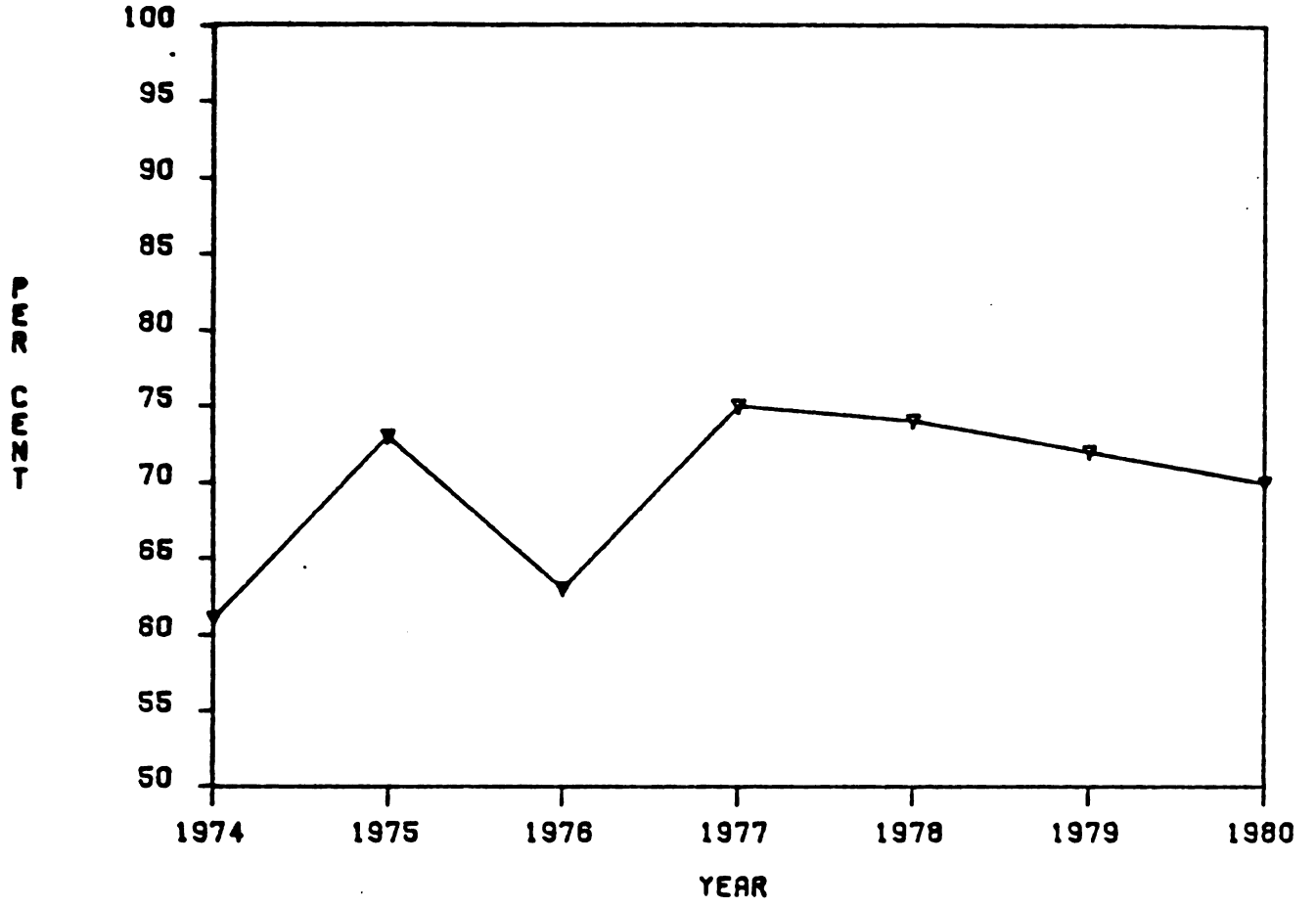
institutional innovations confined to the hog subsector can do about such variations. And, in fact, in a well functioning economic system, output will surely respond to changes in input cost. However, the fluctuation in the hog cycle is not primarily an input cost produced phenomenon.

The cycle causes similar problems for packers also. Packers' capital often is not better utilized than producers' capital. Consider how plant capacity of hog production facilities varied during the 1970's and 1980's.

When few hogs are produced, packers find their margins squeezed. And, generally, their average total costs are up since they are forced to charge fixed costs to fewer hogs processed.

Unfortunately government statistics on packing plant utilization are too aggregate to see what happens to pork packers. But, statistics from the Bureau of Census' Current Industrial Reports "Survey of Plant Capacity," give an indication of how utilization varies for pork packers (Figure 1.5). The "Sausage and Other Processed Meats Plants" was selected as the closest proxy for the pork packing industry. Since in a normal year, seventy per cent of a hog carcass is processed, much of the processed meat in this country is pork. One should not, however, read too much into these numbers. Much of the unutilized plant is obsolete.

Figure 1.5. Per Cent of Practical Plant Capacity Used by Sausage and Other Processed Meat Plants



Risk and Uncertainty:

The problems caused by risk uncertainty on production in general (Knight, 1921; Savage and Freidman, 1948) and agricultural production in particular (Schultz, 1940; Johnson and Quance, 1972) are well known. But, knowing why it happens does not make it easier to control. Figure 1.1 and a survey of pork producers that is more fully discussed later, show that farmers have not developed a decision rule, given pervasive uncertainty, to modify the cycle.

Classical theory gave no clear help on what to do in the face of uncertainty. The previously mentioned

neo-classical reformulations did. Beginning with Von Neuman and Morgenstern (1944), game theory and statistical decision theory incorporated uncertainty and imperfect information into the theory. Stigler (1961) looked at a decision to purchase a car using utility maximization ideas. He equated the cost of the search for the used car with the marginal returns which would come from the information produced by the search.

Darcovich and Heady (1956) tested nine different expectation models for price and found that, generally outlook information from USDA performed best. Partenheimer and Bell (Johnson, et al., 1961) analyzed the data from the Interstate Farm Management Study for clues on how farmers form price expectations. They found that Heady's models assumed farmers to be mechanical in their expectation formation. Johnson and Lard (Johnson, et al., 1961) looked at six states of knowledge and how decisions might be made under these states. Petit (1964) and Lerohl (1965), as noted, worked on how price expectations are formed.

The results of a survey done for this research and many other surveys show the extreme difficulty farmers have in forming price expectations and how difficult this, in turn, makes production decisions. Any mechanism which might reduce this difficulty would surely be welcome.

Coordination:

The lack of coordination and the pervasive uncertainty in the hog subsector has been shown. As both hog farmers and packers have become more specialized in their operations, the need for coordination has become more manifest. Because of increasing capitalization for both packers and farmers, the risks are higher. Break even points have increased, which means the importance of plant utilization has gone up. Why have not mechanisms arisen that reduce these problems?

Williamson's (1979) taxonomy of "governance" structures suggests such mechanisms would already be in place in most industrialized sectors. By governance structure Williamson means the extent to which firms rely on straight market transactions, contractual relationships or even complete vertical integration to acquire the products they need.

In most cases, as industries move towards more specialized, or what Williamson (1981) calls idiosyncratic investments, more coordination emerges. This is because "the normal prescription that recurring transactions for technologically separate goods and services will be efficiently mediated by autonomous market contracting is progressively weakened as asset specificity increases" (p. 1547).

Highly specialized investments can be used to produce only one kind of product. Efficient use of capital can only be assured if there are contractual agreements between

the parties. The transaction costs of relying on classical markets in such circumstances are much higher than those produced by alternate governance structures, according to Williamson.

Given Williamson's theories, one would expect imposition of more vertical coordination in the hog subsector than is occurring. Several reasons can be put forward for this. While both processors and producers have moved to much more specialized investments, the hog is still a generic product. Although different packers prefer different weights and lengths of hogs, for the most part a 230 pound slaughter hog can be utilized by any packer.

It is not a similar case to General Motors where there may be only one set of production equipment in the country to produce a specialized diesel fuel pump that will go on only one General Motors' engine. Such a diesel pump can obviously not be purchased in the open market. In fact in this case, according to a director of purchasing for a GM division, GM, having decided that it could get an outside supplier to furnish the pump more cheaply, then had to provide the supplier with twenty-three million dollars in capital and a guarantee that it would buy at least ninety per cent of the capacity of that capital for five years.

In addition to the generic reason for lack of coordination in the pork subsector, one can also posit that the goverance cost of such coordination will be high in

such a diffuse system. For instance, GM likes to have two contractors for any one item so that both suppliers know they must keep costs in line. But they never have more than four or five contractors for one item because the cost of administering the contracts becomes to burdensome. The costs of governance become too high. Governance is Williamson's (1981) word for the kind of structure used to move products in the marketing channel. Movement might be through a market, a bilateral contract, total integration, etc.

A packer usually buys pigs from many farmers, dealers and other assemblers. The transaction costs for total contracts covering all these entities would be large. But most packers have special relationships with farmers they have found to be suppliers of the type of hog they need. And most packers do engage in some form of contracting. This will be further detailed in Chapter II.

Williamson's (1981) rule for deciding what kind of structure to go with is: "Assess alternative governance structures in terms of their capacities to economize on bounded rationality while simultaneously safeguarding against opportunism. This is not inconsistent with the imperative 'maximize profits,' but it focuses attention somewhat differently" (p. 1546).

The hog cycle has gotten severe enough that it is imposing severe transaction costs on subsector participants. To work in the environment sometimes requires

the nerves of a draw poker player who is bluffing with an unfilled straight. But it is an open question whether we are well served by a hog subsector design that requires skills similar to Amarillo Slim's in order to survive.

Improving Coordination and Decreasing Price Fluctuation:

Might there be a governance structure that could cut down on the crap shoot nature of participation in the subsector? One is needed that would force more information into the system so that the portion of the cycle which reflects neither changes in demand nor changes in input costs is eliminated.

Because elasticity of demand at the farm level is quite inelastic, any institution that could decrease supply variation could have a dramatic effect on price fluctuation. Farm level elasticity estimates vary. Meyers and Havlicek (1974) estimated elasticity of demand at the farm level to be -.44. Using their elasticity a twenty-five per cent change in quantity supplied will produce a fifty-six per cent change in price, all other things being equal. Such price and quantity changes are within the range of fluctuations occuring during the hog cycle. If an institutional change were able to reduce the quantity supplied fluctuation to ten per cent, the price fluctuation would fall to twenty-two per cent. This, of course, is a major improvement when compared to fifty-six per cent price fluctuation.

Of course various government programs have attempted to deal with this problem with differing degrees of success. They have had only limited effects on periodic over or undersupply.

More than forty years ago Schultz (1940) called for a system of "forward prices" in agriculture. In his well known work Forward Prices for Agriculture, D. G. Johnson (1947) explored the idea in a more exhaustive fashion. Johnson proposed that a group of "experts" set prices for the coming year based on what they thought supply and demand conditions would justify. He assigned this task to experts because "given the possibilities of specialization in training and concentration upon the task of formulating price expectations, a group of experts are in a position to make much more accurate estimates of future prices than can individual producers" (p. 132).

These prices would then be announced far enough ahead so that adequate production plans could be made. He proposed that the price be made good through such methods as government storage, and direct income tranfers to prop up the demand for food. But he felt the primary way to guarantee that foward prices were obtained was through fiscal and monetary policy. He noted that forward contracting based on futures markets did already exist, but he held little hope that this mechanism could establish reliable forward prices.

Interestingly enough D. G. Johnson (1972) did not so much as even mention this forward pricing proposal in later

works. But regardless of his earlier, perhaps naive, trust in experts' ability to enforce a price schema and the power of fiscal and monetary tools, the ideas were among the first to systematically try to get at a major cause of the pervasive uncertainty in agriculture.

As such, they were the precursor of proposals to create a market in contracts which would have the same objective as D. G. Johnson's (1947) forward price idea without necessitating as much government intervention.

The idea was apparently first broached by Shaffer (1969). He wrote:

> It has generally been assumed that contracts involved direct negotiation and dispense with the market as an allocation mechanism. This is a narrow view of the market. A national market in deliverable forward contracts . . . could conceivably be established. This would provide the needed coordination and reduce the stimulus for vertical integration into farming, while providing the advantages of a competitive market system without price uncertainty (p. 257).

That is, a market for trading contracts would call for the delivery of hogs at a date forward from the contract. Shaffer was also proposing that price in this market be transparent in the sense that price is known to all and access is available to all qualified subsector participants.

The first reference to such a market that could be found is in Shaffer's (1969) writings. But one can infer its historical connection to Schultz's (1940) and D. G. Johnson's (1947) forward price idea just from its rather unwieldy title, deliverable foward contracts. Possibly

because of the D. G. Johnson anecedent, the name has become embedded in the literature as Forward Deliverable Contract Market (FDCM). But the fact is, contracts for the delivery of merchandise exist only because they call for delivery forward of the date they are made and because they are a legal instrument specifying delivery.

In this study such a market will be called a Pork Contract Market (PCM). A PCM would:

1) Commit farmers to delivery of slaughter hogs prior to hog maturity. As the system itself matures, more contracts would be let prior to breeding.

2) Create a forward price readily observable to all. The price would be created by interaction of those with intimate knowledge of costs of production and the demand for pork.

3) Be open to all qualified producers and processors with no unnecessary barriers to entry. (This will be spelled out in more detail later.)

4) Have relatively low transaction costs if it were done on an electronic market. The electronic market appears to be the only realistic alternative.

5) Eventually be national in coverage. While it is unlikely that packers in California would contract with Ohio producers, it is possible that this could be done. The market must be national in scope so as to get broad participation. The market itself will determine price differentials among areas.

Such a market could improve both coordination in the subsector and dampen the amplitude of the hog cycle. Both of these effects are desireable attributes. A PCM appears to be the only way to force enough long run price information into the system so that chronic mistakes in long run production plans might be reduced.

The cycle seems primarily to be a manifestation of lack of information. There is certainly no technological

or biological based theory that can explain the jiggling hog numbers in Figure 1.3.

If information about prices ten to twelve months hence actually became reliable, then production levels might be stablized so that the cycle would dampen. But we know that people respond primarily to immediate rewards (Skinner, 1974). Thus, in order for such a market to be created with voluntary participation, it must be designed so that people can obtain benefits from it immediately.

Because of this problem much subsequent work on Shaffer's PCM idea (Holder, 1970) fails to place adequate emphasis on the long term purpose of the market, which is to dampen the amplitude of the cycle. Most of the work subsequent to Shaffer's idea concentrates on the micro benefits of such contract markets. Some of these papers do not even mention the possiblity of dampening the cycle.

The possiblity that contracts might some day force enough information into the system to dampen the cycle can hardly be held out as a reason for participation to someone who is worried that s/he might be forced into bankruptcy next month. For that person the question has to be: "What can you do for me today?"

Anyone who has talked to industry participants knows that those selling the long range benefits of dampening the cycle are viewed with extreme skepticism. The ear of subsector participants can be had, for good reason, only by stressing the immediate benfits of the PCM. Big picture sellers are selling a product without effective demand.

So while the focus on micro benefits of coordination is understandable, it is not entirely justifiable. Clearly the original ideas of Schultz (1940) and D. G. Johnson (1947) were to address the pervasive uncertainty in agriculture and hence try to induce a more rational production pattern. To the extent that these later products do not emphasize this, they get away from what should be the central organizing point. While the long term hope of dampening the cycle is central to the PCM idea, it is the short term benefits which accrue from coordination which will determine whether a PCM is successful.

Some will contend that if a PCM had such systemic benefits, the market would be created on its own power. This idea will be more fully disposed of in the next chapter, but for now it is sufficient to observe that: 1) Such a market is slowly starting to evolve, and; 2) It has not grown faster because of the conflict between short run micro-motives and long run macro-good. That is, the immediate costs of creating a PCM with transparent prices are such that they stop the long run obtaining of the macro good. It is for this reason that a look at the immediate or attachable benefits would be worthwhile. These benefits all result from better coordination. Some of them would not be unique to a PCM. They are:

1) Less uncertaintly about farmer income and therefore a lower cost of capital.

2) A smoother flow of product to processor resulting in a more efficient operation of production plants.

3) A higher expected sales over time because of more price stability.

4) A more competitive market with resulting price enhancement for farmers.

5) Improved transporation with less cross hauling and shrink of animals. Production and processing located more rationally.

6) Somewhat reduced acquistion costs because of efficiencies and reduction in personnel required to sell a hog.

7) Improved information flows about the quality of slaughter hog the market wants and improved premiums to induce such production.

8) Increased rate of technology adoption because of faster diffusion of infomation on successful farmers.

9) Better information on when hogs should be produced and how their weight should vary during the year.

It is these benefits, which can be appropriated immediately or in the near future by firms and individuals. Let us examine in some more detail how the above nine points would rebound to producers and processors benefits.

Turning to point one, it was earlier noted that loans to pork producers and processors are risky. Table 1.3 shows how variable income is for pork producers. From portfolio theory (Sharpe, 1970) we know that the riskier the investment the greater the return demanded. By reducing riskiness, capital can be rented by both processors and farmers at more attractive rates (D. G. Johnson, 1947).

The thrust of point two is that quick benefits would accrue to the industry in part because of smoother flow of product and hence allow more efficient use of capital plant. This would then assure efficent use of labor.

Packers, for the most part, are tied into contracts that require them to commit to the size of their workforce on the Friday before the beginning of the work week. A decision to put a butcher on the floor is a decision to pay for thirty-six hours -- a contract requirement. With fringes, some workers get sixteen dollars or better an hour. If enough hogs can not be purchased at appropriate margins, it gets very expensive in terms of unutilized labor. Even large firms experience daily fluctuation in number of hogs slaughtered so that they are unable to utilize plants efficiently. And the daily fluctuation is nothing compared to the cyclic inefficiencies. Some firms experience a thirty per cent or more variation in volume from the low to the high in the cycle.

Holtman, et al. (1974), Daellenbach and Fletcher (1971), Schneidau and Duewer (1972), and Holder (1970) have either mentioned or focused on reduced slaughter costs resulting from a dependable flow of hogs so that plants can operate at the nadir of their average cost curves. Holtman (1974) found that steady supply meant average savings of $1.33 per hog across five sizes of plants. Daellenbach and Fletcher (1971) found more modest savings. Both the Holtman, and Daellenbach and Fletcher studies focused on average costs. It would seem more logical to report the savings in terms of what one could afford to pay for the marginal contracted hogs which would reduce the supply variation. Pork processor C. R. Payne (Schneidau

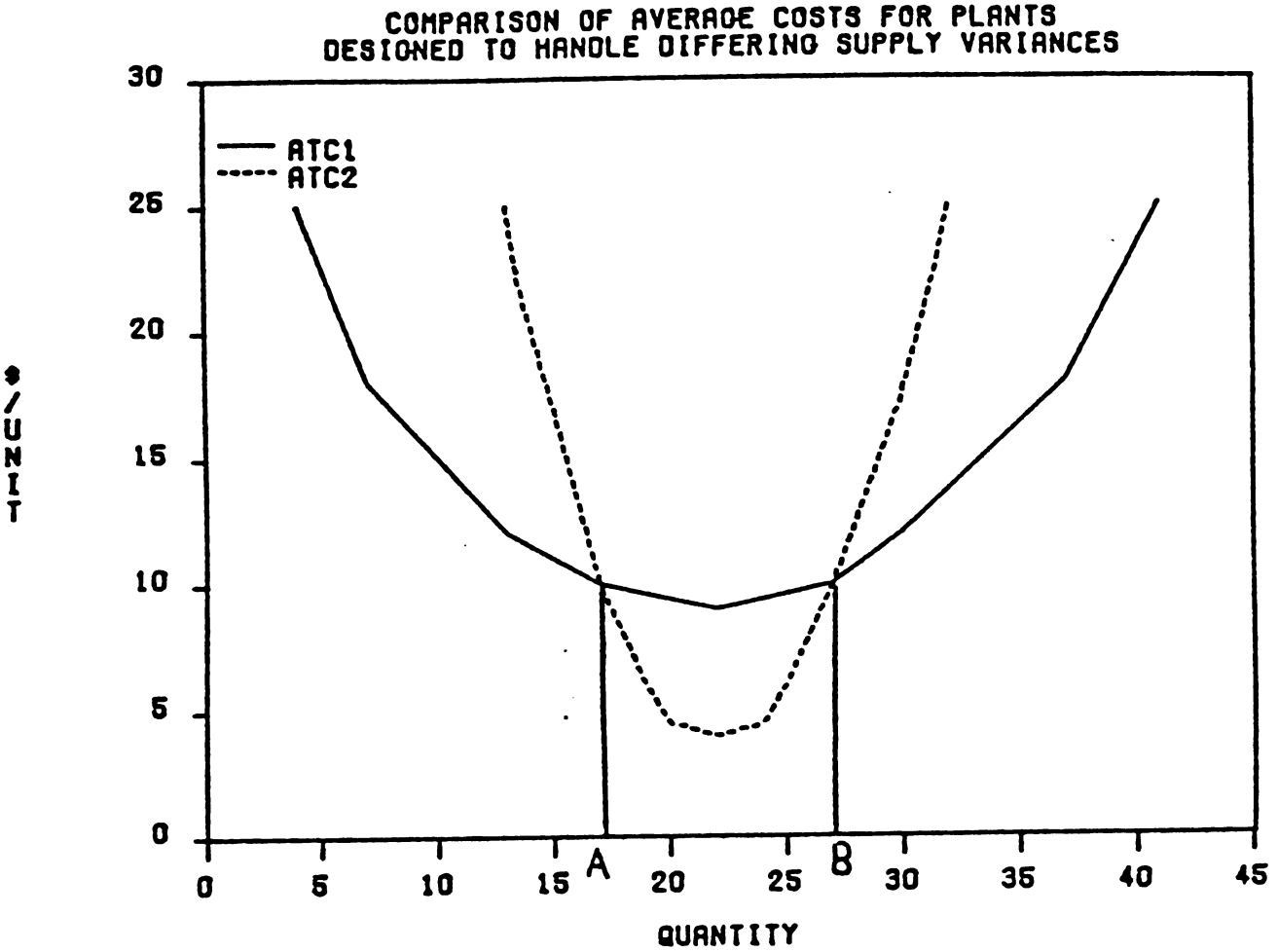
and Duewer, 1972) did that in his rough calculations, assuming a cut-out margin of one dollar per cwt., and found that his company could afford to pay eighty-six cents cwt. for hogs that would increase production from forty-five to forty-six hours and $2.45 per cwt. for hogs that would increase operations for the week from thirty-five to thirty-six hours.

But all these studies focus on short run phenomenon. When, if the normal U shaped average cost curves hold, the more important question seems to be: How should hog slaughtering plants be constructed if we can be assured of a steady supply of hogs?

Twenty years ago or so, because of uncertain supplies, plants were organized so as to give very flat average cost curves. This was particularly true, according to industry observers, when plants were designed to kill either hogs or cattle. These plants for the most part are no longer in use. But even so, plants still must be designed so as to be able to deal with large fluctuations in supply.

This gives rise to the cost curve ATC1 in Figure 1.6. But if long run supply were stablized, in accordance with long run costs of production and demand, much more specialized plants could be built. With assured supply it would be theoretically possible to construct a plant with the cost curves shown by ATC2 in Figure 1.6.

Figure 1.6.



If managers could be assured of a supply which varied only between A and B, they could build a plant with much lower unit operating costs than the one designed to handle a larger supply variation. It should be added that this argument follows logically from the neo-classical assumptions about U shaped average cost curves.

Some packers do deny such savings saying their plants are designed so as to move about the same volume of meat

through the processing or manufacturing lines, leaving all the variance to fall on fresh products. Processed meat (ham, lunch meat, etc.) nearly always provides a larger margin than fresh products. Normally about seventy per cent of the hog winds up processed. But when supply is large, price is low and margins are wide, companies up their kill. Since they always try to operate the process portion of the plant at rated capacity, it is the output of the fresh product that is increased under that situation. Likewise when supplies are tight and hence margins are narrow, a large percentage of the hog goes into the processing lines.

So, from a theoretical basis, small economies could be accomplished from smooth flow of product. But it seems that even larger economies could be gained if, because of dependable supplies, plants could be designed so as to handle an extremely small variation in the number of pigs processed.

Point three concerns the idea that a high price variablity creates a high price image in the consumer mind, according to Brunk (Schneidau and Duewer, 1972). With stable prices, the average number of units purchased are more than with variable prices. If Brunk's hypothesis is correct, then reduction in the amplitude of the hog cycle will mean that demand would shift outward.

A real market in forward contracts, particularly if it were computer operated, would give farmers access to

more processors. That this usually results in price enhancement for farmers, is the benefit claimed from point four.

Markets with few buyers can adversely affect the price farmers recieve. Love and Shuffett (1966) found that, when one or two main hog buyers dropped out of the Louisville Terminal Market, prices there declined twenty-two cents per cwt. relative to Indianapolis, and 22.6 cents per cwt. relative to Chicago.

The electronic spot markets that have operated in various parts of the country have increased hog prices on the order of one dollar per cwt. in Ohio, three dollars per cwt. for feeder cattle in Texas and about ten dollars per cwt. for lambs in Virginia (Henderson and Holder, 1982). Obviously a PCM would not be unique in its ability to increase the price with a thicker market. It is interesting to note that these numbers cast doubt on Baumol's (1982) theory of contestable markets. It is Baumol's contention that wherever there are no entry barriers, ologopolists or even monopolists will perform essentially as they would in a competitive market.

The idea behind point five is that by making direct connections with packers, a PCM would eliminate some cross hauling that is now being done. To the extent that the animal would arrive more directly at the abattoir, shrink would be reduced. But, even more importantly, a PCM could give long range price signals about where production should

occur. If spatial prices for hogs are accurate, the difference in production costs will be reflected from different geographical locations, as will the difference in regional demands. Rizek, et al. (1965) among others indicated that this has not happened.

Spot prices should give off at least some of this information now about where to locate production. If a plant in one geographical location is consistently paying a premium to get the hogs it needs, over the long term the message will get out that it might be more profitable to raise hogs there than someplace else, all other things being equal. But day to day fluctuations do not really give that information in the same way. A jump in price at a country slaughter facility may only indicate that there is a temporary bottle neck and the company is desperately trying to fill its kill schedule for the week so it can avoid paying its butchers for doing nothing.

With point six, the claim is made that, to the extent that there are redundant collection points and underemployed order buyers etc. in the system, a PCM could increase efficiency. Here again this is not an advantage that would be unique to a PCM but rather would accrue to any more efficient market schema. If a PCM did eliminate some subsector participants' functions, these people would obviously resist the institution. Unneeded order buyers would fight a PCM, as would managers of buying stations and auctions who felt their market power being eroded.

But many of these operations would still be needed for assembly points and nimble managers could successfully integrate themselves into the new system.

The idea behind point seven is that price signals from contracts would give clearer indications of the kind of product the consumer wants. As noted, the kind of hog that is produced has changed, becoming ever leaner. But there are constant arguments about whether the hog that the market really wants is being produced. But, contracting would give even clearer signals to the producer. In the spot system, a packer can not change the quality of hogs that are immediately available by paying more for them. Therefore, there is some incentive to cover up and try to get the quality hog for less than its relative worth. Several packers who were interviewed said this. Studies have shown that high quality hogs are underpriced. This, of course, delays the move to high quality hogs. But, if a packer could actually change the quality of hog by paying a higher price, as is the case in a contractual situation, then incentive to cover up would be less. Here the packer could have an immediate effect on the system. Of course, to make such a system effective, improvements in grading methods and standards would have to accompany the PCM.

The claims for point eight are not large. A contracting system probably would not greatly increase the rate of technology adoption when compared to the present system. But to the extent that price signals are improved,

it would give off better information about whose technology is producing products that the market wants. Further, if risk is lowered, there is at least some probability that technology adoption will increase.

Point nine deals with interseasonal variation of hog supply. In addition to a cycle among years, there is also a cycle among months. Since demand varies within the year and production costs are also different at different times of the year, it is desirable that production changes from month to month. Contracts could give clearer information about when packers want hogs during the year and how they would like the weight of them to vary.

That information is present now in cash markets, but not in a timely fashion. There is nothing anybody can do about the number of hogs ready for slaughter tommorrow. It is true that price premiums or discounts can increase the number of heavy or light hogs somewhat. But farmers could be much more responsive to the needs of packers if they had advance warning of what the market needs in terms of weight.

Summary:

The pervasive uncertainty in the hog subsector makes planning extremely difficult. It also means less capital is available to it than otherwise would be. The fluctuations result largely because of periodic over and under production and not because of changes in demand.

A Pork Contract Market (PCM) could reduce the uncertainty by producing a more reliably anticipatory price. In addition to dampening the cycle, a PCM could improve coordination in the system by reducing transaction costs. A PCM would transmit clearer signals than current spot markets about the kind of product needed and when and where it is desired.

The next chapter will take a look at how the current subsector structure has come to be. With that understanding, it should be easier to undertake to introduce a PCM, if that is deemed a desirable course.

CHAPTER II

THE EVOLUTION OF THE HOG SUBSECTOR

> But we all recognize that history has little relevancy to the future, except possibly in the mental block it establishes in our minds.
>
> Max Brunk
> Agricultural Economist
> 1972

Inexorable but Controlled Change:

Deep in Lily Cornett's woods in Letcher County, Kentucky lies the remains of a valuable hog production system. Maybe even as valuable on a square foot basis as Bill Pridgeon's 10,000 head a year total confinement facility in Branch County, Michigan.

Pridgeon's production system is valuable because it can produce a great deal of pork. Cornett's is only valuable because it is made out of an extremely rare furniture wood, wormy chestnut. It is more than 50 years since any hogs came out of his system. Cornett's system still exists only because of his cussedness.

When the industrial revolution finally came to that part of Kentucky, Cornett stood in its way. Cornett, a

latter day arch-druid, refused to allow any of his trees to be cut. He went about in rags rather than sell his beloved woods. As a result, Lily's Woods is a state park and one of the few virgin timber areas in the Eastern United States.

The Chestnut blight which started on the East Coast got to Kentucky about the same time the loggers did. So while the loggers could not cut Cornett's chestnuts, the blight felled them just the same. Cornett cut the downed chestnuts and built shoat pens out of them. Cornett then turned his forest hogs into his woods each spring. The hogs spent the summer harvesting acorns and other mast. In the fall Cornett would throw a little corn into his shoat pens. The hogs would go into the pens to eat the corn. Cornett would close the gates and butcher the hogs.

Bill Pridgeon's hogs would not recognize an acorn if it hit them on the snout. Bill Pridgeon is raising hogs; the Cornett family is not. Both the Pridgeons and the Cornetts have been in their parts of the country for more than 100 years. The difference is, of course, that the Pridgeons chose to stay in the hog production business by following former Secretary of Agriculture Earl Butz's dictum: "Adapt or die."

Cornett would not have had much truck with Butz. He stuck with his system long after new market conditions made it uneconomic. And, his hog operation did die. But even first class farmers 40 or 50 years earlier were using the

system. However, the advent of better transportation and better breeds made such a system no longer competitive.

But Butz's dictum covers more than it exposes. A system's evolution is not some inexorable process that waits for no one and goes where it will. The evolvement is controlled by the institutions and technology we create. And in as much as neither technology nor institutional arrangements are predetermined, outcomes can be vastly different. Thus, while those who want to survive must adapt, it is the survivors who determine the adaptations that take place.

For instance, in Ontario, Canada, an entirely new marketing system for hogs was created during the 50's and 60's. The system apparently works to most participants satisfaction but it has been a failure when tried in other provinces. According to Ontario Pork Producer's Marketing Board sales manager, J.A. Rollings, it is successful because "we had a hog evangelist" who sold the system.

It was not easy to create this new market. Because truckers' and drovers', packers' and farmers' interests were different, they battled each other. The nature of the threats varied with the station of the participant. But sometimes things became heated enough that conflict moved beyond threats to property destruction (Bishop, 1977). Furthermore, interests were not the same within a group. So farmers were fighting farmers and packers were at each others throats. The creation of the market included

an ill-advised attempt by a splinter group to set up their own packing plant; a decision that involved the loss of more than two million dollars and probably included some fraud.

But the centralized marketing system did get off the ground in 1960. Now, all hogs marketed in Ontario are sold on a teletype system under a uniform grading system. C. W. McInnis, by all accounts, was the man who made that system possible. This "hog evangelist," apparently by force of personality, created it. But before the system was up and running, he had become so dissatisfied with some of the compromises that were necessary that he resigned from the marketing board.

It was McInnis who led the ill-advised splinter attempt and in doing so he and others apparently got taken. It is doubtful that the well trained bureaucrats who run the board today would ever be taken in the way the splinter group was. However, it is also likely that today's bureaucrats do not have the color and fire necessary to create the coalition that forged the current marketing system in Ontario. That is, the marketing system in Ontario was not the result of an inexorable process. In came into existence because the teletype was invented, which allowed remote sellers and buyers to be connected, and because those buyers and sellers agreed to new institutional rules. The most important rules were new grading standards and sales by description, which allowed the creation of a new market.

It exists because one person spent years on the road building the coalition that could meld the technology and institutions together so that a new market could be created.

When one reads contemporary accounts of the changes that the rash upstart Iowa Beef has forced into the meat system, one would think that it was the first time there was ever radical change within the meat subsector. It is true that Iowa Beef, which was formed in 1960 with a $300,000 loan from S.B.A., has taken some of the most venerable companies in the industry to the mat. Swift, for instance, decided that their packing operations could never meet their long term profit objectives either in terms of size or dependability. So the packing operations were sold, even though Esmark, Swift's parent company, still owns minority interest in the new packing company, Swift Independent.

Iowa Beef probably did pin Swift to the mat with their innovations and lower labor costs. But 100 years ago Swift was forcing changes into the system of a larger magnitude than anything Iowa Beef ever did. It is left to the reader to decide whether this process of innovation and obsolescence is as Schumpeter (1950) described it. But it requires little thought to conclude that the subsector is in constant change.

When G. F. Swift started shipping Western dressed beef in refrigerator cars that kept the meat fresh, he revolutionized the packing industry. Until that time only

live animals were taken into the Eastern market. His approach made a lot of investments in human and physical capital worth a lot less than they were prior to his innovation. Butchers and others tried to stop the innovation but, of course, were unsuccessful.

The point of all this is that marketing and production systems grow out of a complicated weave of technical and institutional factors. Schmid (1978) rightly contends that it leads to poor analysis to think of markets and government separately. But equally important are non-governmental institutions and technology, a situation which Schmid recognized but perhaps does not stress enough. A market will exist once the interplay of those variables is established. But as the coefficients of the variables and even the variables themselves change, the market will change and prices will change. Price, therefore, is a normative and not positive concept.

Thus, whatever the current market is, it exists because somebody tampered with institutions or technology so that the anecedent market was replaced or altered. The well-schooled analyst must be careful not to fall into the trap of thinking the market is a divinely ordained mechanism that exists in response to natural law. The market is whatever people create through their technology and institutions. Once those are in place, prices and income streams will emerge. But the performance outcomes are a result of a weave of positive and normative information

and the technology and institutions that we have created from that information. The income distributions that emerge from this are inevitable. But since the distributions are not from holy writ, it requires thinking about whether the performance we get is what we want to encourage.

The careful analyst refrains from taking a sanguine view of the market organization just because it is there. Likewise change must be recommended only with extreme care. This is for several reasons. First what is there got there because the community or at least a segment of it decided that such an organization elicited behavior that led to desirable performance, or at least performance that benefits them.

Secondly, a change may be undertaken without resulting in improved performance. This Type II error obviously should be avoided because it needlessly visits costs on subsector participants without giving any benefits.

Finally, nearly all changes involve at least some pareto non-better changes. Economics offers help in determining the direction of these changes. That is, what are the costs and benefits? But economics does not offer much help in deciding which distribution is best. Philosophy, with a greater understanding of the normative, offers a little more help in the distribution area. But such recommendations will always be somewhat subjective.

Even if the judgment is made that the change will lead to an improved performance, there is still a problem in

deciding whether to proceed. That is, will those negatively affected by the change be able to resist the change so the improved performance does not occur?

Since no market has a divine imprimatur, the careful analyst is always left with a dilemma when making policy recommendations. S/he must carefully weigh who wins and who loses under the present or alternative set of rules or institutions. The question is always what will performance be, given this situation of institutions and technology? Who will win and who will lose?

A Role for History:

The sense of constant change in pork marketing can be gained by looking at its history. Agricultural economists now sometimes overlook this important area because as progress in quantitative economics has been made, it tended to debase historical approaches. This is good to the extent that the tedious timelines have been eliminated. But now, unfortunately, many agricultural economists would not argue against Max Brunk's view, which was cited at the beginning of this chapter. These views are but a variant of Henry Ford's dictum that: "History is bunk."

Agricultural economists have written little about marketing in a historical context. Agricultural historians, on the other hand, have not been all that interested in marketing processes, or else lacked the training to

understand them because there is little analysis of such in their writings.

Unfortunately when agricultural economists do write about history it often comes out like a chronology or time line. And for such chronologies Henry Ford may well be right. One may well know when the Battle of Hastings was fought, but so what?

Such episodic or anecdotal history does not inform us in the sense that it helps us think about the future. Clearly it is not necessary to have a knowlege of history to be an agricultural economist.

The ability to fit a regression equation is not affected because the agricultural economist does not know who Henry Wallace was. This is true even though Wallace caused major changes in the supply function of corn. But surely an agricultural economist familiar with the process of technology diffusion in the case of hybrid corn might better be able to deal with similar processes elsewhere.

Further, agricultural economists could substantially improve policy analysis skills, particularly with respect to finding relevant variables, if they were familiar with history within a framework that focuses on why the performance outcomes occurred.

This view of history allows us to see how dynamic markets are. If we change institutions or technology, markets will change automatically, all other things being equal.

This point is made clear, by J. W. Thompson (1942). Thompson, a disciple of Fredrick Jackson Turner, builds the case that frontier livestock raising was not much different regardless of where the frontier was or how much time separated it from a previous frontier. Thus, livestock raising in the 1760's in the Carolina Piedmont was not much different than in the 1880's in the Great Plains. That is because the institutions and technology available to those two geographies and times were not widely different. And, apparently people reacted to that technology and those institutions in a very similar manner even though they were separated by 120 years.

Jacob Bronowski (1973), the mathmetician-philosopher, argues that what we call civilization is built on the backs of those who have gone before. Mitroff and Pondy (1974), Kemeny (1959), and Popper (1959) make the same argument, if somewhat more obliquely, about the evolution of a paradigm for a community of scientists.

Kuhn (1970) notes that "in one sense a paradigm stands for the entire constellation of beliefs, values, techniques and so on shared by members of a community" (p. 175). This definition is not greatly different from C.J. Jung's definition of myth, which he says is what a society uses to explain why things happen.

Kuhn does argue, wrongly I think, that a new scientific paradigm is not necessarily related to the paradigm it replaced. The scientific paradigm, which he defines as

"the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for solution of the remaining puzzles of normal science." Kuhn argues that when a paradigm no longer works to solve a puzzle then a new one will emerge which may not have any relation to what has gone before it. Kuhn does not make his case well here.

Bronowski (1978) gives a much more satisfactory evolutionary view of scientific progress. He acknowledges that there is almost no scientific theory from the 1860's which we hold to be true today.

This is because of the way we must do science. Any theory is full of simplifications or provisional decodings that are lies because they deny the interconnectedness of all events in the universe. But trying to encompass completely such interconnectedness means we could have no theories or be able to analyze anything. Because of our finite capacity to comprehend, we must pretend that such interconnections do not exist. But anyone who believes that events are not random and that we can understand their causes is willing to take the leap of faith that we will be able to produce future theories that even better take account of the interconnectedness of events.

Bronowski (1978) is assuredly one of the optimists. He writes:

> Now such decoding can certainly lead to good laws. If what we judge to be irrelevant is not very relevant, they will be good laws. But it does not follow that they give you the conceptual

> picture of what is in the world at all. And essentially the reason why we have made such enormous changes in our conceptual picture of the world in the last seventy years is because we have had to push out the boundaries of the relevant further and further. Every time we do so, we have to revise the picture totally. Now there is nothing to help us in the decoding. We have to do it in the same way that we invent any word in the human language -- by act of pure imagination (p. 52).

Old theories are discarded only when facts, previously deemed irrelevant, make plain flaws in the theory. A new more powerful theory is developed to explain better the interconnectedness of the world. The new theory may be unlike the old one but the evolution is nearly always apparent.

Now it is foolish to appropriate wily nily natural science models for social science. It has sometimes been done inappropriately because of the progress natural science has made. Natural processes are not social processes and natural science is not social science. Social science must deal more consistently with the normative than natural science. This is true even though any natural scientist, who has thought about it, knows that much of what s/he does can be done only with normative input.

But the appropriation here, to a limited extent, seems apt. That is, markets also appear to be evolutionary in development, just as natural science models evolve in an evolutionary fashion.

Surely one must deal with many more normative "facts" when analyzing a market than when looking for a "natural"

law -- although there are certainly normative aspects of that search. Any market structure is heavily dependent on normative values because of its institutional component. That, prima facie, means that any market structure is corrigible. History is vitally important if one is to understand how markets evolve.

The Research and Conceptual Model Used:

This research is undertaken because of marketing problems in the hog subsector. As such, it is problem solving and interdisciplinary. The framework for the analysis will be the structure- behavior-performance model that Shaffer and Schmid have expanded, but which is a historical descendant of the industrial organization school of thought (Mason, 1939; Bain, 1959; Clark, 1961; Scherer; 1970).

Structure defines: 1) Property rights of individuals, firms and communities; 2) Jurisdictional boundaries or what institutions, technology, people and communities are included, and; 3) Rules for making rules. Behavior comprises the reactions of people and communities to the structure. Performance describes the outcomes given reactions to structure.

In practice it is not possible to always keep the boxes of the model completely separate. For instance, performance rewards might alter behavior, which in turn lead to new ethical standards. This in turn causes a vote to be taken altering property rights, which in turn changes performance.

The market in this research, in a general sense, is comprised of any non-administered or non-integrated system which exchanges goods and services. More specifically in Marion and Handy's (1973) definition:

> The market provides coordination of the economic activity of private enterprises by presenting alternative profit incentives associated with producing the products (and services), organizing their production in different ways, and employing various resources (p. 8).

In the next section it is hoped that a cusory history of the pork subsector will make clear the constant but evolutionary change taking place in the subsector and from this evidence an understanding will grow that a market is not due to some natural law. It is there because it was created by the community.

A Thumbnail Sketch of the Pork Subsector:

By looking at history, one can begin to get some idea of how often the marketing of pork has changed, and how wrenching those changes sometimes were.

Pork has always been an important part of the American diet. Pigs were brought to the Americas by Columbus on his second voyage (Bennett, 1970). Some Spanish explorers even drove them along on their expeditions. Hernan de Soto drove 700 head all the way from Florida to near Fort Smith, Arkansas where he "departed this life the magnanimous, the virtuous, the intrepid captain . . ." His pigs were sold at "public outcry." It is not recorded whether the auction

was Dutch or English or whether system participants had roughly equal amounts of market power (Lewis, 1907).

Early markets in Boston, New York and Philadelphia all used administered prices. In New York, for instance, all meat and produce was supposed to move through the central market. Selling outside this market was illegal. In 1763 a butcher could be fined for selling pork for more than nine cents a pound. All farmers had to sell their pork though the butchers who had paid for stalls in the public market. Whether the administered price was a market clearing price is unknown, but a clamor later arose to do away with the stalls which were sold for prices of up to $2,600 (Devoe, 1867). Henry Cornell opened a butcher shop in 1829 outside of the market. He was fined repeatedly until a law was passed in 1843 making such butcher shops legal in New York. Of course, at that point the owners of the stalls in the public market place had a pecuniary externality visited upon them.

In Boston, until the creation of Faneuil Hall, market was held three days a week. Prices were set and farmers complained that the three day operation created an uneven flow of goods to the market. The laws supporting price regulations were eventually repealed.

In colonial times, pork was more widely consumed than beef and generally sold at a higher price. Pork lent itself to preserving better than did beef and so was generally more in demand. Beef preserving techniques were not yet

well developed. Corned beef at that time was new technology but since Manhattan deli's were not yet featuring the product on rye, there was not a strong demand.

Barreled pork was important for the shipping and West Indian trade. New England at first captured this trade. But soon other areas of the country with comparative advantages became the major production areas. Beef, and to a lesser extent, pork raising were primarily frontier activities. By the Revolution, New England had largely lost out on production except for that which was done to satisfy local demand. Production moved to the middle Atlantic states and by the early 1800's the center of hog production started to move into the Ohio Valley (Wentworth and Ellinger, 1926). By 1840 the center of hog production was already in Kentucky and moved progressively westward to Iowa thereafter.

This westward movement created a problem. Production was far from the population centers. Railroads were only beginning to be built and did not yet extend into the Interior. Canals were in operation, but not very practical for the transporting of large number of livestock. Canals were used for transporting barreled pork but even so the Mississippi was a far more important transportation resource. For instance, in 1839, an average year during the heyday of canals, only 23,667 barrels of pork moved into Buffalo on the main northern canal, the Erie. While on the Mississippi River, the city of New Orleans received 197,800 barrels (Leavitt, 1934).

This difference was because the canals were basically north of the major production centers in Ohio. And, most of the butchering operations were located along the Ohio River, which, of course, connects with the Mississippi. Large scale commerical packing occurred only during the winter. Cincinnati, which became known as "Porkopolis," was ideally located for such production. It was cold enough to cool the carcasses but not so cold that the carcasses froze before preservation.

Before Cincinnati became a packing center, producers in the interior of the country had a very difficult time transporting their product to market. During the first half of the 19th century, many midwestern and mountain producers found it easier to drive their hogs east. It is common knowledge that cattle were driven, particularly in the West, after the Civil War and through the 1880's to the rail terminus points in Kansas. But apparently great numbers of hogs were also driven out of the Ohio Valley and southern mountain states to the eastern markets. Hog driving occurred mostly prior to the Civil War, but in parts of Tennessee lasted until the 1880's (Wentworth and Ellinger, 1926). The eastern markets were markets in the sense that products were exchanged, but there still was not any good price discovery mechanism that assured negotiation to an efficient price. Communications were so slow that speculators could sometimes meet the drovers a number of miles from the intended selling point and buy

their hogs at prices well below the price in the nearby city. Or sometimes when they could not take advantage of this impacted information, the speculators would buy enough hogs to slow the flow to a particular area and drive the price up. Since price discovery mechanisms were not well developed and technological aids to communication were non-existent, information was hard to come by.

Drovers took hogs across the Alleghenies to the eastern markets. Kentucky and Tennessee hogs went into Virginia and the Carolinas (Clemen, 1923). But hogs were also driven out of the central plains states into Chicago. There were apparently three main routes out of the Ohio Valley. The routes were later followed by the Pennsylvania, Baltimore and Ohio, and New York Central Railroads (Fowler, 1961).

Herds as large as 5,000 hogs were trailed along the turnpikes. The drovers of these large herds bought and assembled the animals locally and then drove them to market, making money on the difference between the local selling price and the market price.

Exactly how price was determined apparently was not given much thought. According to one drover from the French Broad River of Tennessee, the price of hogs was always half the price of cotton. The drover would buy so as to try and make two dollars a cwt. Cotton price, according to one drover in South Carolina, would fluctuate between fifteen and twenty cents a pound so that the price of hogs varied between $7.50 and $10.00 per cwt. in the period after

the Civil War. Hogs driven into South Carolina were apparently bought by, among others, cotton plantation owners.

This look at history offers, at most, a tenuous explanation for the relationship of the price of hogs to cotton. But it is obvious that problems of formula pricing are not a new phenomena.

Hogs could be driven a surprising distance each day -- eight to ten miles (Burnett, 1946). This compares to the ten to twelve miles a day cattle were able to cover (Fowler, 1961). But it was often more than a month between the time the hogs were bought and the time they were sold at market. The price of cotton, of course, could drop more than two cents a pound during that time, thus wiping out the drovers' profits.

Drovers hired drivers to help them move the hogs. There was usually one driver to about a hundred hogs. The usual size of a drove was about four to five hundred hogs, with the drivers spaced appropriately and each carrying whips which they cracked over the herd to direct it.

During the hog driving season in the fall, there would be so many hogs that other traffic on the so-called turnpikes slowed to a trickle (Burnett, 1946). Inns were spaced at intervals of two to seven miles along the road with holding facilities for hogs. Some of these facilities could feed and hold as many as four thousand hogs. Drovers, who were usually men of means, got fairly commodious and

private accommodations in the inns. The drivers however slept three to a bed or sometimes on the floor in front of a large fireplace.

Such trailing of hogs continued in the Tennessee area until the 1880's, but elsewhere died much earlier when railroad transportation became a practical alternative. But, while it lasted, large numbers of hogs were moved over the highways.

It is estimated that as many as 160,000 hogs would be driven through Ashville, South Carolina in a single year (Burnett, 1946). As many as 82,000 hogs moved through the Cumberland Gap in a year. At a turnpike gate on the Cumberland River, 105,000 hogs moved through on their way south. This is not so amazing when one realizes that in 1840, Tennessee was the top hog producing state in the nation, with more than three million animals. For comparison, Tennessee is now usually about thirteenth or fourteenth in hog production among the states.

By the 1850's, hog production was no longer moving west at the pace of cattle production. Hog production had found its home in the corn belt and by 1860 the razorback, or woods hog, was all but gone, save in isolated pockets (Thompson, 1942).

Cincinnati continued to be the largest packing city, but its ascendancy was not to remain long. Already Illinois River packers were springing up because of production in the area. Until the railroads, Chicago was not really an

important factor in the packing industry at all. But with the railroad, Chicago began to be able to assert its advantage. To get products, Chicago packers paid a little higher price than did downstate packers. As long as there were some farmers reluctant to drive their hogs to Chicago, the downstate packers could get away with paying a lower price to procure products. But, with the coming of the railroad, every farmer in the area had access to the Chicago market. As late as 1850, Beardstown, Illinois packed more hogs than did Chicago. But as soon as the downstate packers were forced to pay the same price as Chicago did to procure hams and bellies, they started going belly up (Clemen, 1923).

Between 1853 and 1854, Chicago hog slaughter doubled. And, by 1862 it became the hog butcher capital of the world, surpassing Cincinnati for the first time. A technological development that was pioneered in Cincinnati ironically helped Chicago consolidate its grip on the number one slaughter position. In 1855, a Cincinnati packer "modeled his entire packing room on the principle of a household refrigerator" (Cummings, 1949). This allowed the packing season to be extended. Formerly packing was done only during the winter when carcasses could be cooled rapidly so as to prevent spoilage before the beginning of preservation.

But ice packing caught on in Chicago because of a more plentiful supply of natural ice in the area. By 1864 it

was pretty much the standard operating method for Chicago's 58 packers who were slaughtering more than one-half million head of hogs a year. Packing was still not a year round process but this development greatly expanded the operating season. The development assured Chicago's dominance of the packing trade until transportation in the 1920's again altered packing patterns.

As Chicago became the packing center, stockyards sprouted everywhere. Railroads had their own, as did packers, and there were even some privately owned stockyards. For the first time a somewhat competitive large volume market existed, but it was difficult to get price information with yards spread out all over town -- to say nothing of the inconvenience when drovers had to take their herds between stock yards. Packers, drovers and dealers all wanted better accommodations. The railroads finally agreed that everyone would be better off if there was a centralized stockyard. In 1865, the Union Stock Yard and Transit Co. was created by the Illinois legislature. For the first time a market for hogs capturing most of the characteristics agricultural economists think desirable was created in this country.

In his mostly admirable, if somewhat obsequious history of the packing industry, R. A. Clemen (1923) claims the stockyards emerged primarily because of the development of the railroads and the creation of a new institution, the commission houses.

The stockyard company, the commission firms and the packing companies were all necessary to develop the livestock market, in Clemen's estimation. They all came together, he believed, because the Civil War forced them together. A tremendous demand for product was created and the supply arose to meet it.

After the success of the the Union Stock Yards, other such terminal markets quickly sprang up around the country. Terminal markets remained the pre-eminent way to market hogs for the next seventy years.

Although nearly all stock yards did require that farmers be allowed to sell their stock themselves, without the assistance of commission firms, few farmers ever availed themselves of this opportunity (Davenport, 1922). The evolution of the system meant specialized commission firms could do a better job of selling hogs than farmers could do. It was the creation of the commission firm, which could represent farmers, but yet handle business with packing firms in a routine manner, that allowed the creation of the terminal markets (Clemen, 1923).

Originally, all selling was done by inspection; there were not even official USDA grades. Through the 1920's the trade believed that hogs could not be sold by grade because "there is such a wide range in kind, quality and condition, that practical live stock market men believe it would be impossible to grade it with sufficient exactness to induce the public to buy without personal inspection" (Davenport, 1922, p. 100).

All of the slaughter hogs at the terminal markets were sold by private negotiations. Buyers for packers would approach the commission salesmen and try to make a buy. Since it was a large centralized market, price was generally well known and the commission firm would try to hold firm or move the price upwards, depending on how the firm judged market strength. In the early terminal markets it was difficult to know how strong the market was because there were not organized sources of information. Of course market papers like The Provisioner and the Drover's Journal soon arose to help meet this need.

The USDA started reporting prices in 1911 but it did not officially adopt grading standards until 1952. Prices now are reported on an average basis for Nos. 1, 2, and 3 grade hogs. This, of course, means that it takes knowledge of market conditions to know what a load of exclusively No. 1 hogs is worth.

If a deal is consumated, USDA collects the information and mingles it with the other sales price information. These trades then become the basis for the market reports from seven public stock yards which hog farmers so eagerly listen to on their radios. But whether these markets are any longer representative is a matter of some debate among economists (Hayenga, et al., 1980). Volume has been dropping precipitously and the public stockyards are closing as new market mechanisms supplant their function. The granddaddy of all the markets, The Union Stock Yards in

Chicago, closed in 1970. The defunct Cincinnati terminal market has been purchased by just one packer for use as assembly and holding pens. But, we get a little ahead of the story.

Immediately with the creation of the terminal stockyards, and further technical progress in the packing industry that allowed year round operation, there arose an argument whether there were too many middlemen with each taking a cut of the action and forcing up prices. As the argument ran, it made no sense to ship a live hog into Chicago from Iowa City, butcher it, can the ham and turn around and ship it back to Iowa City (Davenport, 1922). (Meat canning first became safe around 1880. Mechanical refrigeration made year round operation feasible in the 1890's.) It is an argument that continues today in many forms and was extensively analyzed and reported by Stewart and Dewhurst (1939) in their book Does Distribution Cost Too Much?

But the fact is that packing stayed close to the central markets until packing and transportation technology made it possible to operate slaughter plants away from the central markets. Until the the heavy duty semi-truck became practical in the 1920's, and hard surface roads spread over the country, packers had to be located near rail and water transportion. But the truck broke that marriage of terminal market and abattoir. In the second decade of the century, packers began to move their operations away from the central

markets. This, of course, led to the gradual decline of those markets.

Changes in Government Regulations:

While changing technology was causing the decline of terminal markets, the packing industry itself got in trouble for failure to provide a safe healthful product.

The industry, with its centralized processing plants came into existence basically in the twenty years after the Civil War. The fifty years from 1870 to 1920 was a period of incredible technological progress. Despite contentions that today we live in the most rapidly changing age (Toffler, 1970), between 1870 and 1920 the way people lived was probably changing much more rapidly. To confirm this, think about how different the world today is from fifty years ago. It is certainly very much different. But surely 1930 and 1980 are much more alike than were 1930 and 1870. The primary difference between now and 1930 is the speed at which things can happen. Between 1930 and 1890 technology completely altered patterns of living.

The changes were occurring so fast that government failed to keep up with them. Until 1890 there was no federal inspection of meat plants. Then Congress passed the first law requiring that meat for export pass certain inspections. In 1891 and 1895 consumers were partially protected by laws requiring that animals be disease free

both before and after slaughter. However, the conditions under which meat itself was packed were not supervised.

Men, like P. D. Armour and G. F. Swift, who created the pork and beef packing industry, ranked with the major bankers and industrialists of the day. Like Andrew Carnegie and J. P. Morgan, they helped create an industrial engine that powered the nation's growth. But, also like Carnegie and Morgan, Armour and Swift allowed their engines to be built in such a way that both unsafe products and unhealthful working conditions sometimes were produced.

Their singleness of purpose stood them in good stead when it came to creating these industrial machines. Said P. D. Armour: "I do not love money. What I do love is the getting of it . . . What other interest can you suggest to me? I do not read. I do not take part in politics. What can I do?" (Williams, 1969, p. 110).

But the singleness of purpose did not always serve those employed by the packers or those who consumed meat as well. The investigative journalists of the day started an attack on the meat industry. These muckrakers, who did not try to maintain an attitude of what is now known as objective journalism, probably had more effect on the packing industry than any of the industries they attacked.

When novelist Upton Sinclair's The Jungle appeared in 1905, a ground swell of public indignation arose. Sinclair wrote the novel after living briefly in Chicago while investigating the meat industry. In his novel,

Packingtown was an extremely unhealthful place to be and it produced unhealthful products.

Sinclair was a socialist whose frank aim was to restructure the capitalist system. Instead he, among others, helped restructure the way meat is processed in this country. He often said that when he wrote his novel he "aimed at the public's heart but hit its stomach instead" (Williams, 1969, p. 624).

Some of the "Jungle" passages, while generally panned by the critics as poor literature, make riveting reading none the less. This passage was not intended to make flakey lard based pie crust go down easily. Wrote Sinclair:

> Worst . . . were those who served in the cooking rooms in . . . which there were open vats near the level of the cooking floor, their peculiar trouble was that they fell into the vats, and when they were fished out, there was never enough of them to be worth exhibiting -- sometimes they would be overlooked for days till all but the bones of them had gone out to the world as Durham's Pure Leaf Lard.

Sinclair's attack was undoubtedly overdrawn, but his concern was well placed as later government reports showed.

After the appearance of the novel, President Theodore Roosevelt sent a two-man investigating team to Chicago. The men, Charles P. Neil and James B. Reynolds (Congressional Record, 1906), found conditions that were only slightly less deplorable than those described in Sinclair's novel.

Their report to Congress was not dinner table reading either. They wrote:

> We saw meat shoveled from filthy wooden floors, piled on tables rarely washed, pushed from room to room in rotten box carts in all of which processes it was in a way gathering dirt, splinters, floor filth and the expectorations of tuberculous and other workers . . . We saw a hog that had been just killed, cleaned, and washed fall from the sliding rail and slide part of the way into a filthy men's privy. It was picked up . . . (and) carried into the cooling room and hung up with the carcasses with no effort made to clean it . . .

They also saw unfit meat heaped with good pork " . . . and in the heap were even some bits of rope strands and . . . rubbish. Inquiry evoked the frank admission from the man in charge that this was to be ground up and used in making 'potted ham'" (Congressional Record, 1906).

When Roosevelt sent the Reynolds-Neil report to Congress, it resulted in the passage of the Meat Inspection Act of 1906 and The Pure Food and Drug Act of 1906. Those acts helped insure that processed meat was safe. However, inspection problems still occur in the industry as is amply documented by Welford (1972).

During this time the muckrakers aimed another attack at the packers for conspiring to create a monopoly. The populist spirit of the country was also giving rise to farm organizations that believed farmers were not getting a fair shake from the packers.

William Jennings Bryan's famous "Cross of Gold" speech at the 1896 Democratic Convention captured the spirit of the country well. Nearly anyone can describe the kind of cross on which Bryan did not wish to hang. But what is

not so well remembered is that it was more than an attack on big money gold interests and a plea for free silver. It limned the whole spirit of agrarian fundamentalism which was one of the central tenants of populism.

Said Bryan: ". . . the great cities rest upon our broad and fertile prairies. Burn down your cities and leave our farms and your cities will spring up again as if by magic; but destroy our farms and grass will grow in the streets of every city in the country."

This feeling built pressure for an investigation into possible collusion amongst the packing industry. An 1888 investigation concluded there was collusion. But a 1904 investigation, right in the middle of Teddy Roosevelt's trust busting activity, concluded there was no collusion.

However, in 1917, President Woodrow Wilson ordered the Federal Trade Commission to launch yet another investigation. The Justice Department concluded that the FTC report contained enough evidence to prescribe prosecution (U. S. Federal Trade Commission, 1918). That FTC investigation, no doubt, makes present investigators into price fixing envious. The packers approached price fixing almost without guile. The companies freely exchanged letters stating the per cent of market share each company was to get. Letters were kept on file admitting to an agreement to back off from aggressive bidding so as to reduce the price paid for livestock.

These price fixing letters covered the time period from 1915 to 1917 and were obtained by the FTC in 1917. This

collusion was less formal than that which occurred earlier, according to the FTC report. For most of the time between 1893 and 1902, which was after the passage of the Sherman Anti-Trust Act, the biggest packing companies had formal agreements on how territory was to be divided. Penalties were assessed if companies "exceeded (their) allotment in any territory" (p. 47). During some of that time, companies met every Tuesday in Chicago in a suite of rooms leased for that purpose. A Supreme Court injunction ended those collusive agreements. However, Armour, Swift and Morris immediately set out to merge all their operations and those of others into one large operation. They got so far as to spend about ten million dollars purchasing other operations. They made arrangements for a loan of sixty million dollars to finance the merger, according to the FTC report.

"All was going well until the head of Kuhn, Loeb & Co., foreseeing the approach of the 'panic of 1903' refused to put through the financial arrangements and advised against the merger at the time" (U. S. Federal Trade Commission, 1918, p. 48). The FTC also attempted to prove that price fixing existed because the packers all paid the same price. Everyone paying the same price is generally considered one of the conditions of a competitive market and economists working for the packers so pointed it out.

John M. Clark (1923) noted that both sides posited reasonable arguments, but then sided with the FTC by writing:

> On the general question the truth appears to be that the regular operation of a competitive market implies that some take the lead and others follow, and unless there is an appreciable interval during which the prices differ, it is difficult . . . for those who take the lead to gain any advantage by typical competitive tactics of raising prices for things they wish to buy or things they wish to sell. Thus the retarded action of the market which permits different prices to prevail at the same time is not really an 'imperfection,' as theoretical economics has been inclined to regard it. On the contrary, it is an essential requirement (pp. 417-418).

The FTC recommended that a large portion of the packers ancillary businesses, like refrigerator cars, stockyards, cold storage operations, and branch houses be nationalized. Those recommendations, of course, were never acted upon. But with the Justice Department threatening suit, the packers signed what has become known as the "Consent Degree," which sharply limited the kinds of business activity packers could be involved in.

The study also contributed to the passage of the Packers and Stockyards Act of 1921. This remains the primary regulatory law at the packing-livestock end of the industry.

The Packers and Stockyards administration was not aggressive in exercising the supervisory authority the act gave it over packers. Whether it was because of lack of funding or politics is debatable, but for forty years it confined itself to "routine regulation of rates and charges at stockyards and among terminal market commission firms and the handling of annual reports filed by firms covered by the act" (Williams and Stout, 1964, p. 636).

That failure led to an attempt in 1957 to take away the administration of the act from the USDA and give it to the FTC. That was because, according to Senator Watkins, the USDA had "not effectively administered (the act) for thirty-odd years" (U. S. Congress, 1957).

Instead the act was strengthened by lifting Packers and Stockyards to division status in USDA and increasing appropriations. The division then placed its major emphasis away from the stockyards towards the meat packers.

The law prohibits packers from engaging in: 1) Unfair or discriminatory practices; 2) The giving of unreasonable preference to any party; 3) Agreements on market share with other packers, and; 4) Agreements to fix prices or following business practices that would allow manipulation of prices.

Those believing they have suffered loss because of violations of the act may file written complaint with the Packers and Stockyards asking for redress. P&S is then required to carry out an investigation of the matter.

Development of New Systems of Exchange:

As noted, as packing plants started to move into the country, the terminal markets started to decline because farmers no longer needed to move their hogs through the markets in order to make connections with packers.

Auction markets started to make a comeback in the country when the terminal markets started to decline. By 1920 auctions had all but died out. But, from 1920 until

1950 their numbers grew from almost none to nearly twenty-five hundred. The numbers have been declining since but there are still about two thousand auction markets (McCoy, 1979). They are an extremely important market outlet for hog farmers. The volume that moves through them is geographically dependent. They are used extensively for hog marketing in the South and also in the Rocky Mountain area. Records on total number of hogs moving throught the auction system is not kept. But in 1980, packers acquired 9.9 per cent of their hogs through auction markets (Packers and Stockyards Resume, 1982).

Auctions were one of the first price discovery methods used in this country at fairs and other regular events. But, at these events in the early 1800's, information on other markets was nearly non-existant. Now at any auction buyers and sellers are keenly aware of what the price has been at competing markets. The telephone auction has been or is being used to sell hogs in Virginia, Missouri and Wisconsin.

But even though country auctions are well used, terminal markets have remained the primary price discovery mechanism. Economists have lamented that with the decline of the terminal markets there was no longer an adequate price discovery method (Hayenga, et al., 1980; Paul, 1982; Houck, et al., 1978). The history of the terminal market may lead us to question whether the terminal markets, even in their heyday provided the golden age of price discovery.

Recall, for instance, that at least during some of this time, editors of the National Provisioner got payments from the major meat packing companies. The Provisioner was one of the publications relied upon for price information. It was never shown that these payments influenced price reporting, but they constituted a clear conflict of interest. Regardless of that question, as packing plants dispersed thoughout the area where hogs were grown, new marketing methods began to develop.

Contracting:

Contracting until recently has never been very successful in the pork subsector. A contracting program of sorts was tried in the 1920's, in an attempt to give midwestern producers access to eastern processors. But it was not really a forward deliverable contract in the sense that there was a substantial delay in delivery from the date the contract was agreed upon.

In Columbus, Ohio, the Eastern States Co. moved as many as one hundred thousand hogs a year through what was called the guaranteed yield program. Eastern States assembled farmers' hogs and guaranteed that they would dress out to a certain yield. The hogs were weighed live at assembly point and a price agreed upon. If the hogs did not dress out to the guaranteed percentage, the price was discounted. Farmers could also get a premium if the hogs dressed better than specified (Williams and Stout, 1964).

Farmers had to rely on packer honesty in reporting dressing yield. Market managers often mis-estimated what the hogs would yield and all farmers got the same payment per pound when their hogs were comingled with other farmers' hogs. For these and other reasons, farmers became dissatisfied and refused to use the program any longer. The program failed (Dowell and Bjorke, 1941). A properly designed contract would need to recognize these objections.

In the 1950's, there was some production contracting similar to what exists in the broiler industry. It was basically a southern phenomenon. In this study, production contracting is defined as a contract that includes control of inputs used in producing the product. A pork contract market would most likely not include production contracts.

In 1972, the president of Gold Kist, the extremely large southern cooperative that supplies chicken to much of the U.S., said it planned to enter the hog market in the same way it had entered the chicken subsector. It started an ambitious training program at a center were farmers were brought to learn proper methods of production. And it had its own production center to produce just the type of brood stock wanted to run through the processing plants (Schneidau and Duewer, 1972).

But instead of making the same progress it did in the broiler industry, Gold Kist spent the next decade making no progress at all. According to Gold Kist Vice President, Ralph Mobley, by 1981 it was trying desperately to get out

of the hog business. Gold Kist was closing down all its plants and selling most of the hogs under contract to a competitor, Swift.

"We felt we could go out and just do like we did with chicken. But we found it took too much money. We could put in twenty-five thousand chickens for a hundred thousand dollars. A 250 sow operation was costing us four hundred thousand dollars. And our farmers just could not get that kind of financing. The banker would not float it. We'd get out of it altogether if we could find a buyer for our production center," said Mobley.

In the Midwest, apparently never more than six per cent of the hogs were raised under production contracts (Phillips, 1961). When Bloomer (1975) surveyed the Michigan industry he found it virtually non-existent. Between 1960 and 1970, Mighell and Hoofnagle (1972) found that hog contracting in the U.S. increased from .7% of the production to 1% of the production. Although more recent studies of the amount of production contracting, as opposed to product contracting, done could not be located, it is not thought to have grown much recently.

As recently as last winter, the large Michigan packer Frederick and Herrud tried to enter into production contracts with farmers. It was a new departure for Frederick's, because they normally get most of the 14,000 or so hogs they need daily from livestock dealers. They get almost none of their hogs from farmers and have had little direct dealing with farmers.

The Frederick and Herrud contract was supposed to cover five years. It had similarities to broiler contracts. The contract would basically guarantee that if the farmer met the contract conditions s/he would be paid the cost of producing hogs regardless of the market price. But the farmer had to meet some fairly stingent feed conversion ratios, pigs saved per farrowing crate, etc. If the market price was above the farmer's cost of the production, then Frederick and Herrud and the farmer split the excess 40/60.

Allen Scrotch, the manager of a Frederick and Herrud subsidiary that managed the contract sales, pitches the contract to farmers as a way of evening out the cycle. In meetings with farmers, Scrotch drew a graph of the cycle and circled the high point saying when that point is reached packers do not make any money because they can not move the product at rates necessary to cover their fixed costs. He then circled the low points and told farmers that they are not making any money there either.

"We can't live with this cycle as meat packers and processors, and producers can't live with it either," Scrotch told a not particularly receptive audience of farmers in Grand Rapids, Michigan in the Spring of 1982. Scrotch said that the wide price variation means that the Company sells less pork than it could with a more consistent price. The Company's goal, according to Scrotch, was to "take the humps out of the cycle."

That may have been a rather lofty goal for one company, but the Company definately could have reduced its

transporation costs. Many of the Company's hogs come out of Missouri and Iowa. Scrotch said the Company estimated additional costs of five to fifteen dollars a head, when shrink costs are included, to transport an animal from Missouri and Iowa to the slaughter floor in Detroit above those animals purchased locally in Michigan. Another Company officer later disputed this, saying that there was really very little difference in shrink of the animals when you compare "meat on the hook; the difference is all just (excrement)".

Whatever the case, no local farmers were apparently interested in the contracts. So Frederick and Herrud quit the effort to get about fifteen per cent of its production under contract.

Direct Marketing:

With the decline of the terminal market and the movement of packers into the country, marketing direct to the packer became popular. (Traditionally direct marketing has meant any selling that did not go through the terminal markets. It has now been expanded to include anything which does not go through auctions or terminal markets.)

Farmers now deliver direct several ways to packers. They can haul their hogs right to the packing plant if their operations are nearby. Packers have also set up what they call salaried stations or concentration yards away from their plants to which farmers may deliver. And packers

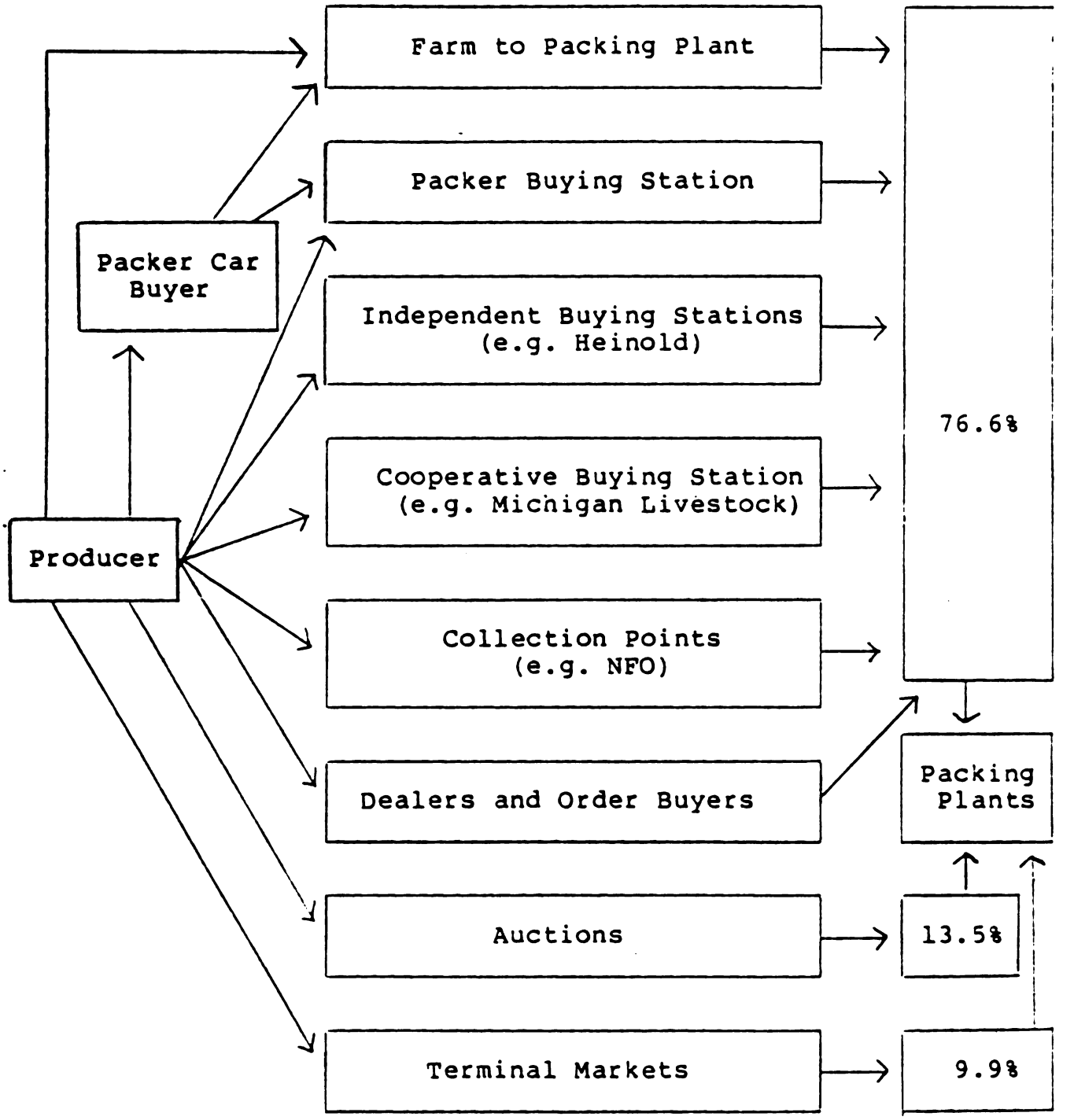
in some parts of the country have what they call car buyers. These are just buyers who go direct to the farmers operations to make arrangements to buy hogs.

Figure 2.1 shows the current marketing channels and the percentages of hogs that are moving through them. There are no specific per-centages kept on the direct channels.

With the direct arrangements, prices are driven by some formula, usually plus or minus terminal market price or some other announced price. For instance, Oscar Mayer, which gets a substantial portion of its hogs direct from farmers, pays on the basis of the price which is broadcast by the radio station, WAMES, which is run by Iowa State University. The radio station is right in the heart of Oscar's procurement area.

If, at times, a packer is not able to get the hogs at the formula price, the price is moved up to induce more farmers to bring in hogs. Formula pricing has evolved at both farmer-packer and packer-retailer exchange levels because it reduces transaction costs.

Figure 2.1. Marketing Channels and Percentages Moving Through Them, 1980.*



*Packers and Stockyard Resume, 1982, Table 3.

At the wholesale level, the formula price is usually figured from the "Yellow Sheet," a daily publication of the National Provisioner. This "Yellow Sheet" began publishing pork prices in 1923.

But the "Yellow Sheet" prices are based on a very small percentage of the meat trade. Whether the reporting of wholesale price is accurate is of concern to farmers because demand for their live product is derived from wholesale demand. How "Yellow Sheet" prices are set has been a matter of some concern to agricultural economists. Harold Breimeyer (U. S. House of Representatives, 1978) told the Small Business Committee Hearings that:

> . . . I feel no constraint whatever to say that basing prices for whole livestock and meat economy on one man's judgement, which in turn, rests on even thinner volume of market trading is so flimsy, so insubstantial, that it simply can't be regarded as satisfactory. Why livestock producer organizations haven't risen up in violent protest for proposals for correction, I cannot understand (p. 17).

In the 1930's, critics charged that direct marketing (non-terminal) was causing a decline in prices. Bjorka (1935) concluded that direct marketing had not "impaired" the pricing function of the public markets or caused prices to decline.

However, recent experience with the Ohio State electronic spot market for hogs, indicates that that is no longer the case (Henderson and Holder, 1982). During the time the Ohio State market was running, there was a statistically significant price increase of about one dollar

per cwt. over the price when there was less competition in the market. This was done by comparing the normal Peoria basis with the one that existed during the time the electronic market was operating.

Not all farmers get the same price. Some large volume farmers are better producers than others. Relationships with these quality producers are valued by the packers. Some packers will pay these producers a premium over their publicly stated prices for their quality hogs.

Larger operators, of course, can supply hogs in quantity to packers. This makes direct dealing between the two parties attractive. Special pricing packages are worked out which are advantageous to both parties. For obvious reasons these deals are not available to lower volume farmers. But, there are disadvantages in that these transactions are not publicly reported and hence limit relevant information. And, in their eagerness to buy hogs direct, a few packers occasionally end up with hogs that do not suit their purposes. They then must resell these hogs through dealers.

Dealers and cooperative livestock marketers are an extremely important part of the marketing system in some parts of the country. For instance, Michigan Livestock Exchange markets about 60% of the hogs sold in Michigan.

Michigan Livestock uses no set formula to reach price agreements with packers, according to their manager, Tom Reed. "We set our own market," he said. They look at what

the competitive cash markets are doing and then start talking to buyers from packing plants.

Reed thinks his sellers can tell by the "tone of voice" of the buyers how badly they need hogs. Based on these different kinds of information, the Michigan Livestock sellers see if they can "bump up" the price or, if the demand is soft, they let it slide. The sellers make sure all buyers agree to pay the same price. Then Michigan Livestock personnel must divide up the hogs they have amongst the packers who want them. The object is to provide each packer with enough volume so slaughter operations will be maintained.

But Reed dislikes deciding who gets what. He is pushing, in conjunction with other midwestern cooperatives, for an electronic marketing system. Such a system will eliminate "playing God," which the current system forces them to do when it comes to dividing the hogs which farmers have sold to Michigan Livestock.

Under the electronic system, whoever paid the highest price would get the load, Reed noted. Thus Michigan Livestock personnel would be spared making decisions about who gets what. Under the current system, such individual pricing of lots would be too time consuming and complicated.

After the hogs are sold by Michigan Livestock, they are loaded onto four decked semi-trucks and transported to packers. These trucks can hold 190 or more market weight slaughter hogs. More details of the electronic marketing

system which midwestern marketing agencies are trying to set up, will be given in Chapter V.

Iowa Beef Entrance into the World:

Iowa Beef is considering a major expansion of its pork operation. Tom Reed and other sellers of pork see Iowa Beef's move as boding good things for them. Some packers fear it will force them out of business.

"I'm afraid they're just going to tear us apart," said the procurement manager at one of what used to be called the big five packers. "They have the (low) labor rates, so they can do it."

Iowa Beef did not enter the pork business until 1976 when it purchased Madison Foods in Madison, Nebraska (Tintsman and Peterson, 1981). In 1981 it took over the Hygrade plant in Storm Lake, Iowa. Hygrade, a Detroit based manufacturer of such products as Ball Park Franks, no longer slaughters any pork, but rather buys all its meat "green."

Carl Toland, the procurement manager for Hygrade, said they found it increasingly difficult to make their slaughter plants run at a profit. For that reason he is now glad they are out of the slaughtering business. "Truly I'm surprised how easy it is to buy the meat. I wish we would have done it a long time ago," he said. In the fall of 1982, another Michigan packer, Farmer Peet, quit slaughtering animals and started buying "green" pork.

Dropping the slaughter operations appears to be an increasing trend. This may or may not be a bad thing for

farmers. Iowa Beef, for instance, is known for sometimes paying more for its slaughter steers than competitors. But the trend is something that farmers will want to monitor. Electronic markets could help overcome disadvantages that do emerge because of increasing concentration of slaughter plants. This would be done by bringing more packers into a market. Slaughter lambs from Virginia are sometimes now sold to Kitchener, Ontario or Albert Lea, Minnesota on the National Electronic Marketing Association's auction system.

Iowa Beef is considering whether to locate another packing plant in Eastern Iowa or Western Illinois that might kill up to 90,000 animals a week. Whether they will make that move is only speculation. (Company officials declined to be interviewed for this research.)

Further, it is doubtful that Iowa Beef can accomplish the same efficiencies in the pork subsector that they have in beef with "boxed" (cut and sorted to order) beef. Pork is not shipped in hanging carcasses but rather already cut. Perhaps Iowa Beef will bring some increased packaging efficiency to the industry. But, it is more likely that its advantage will be labor costs. Other companies, however, have been taking steps to lower their labor rates. For instance, Dubuque Packing left its pork operations in Dubuque, Iowa and took over the former Swift plant in Rochelle, Illinois which is only about 150 kilometers east. The Company has already lost a National Labor Relations

Board union election, but for now its net wages are in the neighborhood of eight to ten dollars an hour, including fringes, less than they were in Dubuque, according to Company officials. Swift has undertaken similar moves elsewhere in the country.

If Iowa Beef does open its large plant, the move will make the product line that it can offer to everyone much stronger. The move will have synergistic effects since company salesman can more readily offer a full line of red meat to all stores. This might mean that some retail stores will be able to eliminate or reduce their costly local-store meat cutting departments. Further, if Iowa Beef is able to command a premium for its fresh pork, the way it can for its beef, then the Company can afford to pay more for its hogs -- hogs that would have formerly gone to Frederick and Herrud and other packers. Frederick's brand, Thorne Apple Valley, is probably strong enough to survive without a fresh product line. So, if Iowa Beef's operations make Frederick and Herrud's supply of slaughter hogs ever more variable, the Company may eventually decide the struggle to stay in the fresh market is not "worth the candle." Frederick and Herrud, or any other packer with trouble getting hogs, would then need to cut a deal with Iowa Beef to assure themselves the green pork they need.

Such a deal would, of course, make Frederick and Herrud's slaughter plant in Detroit worth little. And, it possibly might not bode well for Michigan farmers if

they lost a plant with a kill capacity of 14,000 hogs a day or better.

Of course all of this is the sheerest speculation. But it is interesting to note that a similar process in the fruit and vegetable industry has taken place (Hamm, 1981). Libby's, for instance, has recently sold its processing facilities and has become strictly a marketing firm.

Current Production Trends:

Pork producers, like pork packers, have specialized. Most of this specialization has meant a move to more confinement facilities, which has also meant a move to large facilities.

The ease of operation and the ability to produce pork on a continuous basis first made centralized farrowing housing popular in the 1930's. But farmers who went to such a system soon found themselves wishing they had not. The technology was not yet developed for adequate control of disease and parasites. Disease problems became worse in their confinement buildings each year that they operated them. Farmers with the confinement facilities soon had to go back to portable housing rotated on clean pastures.

But, increasing land prices increased the cost of field farrow operations. So from the middle 1950's until about 1965, production moved back from the fields onto paved barnyard lots (Van Arsdall, 1978). From 1965 on, the move

was from lots to slotted floor confinement farrowing houses with farrowing crates which helped protect the piglets from being crushed by the sow.

Disease control advances permitted this move. Slotted floor nurseries and finishing buildings also came into use. In many of these buildings, heating and ventillation could be controlled. Some farmers found that air conditioning pays for itself by keeping rate of gain up during the heat of summer.

With the move to confinement farrowing houses, farmers increased their capacity from fall and spring litters to almost eight litters a year in a farrowing unit, if they weaned in six weeks. In practice, those following such procedures usually managed to get out only six litters because of irregularity in sow heat and the time required to clean the facility. But now, some of the larger operations have cut weaning time to three or four weeks and are getting twelve litters a year out of each farrowing space.

No long term data on production methods exist, but a 1978 study (Van Arsdale, 1978) showed the following percentages of hogs born in the different types of production facilities in farrow to finish enterprises (Table 2.1). This study is being updated and is due to be published soon.

Table 2.1. Distribution of Farrowing Facilities in Farrow to Finish Enterprises by Region, 1975.

Region	Percentage of Hogs in Each Type of Farrow Facility				
			Central Housing		
	No Facilities	Portable Housing	Solid Floor	Slotted Floor	Mixed Housing
North Central	5.2	14.0	40.1	16.8	23.9
Southeast	7.1	1.7	48.1	29.5	13.6
Southwest	1.9	1.5	45.7	42.6	8.3
All Regions	5.3	12.1	41.3	19.1	22.2

Table 2.2 shows how ever larger production facilities are producing more and more of the hogs. The thousand and up head per year category in the right hand column of the table does not adequately describe the really large operations. Even in Michigan, where capacities tend to be smaller than in some parts of the South, a hog farm with a capacity of two thousand head is not considered very large.

One of the Michigan farms which showed up in the survey on contracting, which will be discussed in the next chapter produces seventy-two thousand hogs a year. The trend to larger operations, as is illustrated in Table 2.2 is expected to continue.

Table 2.2. Number and Percentage of Hogs and Pigs Sold Yearly by Farm Size Classes*

Year	Number of Hogs and Pigs Sold in 1,000's	Per Cent of Hogs Sold by Farm Size				
		1-99	100-199	200-499	500-999	1,000 and Over
1964	80,391	23.0	23.1	33.2	13.2	7.3
1969	85,903	15.6	17.7	34.9	19.2	12.6
1974	76,422	11.4	13.0	29.0	21.7	24.9
⊥978	90,723	8.4	10.5	24.8	22.0	34.0

*Census of Agriculture, 1964, 1969, 1974, 1978.

Summary:

The case for constant but evolutionary change within the hog subsector was examined in this chapter. Examples cited of how change entered the system included: 1) Swift's use of refrigerated railroad cars so dressed meat could be shipped into the Eastern markets; 2) The changeover to an electronic marketing system in Ontario, Canada which changed the structure of the hog subsector there.

The concept of market structure was looked at and it was claimed that no "correct" price exists, but only one that is in response to a particular structure. The structure, given human behavior or conduct, leads to performance outcomes.

The case was made that an understanding of evolutionary history was necessary to understand the structure of the hog subsector. And it was emphasized that the structure conduct performance paridigm will be used as the framework of analysis for this research.

The history of the pork subsector was examined with emphasis on marketing methods. It was seen that the pork subsector has constantly undergone change, but in an evolutionary fashion. Every time technology or institutions have changed, performance has changed. Current problems of the marketing system were highlighted.

CHAPTER III

FUTURES

> To prophesy is extremely difficult, especially with respect to the future.
>
> Anonymous

Contracts are being used extensively in the pork subsector. They are offered by many, but not all, packers, dealers, cooperatives and even some organizations whose primary business is now contracting. The contracts only call for delivery and do not say anything about management practices. Hence these contracts should not be confused with management production contracts.

The contracts did not come into wide use until there was a successful futures market to compliment them. The contracts that now exist are unlike those envisioned for a Pork Contract Market in a number of ways. There is no price negotiation on them, but rather they are almost always sold for a set discount off futures. Many of the current contracts offer no coordination advantages. That is because they are too loosely drawn to assist in planning. Sometimes not all the possible coordination advantages are gained

because the hogs delivered under the contracts are sold in the cash market. This happens when cooperatives contract in order to assure that their yards will be kept busy even if ordinary cash market deliveries to their yards decrease. But these dealers do not treat the contracted hog any differently than cash hogs as far as delivery is concerned. The dealers just wait until the hogs are delivered and then sell the contract hogs in the open market, thereby negating any of the possible coordination advantages that could be gained from the contract.

Despite the dissimilarities, the contracts in the current market also share many likenesses with those contracts which would be let in a Pork Contract Market. Enough similarities, in fact, so that contracting being done now represents the nascence of what, with careful husbanding, could grow into a Pork Contract Market. Since these current contracts do grow directly out of the futures market, it will pay to look at the futures contract for hogs. Such a look will also pay because it is hypothesized that the futures market will be complimentary with a Pork Contract Market.

The Evolution of the Hog Futures Market:

Burns (1979) contends that the rise of futures trading is a process akin to Shaffer's (1969) scientific industrialization of agriculture. Burns believes:

> . . . as an economy and its markets develop, markets become increasingly specialized: from

> rudimentary local spot markets to centralized spot markets, to forward markets, to futures markets and decentralized spot markets, and to option markets . . . (p. 2).

That was Irwin's (1954) theme when he discovered that egg contracts were originally used by commodity handlers and not just speculators. He wrote that early futures markets were crude, without well developed rules or instituitons. Such disorganization, he wrote, was the necessary precursor of the more organized markets of today. Irwin's views are those of the majority of current students of the futures market. Until Irwin (1954) and Working (1970) started examining the market in the 1940's and 1950's, it was thought that the futures market was used primarily by speculators.

When primative futures first appeared in the mid-nineteenth century in Chicago, they were used by the mechandising trade. "Commodity exchanges got their start because merchants needed to assemble in one place in order to bargain over the price, under conditions that would allow each participant in a transaction to feel confident that he had struck as good a bargain as was possible at that time" (Working, 1970, p. 6). But communications technology reduced this necessity of a central gathering spot and many of the exchanges went into a long slow decline because they were no longer able to attract merchandising interest. Working (1970) observes that it was he who first noticed the absolute necessity for use of a contract by actual handlers of the commodity. He believed that unless a

contract is designed so that it is useful to both speculators and users of the commodity, it is doomed to failure. The users of the commodity use the futures market to lay off their price risk acquired from merchandising contracting. Merchandising contracting is the term Working uses to describe contracts that are written for actual delivery of the product. Price risk is the risk that a merchant will end up paying a different price at delivery than competitors are paying in the spot market.

Although futures contracts are sometimes delivered, they are not designed for that purpose. They are designed to facilitate the holding of contracts and not delivery. Working rightly points out that for a mature contract, delivery usually occurs in connection with perversions of the market, corners and squeezes. It is only merchandising contracts that are designed to facilitate the delivery of goods. But, as of now, there is no formal market where price is negotiated for merchandising contracts of slaughter hogs. The fact that merchandising contracts do exist, however, means there is already a market in them in the sense that there is an exchange between two parties whose financial interests are not formally tied together. Processors just announce their contract price as a certain discount of futures. Farmers report that if they are valued suppliers they can privately negotiate lesser discounts. These private discounts, though, are generally not publicly known.

Working's contention that a successful futures market is used by more than just speculators, was backed by research which was done in the 1940's but not published until 1954. Irwin (1954), as noted, showed that egg contracts, which are now very inactive, were from the beginning used by egg handlers. The Chicago Mercantile Exchange did not get around to acting on Working's insights until about 1960. No mention has been found that the exchange explicitly recognized the insights of Working (1970) and Irwin (1954). If Exchange personnel had recognized this crucial insight, they could have earlier designed contracts to bring success to the exchange, instead of the near bankruptcy which occurred in the late 1950's.

Indeed, the history of the Chicago Mercantile Exchange reinforces the idea introduced earlier, that a market is not some gift from God but rather occurs only when the proper combinations of institutions and technology come together. The Exchange early on scored limited success with contracts in butter and eggs. But when technology changed, those contracts declined and the Exchange went into a thirty year decline until in the 1950's it had only a marginally successful potato contract and a quite successful onion contract. Then the onion contract was outlawed by Congress, and the Exchange, for all practical purposes, was dead. But the owners of the Exchange did not roll over immediately. They tried all kinds of contracts; scrap iron, frozen shrimp, hides, and apples.

But, in 1960 they switched their emphasis from trying to attract speculator interest to going after hedging or handler interest, which Irwin and Working said was crucial for success. By 1970 it was the most successful commodity futures exchange in the world (Working, 1970). Even after the Exchange started experiencing some success, it was still thought that only storable and closely graded commodities could be sold on the futures (Williams, 1964; Bakken, 1970).

In 1930, a hog contract had been tried on the old Chicago Livestock Exchange but it failed. No comprehensive analysis of the failure has been found. Bakken (1970) writes that traditionally it was thought that in order for a contract to be successful, it must be homogenous and fungible, fluctuate in price, be accurately graded, measurable by weight, generic, widely used, and salable at all times. It must not be a monopoly good or be perishable. While live hogs could pass most of those tests, there is at least some question on the perishability issue and the grading issue.

In 1961, frozen bellies were tried without much success. Those who actually wanted to buy bellies didn't use the contract because they did not want bellies under the contract terms. The contract was redesigned twice so that by 1963 the terms were acceptable to buyers. At first the contract was used for actual delivery. Deliveries in July of 1965 totaled fifty-six per cent of the open interest (Bakken, 1970). Actual delivery is often characteristic

of a new contract. It is often only as the contract becomes more mature that delivery is rarely taken.

The success in bellies led to live cattle contracts on the Chicago Mercantile Exchange in 1964, and finally to live hogs in 1966. Packers used the belly contracts to hedge output price risk and were successful. When live hog contracts became available, country dealers, like Heinold, used them to start offering producers cash or forward contracts. No scheduling advantages accrued to country dealers, of course. But, it did mean that the hogs under contract were hogs that they would get and for which they would not have to fight with their competitors. Packers also started using the contracts to help in their procurement. However, as shall be discussed, most packers interviewed for this research said that they do not yet do enough contracting to help with scheduling. Several said they would like to get enough hogs contracted so that it could help with their contracting. Several estimated that point would be in the neighborhood of twenty per cent of production. Others said, however, that they see contracting as no real advantage to them but do it only because their competitors do it. But the fact that live cattle and hog contracts have been phenomenally successful is prima facie evidence of usefulness to handlers. The contracts volume and open interest puts lie to the idea that live contracts could not be successfully traded.

Paul (1982, p. 290) takes from the success of these contracts ". . . that the only technical requirements for

successful futures trading in an item are fungibility and no substantial monopoly over its supplies". Paul's requirements might be reduced to just fungibility, so long as the competing commodities are not under the control of the monopolist. That is, fungibility in some sense subsumes the concept of monopoly. A monopolist will be unable to exercise substantial monopoly power if buyers can easily substitute into another product.

The success in selling perishable commodity contracts can be told by looking at the numbers. During the period 1924 to 1925, there were an average open interest of 1,700 contracts in perishable commodities on the Mercantile Exchange. During 1955 to 1956, the average stood at 9,600 contracts. And, average open interest was 124,400 during the period of 1979 to 1980 (Paul, 1982).

Overall, between 1970 and 1980, Paul found that annual growth rate for an exchange was about fifteen per cent. In the intervals 1973 to 1975 and 1978 to 1980, Paul found that open interest in hog futures increased by one hundred per cent. He chose that split interval because there were few government price support mechanisms in place during those years.

This increase occurred because there was an ever larger percentage of contracts sold in relation to the number of hogs on farms. It was not because there were significantly more hogs being raised. Paul believes that a similar increase in the number of hog futures contracts may be expected over the next five years.

In 1982, live hog futures consistently set new records for contracting. Through the month of June, 1,555,807 contracts were traded, a 23.5 per cent increase over the same period the previous year. June, 1982, set an all time record for any month. The fact that live hogs are successfully traded contracts indicates, according to Working (1970), that packers have need of actual delivery contracts for planning purposes.

Unfortunately, except for a few special research projects which the Chicago Mercantile Exchange or the exchanges themselves undertake from time to time, it is not possible to tell how much of the open interest in hogs represents hedging interest. Neither has any work been located which attempts to differentiate between those using futures to hedge the price risk when they sell in the spot market, and those using the futures to hedge their price risk because they have entered into a merchandising contract. The later type of hedging is the much more important kind in terms of this research because of its coordination advantages. Further, the gross monthly statistics with volume for all months obscure details which are of interest to those wanting to dampen the cycle. How far a contract is written must be known if the coordinating effects are to be judged. A contract between a farmer and packer three months prior to delivery does increase the amount of coordination in the system. It allows the packer to plan to a small extent for a delivery and it gives some

information to the farmer. But a three month contract can not change production plans since it does not alter the number of hogs currently in the system. In order for that to occur, a large number of contracts at least ten months ahead of delivery need to be signed so the farmer has good price information upon which to make breeding decisions. It must be that long because that is approximately the period of time from breeding to delivery to market of a 230 pound slaughter hog.

Unfortunately, recent interpretation by the Internal Revenue Service of the tax code has reduced speculative interest in long term contracts. This is unfortunate for creating a thick market in contracts. It may not be so unfortunate if tax receipts figure into one's concerns.

Speculators have been using the commodity exchanges in a number of ways to shield income from tax. The most common is the "tax straddle" which involves taking long and short positions in two contracts that fluctuate similarly. This straddle is handled in such a way so as to produce paper losses. The offsetting gain is deferred until next year when it then becomes taxable at long term capital gains rates instead of regular tax rates. Or it can be rolled forward again to the next year (Paul, 1982). The Treasury estimates that about $1.3 billion dollars are lost this way and is asking for specific legislative prohibition of the manuver (Paul, 1982).

Most would not disagree that the futures market should not be used as a tax dodge, but there is concern that

liquidity will be negatively affected by IRS efforts in this area. When speculators drop out of the market it is usually explained that there is a loss of liquidity. Working (1970) explains the process like this:

> . . . potential buyers, anticipating their needs for pork bellies to process into bacon, also found it advantageous to use the futures contract, for the same reason. But potential buyers do not automatically appear in such a market at the same time that holders of the commodity want to make a forward sales. The potential buyers are likely to hold aloof for awhile, awaiting the inducement of price concessions. At this point, speculators can find opportunity for profit by stepping in, initially as buyers and later reselling to processors or some other speculator (p. 23).

Since forward cash contracting has only been in response to the creation of the futures market, and since a futures market can only work well with speculative interest, some way must be found to encourage more long term speculative interest than now exists in the live hog futures market. The decline has apparently been because of government tax regulations.

Futures Versus Spot Price:

How reliably anticipatory is the futures price? This is a critically important question to this study. That is because, as will be detailed in Chapter IV, hog farmers in Michigan, Iowa, and North Carolina look to the futures as their primary forecasting tool.

Working (1953) found that futures do a good job of forecasting. Table 3.1 shows the price the futures market was predicting fifteen, twelve, nine, six, and three months

prior to the June cash Peoria, Illinois price. Casual inspection shows that the futures market is not an outstanding forecaster during the past five years.

Table 3.1. Average of Monthly Low and High Prices for June Hog Futures and June Peoria Cash Price

	Futures Price Year Prior to Delivery				Futures Price Year of Delivery	Peoria Cash Price
Year of Delivery	April	July	Oct.	Dec.	March	June
1978	39.78	35.98	34.13	38.59	51.08	49.38
1979	44.53	47.80	43.64	46.47	49.20	42.22
1980	43.07	41.03	40.78	43.86	38.23	36.26
1981	44.00	49.01	56.65	57.64	46.71	49.46
1982	58.25	54.90	49.08	42.67	53.14	60.13

Martin and Garcia (1981) tested to see if lagged futures prices are an unbiased predictor of cash prices. They found the futures to be inefficient in this area. They said that futures is neither a good forecaster during unstable periods nor "a rational price formation agency." Martin and Garcia come to their conclusion by checking to see if lagged futures prices are an unbiased estimate of cash prices. That is:

$$CP(t) = A + BFP(t-i)$$

Where:

CP(t) = cash price at the time the contract matures

FP(t-i) = the futures price i months for maturity

If there is no bias, A should equal 0, and B equal 1; Martin and Garcia (1981) found such not to be the case. Leuthold (1974), and Leuthold and Hartman (1979) also found futures markets wanting in this area.

Whether tests like Martin's and Garcia's are fair is debated by some. Although not addressing himself specifically to Martin and Garcia, Dewbre (1981) argues that the appropriate question to ask is: Are price changes which occur in futures markets (or are simulated by an econometric model) in response to changes in economic information consistent with economic theory?

Dewbre argues, particularly with reference to storeable commodities, that the futures should lead cash price through the following mechanism: An increase in expected future production means a lower futures price. Since futures price helps determine how much stock is held, current stocks will drop because the expectations of future profits are no longer as great. This releasing of stock leads to more supply in the current market and hence a drop in the spot price. Increased consumption, because of the decreased price, leads to less carryout of stock. This decreased carryout means future supplies are less than originally anticipated and hence the future price then rises. This

moderates the original decrease in futures prices with the process continuing until a new equilibrium is reached.

Dewbre's objections to tests like Martin and Garcia's seem valid in the sense that no price formation mechanism will have perfect information. In December, one would hardly expect July hog futures to reflect an extremely cold spell in January which drops pigs saved per litter to 6.5. We could only be critical of futures if futures price did not respond as the cold snap occurred. The December price for June futures can only attach some expected value to price because of weather events. But if it is colder than expected, the December predictor for June price will turn out to be low, ceteris paribus.

The Efficiency of Futures:

The proper test of futures seems to be whether they are efficient. The definition of efficient used here is from the finance literature. The literature breaks efficiency into three levels: 1) Weak; 2) Semi-strong, and; 3) Strong.

Weak efficiency is when the price incorporates all past price data so that there can be no discernable pattern in daily price movements. Semi-strong efficiency is where all past price data and currently available public information is incorporated into the price. Strong form efficiency is where all information, both public and private, is incorporated into the price so that not even insiders can make a guaranteed profit from trading.

The tests of the weak efficiency hypothesis involve checking to see if autocorrelation exists in the price series. The residuals should be uncorrelated if all past price information is incorporated into the current price. If these tests are properly performed they should invalidate many forms of technical trading

These tests nearly uniformly show that many technical traders have no real reasons to do what they do. The technical traders argue that their sophisticated trading rules were not being adequately tested by the statistical applications. So "run" tests were devised to see if there was any pattern in the data. Without going into the full arguments, it is sufficient to say that much of the financial community, save for technical traders, now believe that technical trading does not have a scientific basis. Perhaps it should be parenthetically noted that there are many technical traders who eat regularly.

The strong form hypothesis is thought here not to be applicable to the live hog futures market. This is because no company controls pork the way IBM, for instance, controls a certain segment of the computer market. Inside knowlege that Swift is about to introduce a new luncheon meat is not likely to enable an insider to profit on the futures market. The only exception to this would be that the demand for the luncheon meat was so strong that it shifted outward overall demand for pork. One other possible exception would be USDA personnel doing futures trading on the basis of prior knowledge of new breeding intentions or somesuch.

Thus, semi-strong efficiency is the real matter of concern. The traditional tests of this hypothesis have examined how price movement occurs in response to new information. If the price adjustment occurs during or prior to the announcement, the market is said to be semi-strong efficient. This approach could be used with futures. One way would be a systematic examination of how futures adjusts to breeding intentions reports.

Leuthold and Hartman (1979), however, tested futures performances against their own econometric model and found futures wanting. Both Pasour (1980) and Panton (1980) subsequently found Leuthold and Hartman's test wanting. Their criticisms were similar to Dewbre's. Just and Rausser (1981) later found futures to do a better job of forecasting, in a number of instances, than well known commercial econometric models. This was particularly true for fluctuating markets like soybeans. In the more stable markets like wheat, futures do not perform as well as econometric models.

In the case of hogs, Just and Rausser (1981) found that short term forecasts for hogs from the futures market are better than the econometric services. The authors speculate that this is because the futures market can react more quickly to new short-term information. However, the structural models of the long term econometric models are probably better than the long term price discovery methods in the futures market. The authors do note that the data

for livestock performance is not really of adequate sample size yet for firm conclusions.

Gray (1966), Tomeck and Gray (1970), Powers (1970), and Peston and Yamey (1960) all found that futures do promote intertemporal price efficiency. Helmberger, Campbell and Dobson (1981), in their survey of the literature for the AAEA, conclude there is enough evidence on this point that "it appears that the time is ripe for analysis examining situations that combine futures markets and other mechanisms to facilitate intertemporal price efficency" (p. 609). That, of course, is the whole point of this research.

There is no doubt that a lot of work remains to be done in this area of market efficiency. But whatever the conclusions, a Pork Contract Market would result in improved price forecasts if it brought more and better informed traders into the contract marketplace.

Work remains to be done in the area of exactly how futures might compliment product contracting. More extensive surveys need to be taken of contracting firms so that it can be ascertained what is happening in that area.

Summary:

The futures market, like the spot market, developed in evolutionary fashion. When the live hog futures market developed, product contracts for hogs expanded along with

the growth of futures. Hog futures which started in 1966, have experienced steady growth, setting all-time volume records at the time of this writing.

There is much debate in the literature about whether hog futures are efficient in the sense that they incorporate all relevant information into the price formation process. But there is general agreement that futures do promote intertemporal efficiency. Surely if a Pork Contract Market could bring more and better informed traders into the marketplace, forecasts would be improved.

Some scholars have used these ideas as the basis for a call to create new institutions which, in combination with futures, could further improve intertemporal efficiency. A PCM might be one of those institutions. In the next chapter how farmers and processors react to the Pork Contract Market idea will be explored.

CHAPTER IV

FARMER AND PACKER ATTITUDES TOWARDS A PORK CONTRACT MARKET

> . . . his education had had the curious effect of making things he read and wrote more real to him than things he saw. Statistics about agricultural labourers were the substance; any real ditcher, ploughman, or farmer's boy, was shadow. Though he had never noticed it himself, he had a great reluctance, in his work, ever to use such words as 'man' or 'woman.' He preferred to write about 'vocational groups,' 'elements,' 'classes,' and 'populations' for, in his own way, he believed as firmly as any mystic in the superior reality of the things that are not seen.
>
> C.S. Lewis
> That Hideous Strength

The Survey:

The theoretical underpinnings of a Pork Contract Market (PCM) have been established. But, if subsector participants' attitudes about a PCM are unknown, it is impossible to judge whether, or how to operationalize a PCM. To acquire this knowledge, surveys of both farmers and packers were done in the Spring and Summer of 1982. The survey of farmers was a formal random mail survey with follow-up telephone solicitation of non-respondents. The packer survey was purposive and more open-ended.

This chapter will report on the results of those surveys, and the following chapter, Chapter V, will use the results to suggest how a PCM might be operationalized.

The Sample:

Farmers were surveyed in Iowa, Michigan and North Carolina to discover their attitudes about a (PCM). The sample was spread both geographically and in terms of state rank on the hog production list in order to get insight into whether different production methods and different areas of the country affected attitudes towards contracting. Iowa is the number one pork producing state, raising about twenty-five per cent of the nation's hogs. In 1980 Michigan was sixteenth on the state production list and North Carolina was eighth.

Those sampled were members of their state pork producers' associations. Both Iowa and Michigan Pork Producers Associations sent a list of twenty-five of their members after being furnished with a computer generated random number list and instructions for drawing the sample. The North Carolina sample of twenty-five was somewhat less satisfactory. Association officials there said they could not provide a sample from the actual membership list but did provide a list of those members who attended their last annual convention. A random sample was drawn from that list.

Maximum effort was extended to try and get a more satisfactory sample but it failed. Unfortunately there

was not a list of all hog farmers publicly available from which to draw a random sample. USDA maintains a list of U.S. hog farmers for its survey purposes, but agency personnel estimated that it would cost $20,000 to perform the farmer survey. The cost was beyond the budget of this research. The USDA does not permit non-agency personnel access to the hog producer population list. So, a less satisfactory sample had to be used.

In addition to the hog farmers, eight packers were interviewed. The packers interviewed were non-randomly selected by talking to knowledgeable industry personnel and by reviewing trade publications such as National Provisioner and other sources of information like Thomas Grocery Register.

The Instrument:

Since the farmer questionnaire was designed to get at attitudes toward and knowledge of contracting, it was necessary to ask the kind of financially detailed questions that respondents sometimes decline to answer (Lansing and Morgan, 1971).) The financial questions that were asked could be couched in generalities and were asked for the purposes of correlation with variables concerning contracting ideas. For example, it was more useful to ask: "Is more than seventy-five per cent of your working capital borrowed?" as opposed to "How much working capital have you borrowed?" It was originally thought that the most

heavily leveraged would be those most interested in any scheme which reduces uncertainty. They, of course, are the ones least able to withstand outcomes with low incomes. The questionnaire was pretested in personal interviews with five Michigan farmers.

The packers' questionnaire was essentially the mirror image, where appropriate, of the farmers' survey (Purcell, 1973). This was done so it could be discovered where farmers' and packers' attitudes and needs matched and where they did not. Areas where no match existed, like contract size, would need to be looked at with an eye for institutional arrangements which eliminate the discrepancy if a PCM ever was to be started.

A basic questionnaire was taken to each packer interview. However, the interview was allowed to be more open ended than the farmer survey. Packers were interviewed in Michigan, Ohio, Illinois and Oklahoma.

The Response:

Fifty-one of the seventy-five farmer surveys were completed either by return mail or telephone interview. Twenty surveys were completed by Michigan farmers, eighteen by Iowa farmers and thirteen by farmers in North Carolina. Six farmers in the sample were found to be no longer in the hog raising business or were only members of the associations because of their connections with the industry.

Along with the original survey went a signed typed letter with a personal salutation explaining the need for the survey. Also accompanying this original mailing was a five page description of how a contract market might work. Copies of these three items are in Appendix A.

This original mailing drew a response rate of slightly more than one-third or twenty-six farmers. Post cards were then sent reminding farmers that they had not filled out the questionnaire. This action produced seven more responses. Attempts to contact the remaining forty-two farmers by phone were made. Six could not be contacted but the remaining thirty-six were, some after as many as three calls. This produced a total of fifty-one usable surveys. Several farmers agreed to answer the questionnaire questions by phone, but most declined since it was thirteen pages long. However, those declining to allow completion by phone agreed to mail it back save for two farmers. Not all promises were fulfilled. But, during the course of the survey, farmers made apparent the goodwill they have towards land grant institutions and extension services. Farmers who said they thought that contracting was a dumb idea and that the survey was a waste of time, still filled it out after being asked to do so. Only the two who refused to respond to the survey were mildly abusive. One farmer, who produces about seventy-two thousand hogs a year, even called to inquire if he could be of any assistance in moving the survey along.

The goodwill that land grant institutions have should be husbanded carefully. There is indication that all universities receive higher response rates to questionnaires than private or direct government agencies (Brunner and Carroll, 1969).

A total of seventy-six per cent of the surveys were either returned completed or found to have been sent to inappropriate parties. Sixty-eight per cent of the mailed surveys were returned filled out so as to be useful for the analysis; seventy-four per cent of the people who could have responded with useful surveys did so. (Several feed salesmen who somehow got into the sample were not subsequently polled when their occupation was learned.) A response rate of only twenty per cent to mail surveys is commonplace and sometimes it drops below per cent (Kanu and Berenson, 1975; Lansing and Morgan, 1971).

The Problem of Non-Respondent Bias:

Although the response to the survey was quite high, eighteen producers did not respond to it. To what extent do the non-respondents jepordize the randomness of the survey and hence the ability to make inferences about the population in those states sampled?

The simplest and most time honored way to handle this problem is to assume the non-respondents have the same characteristics as those who returned the survey. While this is an often tried method, it is not necessarily a true one. For instance, Neuman and Stephens (1982) criticize

a number of studies of cooperatives for making this assumption. They think such an assumption produces work of doubtful empirical validity.

If the assumption of similarity between those who do and those who don't respond to the survey is unwarranted, then the following bias can be introduced (Neuman and Stephens, 1982; Kish, 1965):

$$\bar{Y} = Y/N = W_1\bar{Y}_1 + W_2\bar{Y}_2$$

Where Y is the population mean characteristic in question, and W_1 and $\bar{Y}_1$ are the proportion of the sample responding and the responding sample mean characteristic respectively. Similarly W_2 is the proportion not responding and $\bar{Y}_2$ is that portion's true mean characteristic.

The biasedness of $\bar{Y}_1$, here $RB(\bar{Y}_1)$, is:

$$RB(\bar{Y}_1) = \frac{\bar{Y}_1 - \bar{Y}}{\bar{Y}} = \frac{\bar{Y}_1 - W_1\bar{Y}_1 - W_2\bar{Y}_2}{\bar{Y}} = W_2\,\frac{\bar{Y}_1 - \bar{Y}_2}{\bar{Y}}$$

Researchers, who blithely assume that the characteristics for both respondents and non-respondents are alike, are essentially saying that both $\bar{Y}_1 - \bar{Y}_2$ and W_2 are small.

It is sometimes an unwarranted assumption as Neuman and Stephens (1982) show. They sent mail questionnaires to 241 cooperatives and later a follow-up letter. This generated a usable response rate of thirty-one per cent. The researchers then selected a random sample of twenty per cent of the non-respondents for a telephone survey.

They found that the cooperatives surveyed by telephone had statistically significant different characteristics for many of their variables.

In this survey of hog farmers, records were kept of who repsonded without prompting and who needed encouragement. Thus it is at least possible to check if there is a statistically significant difference between the first and the second group.

In comparing these groups none of the t statistics for the relevant variables was significantly different from another. Even the questions relating to size or production showed no significant difference between means. For instance, the t statistic for the number of slaughter hogs produced was .06 which means the null hypothesis stating that there is no difference between the two samples, can not be rejected at almost any confidence level. Nor was there a statistically significant difference on attitude questions. For instance, on the matter of whether they would be interested in using the contract market the t statistic for the mean between the two samples was -.79.

Although a pooled variance could have been used on most of the variables, only a few showed to be significantly different in the variance but not in the mean. Therefore, to be consistent, separate variances were used in all cases for the analysis. Fully reporting the t statistics on each variable would not pay dividends. But those wishing more

information on the means of the two samples can inspect Appendix C where the full print out of all the t statistics is displayed.

What has all this shown? Are we on absolutely firm ground if we claim that the non-respondents introduce no bias as far as inferences are concerned? No. The test we have constructed for assuming that the non-respondents are the same as those who do respond would not pass Popper's (1959) falsifiability tests. We have only shown tht there is no significant difference between those who responded promptly and the those who responded only with prompting. But it you accept the possibility of reasoning by analogy, we are certainly on firmer ground than those who just wily nily assume that there is no non-respondant bias. Our tests will still not convince the agnostic but perhaps others, of not quite as exacting standards, will find that a good faith effort has been made at least to indicate that the sample is not biased by non-respondents.

It has been shown that the null hypothsis -- that there is no significant difference between the two samples -- can not be rejected. So we will assume that there is no respondent bias. Given the tests that have been performed, this seems to be a reasonable and better approach than some of the ad hoc weighting schemes to control for non-respondents (Lansing and Morgan, 1971; Kish, 1965).

Sample Population Characteristics:

About sixty-seven per cent of the producers were farrow finish operators, twelve per cent sold both feeder pigs and slaughter hogs; fourteen per cent bought feeder pigs and sold slaughter hogs and about eight per cent operated feeder pig facilities.

Total confinement operations were the most popular with fifty-three per cent of the respondents having that kind of operation. Thirty-five per cent had semi-confinement facilities and twelve per cent of the farmers raised their hogs in either open lots or in the field.

The number of slaughter hogs produced annually ranged from less than 100 to 80,000 with a mean of 4,500 and a standard error of a little better than 2,000. The median number of hogs marketed annually was about 1,200. Farmers in the sample marketed on the average of once every two weeks but the range was from twice a year to every day, with the standard sample error in the number of yearly marketings being three.

About fifty-seven per cent of the farmers in the sample relied on their hog operation for more than fifty per cent of their income, with the standard error here being less than nine per cent. But, in retrospect this question was not carefully constructed to determine whether the farmers considered corn crops as part of the hog operation. The packers interviewed had a daily kill capacity ranging from

1,600 to 40,000. All the packers' hog facilities slaughtered only pork, a situation that would not have existed twenty years ago.

The Survey Results:

Information about Time Limitations on Delivery for Contracted Hogs: In order for contracting to work smoothly, farmers need to know prior to breeding when their hogs will be ready. By putting operations in a more controlled environment, confinement production has reduced uncertainty in production somewhat. Unfortunately there is still a lot of biological uncertainty. Even with the move to confinement facilities, farmers do not show a great deal of certainty about when the pigs from a sow or gilt would be ready for market. About seventy-five per cent of the farmers said that prior to breeding they would need at least a range of a month in order to be sure they would have the pigs ready for market. About twenty per cent believed they could tell within a week of when the hogs would be ready for market and four per cent said they could estimate within two days.

Even after the litter was weaned, farmers still remained relatively unsure when the hogs would be ready for market. Fifty-eight per cent of those answering the question still said they needed at least a month to tell when the hogs would be ready. About thirty-six per cent felt they could tell within a week and seven per cent said they could tell within two days.

This is not as big a problem as initially hypothesized. It was thought that because of the coordination advantages, packers would want to know exactly when they were getting the hogs at the time of contract. But packers using contracting nearly universally said that since they never expected to have all their production under contract, they could easily work with a range of days for delivery at contract time. Practices, of course, vary but often farmers call a week before they expect to deliver to let the packers know how they are coming along and then call again two days prior to delivery. Or, they may just call four days before delivery, so long as they deliver before the twentieth of the month, which is the day before the futures contract expires.

Price Expectation: A relatively new institution has apparently changed the way farmers form price expectations. The futures market for live hogs, which has only been in existence since 1966, is the most important of the various sources of information available in helping to form the price expectations of the farmers in the survey. Of those who answered the question about how they form price expectations, fifty-nine per cent said they paid more attention to the futures price than any other factor when making forecasts of future prices. Only eighteen per cent said they do not pay attention to the futures price. The remaining thirteen per cent of the farmers gave it secondary weighting in their expectations formation procedures.

All the other methods of price formation fell far behind the value of futures in the farmers' estimations. This is significant in light of the poor forecasting performance of futures. But readers may recall that hog futures do seem to have a better short term forecasting record than many of the commercial econometric forecasting services (Just and Rausser, 1981).

The price formation question gave farmers six choices about how they form expectation. The choices were: 1) A weighted average of past prices; 2) Futures market; 3) USDA pig crop forecasts; 4) Extension Service price forecast; 5) Own computer or calculator model, and; 6) Another method. Farmers were instructed to rank their choices in order of the importance they attached to the methods. A chart of the absolute frequencies of the farmers' responses is in Table 4.1:

Table 4.1. Absolute Frequencies of Relative Importance of Information Sources Used in Formation of Price Expectations

Information Sources	Relative Importance		
	First	Second	Third
A Weighted Average of Past Prices	2	5	9
Futures Market	26	6	2
USDA Pig Crop Forecasts	6	11	8
Extension Service Price Forecast	0	1	3
Own Computer or Calculator Model	3	2	0
Another Method	6	1	2

This is not research into the formation of price expectations, so it is not held that the above question fully captures the way farmers form expectations. From other work it is known that farmers' expectations decisions are quite complicated (Johnson and Quance, 1972; Darcovich and Heady, 1956; G. Johnson, et al., 1961; LeRohl, 1965; Petit, 1964).

It is amazing that an institution, hog futures, which only started in 1966 has already become so important in expectation formation. Of course, it has an advantage over the other offered choices in that it requires almost no work to acquire that information.

The category labeled "other methods," which farmers were asked to write in, contained mostly mention of either

packers or other newsletters and consulting services. Interestingly enough, most of the farmers in the survey, as will be noted shortly, said they did not alter their operations based on forecasts. In fact, most of the confinement operators said they ran their operations flat out regardless of their price expectations.

Price Forecasting Ability: Most farmers admitted to a great deal of difficulty in predicting prices ten months from now. Of those answering, a total of forty per cent said their price predictions were sometimes off by twenty-five per cent or more in that time period. About seven per cent said they sometimes missed by forty per cent or more. But forty-four per cent reported they usually catch it between ten and twenty-five per cent. About seventeen per cent of the farmers felt they missed their guess by less than ten per cent.

Output Response to Price Changes: Neoclassical economic theory suggests that as price varies, production adjusts. But many farmers in the survey offered confirmation of the overproduction trap theory (Johnson and Quance, 1972). An astounding seventy-four per cent of the farmers said they do not alter production in response to price variation. The .05 confidence interval on this response was only 1.6 per cent. This, of course, would mean that these farmers do not believe the value of their capital in use is ever less than salvage value. This may mean the variation in supply comes from marginal operators

going in and out of the business or it may mean that these flat out farmers do not consider a five to fifteen per cent change in hogs produced to be a significant change.

Sixty per cent of the farmers surveyed acknowledged not always covering their variable costs. Several times during the course of this research remarks were made on the order of: "We just can never out guess the market so we run at capacity regardless." Producers who use this rule are living very high on the hog right now but it also means that they have recently come through two very rough years.

Attitudes about the Cycle: But even with those rough years immediately behind them, forty-one per cent of those answering still felt that they were better off with the cycle than without it. This was a sentiment that was sometimes expressed in personal interviews with Michigan farmers.

Reg Cridler, a Rockford, Michigan producer of about two thousand slaughter hogs a year, explained that the really good times allow him to get enough capital ahead to improve his operations. His wife, Diane, added that the low end of the cycle forces inefficient producers out of business.

Ivan Top, president of the Michigan Pork Producers Association, has also long felt positively about the cycle. "I used to say we could not live without the peaks so we had to take the valleys. But I've been raising hogs for

fifteen years and this is the longest I've been losing," said Top, referring to the two years of red ink entries his ledger books acquired just prior to the last several months of positive entries again.

"If anyone would have talked to me about contracting a couple of years ago I would not have paid any attention. But now I am at least willing to listen because I do not want to go through another two years like I have just gone through," Top said early in 1982.

Top, from Hamilton, Michigan, almost committed himself to a major expansion of his facilities in 1981. He had the building contracts in hand and the financing committed but at the last minute canceled the construction because of uncertainty about future prices.

But, although it was surprising that so many of the surveyed farmers felt positively about the cycle, it should be emphasized that 58.3 per cent of the respondents did feel that the cycle was a hinderance in running their businesses.

Ability to Always Cover Variable Costs: About sixty per cent of the farmers felt that at the low end of the cycle they could not cover their costs of production. How closely all farmers monitor their costs of production is a matter of some debate. Several of the packers interviewed believed a sizable number of farmers often do not know their costs of production.

Packers' views gain credence when one observes that price has been as low as thirty dollars in the last two

years and forty of the farmers in the survey said they always cover variable costs. Surely not all of that group were covering variable costs all of the time. During some of that time grow margin per cwt. over feed cost was not much above three dollars. Some farmers may cover their non-feed variable costs with three dollars per cwt., but certainly not all can do it. For instance, 1982 Michigan State Telfarm records show non-feed average variable costs to be $9.10.

If you believe that variable production costs are always covered, then the flat-out operation rule may be economically defendable. And, to that extent, the direction of the farmers' answers was rational when it comes to deciding at what level to operate.

Changes in Production Based on Price Predictions: While an overall total of only twenty-six per cent of the farmers said they change production levels based on price predictions, eleven of the thirteen farmers who said they did not always cover variable cost said they would change production levels based on price prediction. The cross tabulation Table 4.2 with row percentages is shown below:

Table 4.2. Effects of Variable Cost Coverage on Willingness to Change Production Based on Price Prediction by Percentage

		Sometimes Unable to Cover Production Cost	
		Yes	No
Change Production Based on Price Predictions	Yes	83 %	17 %
	No	53 %	47 %

One can see why the high degree of uncertainty about future prices means that farmers may not pay as much attention to what costs are. If you are unsure about returns you can not really decide about incremental shifts in production because you have only cost data and no revenue data upon which to make the decision. Therefore it may be rational just to concentrate on making production as efficient as possible and then, if in the long run average you find yourself making money, expand your operations.

Ken Norton, a Michigan producer of about 1,700 hogs a year explained that it is easy just to shove the hog accounting reports in the drawer rather than spend the evening studying them because right now he does not alter production. Norton, who uses the Michigan State sponsored

accounting system for farmers, noted that since he runs his operation flat out, it does not really make any difference what the costs are going to be once the hogs are in the barn. Hogs weaned are basically hogs sold because there would rarely be a situation that marginal returns do not exceed marginal costs from that point on. Norton said if he became involved in contracting he would spend much more time analyzing costs because it would pay him dividends. At present he sometimes thinks extra effort spent acquiring information on costs is not worthwhile because he is always uncertain about output price. Because of the uncertainty about output price and high fixed costs resulting from confinement operations, he thinks his "flat out" rule is best.

First Awareness of Not Covering Costs: Of those who said they were sometimes unable to cover total costs, fifty per cent said they only became certain of this shortly before marketing. Only eighteen per cent said they had an inkling of this situation prior to breeding.

But the loss situation apparently did not too often cause real financial difficulties for most of those in the survey. Only thirty-three per cent reported they were ever forced to ask to refinance a loan when such refinancing was not originally planned.

Effect of Leverage on Refinancing: Fifty-six per cent of all the farmers who had more than seventy-five per cent of their operating capital borrowed reported that they

had to ask for refinancing of loans when they had not originally planned on it. Only nineteen per cent of those not so heavily levered reported ever asking for refinancing when it was not planned. The correlation ratio (the portion of variance in the dependent variable explained by independent variable) is .81 with percentage borrowed being the independent variable. The percentage cross tabulations (Table 4.3) are reproduced below.

Table 4.3. Effect of High Leverage on Unplanned Refinancing by Percentage

		More than 75% of Operating Capital Borrowed	
		Yes	No
Unplanned Refinancing of Loan	Yes	56 %	44 %
	No	19 %	81 %

The mean number of years farmers had raised hogs in the survey was 15.9 with the standard error 1.4. The majority of farmers, sixty-one per cent, raised all their corn for their hog production. The mean percentage amount of corn for feed raised on the farm was eighty-one per cent and the standard error was 4.2 per cent.

Use of Contracting or Futures Market: The majority of those surveyed did not ordinarily use futures or cash contracting as a marketing tool. About forty-one per cent of the sample had experience in the area, but only about twenty per cent of the farmers were currently either hedging or cash contracting.

Farmers were about evenly split among the eight choices offered to explain why they did not contract. The choices were: 1) Contracts too large; 2) Untimely contracts; 3) Capital position large enough to absorb unhedged loss; 4) Too time consuming or complicated; 5) Temptation to speculate too great; 6) Dishonesty in those markets; 7) Transaction costs too high, and; 8) Other.

A summary of the absolute frequencies of the farmers who did not hedge or cash contract and their reasons for not doing so is in Table 4.4.

Table 4.4. Reasons for Rejecting Contracting

Reason	Absolute Frequencies
Contracts too Large	10
Untimely Contracts	2
Capital Position Large Enough to Absorb Unhedged Loss	10
Too Time Consuming or Complicated	12
Temptation to Speculate too Great	1
Dishonesty in Those Markets	4
Transaction Costs too High	8
Other	10

Twelve of the nineteen farmers who said they sometimes hedge said they have no rules for doing so. Most of the rules of thumb for hedging were not well defined, like "half of production when futures are relatively high." Some of the replies indicated that the query, which was supposed to elicite the rules of thumb used for future or cash contracting, was not well specified.

But Dale Warsco, the president of the large White Cross Farms in Windsor, North Carolina defined very specfic rules. Warsco, who produces about 72,000 hogs a year, indicated they do not pay much attention to price expectations but watch the futures prices compared to their costs carefully to determine what they should hedge. White Cross is always run at capacity.

Although he sells hogs five days a week, he lumps production into weekly groups. Each Tuesday he uses his computer to print out his costs of production for each group based on a hedged soy bean meal and corn price. If he can net $2.50 cwt. on any of his groups, he hedges five per cent of that production. At a profit of ten dollars cwt. he is fifty per cent hedged. And if profit ever reached a dreamed of twenty dollars cwt. he'd be one hundred per cent hedged.

Market Channels: Only thirteen of the fifty-one farmers used auction markets to sell any of their hogs. Four farmers used that channel exclusively. Nineteen, twelve exclusively, sold their hogs through non-packer buying stations. Twenty-one, sixteen exclusively, sold direct to packer buying station or gate. Two sold to an order buyer. And, reflective of the demise of the terminal market, only four buyers utilized this channel.

Farmers were asked why they used the marketing channels that they did by offering the following choices and instructing them to check all that apply: 1) Closest outlet; 2) Best price; 3) Honestly treated; 4) Convenient hours, and; 5) Other.

The number of farmers checking each choice is shown in Table 4.5.

Table 4.5. Absolute Frequency of Farmers Checking Reasons for Selling in a Marketing Channel

Reason	Absolute Frequency
Closest Outlet	24
Best Price	24
Honestly Treated	10
Convenient Hours	18
Other	6

Price and convenience, as one would expect, were most important. As one would also expect, this should mean that if a contract market is able to enhance prices through a more competitive market, farmers would use it. As has been noted, when Ohio State ran its electronic market there was a price enhancement of about one dollar per hundred pounds when compared to the normal basis between Ohio and Peoria. But even then the big volume growers did not get on the system, alledgedly because packers sweetened their private treaty deals with these large farmers. When the market collapsed, the larger basis reappeared and the largest operator's private deal apparently became less sweet right along with the increase in the basis.

About fifty-one per cent of the farmers surveyed judged their relationship with their buyer so important that they would continue to use that marketing channel even though

they could get a slightly better price elsewhere. Only eleven of the twenty-one farmers in the sample who did have contracting experience said they felt it improved their management ability.

Attitudes about a PCM: Farmers were then asked to compare the Electronic Contract Market to their present marketing channels. Unfortunately not all the farmers answered these questions, but of those who did sixty-three per cent felt that an electronic contract market would produce superior prices to their present system. Eighty per cent felt they could do a better planning job with a contract market. Enthusiasm for this answer should, however, be tempered with the observation that a somewhat lower percentage, fifty-two per cent, of those who had actual contracting experience felt it improved their abiltity to make managment decisions.

This is a problem. The whole idea of a PCM is that it would enable farmers to obtain more reliable forward prices and hence better match supply, given costs of production, with demand. Were a PCM to be instituted, a substantial educational effort should be made to show how such an institution could improve management by generating more reliable prices.

About eighty per cent of those surveyed felt that the PCM would give them access to more buyers than are presently interested in their products. But only forty-eight per cent believed that the contract market could better reward them for producing a superior product.

As evidenced by their previous answers, farmers in the survey were mostly favorably impressed by the idea of a PCM. But they did not think their fellow farmers would be similarly impressed. About seventy-one per cent of those answering believed that most pork producers would favor the present system to a PCM. Likewise fifty-three per cent believed that buyers would find the present system more to their liking.

Sixty-five per cent believed that seller-buyer cooperation is better under the current system than it would be with a contract market. Sixty-nine per cent felt they could more efficiently use their capital under a contracting system.

But farmers split right down the middle on whether they would be more satisfied if a contracting market was added to they system. Somewhat paradoxically, seventy-four per cent of the respondents said they would consider selling a contract in a PCM if it ever was created. The .05 confidence interval for this statistic was only 1.1 per cent. Only thirteen farmers or twenty-six per cent of those responding concluded that they would not be interested in a PCM.

Packers surveyed, for the most part, were lukewarm towards the idea of a PCM. All but one said they would look at a PCM to see if it could help them with their procurement problems. But, it was said more in the spirit of "we will look at everything that comes along, on the

outside chance that it can help us," rather than with enthusiasm.

Packer representatives like Leonard Haverkamp, Vice President of Wilson Foods, felt a PCM would be redundant with the current marketing. Haverkamp, an economist, felt the only justification for a PCM would be that it might tighten the discount off futures that packers currently offer. He discounted the idea that a PCM would give them wider exposure to farmers interested in contracting, thus increasing the coordination in the system.

Haverkamp said the whole subsector, in his estimation, would be better off without the cycle. But, he held out little hope that this could be done, because he did not think it possible to get significant numbers of farmers to sign contracts prior to breeding.

Size was apparently not a significant factor in determining how favorably farmers are disposed toward the PCM idea. A slightly larger nominal percentage of large farmers said they would be willing to contract, as can be seen from Table 4.6. While the numbers are statistically different, the spread is not large enough so as to cause educational programs to be differentiated on size alone.

Table 4.6. Effects of Producer Size on Contracting Attitudes by Percentage

Producer Size	Favorable Towards Contracting: Yes	Favorable Towards Contracting: No
Small	71 %	29 %
Medium	73 %	27 %
Large	78 %	22 %

One might intuit that highly leveraged farmers would be most interested in contracting because of their needs for consistent cash flow in order to keep bankers happy. But there was not a dramatic difference between those who had borrowed heavily and those who had not. Seventy-nine per cent of those with more than seventy-five per cent of operating capital borrowed said they would try a PCM and seventy per cent of those with less than seventy-five per cent of their working capital borrowed were equally interested.

Only thirteen farmers concluded that they would not be interested in a foward contracting market. They were given the following choices for refusing to contract: 1)

Spot price might be above contract price at marketing time; 2) Uncertain when pigs will reach market weight; 3) Contracts might be unfairly enforced so as to give advantage to the packer; 4) Contracts limit future actions, and; 5) Other reasons.

The absolute frequencies of the number of times the farmers checked those choices are show in Table 4.7.

Table 4.7. Absolute Frequencies of Reasons for Lack of Interest in a PCM

Price	Maturity	Enforcement	Limit Actions	Other
7	7	8	9	1

Range of Time for Allowable Deliveries for Contracts: Prior to undertaking the research it was hypothesized that contracts would be more valuable to packers if they had very tight delivery schedules. But the surveyed farmers, for the most part, reported that they would be unwilling to contract tightly if a nine month contract was being considered. If a contract called for delivery to be within one day, only fourteen per cent of the farmers would be willing to contract as much as twenty per cent of their anticipated production. So, a contract that called for delivery nine months hence to the day would not be very successful.

This is even more true if the amount under contract increases. For instance, if the amount of production under contract was sixty per cent, only six per cent of the farmers would contract to within one day. If contracts, however, allowed delivery within a seven day period of time, a cumulative total of thirty per cent of the farmers would be willing to contract sixty per cent of their production. All farmers who were willing to contract would be willing to contract sixty per cent of their production nine months ahead if they were allowed a leeway of a month in delivery time.

As noted earlier, it was at first hypothisized that packers would value tight delivery specifications in their contracts. Subsequent interviewing made it clear that packers would pay no more for such a feature as long as the farmer could keep them informed how production was coming and give them a firm indication of when delivery would be made a week or so in advance. Thus, farmers' reluctance to tightly specify delivery dates does not appear, at least initially, to be a serious impediment to long term contracting. Several packers discounted the idea that significant advantages could be gained from contracting to smooth daily delivery.

This discounting is not supported by studies of advantages gained from smooth flow of product (Schneidau and Duewer, 1972; Holtman, et al., 1974; Daellenbach and Fletcher, 1971). Nor does packer discounting fit with the

long run idea that if plants had a dependable low variance supply of products they could be designed with lower average cost curves (Purcell, 1979). This idea was illustrated in Figure 1.6 (page 43).

Bernard Ebbing, retired procurement manager for Rath Packing in Iowa, said that managers are less than forthright if they claim that hog delivery is not a real concern. Ebbing further noted: "Watch what happens when it looks like the procurement manager will only be able to fill a five hour kill when the schedule calls for eight. I guarantee you he will be out of the box with one dollar tacked onto market price so that he can fill his kill."

Per Cent of Production Contracted: Even if the contract was suitably specified, only one farmer initially was willing to contract one hundred per cent of production. A cumulative total of nineteen per cent were willing to initially contract seventy-five per cent of their production; fifty-eight per cent fifty per cent, and eighty-five per cent would be willing to contract twenty-five per cent. All of the forty-eight farmers answering the question said they would be willing to contract at least ten per cent of their production if they did contract.

Despite the fact that early questions showed that confinement raising has reduced uncertainty, farmers were still for the most part afraid to contract before breeding. Asked when they would prefer to contract, most farmers said

they would only contract after weaning. Sixteen per cent said they would contract before breeding and a cumulative total of forty per cent said they would contract after birth but before weaning. A cumulative total of ninety per cent said they would contract after weaning. Apparently it is only after weaning that uncertainty about production is fully reduced for most farmers. A month before marketing, a cumulative total of ninety-eight per cent of the farmers were willing to contract.

The biological uncertainty in hog production make farmers wary. Harold Trimble, of Dexter, Michigan, said: "I'm always afraid of not having the hogs ready when I need them."

Size did seem to have some effect on willingness to contract before breeding. Only three of twenty-two small producers were willing to contract then; none of the medium sized producers, and five of the seventeen large producers would contract then.

The cross tabulation (Table 4.8) shows the row percentages by size on how long a contract farmers would be willing to take.

Table 4.8. Effects of Producer Size on Length of Contract by Percentage

Producer Size	Length of Contract: Prior to Breeding	Only After Birth	Only After Weaning	Month Before Marketing
Small	14 %	23 %	41 %	22 %
Medium	0	27 %	73 %	0
Large	29 %	24 %	47 %	0

Obviously if the PCM is ever to do anything about the problem of cycling, it must cause a behavioral change in the way farmers respond to prices. And the only way to do that is to structure the PCM so that it can get at the breeding decision. A contract taken three months ahead of delivery may offer some coordination or pricing advantages to either party, but it does not affect the amount of pork coming onto the market.

Thus, if the primary goal of cycle dampening is to be reached, farmers must be willing to contract nine or ten months ahead of delivery. Contracts taken that far ahead affect breeding decisions. That is, farmers taking contracts that far out should contract to the point that

they are receiving no economic rent and then quit. Other farmers would make plans according to that price if they saw that it was reliably anticipatory.

If one of the goals of a PCM is to reduce the cycle, farmers' ideas that nine or ten month contracts are too risky because of biological undertainty must be dealt with. Otherwise information can not be forced into the system which will alter farmer behavioral patterns enough to dampen the cycle. Some way must be found to ameliorate this fear.

Recall that a majority of those who answered the question said the cycle was a hinderance. This in part explains why farmers reacted favorably to the idea of contracting because sixty-nine per cent of the farmers believed that a contract market would decrease the amplitude of the cycle.

One of the major hypotheses of this research is that if more predictable prices were generated then pig crop variance would decrease. That is, farmers would see the price they were going to be selling hogs for nine months from now and act accordingly. But eighty-four per cent of the respondents said they would not change their method of operation if more predictable prices were generated. This makes sense in the short run assuming farmers are always able to cover variable costs. But in the long run, with more stable prices, capital investment in the subsector would adjust to a more efficient point. Whether the stable price would be above (Johnson and Quance, 1972), or below

(D. G. Johnson, 1948), the current long term mean depends on whose disciple you are. What is not arguable, however, is the fact that if a PCM dampened the cycle, capital would be allocated more rationally than under the current system. Under that circumstance, supply would be more nearly harmonized with demand at levels which reflect production costs. If this happens, the amount, given production costs, by which the quantity supplied periodically misses quantity demanded should be reduced.

But in any case, it should be noted that sixteen per cent of the farmers did say they would use the predictable price information for production plans. A ten per cent change in year to year hog volume is unusual.

Operating Details of the Contract Market:

Ownership: Fifty-four per cent of the farmers thought the contract market should be owned and operated by farmers. Only six per cent of the farmers wanted buyers to take such responsibilities and only four per cent wanted the government to do it. But thirty-one per cent wanted a third party to do it. When they did specify which third party, it was usually a joint organization of packers and farmers.

Participation Requirements: Under some conditions it might be necessary to require farmers to participate at low levels in order to make the contracting market successful. It would be extremely difficult at this time

to get a mandatory system in the U.S. Eighty-four per cent of the farmers said they would vote against such required participation. Attitudes could, of course, change substantially with experience or information showing significant benefits to participants.

Other Operating Details: Fifty-two per cent of the farmers thought that pre-set penalties could handle cases of non-contract compliance. Other ways of handling non-compliance generated little enthusiasm.

Farmers felt strongly that contracts should be inviolate except for acts of God or an uncontrollable disease outbreak. Seventy-eight per cent thought acts of God and sixty-seven per cent thought disease outbreak were acceptable reasons for not meeeting a contract. In most of the current contracts there are no escape clauses except to buy your way out of the contract by purchasing market hogs. A few contracts do allow farmers to roll their contracts a month ahead by paying whatever the difference between their contracts and the futures price is. As will be shown, packers would probably demand such assurances in any contract market.

Such requirements would be fine with Dale Warsco, Windsor, North Carolina. He wrote: "They should not be allowed to cancel any contract. They can always sell out of their position. There should never be any other way out!!!"

Should a contract market allow the selling of contracts in order to allow a farmer to get out of a contract?

Theoretically, since the purpose of this market is to get participants in the system who face actual market demands and costs of supply, a secondary market that did not require delivery would negate the PCM's purpose. If pure speculators were involved, the market might end up being somewhat redundant with the futures. The PCM market, of course, would be intended to facilitate the delivery of actual products and not the holding of contracts which is what the futures market is designed to do (Working, 1954).

But farmers overwhelmingly wanted to be able to sell their contracts. About eighty-five per cent thought it was a good idea to be allowed to sell their contracts. Upon reflection, there is no reason why others could not be allowed to create an ad hoc secondary market in these contracts so long as they intended to actually take delivery or deliver the product. This presence in the market would add liquidity and make both farmers and packers less reluctant to take a contract initially if they knew that they might sell it if some unforeseen event occurred. A secondary market would assure that the relationships between months stayed in line, although the futures contract would perform this action for the most part.

For instance, a farmer holding a nine month contract for four months could get out of it by selling it to a speculator. The speculator in turn would purchase a five month contract from another farmer so the speculator could fulfill the original nine month contract. A speculator

of course would only undertake such an action if there was a chance to make a profit between the contract that was originally taken nine months ago and the new five month contract.

Contract Size: At this point the scale of most hog farms is not large enough to make the standard Chicago Mercantile Exchange contract attractive to most farmers. The standard contract is for 30,000 pounds. Some packers offer 15,000 pound contracts which they hedge on the Mid-American Exchange or else just comingle their smaller contracts so as to meet the 30,000 Mercantile Exchange requirements. If they end up with a split contract at the end of the day they figure that is not too much risk to face.

Farmers in the survey showed a marked preference for contracts of 15,000 or 5,000 pounds. Thirty-five per cent of the farmers wanted 15,000 pound contracts or about sixty-eight market weight hogs. Forty-four per cent wanted 5,000 pound contracts or about twenty-three market weight hogs. Twelve per cent wanted contracts of 1,000 pounds. Only eight per cent found the standard 30,000 pound contract acceptable. Thus, a cumulative total of ninety-two per cent of the farmers wanted a contract that is smaller than the Chicago Mercantile Exchange offers. While it was earlier learned that farm size does not make a dramatic difference in contracting attitudes; it is, as you would suspect, crucially important in determining attitudes about

contract size. No small producers were interested in 30,000 pound contracts and no medium or large producers felt contracts of 1,000 pound increments would serve their purposes. The cross tabulation table (Table 4.9) with respect to farm size and contract size preference is as follows:

Table 4.9. Effects of Producer Size on Contract Size Preference by Percentage

Producer Size	Size of Contract in Pounds			
	30,000	15,000	5,000	1,000
Small	0	19 %	52 %	29 %
Medium	10 %	40 %	40 %	50 %
Large	18 %	53 %	30 %	0

The mirror image survey revealed a major difference between packers and farmers as far as contract size is concerned. All packers preferred to deal only in contracts of 30,000 pounds and seventy-five per cent of the small producers preferred contracts of 5,000 pounds of less.

Because a large number of contract size variations complicates the system and increases per unit cost, the decision could be made to eliminate the smaller size

contracts. This could be done particularly on the grounds that it is the large producers who can produce the volume sufficient to cover the overhead costs of running the PCM.

The Ohio State HAMS system did not succeed in part because it failed to induce the large producers to use the system consistently. There were, of course, other reasons for its failure.

Allowing contracts of only 15,000 pounds or larger would simplify the system. A simple system probably has a better chance of success than one that is complicated. But such "simplification" means smaller farmers probably would not participate and that is a matter of concern.

This concern is based on two observations. The first observation is based on equity grounds. It is perhaps the small farmers who most of all need the help contracting can offer. The second reason to include the smaller contracts is because of a PCM long range goal of dampening the amplitude of the hog cycle. If small farmers provide a significant number of the marginal hogs necessary to swing the cycle, then it is quite important to get them involved in the system in order to reduce the swing. This issue will be dealt with further in Chapter V.

Already institutions have appeared to bridge the gap between small producers and large contracts. This perhaps explains the phenomenal success of Refco Foods, Ltd. in Chicago. Industry sources usually point to this organization as doing more contracting than any other.

Of course there is no way to know that for sure because there is no data collected in the area.

Refco's success is probably due to its willingness to take just about any size contract. This rather strong anecdotal evidence strongly backs the farmers' survey statements that smaller contracts than are being offered on the Mercantile Exchange are important to them. Refco's success comes despite demanding a generally larger discount off futures than their competitors do.

Four of the packers interviewed expressed reluctance to deal with contracts smaller than 30,000 pounds. Companies like Refco would have a role to play as the contracting system evolves.

Grading: Grading is also a critical question. If unseen animals are sold by contract, grading must offer assurances of the quality of animals to be delivered. All livestock varies widely in amount of usable meat as well as the quality of the meat. Because of this variation it was long thought that livestock could not be traded on the futures. That carnard has been laid to rest, but it is an article of faith among traders in livestock that the buyer wants to be able to "eyeball" the stock being purchased or else know and place confidence in the seller. This is one of the reasons personal relationships are important in the livestock industry. But electronic markets have shown that livestock can be traded by description.

USDA, of course, has Number's One, Two and Three grades for hogs. And the Mercantile Exchange uses those

standards. The USDA grades are based on a sliding scale relationship between backfat and weight. An experienced grader can do a pretty good job of grading hogs to USDA standards simply by eyeballing them. The judgement is made by evaluating the backfat in relationship to the hog's length or weight and degree of muscling.

But there are several problems with the system. First there can still be tremendous variation within the Number One category. Some hog carcasses will cut out as high as seventy per cent or better in the four best cuts and they are paid at the same rate as a fifty-three per cent hog because both are defined as Number One hogs. Cutout is defined as the portion of a carcass that is ham, loin, picnic and Boston butt. At today's prices such a difference in cutout can make a real difference in profit. This problem will be more fully discussed in Chapter V.

Secondly, graders do not always grade accurately. Because of these problems some companies use their own live grading standards which are usually a variation of USDA grades. For instance, some companies split the USDA Number One category into three categories. Most industry experts agree that the preferred way to grade a hog is after it has been killed and while the carcass is still warm.

This method of rail grading is used in Canada but it is only beginning to catch on here. One of the problems is that technology still has not advanced far enough so that backfat on the carcass can be measured easily in a

production situtation. Several companies are marketing either mechanical needles which go through the backfat but stop at the meat or ultra sound devices that measure backfat by taking into account the different density of backfat and lean meat. But nearly all company executives said that neither of these methods have worked well so far in a production environment.

But even if carcass grading is the better method for determining carcass value, it is not a method that has gained wide acceptance. Farmers sometimes mistrust such schemes because they usually will not be able to watch their animals being graded. They can at least usually know immediately how their live animals are graded.

This mistrust is reflected in the fact that forty-nine per cent of the farmers wanted the current USDA live standard used in the contract market grade requirements. But thirty-seven per cent did opt for carcass grading.

The experience at Kahn's in Cincinnati shows that farmers do come to trust a grade and yield program. When Kahn's started its contracting program in 1981, only ten per cent of the contracts were under grade and yield specification -- the rest being live graded. By the end of 1982, virtually all of the contracts were on grade and yield.

All the packers interviewed agreed that there would be some grading standard that they could use. The subsector now has a hodge podge of grading standards with some

companies having their own. Packers seemed fairly indifferent to whether grading was live or carcass. But if they had their choice, most would opt for carcass grading.

Again, farm size did relate to ideas about grading. Only twenty-three per cent of the large producers were satisfied with the USDA standards, while sixty-eight per cent of the small producers thought the USDA standards were the ones to use. Fifty-five per cent of the medium producers' preferences was for the current USDA standard. Forty-one per cent of large producers preferred carcass grading; thirty-six per cent of the medium sized producers, and thirty-three per cent of the small producers felt the same way.

This indicates that there is a recognition on the part of many farmers, particularly the larger hog producers, that current standards are inadequate. Packers' and producers' organizations are currently jointly considering these problems of pork value and grading standards.

Of course, exactly what the quality of the pork will be when it is being raised, or prior to breeding, is somewhat difficult to gauge. Most contracts now just call for hogs to be One's, Two's or Three's with not more than twenty per cent being Three's. And if there are excess Three's, a discount of some sort is applied.

An electronic market would have the possiblity of negotiating the discount with every contract settlement.

However, this temptation to exploit the limitless possibilities of the computer is probably best avoided. Users of some of the failed electronic systems have complained that the systems were made too complicated.

For whatever the reason, most farmers wished that the discount factor be set beforehand and periodically reevaluated. Only twelve per cent thought it should be part of the negotiation process. About sixty-eight per cent of the farmers felt that a joint-committee of packers and producers should negotiate the discount and periodically meet to decide if it should be changed.

Summary:

Farmers were willing to use a PCM, but they, for the most part, did not see it as producing information which could be used to plan production. Packers were lukewarm to the idea of a PCM, but only one of the eight surveyed was openly hostile to the idea. The subliminal feeling produced from the interviews was that packers felt such an idea could not really improve upon their current procurement procedures.

Farmers were reluctant to contract prior to breeding decisions if the contract called for delivery within a range of a few days. But they were more willing to contract if the nine month contract called for delivery anytime within a month.

Packers said that such loose delivery dates would pose no problem for them in as much as that is the way the current contracting system works. But the question does arise whether packers are not too heavily discounting the coordination advantages that could accrue from a system that has substantial amount of contracting in it.

The majority of farmers felt the PCM should be farmer controlled. But they were overwhelmingly against required farmer participation. There was a mismatch between the size of contract the farmers wanted to sell and the size packers wanted to buy. The simple majority of farmers preferred that contracts be sold on live grade basis, although large producers did prefer carcass grading. Packers did agreed that it would be possible to set up one grading standard that would suit all of their purposes. They said they could use either a live or carcass grading system, but if there was a preference specified it was usually for the carcass system.

In Chapter V the findings from the survey, in conjuction with the work done in the first three chapters, will be used to design the rules for a PCM.

CHAPTER V

THE RULES FOR A PORK CONTRACT MARKET

The ways a pork Contract Market (PCM) could improve coordination and dampen the cycle have been specified. Knowing that a PCM could do these things obviously is not enough to make it happen. An idea for insititutional change that improves performance may be theoretically correct. But, it may never be instituted successfully if the rules for operation do not produce incentives to make the system work and if the social movement, which supports the intitutional change, has not taken place. Usually this means that the changes produce added income streams for system participants. Thus they will support the new institution.

This research has examined the evolutionary path of institutional change in the pork subsector. There is no reason to believe that future changes will not come in similar evolutionary fashion. The emphasis of this chapter will be on creating the evolutionary path that leads to a workable new institution that can sustain itself.

Purcell (1983) lists the following steps as necessary to make an electronic market successful:

1. The people and institutions who will use the system must be involved in its development.

2. The system must be kept simple. Temptations to exploit all the capabilities of the computer should be resisted.

3. Strong educational effort must be made to make sure the system is understood. Understanding will resist uncertainty. Understanding will reduce uncertainty and, in most cases, resistance to the institutional change.

4. Institutions that are part of the current marketing structure must be involved. These institutions can in turn guarantee performance.

5. If existing instituions can not or will not guarantee performance, then a separate system of performance guarantees must be created.

6. If an existing institution will not fill the role, then a new selling agency must be created to handle the transactions between buyers and sellers.

7. The system must be fully tested before the actual market use of it is made. At the first attempt a few parties must be committed to giving it a try.

8. The creator must be patient and make sure of financial staying power to withstand some setbacks because "institutions change slowly."

Many of Purcell's steps apply equally to the creation of a PCM. Since it is likely that a PCM would be instituted in conjunction with an already existing electronic market, at least a few the problems Purcell mentions will already be solved. But in some of problem areas it will be necessary to start over again. For instance, the people who use a PCM must be involved in creating it. The primary task of those creating it will be to design the rules for the PCM.

The "rules of the game" are surely just as important as the theory in determining institutional success. Rules for the PCM will need to determine: 1) Whether hog farmers and packers would be required to participate to some degree. (This rule will affect other rules also. If voluntary participation is chosen, other rules will have to be designed with free rider problems in mind.); 2) Ownership of the PCM; 3) Who should be allowed to buy and sell contracts; 4) The size of contract; 5) How hogs contracted should be described and graded; 6) Under what conditions contracts can be cancelled; 7) Whether a secondary market in the PCM should exist; 8) The kind of information generated by the PCM and who should have access to it; 9) The discounts and premiums for hogs that are not of the exact quality the contract specifies; 10) The method of price negotiation used to sell the contract; 11) Whether transportation for the contracted hogs should be arranged by the system; 12) How far ahead contracts should be let and how variable in length they should be; 13) Over how wide a geographical area contracts should be sold; 14) How tight, in terms of days, delivery of a contract must be, and; 15) The devices used to put buyers and sellers of contracts in contact with each other. Cost of these devices is also an important consideration. This chapter will recommend appropriate rules in these fifteen areas. The recommendations will be based primarily on the research exposited in the previous four chapters, but additional

information on the new electronic spot markets also will be included.

1) Mandatory Participation:

Mandatory anything is repugnant for most Americans. Farmers showed themselves to be overwhelmingly against such requirements for the PCM. In fact, since eighty-five per cent of the farmers in this study were against such a requirement, it might be impossible to get them to vote for it even if it was shown that that would be the only circumstance under which it would be possible to set up a PCM.

Of course, many things are mandatory because it is not practical to have it otherwise. These rules are to eliminate free riders which make operationalization impossible or else to capture economies of scale.

Initially it was thought that it might be necessary to spread a high fixed-cost PCM over a large volume in order to get a unit cost that is competitive with other forms of marketing. Fortunately, as will soon be illustrated, as long as a time share computer system is used, there are not tremendous scale economies beyond a certain minimal volume.

While economies might not require mandatory participation, it should be noted that the higher the volume offered on the PCM, the higher the packer interest. Further, there will need to be concerted action on the part

of producers. They must decide to use the system or else private treaty contracts might be prevelant enough to break the system apart. It was for this reason that the spot electronic market in Ontario, Canada was made mandatory. In Canada, even if a packer owns a production facility, the hogs must be offered for sale to all bidders and can not be moved directly to the packer's plant.

Although it can be established that large volume is not necessary to make a PCM feasible from a cost point, a low volume will not dampen the cycle as much as larger volumes. In the U.S. if the system is not made mandatory, there would be free riders. This is a case where free riders would not be the total anathmema they normally are. It is hoped that those not using the PCM would still use the PCM price generated information to make production plans. In any case, they should be offered inducements to use the system.

Further, since many packers' volumes do not vary by more than fifteen to twenty per cent, coordination advantages from contracting start to occur at fairly low levels. Contracting levels of twenty per cent should be adequate to prodce some coordination advantages between packers and farmers. If a voluntary system could be gotten to this level of contracting, then the ever increasing advantages from contracting might be enough to encourage ever more contracting on the PCM.

Recommendation: Make the PCM voluntary but work hard at combining it with incompatible use goods so as to

cut down on the amount of free riding (Schmid, 1978). If experience shows that a voluntary PCM can not get enough participation to be effective, then perhaps a mandatory system should be considered.

2) Ownership of the PCM:

Fifty-one per cent of the farmers surveyed responded that farmer organizations should own the PCM. But, significantly, thirty-one per cent checked the "other" category box and usually indicated that they meant a joint organization of packers and farmers. But none of the packers expressed a desire to help organize the market by expending funds towards such efforts.

Discussion of ownership of the PCM may be a moot point since it is most likely that a PCM would be done in conjunction with an already existing electronic market. If that happens, the ownership of the PCM, by default, would almost certainly be the ownership of the electronic market.

Because of costs, the only practical alternative would be if a separate PCM organization rented time on the electronic market association's network. Only if all electronic marketing organizations rejected the idea of putting a PCM on their networks would investigation of a unique system for the PCM be worthwhile. The section on the cost of a PCM in this chapter will make plain the tremendous economies of going with an already existing system.

It should be noted that electronic marketing organizations may not be immediately receptive to the idea of a PCM because in some instances organization members are not favorably disposed towards contracting. Agricultural electronic markets are most often owned by farmer marketing organizations. Some of these organizations, a co-op livestock dealer for instance, see the current contracting system as a threat. Currently whenever packers get a substantial portion of their production under contract they reduce the number of animals they buy in the spot market.

This means that ever less volume moves through the spot market system. Because demand is less, some of the organizations contend that prices are lower. It should be noted that whether this is really true depends on the relative shifts in spot supply and demand and whether the spot demand elasticity is greater than supply elasticity. The private treaty contracts may shift spot demand backwards but then they also shift spot market supply in the same direction.

It will need to be emphasized that the contracts would be continuously let on a daily basis in a transparent market. This competitive price determination should overcome many of the objections to current contracts. Prices would be determined as they are in any well functioning market. Showing that even with contracts there will still be assembly functions, should decrease these

organization's objections to a PCM. It is undeniable, however, that some functions may be eliminated. But, the nimble dealer would be able to find a niche to fill in the new system.

The National Electronic Marketing Association (NEMA) in Christiansburg, Virginia, probably has the best chance of any currently existing organization to operationalize an electronic spot market for hogs successfully. It will, therefore, pay to look at their emerging structure. If they are successful with a slaughter hog auction system, that would be the logical place to piggyback a PCM. Hence, NEMA ownership would likely control the PCM.

NEMA was started in conjuction with Virginia Tech and USDA. It is being turned into a farmer controlled organization with transfer of ownership to a jointly held stock corporation backed primarily by National Producers Livestock Association, Denver, Colorado. National Producers is owned by twelve marketing agencies and six agricultural credit organizations.

NEMA has already experienced success with the electronic auction of lambs and hopes to have an electronic auction for slaughter hogs going in 1983. NEMA backers feel that one of the reasons the HAMS project of Ohio State was not eagerly embraced by packers is that it was harder for packers using the electronic system to assemble full semi-loads than it was using the current system.

To eliminate that problem, this time around the organizations plan to offer mostly semi-sized loads of

40,000 to 44,000 pounds. The organizations initially involved in creating the Computerized Slaughter Hog Marketing System are: Equity Producers Association in Wisconsin; Michigan Livestock Exchange; Interstate Livestock Producers Association in Illinois; Producers Livestock in Indiana, and; Souix City Producers in Iowa. These organizations hope to sell ten million hogs a year. They will assemble the semi-sized loads by comingling farmers' hogs.

If their electronic spot market for slaughter hogs works, and if these organizations then buy the idea of a PCM, it would mean the PCM could start with very strong institutional support. Some of the owners of NEMA are large enough to be strong factors in the market. But NEMA's emerging structure has pitfalls also. Although NEMA's charter states that it must offer its services to anyone who wants them, NEMA's owners are not likely to push that idea.

For instance, in Michigan, Heinold and Michigan Livestock are competitors. Michigan Livestock would not mind stealing a march on Heinold by being able to offer farmers a marketing channel that Heinolds does not have. But since Heinold is a strong market factor in Michigan, the NEMA would be stronger if both organizations were using the Computerized Slaughter Hog Marketing System.

Tom Reed, Michigan Livestock manager, said he recognizes this and hopes in the long run that Heinold will

get on the system. NEMA will need to entice all competitors in an area to use the system. All farmer representative particpants should eventually realize that the system will be stronger if their competitors sell on the PCM also. It should be clear that the more volume the market carries, the more packers will use it.

Assuming the exclusion problem is surmounted, then an organization like NEMA would be the logical place to try and start a PCM. The electronic markets that have been successful are producer owned and it is unlikely that packers would be willing to support such a market with their money, particularly if they feel they have some market power with the present system. But if the PCM can provide contract hogs to packers in a reliable easy-to-use manner and, if past history is a reliable indicator, the packer will use the system.

Recommendation: A producer organization should own the PCM. But, they must encourage all packers and producers to use the system. The form of producer control may be predetermined if the PCM is set up in conjunction with an already existing electronic market.

3) Certification:

Who should be allowed to contract? Obviously the PCM's integrity depends on the ability of system participants to meet contractual obligations. In most contracting there is some sort of institutional arrangement that insures this

integrity. In construction contracts, builders are often required to post a performance bond. With futures, the margin account basically serves this purpose.

Recall that farmers surveyed felt that the best way to enforce the contract was with agreed upon penalities included in the contract. But they were of mixed opinions about who should contract. Thirty-one per cent thought anyone who wanted to contract should be allowed to do so and a like percentage thought it should be limited to only those who have been certified by the PCM board. The remainder were split among variations on those choices.

Those who said anyone should be allowed contract may have been motivated by concern that qualified producers be precluded from contracting just because of prejudicial treatment by those doing the certifying. While this is a laudable concern, too much concern in this direction could undermine the PCM. The system would be quickly destroyed by non-delivery on contracts and that could happen if unqualified producers were allowed to contract. On the other hand, a full scale certification seems unnecessary. The current contracting system functions without certification, but both parties know each other. This would not be the case with a PCM.

Perhaps a compromise between complete certification or no one being excluded from contracting would be best. If a farmer desired to do contracting directly from the farm, then an agency of the PCM could certify the farmer as being able to meet contractual obligations.

But it is assumed, at least in the beginning, that most farmers would not be contracting directly from their farms, but rather have a local assembly point offer their contracts. Only the largest farmers would probably be willing to bear the expense of installing a terminal in their homes. Farmers who have already purchased micro-computers with modems and the right communications package could get on the system without much additional expense.

It could be the assembly points' responsiblity to screen all of the farmers wishing to contract through them. If the assembly point was convinced that the farmer was a reliable producer then the farmer's contracts should be offered for sale through the assembly point. If the farmer did not meet the contract, both the farmer and the assembly point could be made legally responsible. The farmer and the assembly point could work out the considerations necessary to induce the assembly point to do this. Assembly points would have the incentive to bear this risk since a contract signed through them guarantees volume moving through their yards and hence commissions. It means that much less pressure to get out and beat the bushes for spot market transactions.

The current contracting system requires no performance bond and it seems an unnecessary expense to require it in a PCM. Prestated penalities such as having to buy out the contract with the purchase of spot market hogs for delivery

could effectively handle the problem of non-performance. But an extensive education effort on the inviolatability of the contract would need to take place. This would guard against the courts being resorted to as a mediator of disputes in all but the most flagrant cases.

Recommendation: If an assembly point judged a farmer responsible to contract, then the farmer could contract. In case of non-contract compliance from the farmers' side, the assembly point would bear a secondary responsibility. That is, if the farmer did not make the deal good, both the farmer and the assembly point could be sued. But, prestated penalties would avoid court action in most cases.

In the case of a farmer wishing to contract directly, an agency of the board would have to certify the ability of the farmer to meet commitments. The same agency of the PCM would also need to certify the credit worthiness and performance of all those wishing to buy contracts.

4) Size of Contract:

From the survey, it is known that the smaller firms prefer smaller contracts, five thousand pounds or less. We also know that packers prefer to deal with thirty thousand pound contracts because hedging on the Mercantile Exchange is facilitated. We know too that nearly all packers will hedge their contracts. This is because one of their greatest fears is paying a cash price substantially different than their competitors. Of course they would

love to pay a lower price. But, they will not take the risk of paying a higher price than their competitors because of low margins in the packing business. As noted earlier, nearly all the packers said that they were margin killers and not price risk takers. By hedging their farmer contracts with the sale of a futures contract, price will vary approximately the same as their uncontracted competitors. Thus, at the time the contracts are delivered, they end up paying approximately the same price as they would have in the spot market.

Even producers of more than two thousand head annually had a preference for contracts of fifteen thousand pounds. However, about eight per cent of this group had no objections to dealing with thirty thousand pound contracts.

There is an obvious mismatch here between packers' and farmers' desires as far as contract size is concerned. The mismatch would be even greater if packers had their preferences. The packers' preference for thirty thousand pound contracts is only because that is the way the contract on the Chicago Mercantile Exchange are specified. Some packers would prefer that the contracts were actually in the neighborhood of 42,000 to 44,000 pounds. That way contracts would nearly match the net weight of a semi-trailer loaded with hogs. But packers, of course, will not move to that size contract unless the Mercantile Exchange also offers such a contract. Some packers are trying to get the Exchange to move contracts to a size that more nearly matches a semi-load.

The current contracting system, as earlier pointed out, is groping towards a solution to this mismatch. Some companies, like Refco, are currently willing to take nearly any sized contract. Usually the smaller the contract, the larger the discount from futures price. These small contracts are usually comingled so that they can be hedged on the Mid-American or Mercantile Exchange. But since these contracts are often just hedged and not sold to packers in their comingled form, the coordination advantages of contracting disappear.

In order for a PCM to overcome this mismatch in desires, smaller contracts than what packers are interested in will have to be offered. Offering these smaller contracts will increase the cost of operating the system somewhat, but the more important concern is that the small contracts be put on the system in such a way so as not to kill the packer's interest in the PCM. If packers have to sit through the auctioning of many six thousand pound contracts they might lose interest in the system. The best way to surmount this problem would be to allow contracts of a certain size to be traded each day at a certain time.

Assuming the contracts would operate in conjunction with an electronic spot market, the PCM could start after the close of the cash markets for the day. For instance, the pattern could be that for the first half hour only contracts of five thousand pounds are traded, the second half hour only contracts of fifteen thousand pounds and

during the final half hour contracts of thirty thousand pounds are let.

If such a system were set up, then most likely companies like Refco or the private or cooperative livestock exchanges would be the contract buyers of the smaller contracts. The per unit price on these contracts would be lower than per unit on the thirty thousand pound contracts. This differential is what would induce buyers to take the contracts and assemble them into thirty thousand pound lots which they could in turn sell to the packers. Of course, if they were risk takers, these buyers of small contracts could "go naked" or if they believed there was an opportunity for a basis profit compared to the option of selling direct to the packer, they might directly hedge their comingled smaller contracts on the futures market. Ideally though, because of the coordination advantages, packers would be willing to offer these intermediate companies higher prices than could be gotten by hedging the comingled contracts.

Holder (1970) thought contracts should be specified in terms of head. At that time, contracting was just getting started and people did not yet have experience with it. Subsequent evolvement has shown that contracts specified in pounds do work. Wherever the PCM can follow the current contracting system without significant cost it should do so because that will make operationalization of the PCM that much easier. Of course, when contracts

are specified in terms of pounds, it is extremely difficult for farmers to deliver exactly the contracted amount since hogs do not come in one pound increments.

There are several ways to handle this. One is to allow the delivery weight to be plus or minus five per cent with appropriate adjustments based on the contract price. Another would be to require that at least the amount contracted be delivered and then pay for any excess at the current cash price. There are contracts in the market currently that use both of these methods.

This detail seems to be fairly unimportant. What is important is that the method for handling small variations from the specified contract weight be detailed before the letting of the contract.

Recommendation: Specific size contracts should be traded at specific times of the the day. The first contract should probably be about sixty-five hundred pounds, since that matches the twenty-eight to thirty pigs that farmers can get into their farm trucks or fifth-wheel type trailers. Succeeding contracts could be thirteen thousand or fifteen thousand pounds and thirty thousand pounds. If the futures market moves to a larger contract than thirty thousand pounds, then the PCM should move with it. Variations from the specified weight should be allowed only in an upwards direction with the excess paid at current cash price at time of delivery.

5) Description and Grading of Contracted Hogs:

Electronic trading and the futures market showed that livestock can be traded by description. So, the question is, what kind of product description and grading should be established for the PCM?

The Ontario system of electronic trading has been running since 1961. It has been modified through the years to meet changing market conditions and non-random samples indicate that packers and farmers are satisfied with the system. By law, all hogs there must be sold on the teletype system. There are practically no exceptions. Even totally integrated operations must pay marketing charges to the system.

The Canadian market apparently wants a slightly lighter hog, about two hundred pounds, than is produced in the U.S. Further, the market there apparently wants a uniform hog rather than the varying types of hogs produced in the U.S. system. In Canada all hogs are sold on a carcass, rather than liveweight, basis and assigned a quality index based on the relationship between carcass weight and backfat.

For instance, a carcass weighing between 140 and 149 pounds with 2.8 to 2.9 total inches of back fat measured at the shoulder and loin, is a 100 index hog. Similarly, a carcass weighing 170-179 pounds with 3.6 to 3.7 inches of back fat is also a 100 index hog. The highest value hog is 114 and that is for a 170-179 pound carcass with 1.9 total inches of back fat or less.

Packers bid on lots of hogs on the assumption that all hogs will grade to be one hundred. The auction works on a descending bid principle with the first packer to punch the bid button getting the lot. The packer does not know the actual quality of the hogs purchased until they're delivered to the plant. If the hogs that are purchased grade higher than one hundred, the packer pays a premium to the farmer. Likewise if they grade less than one hundred the bid price is discounted.

In the Canadian system each hog is tattooed at the assembly point so both packer and farmer get a full report on how each animal is graded. Thus, farmers will know which of their sow and boar lines are producing superior products. This feedback would seem to be quite important in making sure that farmers get information on what kind of hog is really wanted to meet retail demands.

How does the Canadian system actually work? Assume that a packer bids $75 per carcass cwt. If the animal in question grades 110 and yields eighty per cent, the payment is as follows: (200 x .8)(.75 x 1.1) = $132 or $61 Canadian per cwt.

The example is slightly misleading in that the farmer does not get the amount that is bid for the actual lot of hogs but rather the pool or average price for the week. A premium is paid for hogs delivered so they can be slaughtered on Monday, a day packers have trouble getting hogs.

Canadian farmers interviewed in cursory fashion in 1981 at the Kitchener-Waterloo stockyard and at a meeting of producers held by the Hog Producers Marketing Board in Arthur, Ontario, nearly all liked the system including the pool pricing. They said the average pricing for the week freed them from spending a lot of time listening to the radio trying to decide when the weekly high would be.

Although the Canadian survey hardly represented a random sample, not one of the approximately ten farmers interviewed in those two places had really negative things to say about the Board. Only one farmer, interviewed on his farm, was unfavorably disposed towards the Marketing Board. But his gripe was more directed at the way the Board sought foreign markets and not really towards the system itself. The one Canadian packer interviewed, the largest in the country, also said the system works well for packers.

But even though there seems to be universal approval of the system in Canada, it probably would not work here in the same form because packers apparently want a more varied product here than the Canadian system provides. For instance, Frederick and Herrud's contract now specifies that its premium hogs have a live weight between 210 and 250. Swift Independent wants its contract hogs to weigh between 200 and 230 pounds. Several of the U.S. packers interviewed stressed that the Canadian system was not flexible enough for them because it gave no information on the lot as far as grade or weight but rather assumed that the hogs would be of average weight and grade.

The grading issue, while somewhat outside the purview of this research, is extremely critical. In fact, grading problems must really be solved before it is possible to institute a PCM. Obviously, some universally agreed upon standard must be accepted if hogs are to be sold strictly by description. Further the system must adequately differentiate a hog's quality. The system is slowly moving in that direction now. The National Pork Producers Pork Value Task Force is one encouraging development in this area. But the task force must make absolutely sure it involves packers in the development of the grading system. A system which does not satisfy packers will not be used.

Most of the U.S. packers interviewed did feel that one grading system would work so long as they knew what the approximate grade and weight of the lot of hogs offered for sale is and could thus appropriately adjust their bid price relative to their needs.

The HAMS system, the short-lived Ohio electronic market, had a more flexible grading system letting the market set prices for different weight and grade hogs. And if market tests are valued, the Hams grading system met the needs of some subsector participants. Even though the HAMS system has long since collapsed, the grading system was effective enough to still be utilized by some participants. The grading system was based on back fat and muscling as reflected in Table 5.1:

Table 5.1. Grade Description for HAMS

USDA Grade	Back Fat* Thickness**	Degree of Muscle	Expected % Lean Cuts of Hot Carcass***
1 plus	1.1 or less	Thick or better	60 or more
1 average	1.3 or less	Thick or better	58 - 60
1 minus	1.4 or less	Moderately thick or better	56 - 58
2 plus	1.4 - 1.6	Moderately thick or better	55 - 57
2 or less	1.6 or more	Less than moderately thick	56 or less

* Slightly fatter hogs may qualify for a higher grade if they have superior muscling.

** Hogs qualifying for a grade on the basis of back fat may in a lower grade if they lack desired muscling.

*** Based upon a 230 pound live hog or carcass length of at least 30 inches.

In addition, the Hams system gave the average weight and weight range for a lot of hogs. It also listed the number of red haired animals in a lot. Red hair is undesirable because it is more difficult to remove than the hair from white breeds. However, white breeds are more likely to exhibit poor muscling and soft bellies than darker breeds. Some white animals are of excellent quality.

The HAMS grading system was effective because it split the current USDA grades into more discriminating categories. B. D. Van Staven of Ohio State University did

a study using February 16, 1981 prices. He found the carcass value for a one plus hog to be $53.29; for a one average to be $51.30; a one minus $49.67, and; a two minus $48.23. The average USDA one, two and three hog was $52.20, $50.03, and $47.94, respectively (Baldwin, 1981).

In a similar study at the University of Illinois, researchers in cooperation with Successful Farming, slaughtered five hogs on July 30, 1980. The hogs were numbers one, two or three's but all were purchased at the same price per cwt. The live weight value of the animals to the packer, derived from the wholesale value of the broken carcass varied tremendously (Johnston and Houghton, 1980). The live weight value to the packers varied by more than twenty dollars per animimal when the lowest quality and the highest quality hog were compared.

Farmers are now producing better quality hogs. In 1980, ninety-six per cent of the hogs marketed were grades one or two. In 1968, the figure was only fifty per cent (Van Sickle, 1983).

Van Staven and the University of Illinois researchers indicated farmers are probably not being fully rewarded for this improvement. If farmers were capturing more of the returns from this improvement, the system would move more quickly towards the kind of pig that retail demand wants. Clearly the HAMS system could better reward the superior producer and take away some undeserved rewards from poor producers.

It is a live grading system which was the most preferred way to grade by producers in the survey. Forty-nine per cent of the producers in the farmer survey selected live grading as their preferred method. But this preference for live grading may be just because that is what producers are used to. Recall the experience at Kahn's in Cincinnati where after a year's experience producers switched to a preference for carcass grading. Producers apparently started seeing that they could get paid more by producing quality hogs and having them carcass graded.

Live grading is highly dependent on the skill of the grader and if some live graders are better than others then the name of the grader becomes useful economic information. A carcass grading system, because it is more mechanical, does not put the same burden on the grader.

However, exactly which grading system would be better may be a moot point if one assumes that a PCM would be tied to an electronic marketing system with an already existing spot market for hogs. Under that situation the PCM grading system would probably bear a strong relationship to the spot market grading system.

As mentioned, NEMA in Christianburg, Virginia hopes to have an electronic market system for hogs running by 1983. However, the grading system still has not been selected.

Recommendation: The ideal system is a carcass grading system that might be a variation on the Canadian

system or any one of the packers' grading systems currently in use. (Whatever the carcass grading system, it should use only one back fat measurement since the single measurement has been shown to be as good a predictor as the two measurements.) Since farmers apparently prefer live grading, it might be wise to start with a system that allows either live or carcass grading. If farmers saw that by producing a quality product and having it carcass graded they could be paid more, the system would surely move towards carcass grading. Recall that this is what happened with Kahn's contract program. If that happened, farm level demand would more accurately reflect primary demand at the retail level.

6) Canceling Contracts:

Are there ever extraordinary situations that would justify either party not honoring a contract negotiated? Seventy-eight per cent of the farmers thought contracts would not need to be honored if "acts of God" prevented delivery.

Some current contracts specify that there is no way out of the contract except to pay any difference between the contract and cash price. Other contracts like Swift's have clauses that could be interpreted in a number of ways. The Swift Company's escape clause reads:

> ". . . neither party shall be liable in any respect for failure or delay in the fulfillment or performance of this contract, if hindered or prevented, directly or indirectly, by war;

> condition of war; acts of enemies; national emergency; sabotage; revolution or other disorders; strikes, lockouts or other labor disturbances; orders or acts of government or governmental agency or authority; interference by civil or military authority; or any cause like or different kinds beyond either party's control."

Conceivably Swift's contractual clause could be interpreted to cover outbreaks of disease since these are sometimes stochastic events. But while even the best producers get disease, they get less of it than those who do not watch details as carefully as they might. Determining if a disease outbreak is induced because of poor management practices or stochastic events is difficult.

Likewise, a strike may be unavoidable if demands are unreasonable. But strikes are also sometimes management induced. Usually a strike results from a complex weave of failings on both sides. Asking an agency of the PCM to sort out this weave seems unnecessary. Besides, any competent management that faces a strong probability of a strike, but yet continues to buy contracts without heed, is behaving irresponsibly.

Asking an agent of the PCM to decide whether failure to fulfill a contract is the fault of the party involved or the result of a stochastic event seems unwarranted. Besides it would be possible to purchase insurance against most of these events.

Recommendation: The contract should be honored under all circumstances or else the non-performing party should be required to reimburse the other party to the contract

for damages. The only exception to this would be for the standard insurance contract escape clauses which cover acts of war or God. This clause would not cover strikes, lockouts or disease, etc.

7) Secondary Market for the PCM:

Farmers overwhelmingly wanted the freedom to sell their contracts. There is no reason not to allow them to do this so long as they can sell it to a buyer who is capable of fulfilling the contract. Similarly packers should be allowed to sell their side of the contract to bonafide buyers so long as the sales do not inflict extra costs on the sellers. And, of course, either party should be allowed to buy their way out of a contract by paying the difference between the contract and the spot price at time of delivery.

The sale of contracts to parties not capable of producing or having use for hogs would negate the purpose of the PCM since the coordination and cycle dampening effects would be lost and the PCM could become redundant with the futures market.

Recommendation: Selling of already negotiated contracts should be allowed so long as they are sold to someone capable of living up to the terms of the contract. It may be that a person selling a contract to someone who does not perform should be held jointly responsible for the nonperformance.

8) Confidentiality and Information:

Should the identity of buyers and sellers be known? Emerging electronic spot markets can again be a guide here. Some of them divulge the identity of the seller but not the buyer. But, it should be noted that the information given off by contracts and spot markets is different. Knowing the number of hogs one's competitor buys today, as well as the price, is useful to the extent that one can respond based on that knowledge. But because of the shortness of time to alter one's own actions, this information is of limited value. Contract information is different. If one has an inkling of the competitor's plans six months hence, then one's own plans can be altered. Thus, information about plans from contracting would be of higher value than that given off by the spot market.

On the supply side, the large number of sellers means that knowledge about the amount of contracting being done by your neighbor will not help you gain any advantage, at least no advantage that can be taken at the expense of the neighbor.

But, recall that fifty-one per cent of the farmers felt the relationships with their buyers was important enough that they would continue it even though they might be slightly better off elsewhere. This indicates that, although the inference can not be made directly from the questionnaire, farmers like to have the buyer know whose hogs they are purchasing. Farmers in conversation confirmed

this hypothesis. Packers also said they like to know from whom they are buying hogs because it is an additional source of information about the quality of the hogs. That is, given current grading standards, packers might be willing to pay more for lot A than lot B of slaughter hogs because lot A comes from a producer known to raise high percentage cut out hogs. This premium payment is made even though both lots A and B graded number one. If grading standards were more precise, information about who is raising the hogs would be less valuable.

Of course, once sales were consumated, there should be as wide as possible dissemination of the contracted price. At the end of the trading day, there could be reports summarizing prices, by month, total sales, and direction of price movements.

Recommendation: For now, farmers raising the hogs should be identified, unless they asked not to be. Packers buying the hogs on contract should not be identified, unless they ask to be identified. If grading standards get precise enough so that the name of the farmer carries no information, the listing of names could be dropped.

A concerted effort should be made to publicize the price information generated by the PCM. Only if the information is widely available can farmers use it to make production plans.

9) Discount and Premium Adjustments:

Farmers with experience know the quality of hogs they can raise. Farmers who are contracting fifty per cent of their hogs or less would have no trouble meeting stringent quality standards. That is, a large farmer in the fifty per cent contracted position would rarely be unable to deliver contracts that called for all number one plus hogs, if the HAMS grading system was being followed. But a farmer one hundred percent contracted would have trouble meeting such stringent quality requirements.

Unfortunately there is still quite a bit of uncertainty in production. Even first class farmers can not consistently deliver the same type of hog. Genetic science at this point does not yet always produce exactly the hog that is wanted. Because of this, assembly points have to constantly sort lots to get uniformity.

"You just can not hand make a hog," said Tom Reed, manager of Michigan Livestock Exchange (MLE), in noting that farmers often have trouble bringing the same kind of animal to the MLE yards. Because of this inconsistency, it would be difficult to contract one hundred per cent of your production to a certain grade, if it is too tightly drawn. The current contracting system recognizes all these vagaries by allowing loose specifications of grade requirements for contracts.

Dinner Bell, for instance, specifies that the barrows and gilts for which it contracts be only USDA Number One's,

Two's, or Three's with average lot weight between 200 and 220 pounds. Dinner Bell discounts for individual hogs over 230 and under 190 pounds.

In effect Dinner Bell has committed to pay farmers the same amount for a hog that cuts out upwards to seventy per cent in the four lean cuts as they will for a hog that cuts out forty-seven per cent. As previously noted, there is a rather large difference in the retail value of the two animals.

The effect of these grade standards can be seen by looking at the cut out value data for February 16, 1981 (Baldwin, 1981). Using those values, one 30,000 pound contract should have a cut out value of $15,660 if the carcasses turned out to be all Number One. If, however, they were all Number Three the value would be $14,382. The difference in value between the two cut outs is $1,270, but both would meet the terms of the contract.

Although it is highly unlikely that farmers could deliver loads of all Number Three's even if they chose to do so. But the fact is that a contract so loosely specfied has less value than those more tightly drawn.

Some contracts from other companies are more tightly drawn. Whether companies pay more for those contracts is difficult to tell since there are no public price data on private treaty contracting.

Both Michigan Livestock Exchange and Wilson Packing, for instance, only allow ten per cent of the hogs in their

contracts to be Number Three's. Swift sets the Number Three limit at twenty-five per cent. Frederick and Herrud and Land of Lake take only One's and Two's. Kahn's specifies a base price on twelve different weights in ten pound increments, and then pays a premium or discount on each one of those bases depending how the hog yields. The point is, that ignoring the great range in contract specifications, the industry recognizes the need to allow a variance in the quality of contracted product.

The PCM will need to recognize this also so that farmers can not be found in non-compliance of the contract just because they do not quite raise the quality hog for which they had contracted. This can be handled by a premium and discount schedule.

The schedule could be made part of the negotiating process or it could be preset. Eighty-eight per cent of the farmers surveyed said they preferred to work with a preset premium and discount schedule that was periodically readjusted. The Canadian system uses this periodic readjustment process. A computer system that included the discount and premium schedule as part of the negotiation process would be more complicated and require a greater programing effort.

Recommendation: The premium or discount schedule should be preset but adjusted once or twice a year by the PCM in consultation with the packers. A discount schedule similar to Kahn's would be best because it would better

reward the superior producer and allow the clearest signal about the specfic kind of product that the market wants. Any premium and discount schedule would do, as long as the whole industry supports it.

10) Price Negotiation Methods for the PCM's:

The underlying assumption in this work has been that contracts would be sold through a descending or ascending auction system. This assumption was made because contracts offered on the CATTLEX system using the bid-offer techniques were never very successful. Possibly, according to system organizers, this is because those offering and selling the contracts had unrealistic expectations. Often those offering the contracts placed unrealisticly high reservation prices on their contracts. Possibly this was done with the idea that they would take a contract if they got such a good price but otherwise they would take their chances on the spot market. But whatever the reason, it meant that CATTLEX never obtained significant contracting volume.

TELCOT, which sells both spot and contract cotton, has had more success with the bid-offer system. But the uncertainty involved in raising cotton is much higher than for hogs. Therefore the TELCOT contracts specify only the amount of acreage contracted and makes no promises as to amount or grade delivered. For those reasons a cotton contract is not really comparable to a livestock contract.

TELCOT tried several methods before it finally hit on the procedure that works best in its system. Farmers, however, can offer their cotton using several different price discovery methods.

There is no reason why the PCM could not try both bid-offer and auction techniques to determine which works best. The computer could be programed for several different bid-offer procedures.

The program could use a "sealed" bid approach. Here packers would offer bids on a lot of slaughter hogs without knowing what competitors are bidding. At the deadline for bid acceptance the high bidder would get the lot so long as the bid was above the reservation price of the person offering the lot. The transaction price would then be reported on the system.

Alternately the contract could be sold by firm offer. Here the offer would be made at a set price and the first party to meet the price would get the lot.

Programming efforts for either of these methods would not be extremely difficult or costly. For instance, in 1981 NEMA estimated it could develop a bid offer system for Producers Livestock Association in Ohio for $13,200.

Or the system could be made flexible enough so that it corresponds to the higgling and jiggling that goes on at a terminal market. Packers could make bids on farmers' offers and farmers could counter the bids. Packers could counter the counters and so forth. But this last method,

while having desirable properties, would be difficult to program and would also require a lot of computer and participant time.

The price discovery method selected will affect the price level. Experiments show that English Auctions result in a higher and more efficiient price than do Dutch auctions (Smith, 1982). In that same article Smith also noted that for posted offer systems with at least two sellers there "is a strong tendency . . . for posted-offer prices to decay to the (competitive equilibrium) price range" (Smith, 1982 p. 951). But he does not compare results of the bid offer and auction systems. Although it can be inferred from his work that bid-offer systems with more than one seller and buyer are about as efficient as an auction systems. Concludes Smith (1982):

> At the heart of economics is a scientific mystery: How is it the pricing system accomplishes the world's work without anyone being in charge? . . . it would appear that after two hundred years, (economists) know and understand very little. Incredibly, it is only in the last twenty years that we have seriously awakened to the hypothesis that property right institutions might be important to the functioning of the pricing system! (p. 952).

Smith surely overstates the case by a good bit. But his basic point that the type of price discovery mechanism will affect price levels is quite valid. Past experience shows English auctions work best for livestock (Purcell, 1983). But a variation of the bid offer system has worked for cotton.

Recommendation: Initially the PCM should sell contracts using the English auction system, but hold in reserve the possibility of going to some sort of bid-offer system. System designers need to be flexible on exactly which approach is best. If, as the system is built, it appears there is more interest in the bid-offer procedure, designers should move to that method. Both of these methods could be tried to see which is the most effective.

11) Transportation:

Much of the early work on a contract market for hogs (Holder, 1970) and other electronic spot markets assumed that transportation should be part of the bundle of services provided by the market and hence included in the product price. But the only way to include transportation costs as a direct part of the PCM is to fix them, since transportation providers are not direct participants in the market itself. Such administered prices would make the system less flexible than need be.

Transportation costs in the hog subsector fluctuate depending on how large the demands for hog hauling services are and what the opportunities are for alternative use of tractor and driver time. In the late 1982 phase of the cycle with hog production off about nine per cent from the previous year, truckers were looking for work. Because of this, some cut prices. A system that adds some fixed

charge based on distance could not adequately keep up with these changes in transportation costs.

The Ontario hog marketing system does provide transportation if it is desired. But the bid price is FOB and transportation charges are additional. Transportation charges in the U. S. spot electronic markets are not included in the bid price.

Similarly, product for most regular agricultural marketing channels is now purchased FOB the assembly point. If a farmer is selling hogs directly to the packer, the agreed upon price usually includes farmer provided transportation unless there is a substantial distance involved.

It can be seen that the current system allows increased efficiency by allowing the parties to work out their own transportation arrangements. The successful electronic markets like the National Electronic Marketing's Lamb Auction continues this pattern of keeping transportation services outside the services included in the auction. This pattern encourages transportation efficiency because parties can arrange their own at minimum cost rather than facing a fixed charge that would have to be assessed if transportation services were part of the contract price. The charges would have to be fixed since truckers would not be party to negotiations.

When packers buy hogs in the current spot market they, of course, factor in how far the hogs are from their plant

and reflect this factor in their bid. They could continue to do that in a PCM but it might be helpful to them to know exactly how many miles they were from the hogs upon which they were bidding.

For instance, assume that both Dinner Bell in Defiance, Ohio, and Frederick and Herrud in Detroit, Michigan, were interested in bidding on a lot of hogs to be assembled at Michigan Livestock's Battle Creek yards to weigh forty-two thousand pounds. The computer could be programmed to tell Frederick's buyer that its plant is 113 miles from the assembly point and the Dinner Bell terminal could show that Defiance is about 108 miles from Battle Creek. This would not require a major programming effort. But presumably both the Dinner Bell and Frederick and Herrud buyers are well aware of how far they are from Battle Creek and every other place from which they buy hogs. Thus, such a listing of distances might not be worth the effort.

This transportation arrangement could work equally well for a farmer large enough to supply a full load of hogs direct from the farm. However it should be noted that in many cases even large farmers will prefer to contract their hogs through some sort of assembly yard. They do this even though they pay a commission fee because it cuts down on the possibility of disease on the farm resulting from contamination by commercial trucks.

Recommendation: Adding transportation arrangements needlessly clutters the PCM and makes it more inflexible.

Transportation should usually be FOB the assembly point. If in a particular instance the farmer or assembly yard prefers to provide transportation, it can be so noted on a comment line of the screen which describes the lot for sale. Bids would then be adjusted to reflect the provided transportation.

If, after inception of the PCM, it becomes apparent that some parties wanted transportation services, a market for such services could be added. But transportation and hogs should not be bundled together save in the case when the transaction costs of acquiring transportation costs exceeds the variance in transportation costs. If the parties want information on how far the assembly point is from their plant, the computer can be programed to handle this.

12) How Far Ahead Contracts Should Be Let:

Ideally, contracts should be let every day, but only for a period nine and one-half or ten months in length. And, everybody should contract so the price generated is reliable and production plans can be made accordingly.

Most of the contracts being let now are for durations too short to affect the breeding decision. The farmers surveyed showed a general reluctance to contract prior to breeding. Therefore, a PCM that just offered nine or ten month contracts is unlikely to attract much attention or use. And, in any case, since all contracts do offer

coordination advantages, any length of contract would improve coordination in the system.

Recommendation: In order to attract immediate interest, the PCM should mimic the current contracting system as far as length of contract is concerned. Contracts should be let on a regular basis and the contracts should be approximately two to fifteen months in length. Efforts should be undertaken to encourage farmers to do long term contracting on the system whenever they can meet their profit objectives.

13) Geographical Area:

If a PCM went with NEMA, it would be confined to the Midwest initially, as far as producers are concerned. Packers outside the Midwest could still get on the NEMA system if they desired. Initially, however, there will not be enough exposure to make it a national PCM. The goal would be, of course, to have a national PCM in order to get input into the system from all parts of the country.

A national system would not mean that an Illinois farmer would be contracting with a Los Angeles packer. In fact, because of transportation costs, contracting will most likely remain a regional occurrence. But, if the PCM were national, it would reduce spatial problems. For instance, a Virginia packer might know that every July it is difficult to fill the kill schedule with just Virginia and North Carolina hogs. The rest of the year the region

can satisfy the packer's demand. In that situation, the packer would have strong incentives to buy July PCM contracts in Ohio.

Recommendation: The incipient PCM would most likely be regional. This is particularly true if it were piggybacked on a regional electronic spot market. But, the long range goal should be to make the PCM national.

14) Length of Delivery of Contracts:

The tightest delivery that contracts now call for is within a range of twenty days. Most of them allow delivery within a month's period. Nearly all farmers in the survey resisted the idea of nine month contracts which specified delivery to the day. However, thirty per cent were willing to contract to within a week's delivery if they were contracting only about sixty per cent of their production.

Packers, however, said that significant coordination advantages would not accure to them if contracts, at the letting, specified a tight delivery schedule. Given this information, the simplist thing would be to abandon any effort to tighten current contract delivery specifications. However, there are significant advantages from a contract which specifies a delivery date within a week or so. This must certainly be true if the studies on the economics gained from smooth flow of product are correct. Packers may well be underestimating the benefits of predictable delivery.

Recommendation: The first contracts let on a PCM should follow current contracts as far as tightness of delivery is concerned. But, consistent efforts should be made to experiment with a narrower or tighter range for allowable number of delivery days. Of course, even at the inception of a PCM, a system should be set up so that as the contract approaches delivery, farmers inform packers of their intentions.

15) Physical Devices Needed to Implement the Market and Their Costs:

A pork contract market would not really be feasible without the computer. Just as the advent of computers hooked into a network made possible electronic spot markets, so too they make possible the PCM.

The effort to develop computerized electronic spot markets has been costly. Literally millions of dollars have been spent by both government and the private sector in order to develop the software necessary to run these specialized programs.

Among the efforts have been the HAMS project in Ohio for slaughter hogs, TELCOT for cotton in Lubbock, Texas, CATTLEX for feeder cattle in College Station, Texas, CATS for dressed beef in Chicago, and NEMA for a number of agricultural products in Christiansburg, Virginia.

These efforts were sometimes started by saying that they were only experiments. Possibly this was a bit

disingenious on the organizers part. They were experiments in the sense that their outcomes were unknown. But none of these efforts were experiments in the sense that they were planned for termination if they ran as the organizers hoped. Only TELCOT and NEMA have experienced real success. This is not totally unexpected since institutional change usually only takes place after a couple of false starts.

Something was learned from each of these false starts. For instance, HAMS opted to go with its own computer and dedicated phone lines because employees thought they would have a less expensive and higher quality system if volume developed. But the volume never developed and HAMS was saddled with a cash flow problem.

Other problems that have existed for some of these systems include not fully testing the software before starting the market. Both NEMA and HAMS harmed themselves in this fashion.

These new systems must also make sure that conflicts of interest are minimized as much as possible. One of the systems was severely hurt when farmer representatives figured out how to run up the price in the spot market beyond what it would have normally been supported at.

In nearly all markets there often exists what is periphrastically known as market support. This support can be as simple as asking a neighbor to attend your auction and do a little bidding on items s/he does not want. Or maybe a buying station would pay more than hogs can be sold

for in order to increase the number of farmers using the station's yards. But this kind of market support is self correcting in that the person doing the support eventually ends up paying for it.

But in the electronic market case in question, a marketing agency was allowed to bid for processors. It then used its own bidding machine to bump the price slightly. Then it would bid the processor again so that the processor always got stuck with just an incrementally higher price. When word of this got around, the system collapsed nearly overnight.

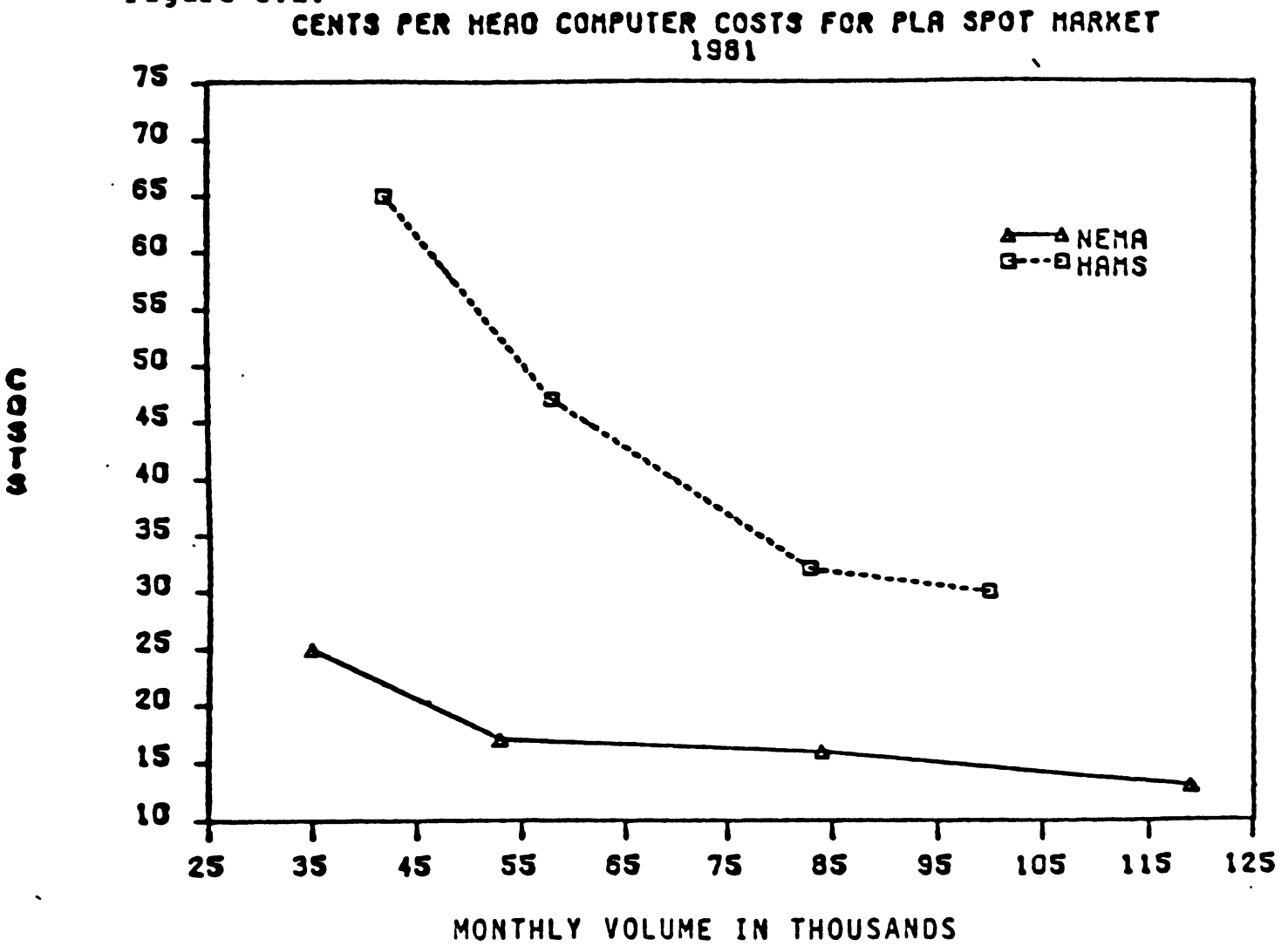
In future systems the importance of only allowing proper represenatives access to the bidding terminal must be emphasized. If order buyers are authorized to buy for a company they must only do it on their number and not the company's number, etc. Market support can be allowed if the people doing the supporting face the possiblity of buying a contract or load of hogs they do not really want.

NEMA has survived apparently because they went with a time share computer system from the INFONET Division of Computer Sciences Corp. and used ordinary phone lines. HAMS, on the other hand, had its own Hewlett-Packard mini-computer and leased phone lines which provided a much higher quality signal than ordinary phone lines. While this system was of higher quality it was much more expensive than NEMA's.

A look at Figure 5.1 shows that while the HAMS system did exhibit economies of scale, at all reasonable volumes

NEMA could provide the computer services cheaper. The per head costs on a monthly basis are estimates for providing computer services for electronic marketing for the Producers Livestock Association in Ohio.

Figure 5.1.



The numbers in Figure 5.1 were taken from studies by Baldwin (1981) and Russell (1981). Every attempt was made to make them include only the same costs, but since only the secondary data was examined, they might not be finitely

comparable. However, the orders of magnitude of the graph are certainly correct. Holder and Henderson (1982) have also concluded that time share systems are much cheaper to operate.

HAMS was stuck with fixed computer charges of about $25,000 a month and NEMA's fixed costs are close to zero. With NEMA's high initial software costs of development out of the way, the system can be extended for what are nominal amounts in the world of computers.

For instance, in 1981, NEMA personnel estimated for $24,500 they could develop software to run an electronic auction for the Producers Livestock Association. This was an extremely sophisticated system that could combine lots among yards. Once a lot was sold, the computer accounted for the value of each lot which went into the combination and printed out the checks to the farmers who provided the hogs. It also was able to keep track of the different grades in the combination and properly pay at the different rates. The package would have also included weather reports and market estimates.

More recently, in the proposed computerized slaughter hog market for midwestern producers the software development amounted to about $42,000. But this includes a major upgrade of the software so that it is much more flexible than the current system. The budget, which NEMA hopes USDA will fund in large part, also includes another $41,500 for such things as travel costs involved in training the new

operators, computer training time, new equipment evaluations, etc.

It is critical that the operators of the system be well trained and work on a dummy system for a while. That way, human and software problems can be identified before the system is actually used to sell hogs. Failure to identify such problems in another electronic marketing attempt was a contributing factor to its demise.

In the NEMA system, the terminal-printers which are Texas Instrument Silent 700's, cost about $1,450 each or can be leased for $80 per month. These terminals have built in modems. It costs $36 an hour to hook one of the terminals to the INFONET computer network. In NEMA's proposed slaughter hog market, those hooking into the system will not pay for connect time. Instead, these costs will be covered by marketing charges for hogs sold.

If there were ten buyers on the system and a lot was sold every two minutes, the per lot charge would be about $15. If all of the lots were semi-size loads, the per head direct computer costs could fall as low as eight cents per head. Of course this would be a lower bound for charges since it is unlikely that all loads would fill a semi.

The system proposed for the midwestern slaughter hog market will be simple. It fact there are many more sophisticted terminals available, but perhaps the system's simplicity is a real advantage.

Said Tom Reed, director of Michigan Livestock Exchange: "I know by the time we get the system up it will

be obsolete. But so what? We have a computer system (at Michigan Livestock) which cost $38,000 (and is about a year old.) It is probably already obsolete but it has already made us $100,000."

Kenneth Neel, the manager of NEMA, thinks that at this point any software development costs for any subsequent marketing program could be covered by $15,000.

Recommendation: The PCM can only be successful in a computerized system. Since NEMA already has such a system it may be the logical organization to approach about the possiblities of a PCM.

Summary:

The following rules for the PCM have been recommended:

1) Since mandatory participation requirements were thought odious by the overwhelming majority of farmers, such a rule probably would be strongly resisted. Participation should be voluntary. Fairly low levels of contracting are needed to produce coordination advantages. Higher levels are needed if the cycle is to be dampened. Education programs and incompatible use goods (Schmid, 1978) must be used to overcome free rider problems.

2) Producers should own the PCM. Packers did not express any interest in putting up funds to help organize a market. Furthermore, the electronic spot markets that look like they have the best long run chance of success are producer owned.

3) Any producer who is capable of raising quality hogs should be allowed to contract. If the producer wants to contract through an assembly point, the decision whether s/he is a capable producer should be left to the assembly point personnel. If the producers want to contract directly from the farm, the PCM should certify their capabilities.

4) Contracts of variable size should be let in order to attract maximum interest to the market. Intermediaries can match these different contracts by assembling the smaller ones into larger ones. They, of course, should be financially rewarded for this service. The different sized contracts should only be let at certain times of the day so buyers and sellers can budget their time.

5) Grading should probably start with live standards, but the standard must be more discriminating than current USDA standards. Possibly the HAM's live grading system would work. The system should be designed so as to encourage movement to carcass grading.

6) Contracts should be honored and only under acts of God or war should parties to the contract have no liability.

7) Buying and selling of contracts in secondary markets should be allowed, or even encouraged, so long as all buyers and sellers intend to produce or slaughter hogs.

8) The identity of buyers should not be revealed unless they desire to be. Sellers should be identified unless they wish not to be. The price information generated

by the PCM should be given as wide a dissemination as possible.

9) Discounts and premiums for superior or inferior hogs should be preset and not made part of the negotiating process. The schedule should be periodically readjusted to reflect changing market conditions.

10) Contracts should be sold by auction, but PCM designers should not be wedded to that concept. If bid-offer techniques appear to have possibilities, that method should also be tried. However, it should be kept in mind that so far bid-offer techniques have not been successful for sale of livestock on electronic markets.

11) Transportation should not be bundled with the PCM price. Transportation should be FOB the assembly points.

12) Contract length should follow the current contract system which allows for contracts anywhere up to fifteen months in length. But, most contracts are now let only after breeding. Therefore, a concerted effort should be made to encourage farmers to contract prior to breeding.

13) The PCM, if operationalized, would need to start on a regional basis. But the goal should be to make it a national market.

14) A range of approximately a month of delivery days will be needed to start the PCM. But efforts should be made immediately to restrict this range so more coordination advantages from the contracts can be gained.

15) If a PCM is to be successful, it must be instituted on a computer market. NEMA seems the logical market to first explore possibilities of creating a PCM.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The number of hogs slaughtered in this country every year ranges from sixty-five to ninety-five million. This study and countless others, have established that such fluctuation is not because of fickleness in consumer demand. But rather, it is primarily because of breeding decisions made with inaccurate information about what the price will be when the hogs from that breeding decision are ready for market. One can decry a farmer's foolishness for periodic over and under production which means the system is only rarely in equilibrium. But, such decrying is foolish, since the information that could lead to better decisions is not readily available.

What is the rational decision for the hog farmer breeding in the fall and winter of 1982 and 1983? The cash price currently stands in the mid-50's. Since May of 1982 things have done very well, but this profitable period follows a year or more of losses.

Given past experience with the cycle and information about breeding intentions, the farmer knows that prices

will drop. The futures market estimates October 1983 price to be approximately $48. December 1983 and February 1984 contracts are even lower. But volume in these contracts is thin and long range futures have not been a particularly accurate estimater of cash prices. Despite this, hog futures are the most important source of information when it comes to forming price expectations, according to the survey done for this study.

Market forecasting services are also predicting lower prices. Even if a farmer knows his/her marginal costs and is at capacity now, s/he does not know when to start culling sows at an increased rate because it is unknown when price will decline. By the time the farmer is certain the price will decline, mistaken breeding decisions will have already been made. Given the available information, no "correct" breeding decisions can be made.

Production decisions will always be fraught with uncertainty, but in this study, a Pork Contracting Market (PCM) was proposed as a way to reduce this uncertainty by improving the quality of information available to farmers. A PCM would connect, by computer, those wishing to sell and those wishing to buy contracts for delivery of hogs at some future date. The contract would only deal with delivery of a specified quality and quantity of hogs at a specified time and place. The contract would not deal with production methods or provide feed or any of the other items associated with production contracting.

A PCM could reduce uncertainty about future price by introducing new but knowledgeable participants into the the process of price formation. It could do this without requiring all of the participants to learn about the arcane world of futures. Knowledge of valid and dubious futures terminology would not be necessary for farmer participants. It would not really make any difference if "spreads, straddles, exhaustion gaps, duplex horizontals, open interest, or margin calls" all remained a mystery. What would be necessary is a firm knowledge of production costs. And, what would result from a high volume PCM would be higher quality information than is generated by the current market. A transparent negotiated future price would be developed, upon which production plans could be better made. Besides which, coordination advantages would result from these contracts. If packers signed contracts to reduce volume fluctuations into their plants, coordination advantages would accrue. Exactly how these advantages would be distributed depends on the various elasticities of supply and demand at the different levels in the subsector. But theoretically, consumers, producers, and packers could all gain from such a system. The market would be open to all and, because of its straightfoward simplicity, it should be useful to all in the subsector.

This reseach showed that evolutionary change has been constantly occurring in the pork subsector and that a PCM could well be part of the continuim. In fact, a rudimentary

PCM has already started to emerge, with packers and others offering contracts at a set discount off futures. But these contracts are not easily comparable under the current system. And, there is no easy way for buyers and sellers to indicate to each other their wishes as far as contracting is concerned. This is because there is not an organized market where many buyers and sellers can easily get together. Contracts that are signed now are mostly between buyers and sellers who are in normal contact with each other. But what about those who do not regularly do business together? A packer in a nearby state who regularly experiences a shortage of hogs in July might be willing to pay a premium for out of state July contracts. But, currently farmers in those adjoining states have no good way of finding that out.

It is only with diligent effort that knowledge of the various contracts available can now be obtained. And, comparing them is very difficult. There is no price negotiation on them. The only negotiation is that done indirectly in the futures market. The current contracts are, in essence, formula priced.

Further, the current contracts do not always discriminate well as to quality of hog produced. Since hogs, for the most part, are bought on the average, low quality hogs receive too high a price and producers of high quality hogs are not adequately compensated. Some current contracts just specify that hogs be Number One, Two or Three.

Neither are current contracts greatly useful in helping the packer plan the flow of hogs into the abattoir. Furthermore, there is no currently readily available mechanism that coordinates the desires of those wishing to buy large contracts and those wishing to sell small contracts. A PCM could be designed to meet these problems.

The survey for this research showed farmers quite willing to give a PCM a try and packers, for the most part, said they would give it a look. But, none of the packers' reacted enthusiastically to the idea.

As judged by their answers to the survey, many farmers would probably not initially sign PCM contracts prior to breeding. Larger farmers were more willing to sign contracts prior to breeding. But smaller farmers, for the most part, felt safe contracting only after weaning.

For obvious reasons, the larger the per cent of total production farmers were contracting, the shorter the length of contract they were willing to take. Similarly, the tighter the contract in terms of range of days allowable for delivery, the lower the amount farmers were willing to contract. Packers, however, mostly dismissed the idea that a tight delivery schedule could help them with coordination. As noted earlier, packers are probably underestimating coordination advantages.

Unfortunately, most of the farmers surveyed said they would not change production plans even if it appeared that a PCM was generating reliable information. Most seemed

to be using the operating rule of thumb that they produced at capacity regardless of price projections. These findings are disquieting in that they cast some doubts on the validity of the sample. Obviously, given the rather sharp fluctuations in supply of hogs, this is not the rule that significant numbers of farmers are using. It might be hypothisized that since all the farmers surveyed were members of their state Pork Producers Associations, they are the producers who are in the system for the long haul. The fluctuation in supply may be coming from producers who get in and out of the business. If this hypothesis is correct, then a PCM would be quite useful in giving these in and out people information about whether they should get in and out. Such information should dampen the cycle. The majority of farmers thought that a farmer organization should own the PCM but they were overwhelmingly against mandatory participation in a PCM.

Using the results of the survey and the background in the first three chapters, rules which would make operation of a PCM possibile were put forward. The rules covered fifteen critical areas that the researcher thought necessary to make a PCM successful.

Generally the rules called for an evolutionary approach. For instance, it was recommended that the PCM be made voluntary. The survey showed that farmers would probably reject any legal effort which would require participation. It was noted that, given the current cost

of electronic exchanges, not a large volume of contracts would be necessary in order for the PCM to be self supporting.

But can one tell whether this evolutionary approach is best? The approach seems to be suggested by a look at the history of the pork subsector as well as history in general. Adjustments are always more painful and not always accomplished as well when the change is discreet or revolutionary rather than evolutionary. This is not to imply that evolutionary change is accomplished painlessly. But, whenever possible this method of change would seem preferable to discreet kinds of change. This is because evolutionary change allows gradual economic adjustment rather than causing immediate economic dislocation.

It is recognized that a PCM might not become successful, in the sense that it could dampen the cycle, without some form of mandatory participation. But, since farmers are so clearly against that, and since a PCM should be able to cover operating costs at low volume, it seems that the logical approach is to start with voluntary participation. If such a voluntary approach does not work, a mandatory approach can be considered. The fifteen proposed rules of operation are summarized at the end of Chapter V and it would not repay repeating them here.

How Policy Makers Might Proceed:

USDA sponsored this research, presumedly because their policy makers thought the negotiated contract markets had

merit. How should they now proceed? As a result of this research, there are at least three policy decisions concerning a PCM that could conceivably be made. They are presented briefly below and in greater depth on the following pages.

1. Do nothing on the grounds that an incipient PCM already exists and it may develop most of the properties that economists believe are desirable in a market.

2. Start educational programs about contracting and begin to work with an agency that might create a computer driven PCM. Do further research on the exact nature of the currently existing contract market. Consider collecting and publishing price series data on current contract prices. (Refco contract prices are already being distributed by some of the wire services.) But, hold off on an actual attempt to create a PCM on the grounds that subsector participants consider both electronic spot markets and contracts new and untested marketing channels. Subsector participants should first gain more experience with the electronic spot markets before what is perceived as a new marketing channel is added to the electronic market.

3. Take the fifteen recommendations for rules of operation made in Chapter V, evaluate them, and then try to implement a PCM based on that evaluation.

The three possible policy approaches assume that a PCM would improve performance and thus is a desirable institution. More details about the initiatives and possible results of the three policy directions are given below.

Policy Direction One: "Do nothing and just let the market emerge as it will."

This policy alternative obviously would involve hardly any cost or effort. Since a market, of sorts, for the

contracting of slaughter hogs has already emerged, this policy does not mean there will not be a PCM. However, it is arguable whether under such unguided circumstances a PCM with desirable competitive and coordination properties will emerge. So far, in the existing market there is no indication that the current market will overcome its lack of organization. Up until now no real price competition on the contract has emerged. Neither has a mechanism arisen to really facilitate the coordination of contracts of different sizes. Under the current system many of the possible coordination advantages are lost. And under the current system there is little price reporting. It is unlikely that a private sector initiative will be forthcoming to produce the needed coordination. That is because some of the above benefits are, in Schmid's (1978) terminology, joint impact goods with high exclusionary costs. This means that the private sector could not attach all the benefits necessary to induce them to undertake the coordination. Thus, it may be necessary for government to provide the coalescing force to get the PCM off the ground. But, once this organizational input is given, it would appear that enough of the PCM benefits are attachable so that the market could be self-supporting. Of course, one of the main benefits of a PCM, a reliably anticipatory price, would remain a joint impact good.

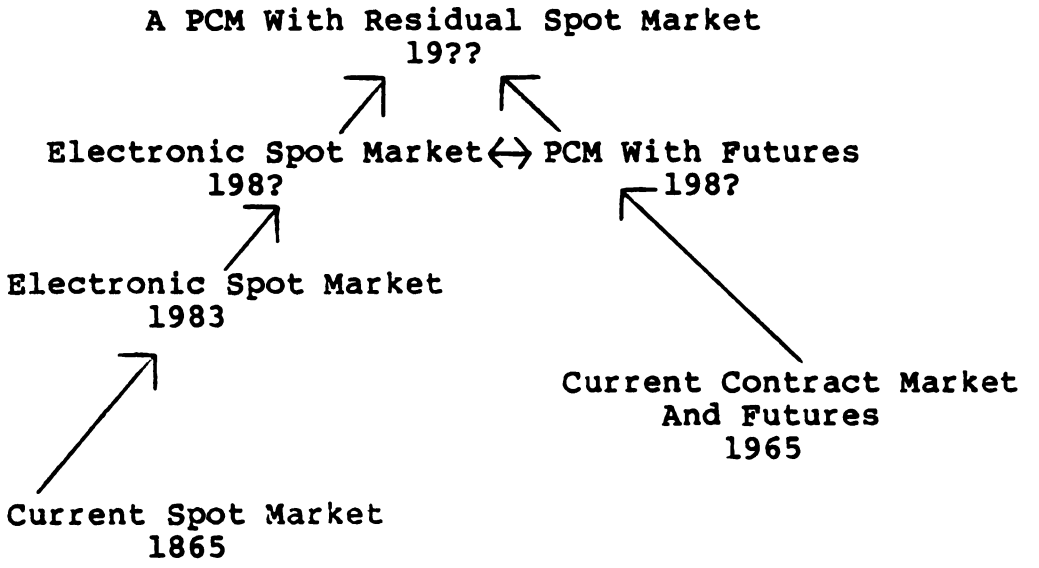
Although some private sector efforts to smooth out the bottlenecks in the current contracting system have

emerged, the efforts are too separate for the benefits to emerge that could come from a concerted effort in all areas. One example of this private sector effort is the way some companies are now taking nearly any size pork contract if the discount off futures is large enough. But they do not turn around and merge those contracts into one that would be of use to packers.

Policy Direction Two: "Take steps to encourage a PCM with desirable prices, but hold off on immediate attempts to institute the market."

Farmers for the most part are just starting to contract. Furthermore, most packers or farmers have no experience with electronic marketing. It can be hypothisized that they would consider an electronic spot market and a PCM to be different marketing channels. And, introducing them simultaneously might not be wise. Perhaps if electronic spot markets were first given time to emerge and a PCM introduced later, a schematic like that shown in Figure 6.1 might be representative of what might happen. Such a process would fit well with the evolutionary theme of this dissertation.

Figure 6.1. The Gradual Emergence of a PCM



This evolutionary policy option should also include an effort to publish prices on contracts currently being let. The details of such a collection might be difficult. But dissemination of such information would be an important step making more farmers aware of contracting and the opportunities available and might also induce some price competition.

An educational effort, possibly through the Extension Service, should be launched to inform subsector participants of opportunities that would be available through a PCM. A careful effort to locate the best electronic market on which to insititute a PCM should begin and a survey of which markets would gladly entertain such a proposal should be undertaken. Other steps that might take place under this

option would include further research into the status of the currently existing contract market and how it is affecting performance.

Under this option the most propitious time, in terms of the hog cycle, to institute the PCM could be chosen. Inspection of open interest and volume numbers indicate that the amount of contracting and hedging probably goes up as prices move up from the low in the cycle. If the futures market is an accurate indicator of when contracting interest is the highest, the appropriate time to institute a PCM would be when future price returns to profitable levels after farmers have been experiencing losses. At that point a PCM might have the greatest level of incipient support. That support might sustain the PCM long enough so that the institutional advantages of a PCM could become clearer to participants. Once those advantages were clear, the PCM would have a better chance of surviving.

Policy Direction Three: "Institute a PCM as soon as possible."

This policy option would have the advantage over option two in that it would involve less expenditure of research money. But it would also increase the chances that a PCM would be instituted incorrectly and thus fail.

If this option were chosen it would mean that a PCM would need to be instituted concurrently with an electronic spot market. There would be only two other options. One would be to try to institute a PCM on a market that does

not have a spot market for hogs. The other would be to set up an entirely new electronic market for the PCM. But the spot market and the PCM at first should be complimentary in terms of participants' time, treasure, and willingness to use the market. Therefore it would not seem wise to try to implement a PCM separate from the spot market. Furthermore, it is unlikely that a separate electronic PCM would be cost effective when compared to a joint PCM-spot electronic market.

If option three were selected, the fifteen rules for implementation of an electronic market should be evaluated and added to or deleted from, as the evaluation indicates. Electronic markets should then be contacted and evaluated to ascertain where the best place to begin implementing a PCM would be. Once those decisions are reached, implementation could begin.

Concluding Remarks:

The hog cycle and a way to dampen it was examined in this study. It was held here that the hog cycle could be dampened by a new institution, a Pork Contract Market (PCM). Although it was noted that a current contract market exists, it lacks many of the mechanisms necessary to effect coordination and dampen the cycle.

Farmers surveyed were willing to use a PCM. This is particularly true of larger farmers. Packers, on the other hand, said they were only willing to consider using the market.

Using the survey results, rules for making a PCM operational were then offered. And, finally, in this chapter, some policy options for USDA, with respect to a PCM, and ideas for further research were offered.

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APPENDICES

APPENDIX A

SURVEY MAILINGS

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURE HALL

EAST LANSING • MICHIGAN • 48824

June 10, 1982

XXX
XXX
XXX

Dear XXX:

A questionnaire accompanies this letter. We hope you fill it out because then you can help determine whether a new method for marketing hogs should be tried. The questionnaire's purpose is to discover how farmers feel about Computer Auction of Pork Contracts and how satisfied they are with current marketing arrangements.

We know filling out questionnaires is tedious, but your participation is important because you have been randomly selected on a scientific basis from the membership list of the (appropriate state) Pork Producers Association. This means that if you don't participate, we won't have complete confidence in the results. Further, by your participation, you have a chance to encourage or kill a new marketing channel for hogs.

We need you to tell us whether a Computer Auction of Pork Contracts (CAPC) could help hog farmers. Such a market for hogs does not exist now but it could by combining several existing marketing methods. Their combination should produce more competitive foward contract markets and hence superior information about supply and demand conditions in the future. Under these conditions we believe that both farmers and processors could make better production plans and thus use their farms and packing plants more efficiently. Price fluctuation should decrease because the periodic variation in quantity supplied would moderate. Some studies indicate that with a less variable price people would consume more pork.

This proposed CAPC takes the computer markets existing in a few other agricultural markets and combines them with the private treaty foward contracts for hogs that now exist nearly everywhere. These new contracts would be sold directly to processors for the purpose of delivery. In addition to bringing more buyers into the market, the terms of the contract would become more negotiable.

The enclosed article entitled: "Computer Auction of Pork Contracts" will give you more details of how such a market might work. You may wish to read it before filling out the questionnaire. But the article can't give you full information since the design of such a market, or even if it should exist, must be determined in part by your answers to the questionnaire. So this is your chance to either help shape a new marketing mechanism or, if you think the idea is ridiculous, to help kill it.

The questionnaire is not as long as it appears to be. It had to be spaced out in order to make computer tabulation easy. Each question has a purpose. We tried not to ask any unnecessary questions because we know your time is valuable.

We look foward to hearing from you. Please return the questionniare in the business reply envelope which is enclosed. Thank you for helping us with this research. We hope your help will someday return benefits to you.

Sincerely,

Daniel Kauffman
Ph.D candidate

1

COMPUTER AUCTION OF PORK CONTRACTS

Computer Auction of Pork Contracts is an untried and new concept. New concepts are often easiest to grasp by example.

A Computer Auction of Pork Contracts(CAPC) might work something like this: Assume you are getting to ready to breed your weekly average of seven sows. In the past you've averaged 7.5 pigs per litter and your normal conception rate is a little better than average. So, you know that a little more than nine months from now you'll have about 45 220-lb. hogs ready for market.

But since there is still biological uncertainty in production, you'd be uncomfortable contracting all of your estimated production. You're relatively certain that at least 75 per cent of the 45 hogs will be ready then. Further, you're against contracting all of your hogs since the spot price just might take off and leave you without even a short ride on that rare gravey train.

But if the price is right you'd be willing to contract about 32 of your projected 45 hogs or about 70 cwt. Further you know your cost of production, including satisfactory return to capital management and labor to be about $47 @ cwt. And judging by how often you've talked to your banker lately, you and he are best friends. But you friendship might improve if you offered him more solid evidence that your payments will be made on time.

Armed with this information you call your local co-op and tell them you'll have a 70 cwt. of No. 1&2 hogs for sale about 9.5 months from now. You also tell the co-op employee that under no circumstance will you accept a price of less than $52 @ cwt for this production. A co-op station employee, trained to operate a computer terminal, puts your offer of 7,000 lbs. for sale into the computer system. Your reservation price of $52 is put into the computer and will abort the contract if bidding doesn't go above that price. But no one besides yourself and necessary co-op employees knows what your reservation price is.

Your offer will go to all packers in a 600 mile circumference of the co-op. Each packer has a computer terminal on which to recieve and send information.

The approximate cost of transportation from the assmebly point and the appropriate pencil shrink is applied automatically by the computer program. Thus each packer knows approximately what it will cost to get your hogs to his kill floor.

Packers know from past experience what their need for product will be nine or so months from now. They also know approximately what kind of price they can sell their output for and what kind of margins on that output they will need.

Demand for fresh pork is sometimes difficult to judge too far in advance, but large processors can gauge approximately how much of their branded processed products they will be able

to move at a given price. Advertising programs are predicated on being able to supply the processed product at a predictable price. Packers don't like price or quantity variation because it plays havoc with their marketing strategies.

However processors don't want to be caught paying substantially more for their pigs than the competition; just as farmers don't want to sell their pigs for less than other farmers.

Because of the delivery feature, the contract helps assure that the plant will operate at profitable levels. The contracts should also reduce shrink and transportation costs because the hogs will flow more directly to the plants. For those reasons packers hould be willing to pay somewhat more for the Computer Pork Contracts than for a similar futures contract which really isn't intended for delivery.

Now let's get back to the 70 cwt. you've offered for sale at the co-op. Similar contracts yesterday sold for $50. (This price, of course would be higher if we were in the current market.) So CAPC market employes start the computer bidding for your contract at that price. Packers think the market has softened since then and refuse to offer a bid at that rate. The price needed to start bidding starts dropping 10 cents every every three seconds. The price reaches $48.60 before the first bid is received. But all six packers in the area know a healthy profit can be made nine months from now with hogs at that price.

They start bidding against each other until the price reaches $53.60. The buyer from only one packer feels there is money to be made at a higher price than that so that packer gets the bid. All buyers and sellers can see the price for which the contract was sold on their computer terminals. But only the buyer and seller know each others identity.

As part of the contract, you have agreed to deliver the hogs within a certain time period. If your hogs are not ready by then you may have to go into the open market to fill out your contract. Further, if your hogs are not of the quality you promised, then the price you receive will be discounted by a factor specified when the contract was made. Conversely, depending on the grading system, if the hogs are better quality than you promised you might be paid a premium.

If enough of these contracts are traded, both producers and processors could start to make better production plans. Packers gain efficiency if they can schedule hogs into their plant in a timely manner. Their fixed costs are high and their labor contracts often commit them to fixed labor charge for the week. If pigs are not there when they need them the plant will operate at a loss. Packers need a steady supply of pork since only 30 per cent of the carcass is sold as fresh meat. The rest goes into processed branded products. These products are often highly advertised and if product flow is not smooth it decreases

the ability of companies to plan marketing stategies and hence in the long run less pork is sold to the consumer.

Farmers would similarly benefit by getting access to more buyers than they currently have and hence they would be gaining a more competitive market. They would be getting accurate information about true demand and supply conditions far enough ahead of time to make more profitable production decisions. This is extremely important in agriculture. When a steel producer fires up a blast furnace the selling price of the first steel to come out of it is known. When a pork producer decides to produce a pig no one knows the price for which that animal can be sold. This makes production decisions extremely difficult. Computer Auction of Pork Contracts could reduce this uncertainty.

Daniel Kauffman
Michigan State University
June, 1982.

Pork Contract Questionnaire

Dan Kauffman - Michigan State University

Directions: Please check the best answer to each question. When specified, please check only one answer. Occasionally you will be asked to check as many answers as apply. Plese do not write in the columns or boxes along the right margins.

Office Use Only

Column

_____ 1-2

_____ 3

_____ 4

1. What type of swine operation do you have? (Please check one.)

   A. Produce feeder pigs ___

   B. Finish slaughter hogs ___

   C. Farrow-finish ___

   D. Both slaughter and feeder pigs ___ _____ 5

2. How are the majority of your pigs or hogs produced? (Please check one.)

   A. Field ___

   B. Open lot ___

   C. Semi-confinement ___

   D. Total Confinement ___ _____ 6

3. Approximately how many pigs or hogs do you sell a year?

   A. Feeder Pigs _____ _____ 7-11

   B. Slaughter Hogs _____ _____ 12-16

4. How many times a year do you try to market? _____ _____ 17-18

5. Does your pork operation provide more than 50% of your farm income in a normal year?

   A. Yes ___ B. No ___ _____ 19

6. Prior to breeding, how accurately can you estimate when at least 90% of the litter will be ready for the slaughter hog market? (Please check one.)

   A. Within two days ___

   B. Within a week ___

   C. Within a month ___ _____ 20

7. After the litter is weaned, how accurately can you estimate when 90% of the pigs will be ready for the slaughter hog market? (Please check one.)

   A. Within two days ___

   B. Within a week ___

   C. Within a month ___ _____ 21

8. Future price is important if one is to make rational production decisions. How do you estimate future price? (Rank in order of importance: 1,2,3 etc. If you don't use one of the estimation procedures leave it blank.)

   A. I look at past prices and take a rough weighted average with the most recent prices getting the most weight. Then I make a projection from that average based on the way the price has been moving. ___ _____ 22

   B. I use the futures market as a guide for what price will be. ___ _____ 23

   C. I look at the USDA pig forcast numbers and make a price prediction on that basis. ___ _____ 24

   D. I use the Extension Service's price forecast. ___ _____ 25

   E. I have my own computer or calculator model to predict prices. ___ _____ 26

   F. I use another method. ___ (Please briefly describe it.) _____ 27

9. Farrow-finish operators could make improved production decisions if they could accurately predict the price of hogs ten months from now. Within how many percentage points can you usually predict the price ten months from now? (Please check one.)

A. 0-10 per cent ___

B. 10-25 per cent ___

C. 25-40 per cent ___

D. 40 per cent or more ___ _____ 28

10. Do you ever change production based on your price predictions?

A. Yes ___ B. No ___ _____ 29

11. In your view is the hog cycle, with its accompanying price variation, a help or hinderance to producers?

A. Help ___ B. Hinderance ___ _____ 30

Other Comments: (Optional)

12. At the low end of the cycle are you sometimes not able to cover your variable costs like feed, paid labor, veterinary supplies and utilities?

A. Yes ___

B. No ___ (If answer is no, go to question 14) _____ 31

13. If yes, when have you been sure you won't cover your variable costs? (Check one.)

A. Prior to breeding. ___

B. Usually when the pigs move into the grower stage. ___

C. Not until shortly before marketing. ___ _____ 32

(Please comment on the production decisions you make when you face this situation.)

4

14. Is more than 75% of your working capital borrowed?

A. Yes ___ B. No ___ _____ 33

15. Have you ever experienced cash flow problems of sufficient degree to ask your banker to refinance a loan when such action was not originally planned?

A. Yes ___ B. No ___ _____ 34

16. How many years have you been raising hogs?

_____ years _____ 35-36

17. How many acres do you plant in crops?

_____ acres _____ 37-41

18. Approximately what per cent of the corn for your hogs is raised on your farm in a normal year?

_____ per cent _____ 42-44

19. Have you ever sold a futures or forward live hog contract?

A. Yes ___ B. No ___ _____ 45

20. Is hedging or forward contracting a regular part of your current marketing strategy?

A. Yes ___ (If answer is yes, go to question 22.)

B. No ___ _____ 46

21. If you have never hedged or contracted or if you have and quit, why? (Check all that apply.)

A. The contracts are too large for my operation. ___ _____ 47

B. Contracts aren't offered in the months I need them. ___ _____ 48

(Question continued on next page.)

5

C. My capital position is large enough to absorb an occasional loss and in the long run I think I'm better off without hedging. ___ _____ 49

D. Even full time professionals who watch the market all day sometimes lose money at it. I don't have that kind of time so I figure I'll take an even worse beating. ___ _____ 50

E. Everytime I've started to hedge I ended up doing a little speculating on the side. That always got to be too dangerous. ____ _____ 51

F. Dishonesty in these markets is too prevelant for me to feel comfortable using them. ___ _____ 52

G. The discount off futures or the brokerage fees are too large. ___ _____ 53

H. I don't hedge for reasons not described above. ___ (Please describe briefly.) _____ 54

(Go to question 23.)

22. If you do hedge or contract, do you have a rule of thumb for deciding the portion of your production you want to commit to these methods?

A. Yes ___ B. No ___ _____ 55

(If yes, what is the rule?)

23. Approximately what percentage of your hogs do you market through the following channels?

A. Auction Market: _____% _____ 56-58

B. Country buying station (Co-op, Heinhold, NFO, Farm Bureau, etc.): _____% _____ 59-61

(Question continued on the next page.)

6

C. Direct to packer gate: _____% _____ 62-64

D. Packer buying station: _____% _____ 65-67

E. To an order buyer at the farm: _____% _____ 68-70

F. Teleauction market: _____% _____ 71-73

G. Terminal Market: _____% _____ 74-76

H. Other: _____% (Please describe.) _____ 77-79

_____ 1-2

_____ 3

24. Why do you use the marketing method you do? (Check all that apply.)

A. I sell to the closest available outlet. ___ _____ 4

B. I sell wherever I can get the best price. ___ _____ 5

C. It's the only place I am treated honestly. ___ _____ 6

D. They are open when I want to deliver. ___ _____ 7

E. Other ___ (Please explain.) _____ 8

25. Is the relationship with your buyer important enough to you to sell in that marketing channel even though you might do slightly better elsewhere?

A. Yes ___ B. No ___ _____ 9

26. If you have ever forward contracted or sold a futures contract, did it improve your ability to make mangement decisions in general, and production decisions in particular?

A. Yes ___ B. No___ _____ 10

27. The concept of a Computer Auction of Pork Contracts (CAPC) has been explained to you in the letter which accompanied this questionnaire. (It could work the same way for feeder pigs.) With respect to the following categories, would you rate your present marketing system or an CAPC as superior? (Write P if you think your present system is superior, C if you think an CAPC would be superior.)

A. Prices ___	_____	11
B. Information for planning and management ___	_____	12
C. Number of buyers ___	_____	13
D. Price premiums for superior product ___	_____	14
E. Acceptance by farmers in general ___	_____	15
F. Acceptance by buyers in general ___	_____	16
G. Buyer-seller relationships and cooperation ___	_____	17
H. Efficient use of the capital you have invested in your hog operation ___	_____	18
I. Your satisfaction with the marketing system ___	_____	19

28. Would you ever consider selling a forward slaughter hog contract on a computer market?

A. Yes ___ (If answer is yes, go to question 30.)

B. No ___ _____ 20

29. If you wouldn't consider forward contracting, where price is negotiated between numerous buyers and sellers, what are the reasons? (Check all that apply.)

A. I'm afraid the spot price would move substantially above my contracted price and I'd end up missing a chance at an outstanding profit. ___ _____ 21

(Question continued on next page.)

8

B. I'm too uncertain about when my pigs will reach market weight to commit to any kind of delivery date no matter how loose it may be. ___ _____ 22

C. All contracts that I've ever seen could be used against the producer. And I'm afraid that the contract provisions wouldn't be fairly enforced with respect to grading. ___ _____ 23

D. Contracts limit my actions more than I care to have them limited. ___ _____ 24

E. Other reasons. ___ (Please specify.) _____ 25

30. Remember that the tighter you're willing to schedule delivery, the higher the contract price should be since it lowers the packers' costs if they know when deliveries will be made. However if you were to contract, the tighter you scheduled delivery, the higher the chance that you wouldn't be able to fully meet the contract terms. Assume that you're contracting 20% of your production. How tightly would you be willing to guarantee delivery if you were contracting nine months in advance? (Please check one.)

A. Within one day ___

B. Within two days ___

C. Within a week ___

D. Within a month ___ _____ 26

31. Now assume that you're contracting 60% of your production. How tightly would you then be willing to contract? (Please check one.)

A. Within one day ___

B. Within two days ___

C. Within a week ___

D. Within a month ___ _____ 27

9

32. If the penalty clauses for not fulfilling a contract were acceptable and if you chose to participate in an CAPC, how much of your production would you initially be willing to contract? (Please check one.)

A. 100% ___

B. 75% ___

C. 50% ___

D. 25% ___

E. 10% ___ _____ 28

33. If you did contract, how far ahead would you be willing to contract? (Check one.)

A. Prior to breeding ___

B. Only after birth ___

C. Only after weaning ___

D. Only about a month before hogs reach market weight ___ _____ 29

34. If Electronic Auction of Pork Contracts became wide-spread, do you think they might decrease the extremes that are present in the cycle?

A. Yes ___ B. No ___ _____ 30

35. If the use of CAPC's started generating more predictable prices with less up and down variation during the cycle than at present, would it change your production methods?

A. Yes ___ B. No ___ _____ 31

(If yes, briefly specify the change.)

10

36. Whom do you think should own and operate the Computer Auction of Pork Contracts? (Please check one.)

A. Sellers ___

B. Buyers ___

C. Government ___

D. Another party (please specify) ___

E. Such a market should not exist. ___ _____ 32

37. Who should pay the cost of the exchange? (Please check one.)

A. Farmers should pay on a @ cwt. or @ head marketed basis. ___

B. Buyers should pay. ___

C. The cost should be split. ___ _____ 33

38. Assume that further study showed that CAPC's could make farmers better off but only if everyone marketed a certain portion of their pig production through it. That is, the study showed that the system must have more volume than could be gotten through voluntary participation. Would you then vote for such required participation?

A. Yes ___ B. No ___ _____ 34

39. What method should be used to insure that a contract is honored by both parties? (Please check one.)

A. A bonding agency should guarantee performance. ___

B. Agreed upon penalities should be imposed on either of the parties not living up to the conditions of the contract. ___

(Question continued on next page.)

11

C. The written agreement should be enough and the courts could then handle any case of contract non-compliance. ___

D. Questions of whether either party has failed to live up to the contract should be handled by an arbitrator whose rulings would have the force of law. ___

E. An agent of the board of directors of the CAPC could handle such disputes. ___ ____ 35

40. Who should be allowed to contract? (Please check one.)

A. Anyone ___

B. Any processor or producer that has raised or butchered hogs in the past. ___

C. Only those who are certified as being able to deliver on their promises. ___

D. Only processors or producers who've had more than five years experience. ___

E. Anyone who can buy a performance bond. ___ ____ 36

41. Under what conditions should the farmer be allowed to cancel the contract? (Check all that apply.)

A. Acts of God ___ ____ 37

B. Disease outbreak kills the pigs intended for the contract. ___ ____ 38

C. The market price at time of delivery is $10 @ cwt. above the contract price. ___ ____ 39

D. Deciding not to raise hogs anymore ___ ____ 40

E. Other ___ (Please specify.) ____ 41

12

42. Should producers or processors be allowed to sell or pay someone else qualified to take their contracts if for some reason they don't want to or are unable to meet the contract terms?

A. Yes ___ B. No ___ _____ 42

43. How small would a contract need to be interest you? (Please check one.)

A. Increments of 30,000 lbs. ___

B. Increments of 15,000 lbs. ___

C. Increments of 5,000 lbs. ___

D. Increments of 1,000 lbs. ___ _____ 43

44. How would you like to see animals graded in the CAPC? (Please check one.)

A. On the hoof, at the point of delivery, using present USDA 1's, 2's and 3's standards. ___

B. Any standard is okay by me just so long as I know what it is before I begin production. ___

C. On the rail (carcass graded) by a government grader. ___

D. On the hoof using ultrasonic measure of the loin eye area. ___

E. On the hoof using the depth of backfat and weight of hog. ___ _____ 44

45. How should animals that don't meet the contract standards be discounted? (Please check one.)

A. The discount should be negotiated with every contract. ___

B. The discount should be set beforehand and periodically re-evaluated. ___ _____ 45

13

46. Who should establish the discount? (Please check one.)

A. The operators of the exchange ___

B. Packers ___

C. Farmers ___

D. Packer-farmer bargaining committee___

E. Government ___

F. It should be negotiated during each contract. ___

G. Other ___ (Please specify.)

_____ 46

47. Would you like a summary of the results of this survey?

Yes ___ No___

(If yes, please write your name and address at the bottom of this page.)

48. May I quote you by name in this research?

Yes ___ No ___

(If yes, please write your name and address at the bottom of this page.)

Thank you for taking the time to complete this questionnaire.

APPENDIX B

COMPUTER STATISTICAL SUMMARY OF FARM SURVEY

VOGELBACK COMPUTING CENTER
NORTHWESTERN UNIVERSITY

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 8.3 MSU MAY 4, 1982

100000 CM MAXIMUM FIELD LENGTH REQUEST

```
RUN NAME          PRODUCER SURVEY DATA
FILE NAME         PROGRAM1
VARIABLE LIST     ID,V1 TO V87
INPUT FORMAT      FIXED(F2.0,F1.0,1X,2F1.0,2F5.0,F2.0,16F1.0,F2.0,F5.0,
                  F3.0,11F1.0,8F3.0/3X,43F1.0)
```

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
ID	F 2. 0	1	1- 2
V1	F 1. 0	1	3- 3
V2	F 1. 0	1	5- 5
V3	F 1. 0	1	6- 6
V4	F 5. 0	1	7- 11
V5	F 5. 0	1	12- 16
V6	F 2. 0	1	17- 18
V7	F 1. 0	1	19- 19
V8	F 1. 0	1	20- 20
V9	F 1. 0	1	21- 21
V10	F 1. 0	1	22- 22
V11	F 1. 0	1	23- 23
V12	F 1. 0	1	24- 24
V13	F 1. 0	1	25- 25
V14	F 1. 0	1	26- 26
V15	F 1. 0	1	27- 27
V16	F 1. 0	1	28- 28
V17	F 1. 0	1	29- 29
V18	F 1. 0	1	30- 30
V19	F 1. 0	1	31- 31
V20	F 1. 0	1	32- 32
V21	F 1. 0	1	33- 33
V22	F 1. 0	1	34- 34
V23	F 2. 0	1	35- 36
V24	F 5. 0	1	37- 41
V25	F 3. 0	1	42- 44
V26	F 1. 0	1	45- 45
V27	F 1. 0	1	46- 46
V28	F 1. 0	1	47- 47
V29	F 1. 0	1	48- 48
V30	F 1. 0	1	49- 49
V31	F 1. 0	1	50- 50
V32	F 1. 0	1	51- 51
V33	F 1. 0	1	52- 52
V34	F 1. 0	1	53- 53
V35	F 1. 0	1	54- 54
V36	F 1. 0	1	55- 55
V37	F 3. 0	1	56- 58
V38	F 3. 0	1	59- 61
V39	F 3. 0	1	62- 64
V40	F 3. 0	1	65- 67
V41	F 3. 0	1	68- 70
V42	F 3. 0	1	71- 73
V43	F 3. 0	1	74- 76
V44	F 3. 0	1	77- 79
V45	F 1. 0	2	4- 4
V46	F 1. 0	2	5- 5
V47	F 1. 0	2	6- 6
V48	F 1. 0	2	7- 7

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
V49	F 1. 0	2	8- 8
V50	F 1. 0	2	9- 9
V51	F 1. 0	2	10- 10
V52	F 1. 0	2	11- 11
V53	F 1. 0	2	12- 12
V54	F 1. 0	2	13- 13
V55	F 1. 0	2	14- 14
V56	F 1. 0	2	15- 15
V57	F 1. 0	2	16- 16
V58	F 1. 0	2	17- 17
V59	F 1. 0	2	18- 18
V60	F 1. 0	2	19- 19
V61	F 1. 0	2	20- 20
V62	F 1. 0	2	21- 21
V63	F 1. 0	2	22- 22
V64	F 1. 0	2	23- 23
V65	F 1. 0	2	24- 24
V66	F 1. 0	2	25- 25
V67	F 1. 0	2	26- 26
V68	F 1. 0	2	27- 27
V69	F 1. 0	2	28- 28
V70	F 1. 0	2	29- 29
V71	F 1. 0	2	30- 30
V72	F 1. 0	2	31- 31
V73	F 1. 0	2	32- 32
V74	F 1. 0	2	33- 33
V75	F 1. 0	2	34- 34
V76	F 1. 0	2	35- 35
V77	F 1. 0	2	36- 36
V78	F 1. 0	2	37- 37
V79	F 1. 0	2	38- 38
V80	F 1. 0	2	39- 39
V81	F 1. 0	2	40- 40
V82	F 1. 0	2	41- 41
V83	F 1. 0	2	42- 42
V84	F 1. 0	2	43- 43
V85	F 1. 0	2	44- 44
V86	F 1. 0	2	45- 45
V87	F 1. 0	2	46- 46

THE INPUT FORMAT PROVIDES FOR 88 VARIABLES. 88 WILL BE READ.
IT PROVIDES FOR 2 RECORDS (*CARDS*) PER CASE.
A MAXIMUM OF 79 *COLUMNS* ARE USED ON A RECORD.

```
*                N OF CASES      UNKNOWN                                          6
*                VAR LABELS      ID,IDENTIFICATION/                               7
*                                V1,STATE/                                        8
*                                V2,TYPE SWINE OPERATION/                         9
*                                V3,HOW PIGS PRODUCED/                           10
*                               V4,NUMBER FEEDER PIGS PRODUCED/                  11
*                               V5,NUMBER SLAUGHTER HOGS PRODUCED/               12
*                               V6,NUMBER OF YEARLY MARKET TRIES/                13
*                               V7,PORK OPERATION PROVIDE 50 OF INCOME/          14
*                               V8,ESTIMATE MARKET PRIOR TO BREEDING/            15
*                               V9,ESTIMATE MARKET AFTER LITTER WEANED/          16
*                               V10,EST. FUTURE PRICE BY WEIGHTED AVERAGE/       17
*                               V11,EST. FUTURE PRICE WITH FUTURES MARKET/       18
*                               V12,EST. FUTURE PRICE WITH USDA FORECAST/        19
*                               V13,EST. FUTURE PRICE-EXTENSION SERVICE/         20
*                               V14,EST. FUTURE PRICE-OWN COMPUTER MODEL/        21
*                               V15,EST. FUTURE PRICE-ANOTHER METHOD/            22
*                               V16,PERCENT OF ACCURAGE PRICE PREDICTION/        23
*                               V17,CHANGE PRODUCTION BASED ON PREDICT./         24
*                               V18,HOG CYCLE PRICE VARIATION/                   25
*                               V19,COVER COSTS AT LOW END OF CYCLE/             26
*                               V20,WHEN SURE YOU WON'T COVER COSTS/             27
*                               V21,MORE THAN 75 PCT CAPITAL BORROWED/           28
*                               V22,UNPLANNED REFINANCING OF LOAN/               29
*                               V23,NUMBER OF YEARS RAISING HOGS/                30
*                               V24,ACRES PLANT IN CROPS/                        31
*                               V25,PERCENT HOG CORN RAISED/                     32
*                               V26,SOLD FUTURES OR FORWARD HOG CONTRACT/        33
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*                    V27,CURRENTLY USE HEDGING OR CONTRACTED/                                    34
*                    V28,CONTRACTS TOO LARGE/                                                    35
*                    V29,NOT OFFERED WHEN I NEED THEM/                                           36
*                    V30,LARGE CAPITAL POSITION/                                                 37
*                    V31,NOT ENOUGH TIME/                                                        38
*                    V32,BEGAN DANGEROUS SPECULATING/                                            39
*                    V33,TOO MUCH DISHONESTY/                                                    40
*                    V34,DISCOUNT AND FEES TOO LARGE/                                            41
*                    V35,OTHER REASONS/                                                          42
*                    V36,RULE FOR PORTION HEDGED/                                                43
*                    V37,HOGS MARKETED-AUCTION MARKET PCT/                                       44
*                    V38,HOGS MARKETED-BUYING STATION PCT /                                      45
*                    V39,HOGS MARKETED-DIRECT PACKER GATE PCT/                                   46
*                    V40,HOGS MARKETED-PACKER BUYING STATION PCT/                                47
*                    V41,HOGS MARKETED-FARM ORDER BUYER PCT/                                     48
*                    V42,HOGS MARKETED-TELEAUCTION MARKET PCT/                                   49
*                    V43,HOGS MARKETED-TERMINAL MARKET PCT/                                      50
*                    V44,HOGS MARKETED-OTHER PCT/                                                51
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*                    V46,SELL WHEREVER BEST PRICE/                                               53
*                    V47,HONESTLY TREATED/                                                       54
*                    V48,OPEN WHEN CONVENIENT/                                                   55
*                    V49,OTHER REASON/                                                           56
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*                    V57,ACCEPTANCE BY BUYERS/                                                   64
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*                    V60,SATISFACTION WITH MARKETING SYSTEM/                                     67
*                    V61,CONSIDER SELLING FORWARD CONTRACT/                                      68
*                    V62,MISS CHANCE AT PROFIT/                                                  69
*                    V63,TOO UNCERTAIN ABOUT PIG WEIGHT/                                         70
*                    V64,WOULDN'T BE FAIRLY ENFORCED/                                            71
*                    V65,CONTRACTS LIMIT MY ACTION/                                              72
*                    V66,OTHER REASONS/                                                          73
*                    V67,GUARANTEE DELIVERY-20 PCT OF PRODUCTION/                                74
*                    V68,GUARANTEE DELIVERY-60 PCT OF PRODUCTION/                                75
*                    V69,PRODUCTION WILLING TO CONTRACT/                                         76
*                    V70,HOW FAR AHEAD WILLING TO CONTRACT/                                      77
*                    V71,CAPC DECREASE EXTREMES/                                                 78
*                    V72,CAPC'S CHANGE YOUR PRODUCTION METHODS/                                  79
*                    V73,WHO SHOULD OWN AND OPERATE CAPC/                                        80
*                    V74,WHO PAY COST OF EXCHANGE/                                               81
*                    V75,REQUIRED PARTICIPATION/                                                 82
*                    V76,METHOD USED TO INSURE CONTRACT HONORED/                                 83
*                    V77,WHO ALLOWED TO CONTRACT/                                                84
*                    V78,CANCEL CONTRACT-ACTS OF GOD/                                            85
*                    V79,CANCEL CONTRACT-DISEASE OUTBREAK/                                       86
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*                    V84,HOW SMALL CONTRACT TO INTEREST YOU/                                     91
*                    V85,HOW ANIMALS GRADED/                                                     92
*                    V86,HOW ANIMALS DISCOUNTED/                                                 93
*                    V87,WHO ESTABLISH DISCOUNT/                                                 94
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*                    V2(1)FEEDER PIGS(2)SLAUGHTER HOGS(3)FARROW-FINISH                           96
*                    (4)SLAUGHTER AND FEEDER(9)NO ANSWER/                                        97
*                    V3(1)FIELD(2)OPEN LOT(3)SEMI-CONFINEMENT                                    98
*                    (4)TOTAL CONFINEMENT(9)NO ANSWER/                                           99
*                    V4 TO V5(99999)NO ANSWER/                                                  100
*                   V6(99)NO ANSWER/                                                            101
*                   V7(1)YES(2)NO(9)NO ANSWER/                                                  102
*                   V8 TO V9(1)WITHIN TWO DAYS(2)WITHIN WEEK                                    103
*                   (3)WITHIN MONTH(9)NO ANSWER/                                                104
*                   V10 TO V15(8)DO NOT USE(9)NO ANSWER/                                        105
*                   V16(1)0-10 PCT(2)10-25 PCT(3)25-40 PCT                                      106
*                   (4)40 PCT OR MORE(9)NO ANSWER/                                              107
*                   V17(1)YES(2)NO(9)NO ANSWER/                                                 108
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*                          V18(1)HELP(2)HINDERANCE(9)NO ANSWER/                                                    109
*                          V19(1)YES(2)NO(9)NO ANSWER/                                                             110
*                          V20(1)PRIOR TO BREEDING(2)GROWER STAGE(3)BEFORE MARKETING                               111

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*                          (8)DOES NOT APPLY(9)NO ANSWER/                                                          112
*                          V21 TO V22(1)YES(2)NO(9)NO ANSWER/                                                      113
*                          V23(99)NO ANSWER/                                                                       114
*                          V24(99999)NO ANSWER/                                                                    115
*                          V25(999)NO ANSWER/                                                                      116
*                          V26 TO V27(1)YES(2)NO(9)NO ANSWER/                                                      117
*                          V28 TO V35(1)REASON(7)NOT A REASON(8)DOES NOT APPLY                                     118
*                          (9)NO ANSWER/                                                                           119
*                          V36(1)YES(2)NO(8)DOES NOT APPLY(9)NO ANSWER/                                            120
*                          V37 TO V44(99)NO ANSWER/                                                                121
*                          V45 TO V49(1)REASON(2)NOT A REASON(9)NO ANSWER/                                         122
*                          V50(1)YES(2)NO(9)NO ANSWER/                                                             123
*                          V51(1)YES(2)NO(3)HAVEN'T CONTRACTED(9)NO ANSWER/                                        124
*                          V52 TO V60(1)PRESENT SUPERIOR(2)CAPC SUPERIOR                                           125
*                          (9)NO ANSWER/                                                                           126
*                          V61(1)YES(2)NO(9)NO ANSWER/                                                             127
*                          V62 TO V66(1)REASON(7)NOT A REASON(8)DOES NOT APPLY                                     128
*                          (9)NO ANSWER/                                                                           129
*                          V67 TO V68(1)WITHIN ONE DAY(2)WITHIN TWO DAYS                                           130
*                          (3)WITHIN A WEEK(4)WITHIN A MONTH(9)NO ANSWER/                                          131
*                          V69(1)100 PCT(2)75 PCT(3)50 PCT(4)25 PCT                                                132
*                          (5)10 PCT(9)NO ANSWER/                                                                  133
*                          V70(1)PRIOR TO BREEDING(2)ONLY AFTER BIRTH                                              134
*                          (3)ONLY AFTER WEANING(4)MONTH BEF. MKT. WT.                                             135
*                          (9)NO ANSWER/                                                                           136
*                          V71 TO V72(1)YES(2)NO(9)NO ANSWER/                                                      137
*                          V73(1)SELLERS(2)BUYERS(3)GOVERNMENT(4)ANOTHER PARTY                                     138
*                          (9)NO ANSWER/                                                                           139
*                          V74(1)FARMERS(2)BUYERS(3)COST SPLIT(9)NO ANSWER/                                        140
*                          V75(1)YES(2)NO(9)NO ANSWER/                                                             141
*                          V76(1)BONDING AGENCY(2)AGREED PENALTIES(3)COURTS                                        142
*                          (4)ARBITRATOR(5)AGENT OF BOARD(9)NO ANSWER/                                             143
*                          V77(1)ANYONE(2)RAISED HOGS IN PAST(3)CERTIFIED TO DELIVER                               144
*                          (4)FIVE YEARS EXPER.(9)NO ANSWER/                                                       145
*                          V78 TO V82(1)REASON(7)NOT A REASON(9)NO ANSWER/                                         146
*                          V83(1)YES(2)NO(9)NO ANSWER/                                                             147
*                          V84(1)30,000 LBS.(2)15,000 LBS.(3)5,000 LBS.(4)1,000 LBS.                               148
*                          (9)NO ANSWER/                                                                           149
*                          V85(1)USDA STANDARDS(2)ANY STANDARD(3)CARCASS GRADED                                    150
*                          (4)ULTRASONIC MEASURE(5)DEPTH OF BACKFAT(9)NO ANSWER/                                   151
*                          V86(1)WITH EVERY CONTRACT(2)SET BEFOREHAND(9)NO ANSWER/                                 152
*                          V87(1)OPERATORS(2)PACKERS(3)FARMERS(4)COMMITTEE                                         153
*                          (5)GOVERNMENT(6)NEGOTIATED(7)OTHER(9)NO ANSWER/                                         154
*                MISSING VALUES V2 TO V3(9)/                                                                       155
*                          V4 TO V5(99999)/                                                                        156
*                          V6(99)/                                                                                 157
*                          V7 TO V9(9)/                                                                            158
*                          V10 TO V15(8,9)/                                                                        159
*                          V16 TO V19(9)/                                                                          160
*                          V20(8,9)/                                                                               161
*                          V21 TO V22(9)/                                                                          162
*                          V23(99)/                                                                                163
*                          V24(99999)/                                                                             164
*                          V25(999)/                                                                               165
*                          V26 TO V27(9)/                                                                          166
*                          V28 TO V35(7,8,9)/                                                                      167
*                          V36(8,9)/                                                                               168
*                          V37 TO V44(99)/                                                                         169
*                          V45 TO V49(7,9)/                                                                        170
*                          V50 TO V61(9)/                                                                          171
*                          V62 TO V66(7,8,9)/                                                                      172
*                          V67 TO V77(9)/                                                                          173
*                          V78 TO V82(7,9)/                                                                        174
*                          V83 TO V87(9)/                                                                          175
*                LIST CASES     CASES=2/VARIABLES=ALL                                                             176
*                PRINT FORMAT   ALL(2)                                                                            177

CPU TIME REQUIRED..       .810 SECONDS

*                FREQUENCIES    GENERAL=ALL                                                                       178
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*                  STATISTICS      ALL                                                                    179
*                  COMMENT         COMPUTE         SIZE=V5                                                180
*                  COMMENT         RECODE          SIZE(LO THRU 999.99=1)(999.999 THRU 1999.99=2)         181
*                  COMMENT                           (1999.999 THRU HI =3)                                 182
*                  COMMENT         VALUE LABELS    SIZE(1)SMALL(2)MEDIUM(3)LARGE                          183
*                  COMMENT         CROSSTABS       TABLES=SIZE BY V61                                     184
*                  COMMENT          COMPUTE         RESPOND=ID                                            185

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*                  COMMENT          RECODE          RESPOND(2,3,6,18,21,21,27,28,34,35,37,39,40,43,44      186
*                  COMMENT                          57,59,63,65,66,69,70,71,73,74=2)(ELSE=1)               187
*                  COMMENT          LIST CASES      CASES=2/VARIABLES=ALL                                  188
*                  COMMENT          PRINT FORMAT    ALL(2)                                                 189
*                  COMMENT          T-TEST          GROUPS=RESPOND(1,2)/VARIABLE=V3 TO V87                 190
*                  COMMENT          STATISTICS      ALL                                                    191
*                  READ INPUT DATA                                                                         192

          FREQUENCIES - INITIAL CM ALLOWS FOR   860 VALUES
                        MAXIMUM CM ALLOWS FOR  5126 VALUES


CONTENTS OF CASE NUMBER      1
SEQNUM          1.00    SUBFILE    PROGRAM1        CASWGT      1.0000      ID          75.00      V1          1.00
V2              4.00    V3             3.00        V4        200.00        V5        400.00       V6         20.00
V7              1.00    V8             3.00        V9          3.00        V10         8.00       V11         2.00
V12             3.00    V13            8.00        V14         8.00        V15         1.00       V16         2.00
V17             1.00    V18            2.00        V19         1.00        V20         3.00       V21         1.00
V22             1.00    V23            6.00        V24       150.00        V25       100.00       V26         2.00
V27             9.00    V28            1.00        V29         7.00        V30         7.00       V31         7.00
V32             7.00    V33            7.00        V34         7.00        V35         1.00       V36         8.00
V37                0    V38           95.00        V39            0        V40            0       V41            0
V42                0    V43               0        V44         5.00        V45         1.00       V46         1.00
V47             7.00    V48            7.00        V49         1.00        V50         1.00       V51         3.00
V52             2.00    V53            2.00        V54         2.00        V55         2.00       V56         1.00
V57             1.00    V58            2.00        V59         2.00        V60         2.00       V61         1.00
V62             8.00    V63            8.00        V64         8.00        V65         8.00       V66         8.00
V67             4.00    V68            4.00        V69         3.00        V70         1.00       V71         2.00
V72             1.00    V73            4.00        V74         3.00        V75         2.00       V76         3.00
V77             3.00    V78            1.00        V79         7.00        V80         7.00       V81         7.00
V82             7.00    V83            1.00        V84         3.00        V85         1.00       V86         2.00
V87             4.00

CONTENTS OF CASE NUMBER      2
SEQNUM          2.00    SUBFILE    PROGRAM1        CASWGT      1.0000      ID          67.00      V1          1.00
V2              3.00    V3             4.00        V4             0        V5        1400.00      V6         52.00
V7              1.00    V8             3.00        V9          3.00        V10         8.00       V11         1.00
V12             8.00    V13            8.00        V14         8.00        V15         8.00       V16         9.00
V17             1.00    V18            1.00        V19         2.00        V20         9.00       V21         2.00
V22             2.00    V23           15.00        V24       180.00        V25       100.00       V26         1.00
V27             2.00    V28            7.00        V29         7.00        V30         1.00       V31         7.00
V32             7.00    V33            7.00        V34         7.00        V35         7.00       V36         2.00
V37                0    V38          100.00        V39            0        V40            0       V41            0
V42                0    V43               0        V44            0        V45         1.00       V46         7.00
V47             7.00    V48            1.00        V49         7.00        V50         1.00       V51         2.00
V52             1.00    V53            2.00        V54         1.00        V55         9.00       V56         9.00
V57             9.00    V58            9.00        V59         9.00        V60         1.00       V61         1.00
V62             8.00    V63            8.00        V64         8.00        V65         8.00       V66         8.00
V67             4.00    V68            4.00        V69         4.00        V70         3.00       V71         9.00
V72             2.00    V73            1.00        V74         3.00        V75         2.00       V76         2.00
V77             2.00    V78            1.00        V79         1.00        V80         7.00       V81         1.00
V82             7.00    V83            1.00        V84         2.00        V85         1.00       V86         2.00
V87             1.00

END OF FILE ON FILE INPUT
AFTER READING     51 CASES FROM SUBFILE PROGRAM1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

RODUCER SURVEY DATA                                                   05/06/83     SPSS V8.3     .15.06.54.      PAGE     6
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FILE PROGRAM1 (CREATION DATE = 05/06/83)

ID IDENTIFICATION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.00	1	2.0	2.0	2.0
	2.00	1	2.0	2.0	3.9
	3.00	1	2.0	2.0	5.9
	4.00	1	2.0	2.0	7.8
	6.00	1	2.0	2.0	9.8
	12.00	1	2.0	2.0	11.8
	13.00	1	2.0	2.0	13.7
	18.00	1	2.0	2.0	15.7
	20.00	1	2.0	2.0	17.6
	21.00	1	2.0	2.0	19.6
	24.00	1	2.0	2.0	21.6
	25.00	1	2.0	2.0	23.5
	27.00	1	2.0	2.0	25.5
	28.00	1	2.0	2.0	27.5
	29.00	1	2.0	2.0	29.4
	30.00	1	2.0	2.0	31.4
	31.00	1	2.0	2.0	33.3
	33.00	1	2.0	2.0	35.3
	34.00	1	2.0	2.0	37.3
	35.00	1	2.0	2.0	39.2
	36.00	1	2.0	2.0	41.2
	37.00	1	2.0	2.0	43.1
	38.00	1	2.0	2.0	45.1
	39.00	1	2.0	2.0	47.1
	40.00	1	2.0	2.0	49.0
	41.00	1	2.0	2.0	51.0
	43.00	1	2.0	2.0	52.9
	44.00	1	2.0	2.0	54.9
	45.00	1	2.0	2.0	56.9
	46.00	1	2.0	2.0	58.8
	47.00	1	2.0	2.0	60.8
	49.00	1	2.0	2.0	62.7
	51.00	1	2.0	2.0	64.7
	54.00	1	2.0	2.0	66.7

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PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3    .15.06.54.     PAGE    7
FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

                               55.00         1        2.0        2.0      68.6
                               56.00         1        2.0        2.0      70.6
                               57.00         1        2.0        2.0      72.5
                               58.00         1        2.0        2.0      74.5
                               59.00         1        2.0        2.0      76.5
                               61.00         1        2.0        2.0      78.4
                               63.00         1        2.0        2.0      80.4
                               64.00         1        2.0        2.0      82.4
                               65.00         1        2.0        2.0      84.3
                               66.00         1        2.0        2.0      86.3
                               67.00         1        2.0        2.0      88.2
                               69.00         1        2.0        2.0      90.2
                               70.00         1        2.0        2.0      92.2
                               71.00         1        2.0        2.0      94.1
                               73.00         1        2.0        2.0      96.1
                               74.00         1        2.0        2.0      98.0
                               75.00         1        2.0        2.0     100.0
                                        ------     ------     ------
                               TOTAL        51      100.0      100.0

MEAN            41.353     STD ERR        2.965     MEDIAN        41.000
MODE             1.000     STD DEV       21.177     VARIANCE     448.473
KURTOSIS         -.875     SKEWNESS       -.233     RANGE         74.000
MINIMUM          1.000     MAXIMUM       75.000     SUM         2109.000
C.V. PCT        51.211     .95 C.I.      35.397          TO       47.309

VALID CASES         51     MISSING CASES      0

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PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3    .15.06.54.     PAGE    8
FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V1         STATE

                                                 RELATIVE   ADJUSTED      CUM
                                      ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL                 CODE     FREQ       (PCT)      (PCT)      (PCT)

MICHIGAN                       1.00        20       39.2       39.2       39.2

IOWA                           2.00        18       35.3       35.3       74.5

NCAROLINA                      3.00        13       25.5       25.5      100.0
                                        ------     ------     ------
                               TOTAL        51      100.0      100.0

MEAN             1.863     STD ERR         .112     MEDIAN         1.806
MODE             1.000     STD DEV         .800     VARIANCE        .641
KURTOSIS        -1.386     SKEWNESS        .257     RANGE          2.000
MINIMUM          1.000     MAXIMUM        3.000     SUM           95.000
```

C.V. PCT	42.974	.95 C.I.	1.638	TO	2.088
VALID CASES	51	MISSING CASES	0		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V2 TYPE SWINE OPERATION

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0	2	3.9	3.9	3.9
FEEDER PIGS	1.00	4	7.8	7.8	11.8
SLAUGHTER HOGS	2.00	7	13.7	13.7	25.5
FARROW-FINISH	3.00	32	62.7	62.7	88.2
SLAUGHTER AND FEEDER	4.00	6	11.8	11.8	100.0
	TOTAL	51	100.0	100.0	

MEAN	2.706	STD ERR	.129	MEDIAN	2.891
MODE	3.000	STD DEV	.923	VARIANCE	.852
KURTOSIS	1.781	SKEWNESS	-1.274	RANGE	4.000
MINIMUM	0	MAXIMUM	4.000	SUM	138.000
C.V. PCT	34.108	.95 C.I.	2.446	TO	2.965
VALID CASES	51	MISSING CASES	0		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V3 HOW PIGS PRODUCED

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0	1	2.0	2.0	2.0
FIELD	1.00	1	2.0	2.0	3.9
OPEN LOT	2.00	5	9.8	9.8	13.7
SEMI-CONFINEMENT	3.00	18	35.3	35.3	49.0
TOTAL CONFINEMENT	4.00	26	51.0	51.0	100.0
	TOTAL	51	100.0	100.0	

MEAN	3.314	STD ERR	.124	MEDIAN	3.519
MODE	4.000	STD DEV	.883	VARIANCE	.780
KURTOSIS	3.121	SKEWNESS	-1.580	RANGE	4.000
MINIMUM	0	MAXIMUM	4.000	SUM	169.000
C.V. PCT	26.645	.95 C.I.	3.065	TO	3.562
VALID CASES	51	MISSING CASES	0		

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PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   11
FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V4         NUMBER FEEDER PIGS PRODUCED

                                                     RELATIVE  ADJUSTED     CUM
                                          ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                    CODE      FREQ      (PCT)     (PCT)     (PCT)

                                     0       39       76.5      76.5      76.5

                                  1.00        1        2.0       2.0      78.4

                                 50.00        1        2.0       2.0      80.4

                                200.00        2        3.9       3.9      84.3

                                400.00        2        3.9       3.9      88.2

                                500.00        3        5.9       5.9      94.1

                                750.00        1        2.0       2.0      96.1

                               1100.00        1        2.0       2.0      98.0

                               1400.00        1        2.0       2.0     100.0
                                          ------     ------    ------
                                 TOTAL       51      100.0     100.0

MEAN          117.667      STD ERR      40.482       MEDIAN          .154
MODE                0      STD DEV     289.098       VARIANCE   83577.667
KURTOSIS        9.336      SKEWNESS      2.979       RANGE       1400.000
MINIMUM             0      MAXIMUM    1400.000       SUM         6001.000
C.V. PCT      245.692      .95 C.I.     36.357              TO    198.977

VALID CASES        51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   12
FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V5         NUMBER SLAUGHTER HOGS PRODUCED

                                                     RELATIVE  ADJUSTED     CUM
                                          ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                    CODE      FREQ      (PCT)     (PCT)     (PCT)

                                     0        5        9.8       9.8       9.8

                                100.00        1        2.0       2.0      11.8

                                165.00        1        2.0       2.0      13.7

                                300.00        2        3.9       3.9      17.6

                                350.00        1        2.0       2.0      19.6

                                400.00        1        2.0       2.0      21.6

                                500.00        2        3.9       3.9      25.5

                                550.00        1        2.0       2.0      27.5

                                600.00        2        3.9       3.9      31.4

                                650.00        1        2.0       2.0      33.3

                                750.00        1        2.0       2.0      35.3

                                800.00        1        2.0       2.0      37.3
```

850.00	1	2.0	2.0	39.2
900.00	2	3.9	3.9	43.1
1000.00	2	3.9	3.9	47.1
1200.00	4	7.8	7.8	54.9
1400.00	1	2.0	2.0	56.9
1500.00	2	3.9	3.9	60.8
1550.00	1	2.0	2.0	62.7
1900.00	1	2.0	2.0	64.7
2000.00	4	7.8	7.8	72.5
2200.00	2	3.9	3.9	76.5
2300.00	1	2.0	2.0	78.4
3200.00	1	2.0	2.0	80.4
3500.00	3	5.9	5.9	86.3
4000.00	1	2.0	2.0	88.2
4300.00	1	2.0	2.0	90.2
4500.00	1	2.0	2.0	92.2
6000.00	1	2.0	2.0	94.1
10000.00	1	2.0	2.0	96.1
72000.00	1	2.0	2.0	98.0
80024.00	1	2.0	2.0	100.0
TOTAL	51	100.0	100.0	

MEAN	4570.373	STD ERR	2059.646	MEDIAN	1193.750
MODE	0	STD DEV	14708.813	VARIANCE	.216E+09
KURTOSIS	22.392	SKEWNESS	4.803	RANGE	80024.000
MINIMUM	0	MAXIMUM	80024.000	SUM	233089.000
C.V. PCT	321.830	.95 C.I.	433.452	TO	8707.293

VALID CASES 51 MISSING CASES 0

V6 NUMBER OF YEARLY MARKET TRIES

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	2.00	3	5.9	6.4	6.4
	3.00	1	2.0	2.1	8.5

```
                              4.00       2       3.9       4.3      12.8
                              5.00       2       3.9       4.3      17.0
                              6.00       2       3.9       4.3      21.3
                              7.00       1       2.0       2.1      23.4
                             10.00       2       3.9       4.3      27.7
                             12.00       4       7.8       8.5      36.2
                             13.00       1       2.0       2.1      38.3
                             20.00       1       2.0       2.1      40.4
                             23.00       1       2.0       2.1      42.6
                             24.00       2       3.9       4.3      46.8
                             25.00       1       2.0       2.1      48.9
                             26.00       6      11.8      12.8      61.7
                             30.00       2       3.9       4.3      66.0
                             36.00       1       2.0       2.1      68.1
                             40.00       1       2.0       2.1      70.2
                             45.00       3       5.9       6.4      76.6
                             52.00      10      19.6      21.3      97.9
                             98.00       1       2.0       2.1     100.0
NO ANSWER                    99.00       4       7.8   MISSING
                                    ------    ------    ------
                             TOTAL      51     100.0     100.0

MEAN           27.404     STD ERR       3.045     MEDIAN        25.583
MODE           52.000     STD DEV      20.877     VARIANCE     435.855
KURTOSIS        1.041     SKEWNESS       .876     RANGE         96.000
MINIMUM         2.000     MAXIMUM      98.000     SUM         1288.000
C.V. PCT       76.182     .95 C.I.     21.274          TO       33.534

VALID CASES        47     MISSING CASES     4

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   15

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V7         PORK OPERATION PROVIDE 50 OF INCOME

                                                 RELATIVE  ADJUSTED     CUM
                                       ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                  CODE     FREQ     (PCT)     (PCT)     (PCT)

YES                             1.00      29       56.9      56.9      56.9

NO                              2.00      21       41.2      41.2      98.0

                                4.00       1        2.0       2.0     100.0
                                      ------    ------    ------
                               TOTAL      51      100.0     100.0

MEAN            1.471     STD ERR        .086     MEDIAN         1.379
MODE            1.000     STD DEV        .612     VARIANCE        .374
KURTOSIS        3.901     SKEWNESS      1.481     RANGE          3.000
MINIMUM         1.000     MAXIMUM       4.000     SUM           75.000
C.V. PCT       41.592     .95 C.I.      1.299          TO        1.643

VALID CASES        51     MISSING CASES     0
```

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V8 ESTIMATE MARKET PRIOR TO BREEDING

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WITHIN TWO DAYS	1.00	2	3.9	4.4	4.4
WITHIN WEEK	2.00	9	17.6	20.0	24.4
WITHIN MONTH	3.00	34	66.7	75.6	100.0
NO ANSWER	9.00	6	11.8	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	2.711	STD ERR	.082	MEDIAN	2.838
MODE	3.000	STD DEV	.549	VARIANCE	.301
KURTOSIS	2.443	SKEWNESS	-1.791	RANGE	2.000
MINIMUM	1.000	MAXIMUM	3.000	SUM	122.000
C.V. PCT	20.237	.95 C.I.	2.546	TO	2.876

VALID CASES 45 MISSING CASES 6

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V9 ESTIMATE MARKET AFTER LITTER WEANED

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
WITHIN TWO DAYS	1.00	3	5.9	6.7	6.7
WITHIN WEEK	2.00	16	31.4	35.6	42.2
WITHIN MONTH	3.00	26	51.0	57.8	100.0
NO ANSWER	9.00	6	11.8	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	2.511	STD ERR	.093	MEDIAN	2.635
MODE	3.000	STD DEV	.626	VARIANCE	.392
KURTOSIS	-.126	SKEWNESS	-.916	RANGE	2.000
MINIMUM	1.000	MAXIMUM	3.000	SUM	113.000
C.V. PCT	24.931	.95 C.I.	2.323	TO	2.699

VALID CASES 45 MISSING CASES 6

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V10 EST. FUTURE PRICE BY WEIGHTED AVERAGE

```
                                                      RELATIVE  ADJUSTED    CUM
                                            ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                     CODE       FREQ      (PCT)     (PCT)     (PCT)

                                   1.00         2        3.9      10.0      10.0

                                   2.00         5        9.8      25.0      35.0

                                   3.00         9       17.6      45.0      80.0

                                   5.00         2        3.9      10.0      90.0

                                   7.00         2        3.9      10.0     100.0

DO NOT USE                         8.00        24       47.1    MISSING

NO ANSWER                          9.00         7       13.7    MISSING
                                            ------    ------    ------
                                  TOTAL        51      100.0     100.0

MEAN            3.150      STD ERR          .372      MEDIAN          2.833
MODE            3.000      STD DEV         1.663      VARIANCE        2.766
KURTOSIS        1.318      SKEWNESS        1.262      RANGE           6.000
MINIMUM         1.000      MAXIMUM         7.000      SUM            63.000
C.V. PCT       52.796      .95 C.I.        2.372            TO        3.928

VALID CASES        20      MISSING CASES      31

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83    SPSS V8.3    .15.06.54.     PAGE   19

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V11        EST. FUTURE PRICE WITH FUTURES MARKET

                                                      RELATIVE  ADJUSTED    CUM
                                            ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                     CODE       FREQ      (PCT)     (PCT)     (PCT)

                                   1.00        26       51.0      72.2      72.2

                                   2.00         6       11.8      16.7      88.9

                                   3.00         2        3.9       5.6      94.4

                                   7.00         2        3.9       5.6     100.0

DO NOT USE                         8.00         8       15.7    MISSING

NO ANSWER                          9.00         7       13.7    MISSING
                                            ------    ------    ------
                                  TOTAL        51      100.0     100.0

MEAN            1.611      STD ERR          .240      MEDIAN          1.192
MODE            1.000      STD DEV         1.440      VARIANCE        2.073
KURTOSIS       10.126      SKEWNESS        3.170      RANGE           6.000
MINIMUM         1.000      MAXIMUM         7.000      SUM            58.000
C.V. PCT       89.367      .95 C.I.        1.124            TO        2.098

VALID CASES        36      MISSING CASES      15

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83    SPSS V8.3    .15.06.54.     PAGE   20

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V12        EST. FUTURE PRICE WITH USDA FORECAST
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                                                RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ     (PCT)     (PCT)     (PCT)

                               1.00        6      11.8      21.4      21.4

                               2.00       11      21.6      39.3      60.7

                               3.00        8      15.7      28.6      89.3

                               4.00        2       3.9       7.1      96.4

                               7.00        1       2.0       3.6     100.0

DO NOT USE                     8.00       16      31.4   MISSING

NO ANSWER                      9.00        7      13.7   MISSING
                                      ------    ------    ------
                              TOTAL       51     100.0     100.0

MEAN           2.393     STD ERR        .238      MEDIAN          2.227
MODE           2.000     STD DEV       1.257      VARIANCE        1.581
KURTOSIS       5.668     SKEWNESS      1.826      RANGE           6.000
MINIMUM        1.000     MAXIMUM       7.000      SUM            67.000
C.V. PCT      52.542     .95 C.I.      1.905           TO         2.880

VALID CASES       28     MISSING CASES    23

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83    SPSS V8.3    .15.06.54.    PAGE   21

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V13       EST. FUTURE PRICE-EXTENSION SERVICE

                                                RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ     (PCT)     (PCT)     (PCT)

                               2.00        1       2.0       7.1       7.1

                               3.00        3       5.9      21.4      28.6

                               4.00        7      13.7      50.0      78.6

                               5.00        1       2.0       7.1      85.7

                               7.00        2       3.9      14.3     100.0

DO NOT USE                     8.00       30      58.8   MISSING

NO ANSWER                      9.00        7      13.7   MISSING
                                      ------    ------    ------
                              TOTAL       51     100.0     100.0

MEAN           4.143     STD ERR        .376      MEDIAN          3.929
MODE           4.000     STD DEV       1.406      VARIANCE        1.978
KURTOSIS       1.164     SKEWNESS      1.063      RANGE           5.000
MINIMUM        2.000     MAXIMUM       7.000      SUM            58.000
C.V. PCT      33.948     .95 C.I.      3.331           TO         4.955

VALID CASES       14     MISSING CASES    37

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83    SPSS V8.3    .15.06.54.    PAGE   22

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V14       EST. FUTURE PRICE-OWN COMPUTER MODEL
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                                                 RELATIVE  ADJUSTED    CUM
                                     ABSOLUTE      FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE    FREQ       (PCT)     (PCT)     (PCT)

                               1.00       3         5.9      30.0      30.0

                               2.00       2         3.9      20.0      50.0

                               5.00       2         3.9      20.0      70.0

                               6.00       1         2.0      10.0      80.0

                               7.00       2         3.9      20.0     100.0

DO NOT USE                     8.00      34        66.7    MISSING

NO ANSWER                      9.00       7        13.7    MISSING
                                     ------      ------    ------
                              TOTAL      51       100.0     100.0

MEAN             3.700      STD ERR           .803      MEDIAN          2.500
MODE             1.000      STD DEV          2.541      VARIANCE        6.456
KURTOSIS        -1.998      SKEWNESS          .166      RANGE           6.000
MINIMUM          1.000      MAXIMUM          7.000      SUM            37.000
C.V. PCT        68.670      .95 C.I.         1.882             TO       5.518

VALID CASES         10      MISSING CASES     41

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83     SPSS V8.3    .15.06.54.     PAGE   23

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V15       EST. FUTURE PRICE-ANOTHER METHOD

                                                 RELATIVE  ADJUSTED    CUM
                                     ABSOLUTE      FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE    FREQ       (PCT)     (PCT)     (PCT)

                               1.00       6        11.8      46.2      46.2

                               2.00       1         2.0       7.7      53.8

                               4.00       2         3.9      15.4      69.2

                               6.00       2         3.9      15.4      84.6

                               7.00       2         3.9      15.4     100.0

DO NOT USE                     8.00      31        60.8    MISSING

NO ANSWER                      9.00       7        13.7    MISSING
                                     ------      ------    ------
                              TOTAL      51       100.0     100.0

MEAN             3.231      STD ERR           .699      MEDIAN          2.000
MODE             1.000      STD DEV          2.522      VARIANCE        6.359
KURTOSIS        -1.633      SKEWNESS          .504      RANGE           6.000
MINIMUM          1.000      MAXIMUM          7.000      SUM            42.000
C.V. PCT        78.053      .95 C.I.         1.707             TO       4.755

VALID CASES         13      MISSING CASES     38

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83     SPSS V8.3    .15.06.54.     PAGE   24

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )
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V16       PERCENT OF ACCURAGE PRICE PREDICTION

                                                  RELATIVE  ADJUSTED     CUM
                                       ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ      (PCT)     (PCT)     (PCT)

0-10 PCT                       1.00         7      13.7      17.1      17.1

10-25 PCT                      2.00        18      35.3      43.9      61.0

25-40 PCT                      3.00        13      25.5      31.7      92.7

40 PCT OR MORE                 4.00         3       5.9       7.3     100.0

NO ANSWER                      9.00        10      19.6    MISSING
                                      -------   -------   -------
                              TOTAL        51     100.0     100.0

MEAN           2.293     STD ERR          .132     MEDIAN         2.250
MODE           2.000     STD DEV          .844     VARIANCE        .712
KURTOSIS       -.466     SKEWNESS         .173     RANGE          3.000
MINIMUM        1.000     MAXIMUM         4.000     SUM           94.000
C.V. PCT      36.809     .95 C.I.        2.026           TO       2.559

VALID CASES       41     MISSING CASES     10

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3    .15.06.54.     PAGE    25

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V17       CHANGE PRODUCTION BASED ON PREDICT.

                                                  RELATIVE  ADJUSTED     CUM
                                       ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ      (PCT)     (PCT)     (PCT)

YES                            1.00        13      25.5      26.0      26.0

NO                             2.00        37      72.5      74.0     100.0

NO ANSWER                      9.00         1       2.0    MISSING
                                      -------   -------   -------
                              TOTAL        51     100.0     100.0

MEAN           1.740     STD ERR          .063     MEDIAN         1.824
MODE           2.000     STD DEV          .443     VARIANCE        .196
KURTOSIS       -.759     SKEWNESS       -1.128     RANGE          1.000
MINIMUM        1.000     MAXIMUM         2.000     SUM           87.000
C.V. PCT      25.465     .95 C.I.        1.614           TO       1.866

VALID CASES       50     MISSING CASES      1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3    .15.06.54.     PAGE    26

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V18       HOG CYCLE PRICE VARIATION

                                                  RELATIVE  ADJUSTED     CUM
                                       ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ      (PCT)     (PCT)     (PCT)

HELP                           1.00        20      39.2      41.7      41.7

HINDERANCE                     2.00        28      54.9      58.3     100.0
```

```
NO ANSWER                   9.00        3        5.9    MISSING
                                   ------   ------   ------
                           TOTAL       51    100.0    100.0

MEAN          1.583     STD ERR        .072      MEDIAN        1.643
MODE          2.000     STD DEV        .498      VARIANCE       .248
KURTOSIS     -1.962     SKEWNESS      -.349      RANGE         1.000
MINIMUM       1.000     MAXIMUM       2.000      SUM          76.000
C.V. PCT     31.467     .95 C.I.      1.439           TO       1.728

VALID CASES      48     MISSING CASES     3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83    SPSS V8.3    .15.06.54.     PAGE   27

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V19       COVER COSTS AT LOW END OF CYCLE

                                             RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE    FREQ      (PCT)     (PCT)     (PCT)

YES                         1.00      29       56.9      60.4      60.4

NO                          2.00      19       37.3      39.6     100.0

NO ANSWER                   9.00       3        5.9    MISSING
                                   ------   ------   ------
                           TOTAL      51    100.0     100.0

MEAN          1.396     STD ERR        .071      MEDIAN        1.328
MODE          1.000     STD DEV        .494      VARIANCE       .244
KURTOSIS     -1.887     SKEWNESS       .440      RANGE         1.000
MINIMUM       1.000     MAXIMUM       2.000      SUM          67.000
C.V. PCT     35.406     .95 C.I.      1.252           TO       1.539

VALID CASES      48     MISSING CASES     3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83    SPSS V8.3    .15.06.54.     PAGE   28

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V20       WHEN SURE YOU WON'T COVER COSTS

                                             RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE    FREQ      (PCT)     (PCT)     (PCT)

PRIOR TO BREEDING           1.00       5        9.8      17.9      17.9

GROWER STAGE                2.00       9       17.6      32.1      50.0

BEFORE MARKETING            3.00      14       27.5      50.0     100.0

DOES NOT APPLY              8.00      17       33.3    MISSING

NO ANSWER                   9.00       6       11.8    MISSING
                                   ------   ------   ------
                           TOTAL      51    100.0     100.0

MEAN          2.321     STD ERR        .146      MEDIAN        2.500
MODE          3.000     STD DEV        .772      VARIANCE       .597
KURTOSIS      -.984     SKEWNESS      -.646      RANGE         2.000
MINIMUM       1.000     MAXIMUM       3.000      SUM          65.000
C.V. PCT     33.271     .95 C.I.      2.022           TO       2.621
```

VALID CASES 28 MISSING CASES 23

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V21 MORE THAN 75 PCT CAPITAL BORROWED

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0	1	2.0	2.0	2.0
YES	1.00	18	35.3	36.0	38.0
NO	2.00	31	60.8	62.0	100.0
NO ANSWER	9.00	1	2.0	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.600	STD ERR	.076	MEDIAN	1.694
MODE	2.000	STD DEV	.535	VARIANCE	.286
KURTOSIS	-.457	SKEWNESS	-.835	RANGE	2.000
MINIMUM	0	MAXIMUM	2.000	SUM	80.000
C.V. PCT	33.408	.95 C.I.	1.448	TO	1.752

VALID CASES 50 MISSING CASES 1

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V22 UNPLANNED REFINANCING OF LOAN

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
YES	1.00	17	33.3	33.3	33.3
NO	2.00	33	64.7	64.7	98.0
	8.00	1	2.0	2.0	100.0
	TOTAL	51	100.0	100.0	

MEAN	1.784	STD ERR	.141	MEDIAN	1.758
MODE	2.000	STD DEV	1.006	VARIANCE	1.013
KURTOSIS	29.786	SKEWNESS	4.745	RANGE	7.000
MINIMUM	1.000	MAXIMUM	8.000	SUM	91.000
C.V. PCT	56.395	.95 C.I.	1.501	TO	2.067

VALID CASES 51 MISSING CASES 0

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V23 NUMBER OF YEARS RAISING HOGS

```
                                                  RELATIVE  ADJUSTED    CUM
                                         ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                    CODE     FREQ     (PCT)     (PCT)     (PCT)

                                  1.00       1       2.0       2.0       2.0
                                  2.00       2       3.9       3.9       5.9
                                  3.00       1       2.0       2.0       7.8
                                  4.00       1       2.0       2.0       9.8
                                  6.00       4       7.8       7.8      17.6
                                  8.00       3       5.9       5.9      23.5
                                  9.00       2       3.9       3.9      27.5
                                 10.00       8      15.7      15.7      43.1
                                 11.00       1       2.0       2.0      45.1
                                 12.00       4       7.8       7.8      52.9
                                 15.00       4       7.8       7.8      60.8
                                 16.00       1       2.0       2.0      62.7
                                 20.00       3       5.9       5.9      68.6
                                 22.00       1       2.0       2.0      70.6
                                 25.00       6      11.8      11.8      82.4
                                 28.00       1       2.0       2.0      84.3
                                 30.00       5       9.8       9.8      94.1
                                 33.00       1       2.0       2.0      96.1
                                 35.00       1       2.0       2.0      98.0
                                 40.00       1       2.0       2.0     100.0
                                         -------   -------   -------
                                 TOTAL      51     100.0     100.0

MEAN          15.902     STD ERR         1.389     MEDIAN        12.125
MODE          10.000     STD DEV         9.920     VARIANCE      98.410
KURTOSIS       -.731     SKEWNESS         .558     RANGE         39.000
MINIMUM        1.000     MAXIMUM        40.000     SUM          811.000
C.V. PCT      62.383     .95 C.I.       13.112           TO      18.692

VALID CASES       51     MISSING CASES     0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                 05/06/83     SPSS V8.3    .15.06.54.     PAGE   32

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V24       ACRES PLANT IN CROPS

                                                  RELATIVE  ADJUSTED    CUM
                                         ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                    CODE     FREQ     (PCT)     (PCT)     (PCT)

                                     0       3       5.9       5.9       5.9
                                 10.00       1       2.0       2.0       7.8
                                 60.00       1       2.0       2.0       9.8
                                 80.00       2       3.9       3.9      13.7
                                100.00       1       2.0       2.0      15.7
```

135.00	1	2.0	2.0	17.6
150.00	1	2.0	2.0	19.6
170.00	1	2.0	2.0	21.6
180.00	1	2.0	2.0	23.5
200.00	4	7.8	7.8	31.4
250.00	1	2.0	2.0	33.3
260.00	1	2.0	2.0	35.3
300.00	3	5.9	5.9	41.2
325.00	1	2.0	2.0	43.1
350.00	4	7.8	7.8	51.0
390.00	1	2.0	2.0	52.9
400.00	3	5.9	5.9	58.8
440.00	1	2.0	2.0	60.8
450.00	5	9.8	9.8	70.6
480.00	1	2.0	2.0	72.5
500.00	1	2.0	2.0	74.5
575.00	1	2.0	2.0	76.5
600.00	1	2.0	2.0	78.4
650.00	1	2.0	2.0	80.4
800.00	2	3.9	3.9	84.3
900.00	1	2.0	2.0	86.3
950.00	1	2.0	2.0	88.2
1200.00	4	7.8	7.8	96.1
1600.00	1	2.0	2.0	98.0
1700.00	1	2.0	2.0	100.0
TOTAL	51	100.0	100.0	

MEAN	461.471	STD ERR	56.213	MEDIAN	353.750
MODE	450.000	STD DEV	401.442	VARIANCE	161155.294
KURTOSIS	1.733	SKEWNESS	1.430	RANGE	1700.000
MINIMUM	0	MAXIMUM	1700.000	SUM	23535.000
C.V. PCT	86.992	.95 C.I.	348.563	TO	574.378

VALID CASES 51 MISSING CASES 0

V25 PERCENT HOG CORN RAISED

```
                                                 RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                  CODE     FREQ     (PCT)     (PCT)     (PCT)

                                   0        3       5.9       5.9       5.9

                                3.00        1       2.0       2.0       7.8

                               22.00        1       2.0       2.0       9.8

                               30.00        1       2.0       2.0      11.8

                               50.00        2       3.9       3.9      15.7

                               60.00        2       3.9       3.9      19.6

                               65.00        1       2.0       2.0      21.6

                               70.00        2       3.9       3.9      25.5

                               75.00        3       5.9       5.9      31.4

                               80.00        1       2.0       2.0      33.3

                               90.00        2       3.9       3.9      37.3

                               95.00        1       2.0       2.0      39.2

                              100.00       31      60.8      60.8     100.0
                                       ------    ------    ------
                               TOTAL       51     100.0     100.0

MEAN             81.569     STD ERR         4.284     MEDIAN          99.032
MODE            100.000     STD DEV        30.592     VARIANCE       935.850
KURTOSIS          1.877     SKEWNESS       -1.713     RANGE          100.000
MINIMUM               0     MAXIMUM       100.000     SUM           4160.000
C.V. PCT         37.504     .95 C.I.       72.965           TO        90.173

VALID CASES          51     MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                 05/06/83     SPSS V8.3    .15.06.54.     PAGE    35

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V26        SOLD FUTURES OR FORWARD HOG CONTRACT

                                                 RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                  CODE     FREQ     (PCT)     (PCT)     (PCT)

YES                             1.00       21      41.2      41.2      41.2

NO                              2.00       29      56.9      56.9      98.0

                                7.00        1       2.0       2.0     100.0
                                       ------    ------    ------
                               TOTAL       51     100.0     100.0

MEAN              1.686     STD ERR          .127     MEDIAN           1.655
MODE              2.000     STD DEV          .905     VARIANCE          .820
KURTOSIS         23.741     SKEWNESS        4.044     RANGE            6.000
MINIMUM           1.000     MAXIMUM         7.000     SUM             86.000
C.V. PCT         53.688     .95 C.I.        1.432           TO         1.941

VALID CASES          51     MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                 05/06/83     SPSS V8.3    .15.06.54.     PAGE    36
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FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V27        CURRENTLY USE HEDGING OR CONTRACTED

                                                     RELATIVE  ADJUSTED    CUM
                                          ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                   CODE       FREQ      (PCT)     (PCT)     (PCT)

YES                              1.00         10       19.6      20.0      20.0

NO                               2.00         39       76.5      78.0      98.0

                                 7.00          1        2.0       2.0     100.0

NO ANSWER                        9.00          1        2.0   MISSING
                                           ------    ------    ------
                                TOTAL         51      100.0     100.0

MEAN             1.900     STD ERR          .119     MEDIAN          1.885
MODE             2.000     STD DEV          .839     VARIANCE         .704
KURTOSIS        28.593     SKEWNESS        4.512     RANGE           6.000
MINIMUM          1.000     MAXIMUM         7.000     SUM            95.000
C.V. PCT        44.163     .95 C.I.        1.662           TO        2.138

VALID CASES         50     MISSING CASES       1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83     SPSS V8.3     .15.06.54.     PAGE   37

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V28        CONTRACTS TOO LARGE

                                                     RELATIVE  ADJUSTED    CUM
                                          ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                   CODE       FREQ      (PCT)     (PCT)     (PCT)

REASON                           1.00         10       19.6     100.0     100.0

NOT A REASON                     7.00         28       54.9   MISSING

DOES NOT APPLY                   8.00         10       19.6   MISSING

NO ANSWER                        9.00          3        5.9   MISSING
                                           ------    ------    ------
                                TOTAL         51      100.0     100.0

MEAN             1.000     STD ERR             0     MEDIAN          1.000
MODE             1.000     STD DEV             0     VARIANCE            0
KURTOSIS             0     SKEWNESS            0     RANGE               0
MINIMUM          1.000     MAXIMUM         1.000     SUM            10.000
C.V. PCT             0     .95 C.I.        1.000           TO        1.000

VALID CASES         10     MISSING CASES      41

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83     SPSS V8.3     .15.06.54.     PAGE   38

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V29        NOT OFFERED WHEN I NEED THEM

                                                     RELATIVE  ADJUSTED    CUM
                                          ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                   CODE       FREQ      (PCT)     (PCT)     (PCT)
```

```
REASON                      1.00       2        3.9      100.0     100.0
NOT A REASON                7.00      36       70.6     MISSING
DOES NOT APPLY              8.00      10       19.6     MISSING
NO ANSWER                   9.00       3        5.9     MISSING
                                  ------     ------     ------
                           TOTAL      51      100.0      100.0

MEAN             1.000     STD ERR          0     MEDIAN          1.000
MODE             1.000     STD DEV          0     VARIANCE            0
KURTOSIS             0     SKEWNESS         0     RANGE               0
MINIMUM          1.000     MAXIMUM      1.000     SUM             2.000
C.V. PCT             0     .95 C.I.     1.000         TO          1.000

VALID CASES          2     MISSING CASES   49

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83    SPSS V8.3    .15.06.54.    PAGE   39

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V30       LARGE CAPITAL POSITION

                                             RELATIVE   ADJUSTED     CUM
                                  ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)      (PCT)      (PCT)

REASON                      1.00      10       19.6      100.0     100.0
NOT A REASON                7.00      28       54.9     MISSING
DOES NOT APPLY              8.00      10       19.6     MISSING
NO ANSWER                   9.00       3        5.9     MISSING
                                  ------     ------     ------
                           TOTAL      51      100.0      100.0

MEAN             1.000     STD ERR          0     MEDIAN          1.000
MODE             1.000     STD DEV          0     VARIANCE            0
KURTOSIS             0     SKEWNESS         0     RANGE               0
MINIMUM          1.000     MAXIMUM      1.000     SUM            10.000
C.V. PCT             0     .95 C.I.     1.000         TO          1.000

VALID CASES         10     MISSING CASES   41

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                     05/06/83    SPSS V8.3    .15.06.54.    PAGE   40

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V31       NOT ENOUGH TIME

                                             RELATIVE   ADJUSTED     CUM
                                  ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)      (PCT)      (PCT)

REASON                      1.00       9       17.6      100.0     100.0
NOT A REASON                7.00      29       56.9     MISSING
DOES NOT APPLY              8.00      10       19.6     MISSING
NO ANSWER                   9.00       3        5.9     MISSING
                                  ------     ------     ------
                           TOTAL      51      100.0      100.0
```

```
MEAN             1.000     STD ERR              0     MEDIAN           1.000
MODE             1.000     STD DEV              0     VARIANCE             0
KURTOSIS             0     SKEWNESS             0     RANGE                0
MINIMUM          1.000     MAXIMUM          1.000     SUM              9.000
C.V. PCT             0     .95 C.I.         1.000             TO       1.000

VALID CASES          9     MISSING CASES       42

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3    .15.06.54.     PAGE    41

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V32        BEGAN DANGEROUS SPECULATING

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE       FREQ      (PCT)     (PCT)     (PCT)

REASON                      1.00          1        2.0     100.0     100.0

NOT A REASON                7.00         37       72.5    MISSING

DOES NOT APPLY              8.00         10       19.6    MISSING

NO ANSWER                   9.00          3        5.9    MISSING
                                     ------     ------    ------
                           TOTAL         51      100.0     100.0

MEAN             1.000     MEDIAN           1.000     MODE             1.000
RANGE                0     MINIMUM          1.000     MAXIMUM          1.000
SUM              1.000

VALID CASES          1     MISSING CASES       50

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3    .15.06.54.     PAGE    42

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V33        TOO MUCH DISHONESTY

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE       FREQ      (PCT)     (PCT)     (PCT)

REASON                    . 1.00          4        7.8     100.0     100:0

NOT A REASON                7.00         34       66.7    MISSING

DOES NOT APPLY              8.00         10       19.6    MISSING

NO ANSWER                   9.00          3        5.9    MISSING
                                     ------     ------    ------
                           TOTAL         51      100.0     100.0

MEAN             1.000     STD ERR              0     MEDIAN           1.000
MODE             1.000     STD DEV              0     VARIANCE             0
KURTOSIS             0     SKEWNESS             0     RANGE                0
MINIMUM          1.000     MAXIMUM          1.000     SUM              4.000
C.V. PCT             0     .95 C.I.         1.000             TO       1.000

VALID CASES          4     MISSING CASES       47

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3    .15.06.54.     PAGE    43
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```
FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V34       DISCOUNT AND FEES TOO LARGE

                                             RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL             CODE     FREQ      (PCT)     (PCT)     (PCT)

REASON                     1.00       7        13.7     100.0     100.0

NOT A REASON               7.00      30      . 58.8    MISSING

DOES NOT APPLY             8.00      11        21.6    MISSING

NO ANSWER                  9.00       3         5.9    MISSING
                                  ------     ------    ------
                          TOTAL      51       100.0     100.0

MEAN            1.000     STD ERR           0      MEDIAN          1.000
MODE            1.000     STD DEV           0      VARIANCE            0
KURTOSIS            0     SKEWNESS          0      RANGE               0
MINIMUM         1.000     MAXIMUM       1.000      SUM             7.000
C.V. PCT            0     .95 C.I.      1.000           TO         1.000

VALID CASES         7     MISSING CASES    44

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                05/06/83    SPSS V8.3    .15.06.54.    PAGE   44

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V35       OTHER REASONS

                                             RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL             CODE     FREQ      (PCT)     (PCT)     (PCT)

                              0       1         2.0       6.7       6.7

REASON                     1.00      14        27.5      93.3     100.0

NOT A REASON               7.00      24        47.1    MISSING

DOES NOT APPLY             8.00       9        17.6    MISSING

NO ANSWER                  9.00       3         5.9    MISSING
                                  ------     ------    ------
                          TOTAL      51       100.0     100.0

MEAN             .933     STD ERR        .067      MEDIAN           .964
MODE            1.000     STD DEV        .258      VARIANCE         .067
KURTOSIS       15.000     SKEWNESS     -3.873      RANGE           1.000
MINIMUM             0     MAXIMUM       1.000      SUM            14.000
C.V. PCT       27.664     .95 C.I.       .790           TO         1.076

VALID CASES        15     MISSING CASES    36

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                05/06/83    SPSS V8.3    .15.06.54.    PAGE   45

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V36       RULE FOR PORTION HEDGED

                                             RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE     FREQ      FREQ      FREQ
```

```
CATEGORY LABEL               CODE     FREQ      (PCT)     (PCT)     (PCT)

                                0        1        2.0       5.0       5.0

YES                          1.00        7       13.7      35.0      40.0

NO                           2.00       12       23.5      60.0     100.0

DOES NOT APPLY               8.00       30       58.8    MISSING

NO ANSWER                    9.00        1        2.0    MISSING
                                    ------     ------    ------
                            TOTAL       51      100.0     100.0

MEAN            1.550    STD ERR        .135    MEDIAN         1.667
MODE            2.000    STD DEV        .605    VARIANCE        .366
KURTOSIS         .189    SKEWNESS     -1.003    RANGE          2.000
MINIMUM             0    MAXIMUM       2.000    SUM           31.000
C.V. PCT       39.020    .95 C.I.      1.267         TO        1.833

VALID CASES        20    MISSING CASES    31

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   46

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V37       HOGS MARKETED-AUCTION MARKET PCT

                                               RELATIVE   ADJUSTED     CUM
                                    ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL               CODE     FREQ       (PCT)      (PCT)      (PCT)

                                0       38       74.5       74.5       74.5

                             2.00        1        2.0        2.0       76.5

                            10.00        2        3.9        3.9       80.4

                            50.00        3        5.9        5.9       86.3

                            80.00        1        2.0        2.0       88.2

                            90.00        1        2.0        2.0       90.2

                            95.00        1        2.0        2.0       92.2

                           100.00        4        7.8        7.8      100.0
                                    ------     ------     ------
                            TOTAL       51      100.0      100.0

MEAN           16.412    STD ERR       4.748    MEDIAN          .342
MODE                0    STD DEV      33.909    VARIANCE    1149.847
KURTOSIS        1.684    SKEWNESS      1.825    RANGE        100.000
MINIMUM             0    MAXIMUM     100.000    SUM          837.000
C.V. PCT      206.616    .95 C.I.      6.875         TO       25.949

VALID CASES        51    MISSING CASES     0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   47

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V38       HOGS MARKETED-BUYING STATION PCT

                                               RELATIVE   ADJUSTED     CUM
                                    ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL               CODE     FREQ       (PCT)      (PCT)      (PCT)
```

```
                                   0       32        62.7       62.7      62.7

                                5.00        1         2.0        2.0      64.7

                               50.00        3         5.9        5.9      70.6

                               90.00        2         3.9        3.9      74.5

                               95.00        1         2.0        2.0      76.5

                              100.00       12        23.5       23.5     100.0
                                        -------    ------     ------
                               TOTAL       51       100.0      100.0

MEAN          31.961     STD ERR       6.283      MEDIAN         1.484
MODE               0     STD DEV      44.867      VARIANCE    2013.078
KURTOSIS      -1.353     SKEWNESS       .778      RANGE        100.000
MINIMUM            0     MAXIMUM     100.000      SUM         1630.000
C.V. PCT     140.382     .95 C.I.     19.342           TO       44.580

VALID CASES       51     MISSING CASES     0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3     .15.06.54.     PAGE    48

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V39        HOGS MARKETED-DIRECT PACKER GATE PCT

                                                  RELATIVE   ADJUSTED      CUM
                                       ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL                  CODE     FREQ      (PCT)      (PCT)      (PCT)

                                   0       35        68.6       68.6      68.6

                               10.00        1         2.0        2.0      70.6

                               25.00        1         2.0        2.0      72.5

                               50.00        1         2.0        2.0      74.5

                               90.00        1         2.0        2.0      76.5

                               98.00        1         2.0        2.0      78.4

                              100.00       11        21.6       21.6     100.0
                                        -------    ------     ------
                               TOTAL       51       100.0      100.0

MEAN          26.922     STD ERR       6.070      MEDIAN          .457
MODE               0     STD DEV      43.351      VARIANCE    1879.314
KURTOSIS       -.802     SKEWNESS      1.080      RANGE        100.000
MINIMUM            0     MAXIMUM     100.000      SUM         1373.000
C.V. PCT     161.027     .95 C.I.     14.729           TO       39.114

VALID CASES       51     MISSING CASES     0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3     .15.06.54.     PAGE    49

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V40        HOGS MARKETED-PACKER BUYING STATION PCT

                                                  RELATIVE   ADJUSTED      CUM
                                       ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL                  CODE     FREQ      (PCT)      (PCT)      (PCT)
```

```
                                0       45      88.2      88.2      88.2

                            25.00        1       2.0       2.0      90.2

                           100.00        5       9.8       9.8     100.0
                                    ------    ------    ------
                            TOTAL       51     100.0     100.0

MEAN            10.294      STD ERR         4.211      MEDIAN          1.667
MODE                 0      STD DEV        30.073      VARIANCE      904.412
KURTOSIS         5.753      SKEWNESS        2.727      RANGE         100.000
MINIMUM              0      MAXIMUM       100.000      SUM           525.000
C.V. PCT       292.142      .95 C.I.        1.836           TO        18.752

VALID CASES         51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                           05/06/83     SPSS V8.3    .15.06.54.     PAGE    50

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V41       HOGS MARKETED-FARM ORDER BUYER PCT

                                              RELATIVE  ADJUSTED     CUM
                                    ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                CODE    FREQ     (PCT)     (PCT)     (PCT)

                                0       49      96.1      96.1      96.1

                            20.00        1       2.0       2.0      98.0

                            50.00        1       2.0       2.0     100.0
                                    ------    ------    ------
                            TOTAL       51     100.0     100.0

MEAN             1.373      STD ERR         1.049      MEDIAN           .408
MODE                 0      STD DEV         7.489      VARIANCE       56.078
KURTOSIS        37.772      SKEWNESS        6.014      RANGE          50.000
MINIMUM              0      MAXIMUM        50.000      SUM            70.000
C.V. PCT       545.595      .95 C.I.        -.734           TO         3.479

VALID CASES         51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                           05/06/83     SPSS V8.3    .15.06.54.     PAGE    51

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V42       HOGS MARKETED-TELEAUCTION MARKET PCT

                                              RELATIVE  ADJUSTED     CUM
                                    ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                CODE    FREQ     (PCT)     (PCT)     (PCT)

                                0       51     100.0     100.0     100.0
                                    ------    ------    ------
                            TOTAL       51     100.0     100.0

MEAN                 0      STD ERR             0      MEDIAN              0
MODE                 0      STD DEV             0      VARIANCE            0
KURTOSIS             0      SKEWNESS            0      RANGE               0
MINIMUM              0      MAXIMUM             0      SUM                 0
.95 C.I.             0             TO           0

VALID CASES         51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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PRODUCER SURVEY DATA                                                    05/06/83     SPSS V8.3    .15.06.54.      PAGE   52

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V43         HOGS MARKETED-TERMINAL MARKET PCT

                                                  RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                  CODE     FREQ      (PCT)     (PCT)     (PCT)

                                   0       47      92.2      92.2      92.2

                               10.00        1       2.0       2.0      94.1

                               75.00        1       2.0       2.0      96.1

                              100.00        2       3.9       3.9     100.0
                                       ------    ------    ------
                               TOTAL       51     100.0     100.0

MEAN             5.588      STD ERR         3.076       MEDIAN          .426
MODE                 0      STD DEV        21.969       VARIANCE     482.647
KURTOSIS        14.446      SKEWNESS        3.945       RANGE        100.000
MINIMUM              0      MAXIMUM       100.000       SUM          285.000
C.V. PCT       393.134      .95 C.I.        -.591            TO       11.767

VALID CASES         51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                    05/06/83     SPSS V8.3    .15.06.54.      PAGE   53

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V44         HOGS MARKETED-OTHER PCT

                                                  RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                  CODE     FREQ      (PCT)     (PCT)     (PCT)

                                   0       44      86.3      86.3      86.3

                                5.00        1       2.0       2.0      88.2

                               10.00        1       2.0       2.0      90.2

                               25.00        1       2.0       2.0      92.2

                               50.00        3       5.9       5.9      98.0

                              100.00        1       2.0       2.0     100.0
                                       ------    ------    ------
                               TOTAL       51     100.0     100.0

MEAN             5.686      STD ERR         2.552       MEDIAN          .398
MODE                 0      STD DEV        18.221       VARIANCE     332.020
KURTOSIS        15.402      SKEWNESS        3.782       RANGE        100.000
MINIMUM              0      MAXIMUM       100.000       SUM          290.000
C.V. PCT       320.445      .95 C.I.         .561            TO       10.811

VALID CASES         51      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                    05/06/83     SPSS V8.3    .15.06.54.      PAGE   54

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )
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V45       SELL TO CLOSEST AVAILABLE MARKET

                                           RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL              CODE    FREQ     (PCT)     (PCT)     (PCT)

REASON                      1.00     24      47.1     100.0     100.0

                            7.00     26      51.0     MISSING

NO ANSWER                   9.00      1       2.0     MISSING
                                  ------    ------    ------
                           TOTAL     51     100.0     100.0

MEAN            1.000      STD ERR            0       MEDIAN          1.000
MODE            1.000      STD DEV            0       VARIANCE            0
KURTOSIS            0      SKEWNESS           0       RANGE               0
MINIMUM         1.000      MAXIMUM        1.000       SUM            24.000
C.V. PCT            0      .95 C.I.       1.000             TO        1.000

VALID CASES        24      MISSING CASES     27

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                05/06/83    SPSS V8.3    .15.06.54.     PAGE   55

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V46       SELL WHEREVER BEST PRICE

                                           RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL              CODE    FREQ     (PCT)     (PCT)     (PCT)

REASON                      1.00     24      47.1     100.0     100.0

                            7.00     26      51.0     MISSING

NO ANSWER                   9.00      1       2.0     MISSING
                                  ------    ------    ------
                           TOTAL     51     100.0     100.0

MEAN            1.000      STD ERR            0       MEDIAN          1.000
MODE            1.000      STD DEV            0       VARIANCE            0
KURTOSIS            0      SKEWNESS           0       RANGE               0
MINIMUM         1.000      MAXIMUM        1.000       SUM            24.000
C.V. PCT            0      .95 C.I.       1.000             TO        1.000

VALID CASES        24      MISSING CASES     27

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                05/06/83    SPSS V8.3    .15.06.54.     PAGE   56

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V47       HONESTLY TREATED

                                           RELATIVE  ADJUSTED    CUM
                                  ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL              CODE    FREQ     (PCT)     (PCT)     (PCT)

REASON                      1.00     10      19.6     100.0     100.0

                            7.00     40      78.4     MISSING

NO ANSWER                   9.00      1       2.0     MISSING
                                  ------    ------    ------
                           TOTAL     51     100.0     100.0
```

```
MEAN             1.000      STD ERR             0      MEDIAN          1.000
MODE             1.000      STD DEV             0      VARIANCE            0
KURTOSIS             0      SKEWNESS            0      RANGE               0
MINIMUM          1.000      MAXIMUM         1.000      SUM            10.000
C.V. PCT             0      .95 C.I.        1.000            TO        1.000

VALID CASES        10       MISSING CASES     41

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3     .15.06.54.     PAGE    57

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V48        OPEN WHEN CONVENIENT

                                                    RELATIVE  ADJUSTED     CUM
                                         ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                   CODE      FREQ      (PCT)     (PCT)     (PCT)

REASON                           1.00       18       35.3      100.0     100.0

                                 7.00       32       62.7     MISSING

NO ANSWER                        9.00        1        2.0     MISSING
                                          ------    ------    ------
                                TOTAL       51      100.0      100.0

MEAN             1.000      STD ERR             0      MEDIAN          1.000
MODE             1.000      STD DEV             0      VARIANCE            0
KURTOSIS             0      SKEWNESS            0      RANGE               0
MINIMUM          1.000      MAXIMUM         1.000      SUM            18.000
C.V. PCT             0      .95 C.I.        1.000            TO        1.000

VALID CASES        18       MISSING CASES     33

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3     .15.06.54.     PAGE    58

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V49        OTHER REASON

                                                    RELATIVE  ADJUSTED     CUM
                                         ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                   CODE      FREQ      (PCT)     (PCT)     (PCT)

REASON                           1.00        6       11.8      100.0     100.0

                                 7.00       44       86.3     MISSING

NO ANSWER                        9.00        1        2.0     MISSING
                                          ------    ------    ------
                                TOTAL       51      100.0      100.0

MEAN             1.000      STD ERR             0      MEDIAN          1.000
MODE             1.000      STD DEV             0      VARIANCE            0
KURTOSIS             0      SKEWNESS            0      RANGE               0
MINIMUM          1.000      MAXIMUM         1.000      SUM             6.000
C.V. PCT             0      .95 C.I.        1.000            TO        1.000

VALID CASES         6       MISSING CASES     45

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3     .15.06.54.     PAGE    59
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FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V50        RELATIONSHIP WITH BUYER IMPORTANT

                                              RELATIVE   ADJUSTED     CUM
                                   ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)      (PCT)      (PCT)

YES                         1.00      26        51.0       53.1       53.1

NO                          2.00      23        45.1       46.9      100.0

NO ANSWER                   9.00       2         3.9     MISSING
                                   -------    -------    -------
                           TOTAL      51       100.0      100.0

MEAN           1.469    STD ERR         .072     MEDIAN          1.442
MODE           1.000    STD DEV         .504     VARIANCE         .254
KURTOSIS      -2.070    SKEWNESS        .127     RANGE           1.000
MINIMUM        1.000    MAXIMUM        2.000     SUM            72.000
C.V. PCT      34.316    .95 C.I.       1.325            TO       1.614

VALID CASES       49     MISSING CASES      2

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83    SPSS V8.3    .15.06.54.    PAGE   60

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V51        CONTRACTING IMPROVE PRODUCTION DECISION

                                              RELATIVE   ADJUSTED     CUM
                                   ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)      (PCT)      (PCT)

YES                         1.00      11        21.6       22.4       22.4

NO                          2.00      10        19.6       20.4       42.9

HAVEN'T CONTRACTED          3.00      28        54.9       57.1      100.0

NO ANSWER                   9.00       2         3.9     MISSING
                                   -------    -------    -------
                           TOTAL      51       100.0      100.0

MEAN           2.347    STD ERR         .119     MEDIAN          2.625
MODE           3.000    STD DEV         .830     VARIANCE         .690
KURTOSIS      -1.140    SKEWNESS       -.740     RANGE           2.000
MINIMUM        1.000    MAXIMUM        3.000     SUM           115.000
C.V. PCT      35.384    .95 C.I.       2.108            TO       2.585

VALID CASES       49     MISSING CASES      2

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83    SPSS V8.3    .15.06.54.    PAGE   61

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V52        PRICES

                                              RELATIVE   ADJUSTED     CUM
                                   ABSOLUTE     FREQ       FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)      (PCT)      (PCT)

PRESENT SUPERIOR            1.00      16        31.4       37.2       37.2

CAPC SUPERIOR               2.00      27        52.9       62.8      100.0
```

```
NO ANSWER                    9.00       8       15.7    MISSING
                                    ------     ------    ------
                            TOTAL      51      100.0     100.0

MEAN            1.628     STD ERR         .075     MEDIAN          1.704
MODE            2.000     STD DEV         .489     VARIANCE         .239
KURTOSIS       -1.784     SKEWNESS       -.549     RANGE           1.000
MINIMUM         1.000     MAXIMUM        2.000     SUM            70.000
C.V. PCT       30.044     .95 C.I.       1.477          TO         1.778

VALID CASES        43     MISSING CASES      8

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3     .15.06.54.     PAGE    62

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V53        PLANNING & MANAGEMENT INFORMATION

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE      FREQ      (PCT)     (PCT)     (PCT)

PRESENT SUPERIOR             1.00        12      23.5      27.3      27.3

CAPC SUPERIOR                2.00        32      62.7      72.7     100.0

NO ANSWER                    9.00         7      13.7    MISSING
                                    ------     ------    ------
                            TOTAL        51     100.0     100.0

MEAN            1.727     STD ERR         .068     MEDIAN          1.813
MODE            2.000     STD DEV         .451     VARIANCE         .203
KURTOSIS        -.927     SKEWNESS      -1.057     RANGE           1.000
MINIMUM         1.000     MAXIMUM        2.000     SUM            76.000
C.V. PCT       26.082     .95 C.I.       1.590          TO         1.864

VALID CASES        44     MISSING CASES      7

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3     .15.06.54.     PAGE    63

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V54        NUMBER OF BUYERS

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE      FREQ      (PCT)     (PCT)     (PCT)

PRESENT SUPERIOR             1.00         9      17.6      19.6      19.6

CAPC SUPERIOR                2.00        37      72.5      80.4     100.0

NO ANSWER                    9.00         5       9.8    MISSING
                                    ------     ------    ------
                            TOTAL        51     100.0     100.0

MEAN            1.804     STD ERR         .059     MEDIAN          1.878
MODE            2.000     STD DEV         .401     VARIANCE         .161
KURTOSIS         .539     SKEWNESS      -1.587     RANGE           1.000
MINIMUM         1.000     MAXIMUM        2.000     SUM            83.000
C.V. PCT       22.229     .95 C.I.       1.685          TO         1.923

VALID CASES        46     MISSING CASES      5
```

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V55 PRICE PREMIUMS FOR SUPERIOR PRODUCT

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PRESENT SUPERIOR	1.00	22	43.1	52.4	52.4
CAPC SUPERIOR	2.00	20	39.2	47.6	100.0
NO ANSWER	9.00	9	17.6	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.476	STD ERR	.078	MEDIAN	1.455
MODE	1.000	STD DEV	.505	VARIANCE	.256
KURTOSIS	-2.092	SKEWNESS	.099	RANGE	1.000
MINIMUM	1.000	MAXIMUM	2.000	SUM	62.000
C.V. PCT	34.243	.95 C.I.	1.319	TO	1.634

VALID CASES 42 MISSING CASES 9

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V56 ACCEPTANCE BY FARMERS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
PRESENT SUPERIOR	1.00	30	58.8	71.4	71.4
CAPC SUPERIOR	2.00	12	23.5	28.6	100.0
NO ANSWER	9.00	9	17.6	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.286	STD ERR	.071	MEDIAN	1.200
MODE	1.000	STD DEV	.457	VARIANCE	.209
KURTOSIS	-1.085	SKEWNESS	.984	RANGE	1.000
MINIMUM	1.000	MAXIMUM	2.000	SUM	54.000
C.V. PCT	35.562	.95 C.I.	1.143	TO	1.428

VALID CASES 42 MISSING CASES 9

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V57 ACCEPTANCE BY BUYERS

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)

```
PRESENT SUPERIOR              1.00      22      43.1      53.7      53.7

CAPC SUPERIOR                 2.00      19      37.3      46.3     100.0

NO ANSWER                     9.00      10      19.6    MISSING
                                      ------   ------    ------
                             TOTAL      51     100.0     100.0

MEAN            1.463     STD ERR         .079      MEDIAN           1.432
MODE            1.000     STD DEV         .505      VARIANCE          .255
KURTOSIS       -2.081     SKEWNESS        .152      RANGE            1.000
MINIMUM         1.000     MAXIMUM        2.000      SUM             60.000
C.V. PCT       34.498     .95 C.I.       1.304             TO        1.623

VALID CASES       41      MISSING CASES     10

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3    .15.06.54.     PAGE   67

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V58        BUYER-SELLER COOPERATION

                                                RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ     (PCT)     (PCT)     (PCT)

PRESENT SUPERIOR              1.00      28      54.9      65.1      65.1

CAPC SUPERIOR                 2.00      15      29.4      34.9     100.0

NO ANSWER                     9.00       8      15.7    MISSING
                                      ------   ------    ------
                             TOTAL      51     100.0     100.0

MEAN            1.349     STD ERR         .074      MEDIAN           1.268
MODE            1.000     STD DEV         .482      VARIANCE          .233
KURTOSIS       -1.647     SKEWNESS        .657      RANGE            1.000
MINIMUM         1.000     MAXIMUM        2.000      SUM             58.000
C.V. PCT       35.752     .95 C.I.       1.200             TO        1.497

VALID CASES       43      MISSING CASES      8

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                       05/06/83     SPSS V8.3    .15.06.54.     PAGE   68

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V59        EFFICIENT USE OF CAPITAL

                                                RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ     (PCT)     (PCT)     (PCT)

PRESENT SUPERIOR              1.00      13      25.5      31.0      31.0

CAPC SUPERIOR                 2.00      29      56.9      69.0     100.0

NO ANSWER                     9.00       9      17.6    MISSING
                                      ------   ------    ------
                             TOTAL      51     100.0     100.0

MEAN            1.690     STD ERR         .072      MEDIAN           1.776
MODE            2.000     STD DEV         .468      VARIANCE          .219
KURTOSIS       -1.335     SKEWNESS       -.855      RANGE            1.000
MINIMUM         1.000     MAXIMUM        2.000      SUM             71.000
C.V. PCT       27.679     .95 C.I.       1.545             TO        1.836
```

```
VALID CASES      42      MISSING CASES     9

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83     SPSS V8.3    .15.06.54.     PAGE   69

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V60        SATISFACTION WITH MARKETING SYSTEM

                                                 RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE       FREQ      (PCT)     (PCT)     (PCT)

PRESENT SUPERIOR             1.00        22        43.1      50.0      50.0

CAPC SUPERIOR                2.00        22        43.1      50.0     100.0

NO ANSWER                    9.00         7        13.7    MISSING
                                     ------     ------    ------
                            TOTAL        51       100.0     100.0

MEAN           1.500     STD ERR          .076       MEDIAN         1.500
MODE           1.000     STD DEV          .506       VARIANCE        .256
KURTOSIS      -2.098     SKEWNESS           0        RANGE          1.000
MINIMUM        1.000     MAXIMUM         2.000       SUM           66.000
C.V. PCT      33.719     .95 C.I.        1.346             TO       1.654

VALID CASES      44      MISSING CASES     7

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83     SPSS V8.3    .15.06.54.     PAGE   70

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V61        CONSIDER SELLING FORWARD CONTRACT

                                                 RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE       FREQ      (PCT)     (PCT)     (PCT)

YES                          1.00        37        72.5      74.0      74.0

NO                           2.00        13        25.5      26.0     100.0

NO ANSWER                    9.00         1         2.0    MISSING
                                     ------     ------    ------
                            TOTAL        51       100.0     100.0

MEAN           1.260     STD ERR          .063       MEDIAN         1.176
MODE           1.000     STD DEV          .443       VARIANCE        .196
KURTOSIS       -.759     SKEWNESS        1.128       RANGE          1.000
MINIMUM        1.000     MAXIMUM         2.000       SUM           63.000
C.V. PCT      35.166     .95 C.I.        1.134             TO       1.386

VALID CASES      50      MISSING CASES     1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                        05/06/83     SPSS V8.3    .15.06.54.     PAGE   71

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V62        MISS CHANCE AT PROFIT

                                                 RELATIVE  ADJUSTED    CUM
```

CATEGORY LABEL	CODE	ABSOLUTE FREQ	FREQ (PCT)	FREQ (PCT)	FREQ (PCT)
REASON	1.00	7	13.7	100.0	100.0
NOT A REASON	7.00	6	11.8	MISSING	
DOES NOT APPLY	8.00	37	72.5	MISSING	
NO ANSWER	9.00	1	2.0	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.000	STD ERR	0	MEDIAN	1.000
MODE	1.000	STD DEV	0	VARIANCE	0
KURTOSIS	0	SKEWNESS	0	RANGE	0
MINIMUM	1.000	MAXIMUM	1.000	SUM	7.000
C.V. PCT	0	.95 C.I.	1.000	TO	1.000
VALID CASES	7	MISSING CASES	44		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V63 TOO UNCERTAIN ABOUT PIG WEIGHT

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
REASON	1.00	7	13.7	100.0	100.0
NOT A REASON	7.00	6	11.8	MISSING	
DOES NOT APPLY	8.00	37	72.5	MISSING	
NO ANSWER	9.00	1	2.0	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.000	STD ERR	0	MEDIAN	1.000
MODE	1.000	STD DEV	0	VARIANCE	0
KURTOSIS	0	SKEWNESS	0	RANGE	0
MINIMUM	1.000	MAXIMUM	1.000	SUM	7.000
C.V. PCT	0	.95 C.I.	1.000	TO	1.000
VALID CASES	7	MISSING CASES	44		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V64 WOULDN'T BE FAIRLY ENFORCED

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
REASON	1.00	5	9.8	100.0	100.0
NOT A REASON	7.00	8	15.7	MISSING	
DOES NOT APPLY	8.00	37	72.5	MISSING	
NO ANSWER	9.00	1	2.0	MISSING	

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                         TOTAL       51      100.0     100.0

MEAN           1.000    STD ERR            0      MEDIAN         1.000
MODE           1.000    STD DEV            0      VARIANCE           0
KURTOSIS           0    SKEWNESS           0      RANGE              0
MINIMUM        1.000    MAXIMUM        1.000      SUM            5.000
C.V. PCT           0    .95 C.I.       1.000            TO       1.000

VALID CASES        5    MISSING CASES     46

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE    74

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V65       CONTRACTS LIMIT MY ACTION

                                              RELATIVE  ADJUSTED     CUM
                                   ABSOLUTE     FREQ      FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)     (PCT)      (PCT)

REASON                      1.00        9       17.6     100.0      100.0

NOT A REASON                7.00        4        7.8     MISSING

DOES NOT APPLY              8.00       37       72.5     MISSING

NO ANSWER                   9.00        1        2.0     MISSING
                                   ------     ------    ------
                           TOTAL       51      100.0     100.0

MEAN           1.000    STD ERR            0      MEDIAN         1.000
MODE           1.000    STD DEV            0      VARIANCE           0
KURTOSIS           0    SKEWNESS           0      RANGE              0
MINIMUM        1.000    MAXIMUM        1.000      SUM            9.000
C.V. PCT           0    .95 C.I.       1.000            TO       1.000

VALID CASES        9    MISSING CASES     42

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PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE    75

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V66       OTHER REASONS

                                              RELATIVE  ADJUSTED     CUM
                                   ABSOLUTE     FREQ      FREQ       FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)     (PCT)      (PCT)

REASON                      1.00        1        2.0     100.0      100.0

NOT A REASON                7.00       12       23.5     MISSING

DOES NOT APPLY              8.00       37       72.5     MISSING

NO ANSWER                   9.00        1        2.0     MISSING
                                   ------     ------    ------
                           TOTAL       51      100.0     100.0

MEAN           1.000    MEDIAN         1.000      MODE           1.000
RANGE              0    MINIMUM        1.000      MAXIMUM        1.000
SUM            1.000

VALID CASES        1    MISSING CASES     50

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   76

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V67       GUARANTEE DELIVERY-20 PCT OF PRODUCTION

                                           RELATIVE  ADJUSTED    CUM
                                ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL           CODE     FREQ      (PCT)     (PCT)     (PCT)

WITHIN ONE DAY           1.00        7       13.7      13.7      13.7

WITHIN TWO DAYS          2.00        5        9.8       9.8      23.5

WITHIN A WEEK            3.00       24       47.1      47.1      70.6

WITHIN A MONTH           4.00       15       29.4      29.4     100.0
                                 ------    ------    ------
                        TOTAL       51      100.0     100.0

MEAN            2.922     STD ERR        .137      MEDIAN         3.063
MODE            3.000     STD DEV        .977      VARIANCE        .954
KURTOSIS        -.230     SKEWNESS      -.777      RANGE          3.000
MINIMUM         1.000     MAXIMUM       4.000      SUM          149.000
C.V. PCT       33.427     .95 C.I.      2.647           TO        3.196

VALID CASES        51     MISSING CASES     0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   77

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V68       GUARANTEE DELIVERY-60 PCT OF PRODUCTION

                                           RELATIVE  ADJUSTED    CUM
                                ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL           CODE     FREQ      (PCT)     (PCT)     (PCT)

WITHIN ONE DAY           1.00        3        5.9       6.0       6.0

WITHIN A WEEK            3.00       12       23.5      24.0      30.0

WITHIN A MONTH           4.00       35       68.6      70.0     100.0

NO ANSWER                9.00        1        2.0    MISSING
                                 ------    ------    ------
                        TOTAL       51      100.0     100.0

MEAN            3.580     STD ERR        .111      MEDIAN         3.786
MODE            4.000     STD DEV        .785      VARIANCE        .616
KURTOSIS        5.039     SKEWNESS     -2.255      RANGE          3.000
MINIMUM         1.000     MAXIMUM       4.000      SUM          179.000
C.V. PCT       21.922     .95 C.I.      3.357           TO        3.803

VALID CASES        50     MISSING CASES     1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                          05/06/83     SPSS V8.3     .15.06.54.     PAGE   78

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V69       PRODUCTION WILLING TO CONTRACT

                                           RELATIVE  ADJUSTED    CUM
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                                       ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ      (PCT)     (PCT)     (PCT)

100 PCT                        1.00         1        2.0       2.1       2.1

75 PCT                         2.00         8       15.7      16.7      18.8

50 PCT                         3.00        19       37.3      39.6      58.3

25 PCT                         4.00        13       25.5      27.1      85.4

10 PCT                         5.00         7       13.7      14.6     100.0

NO ANSWER                      9.00         3        5.9    MISSING
                                       ------     ------    ------
                              TOTAL        51      100.0     100.0

MEAN             3.354      STD ERR          .144      MEDIAN          3.289
MODE             3.000      STD DEV         1.000      VARIANCE        1.000
KURTOSIS         -.503      SKEWNESS         .021      RANGE           4.000
MINIMUM          1.000      MAXIMUM         5.000      SUM           161.000
C.V. PCT        29.807      .95 C.I.        3.064            TO        3.644

VALID CASES         48      MISSING CASES       3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE    79

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V70        HOW FAR AHEAD WILLING TO CONTRACT

                                               RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ     (PCT)     (PCT)     (PCT)

PRIOR TO BREEDING              1.00         8      15.7      16.0      16.0

ONLY AFTER BIRTH               2.00        12      23.5      24.0      40.0

ONLY AFTER WEANING             3.00        25      49.0      50.0      90.0

MONTH BEF. MKT. WT.            4.00         4       7.8       8.0      98.0

                               5.00         1       2.0       2.0     100.0

NO ANSWER                      9.00         1       2.0    MISSING
                                       ------    ------    ------
                              TOTAL        51     100.0     100.0

MEAN             2.560      STD ERR          .131      MEDIAN          2.700
MODE             3.000      STD DEV          .929      VARIANCE         .864
KURTOSIS         -.034      SKEWNESS        -.103      RANGE           4.000
MINIMUM          1.000      MAXIMUM         5.000      SUM           128.000
C.V. PCT        36.302      .95 C.I.        2.296            TO        2.824

VALID CASES         50      MISSING CASES       1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE    80

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V71        CAPC DECREASE EXTREMES

                                               RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ     (PCT)     (PCT)     (PCT)
```

```
YES                         1.00      33     64.7      68.8      68.8

NO                          2.00      15     29.4      31.3     100.0

NO ANSWER                   9.00       3      5.9    MISSING
                                  ------   ------    ------
                           TOTAL      51    100.0     100.0

MEAN           1.313    STD ERR        .068      MEDIAN          1.227
MODE           1.000    STD DEV        .468      VARIANCE         .219
KURTOSIS      -1.361    SKEWNESS       .835      RANGE           1.000
MINIMUM        1.000    MAXIMUM       2.000      SUM            63.000
C.V. PCT      35.689    .95 C.I.      1.176             TO       1.449

VALID CASES       48    MISSING CASES     3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                          . 05/06/83    SPSS V8.3    .15.06.54.     PAGE   81

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V72       CAPC'S CHANGE YOUR PRODUCTION METHODS

                                              RELATIVE  ADJUSTED    CUM
                                   ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)     (PCT)     (PCT)

YES                         1.00       9     17.6      18.0      18.0

NO                          2.00      41     80.4      82.0     100.0

NO ANSWER                   9.00       1      2.0    MISSING
                                  ------   ------    ------
                           TOTAL      51    100.0     100.0

MEAN           1.820    STD ERR        .055      MEDIAN          1.890
MODE           2.000    STD DEV        .388      VARIANCE         .151
KURTOSIS        .989    SKEWNESS     -1.718      RANGE           1.000
MINIMUM        1.000    MAXIMUM       2.000      SUM            91.000
C.V. PCT      21.324    .95 C.I.      1.710             TO       1.930

VALID CASES       50    MISSING CASES     1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                            05/06/83    SPSS V8.3    .15.06.54.     PAGE   82

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V73       WHO SHOULD OWN AND OPERATE CAPC

                                              RELATIVE  ADJUSTED    CUM
                                   ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL              CODE     FREQ      (PCT)     (PCT)     (PCT)

SELLERS                     1.00      26     51.0      54.2      54.2

BUYERS                      2.00       3      5.9       6.3      60.4

GOVERNMENT                  3.00       2      3.9       4.2      64.6

ANOTHER PARTY               4.00      16     31.4      33.3      97.9

                            5.00       1      2.0       2.1     100.0

NO ANSWER                   9.00       3      5.9    MISSING
                                  ------   ------    ------
                           TOTAL      51    100.0     100.0
```

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MEAN           2.229      STD ERR         .209      MEDIAN         1.423
MODE           1.000      STD DEV        1.448      VARIANCE       2.095
KURTOSIS      -1.680      SKEWNESS        .459      RANGE          4.000
MINIMUM        1.000      MAXIMUM        5.000      SUM          107.000
C.V. PCT      64.935      .95 C.I.       1.809           TO        2.649

VALID CASES       48      MISSING CASES      3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3    .15.06.54.     PAGE   83

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V74        WHO PAY COST OF EXCHANGE

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE      FREQ      (PCT)     (PCT)     (PCT)

FARMERS                      1.00       13       25.5      27.1      27.1

BUYERS                       2.00        4        7.8       8.3      35.4

COST SPLIT                   3.00       31       60.8      64.6     100.0

NO ANSWER                    9.00        3        5.9    MISSING
                                     ------    ------    ------
                            TOTAL       51      100.0     100.0

MEAN           2.375      STD ERR         .128      MEDIAN         2.726
MODE           3.000      STD DEV         .890      VARIANCE        .793
KURTOSIS      -1.228      SKEWNESS       -.832      RANGE          2.000
MINIMUM        1.000      MAXIMUM        3.000      SUM          114.000
C.V. PCT      37.484      .95 C.I.       2.116           TO        2.634

VALID CASES       48      MISSING CASES      3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3    .15.06.54.     PAGE   84

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V75        REQUIRED PARTICIPATION

                                                RELATIVE  ADJUSTED     CUM
                                     ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL               CODE      FREQ      (PCT)     (PCT)     (PCT)

YES                          1.00        8       15.7      15.7      15.7

NO                           2.00       43       84.3      84.3     100.0
                                     ------    ------    ------
                            TOTAL       51      100.0     100.0

MEAN           1.843      STD ERR         .051      MEDIAN         1.907
MODE           2.000      STD DEV         .367      VARIANCE        .135
KURTOSIS       1.853      SKEWNESS      -1.945      RANGE          1.000
MINIMUM        1.000      MAXIMUM        2.000      SUM           94.000
C.V. PCT      19.927      .95 C.I.       1.740           TO        1.946

VALID CASES       51      MISSING CASES      0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3    .15.06.54.     PAGE   85

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )
```

V76 METHOD USED TO INSURE CONTRACT HONORED

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
BONDING AGENCY	1.00	7	13.7	14.3	14.3
AGREED PENALTIES	2.00	27	52.9	55.1	69.4
COURTS	3.00	8	15.7	16.3	85.7
ARBITRATOR	4.00	3	5.9	6.1	91.8
AGENT OF BOARD	5.00	4	7.8	8.2	100.0
NO ANSWER	9.00	2	3.9	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	2.388	STD ERR	.154	MEDIAN	2.148
MODE	2.000	STD DEV	1.077	VARIANCE	1.159
KURTOSIS	.919	SKEWNESS	1.139	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	117.000
C.V. PCT	45.087	.95 C.I.	2.079	TO	2.697
VALID CASES	49	MISSING CASES	2		

V77 WHO ALLOWED TO CONTRACT

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
ANYONE	1.00	16	31.4	33.3	33.3
RAISED HOGS IN PAST	2.00	11	21.6	22.9	56.3
CERTIFIED TO DELIVER	3.00	16	31.4	33.3	89.6
	5.00	5	9.8	10.4	100.0
NO ANSWER	9.00	3	5.9	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	2.313	STD ERR	.179	MEDIAN	2.227
MODE	1.000	STD DEV	1.240	VARIANCE	1.539
KURTOSIS	-.015	SKEWNESS	.765	RANGE	4.000
MINIMUM	1.000	MAXIMUM	5.000	SUM	111.000
C.V. PCT	53.638	.95 C.I.	1.952	TO	2.673
VALID CASES	48	MISSING CASES	3		

V78 CANCEL CONTRACT-ACTS OF GOD

```
                                                 RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ      (PCT)     (PCT)     (PCT)

REASON                         1.00       40       78.4     100.0     100.0

NOT A REASON                   7.00       10       19.6    MISSING

NO ANSWER                      9.00        1        2.0    MISSING
                                       -------   -------   -------
                              TOTAL       51      100.0     100.0

MEAN            1.000    STD ERR            0      MEDIAN         1.000
MODE            1.000    STD DEV            0      VARIANCE           0
KURTOSIS            0    SKEWNESS           0      RANGE              0
MINIMUM         1.000    MAXIMUM        1.000      SUM           40.000
C.V. PCT            0    .95 C.I.       1.000           TO        1.000

VALID CASES       40     MISSING CASES     11

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PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3    .15.06.54.     PAGE   88

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V79       CANCEL CONTRACT-DISEASE OUTBREAK

                                                 RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ      (PCT)     (PCT)     (PCT)

REASON                         1.00       34       66.7     100.0     100.0

NOT A REASON                   7.00       16       31.4    MISSING

NO ANSWER                      9.00        1        2.0    MISSING
                                       -------   -------   -------
                              TOTAL       51      100.0     100.0

MEAN            1.000    STD ERR            0      MEDIAN         1.000
MODE            1.000    STD DEV            0      VARIANCE           0
KURTOSIS            0    SKEWNESS           0      RANGE              0
MINIMUM         1.000    MAXIMUM        1.000      SUM           34.000
C.V. PCT            0    .95 C.I.       1.000           TO        1.000

VALID CASES       34     MISSING CASES     17

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PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3    .15.06.54.     PAGE   89

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V80       CANCEL CONTRACT-PRICE $10 ABOVE

                                                 RELATIVE  ADJUSTED    CUM
                                      ABSOLUTE     FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE     FREQ      (PCT)     (PCT)     (PCT)

REASON                         1.00        5        9.8     100.0     100.0

NOT A REASON                   7.00       45       88.2    MISSING

NO ANSWER                      9.00        1        2.0    MISSING
                                       -------   -------   -------
                              TOTAL       51      100.0     100.0

MEAN            1.000    STD ERR            0      MEDIAN         1.000
MODE            1.000    STD DEV            0      VARIANCE           0
```

KURTOSIS	0	SKEWNESS	0	RANGE	0
MINIMUM	1.000	MAXIMUM	1.000	SUM	5.000
C.V. PCT	0	.95 C.I.	1.000	TO	1.000
VALID CASES	5	MISSING CASES	46		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V81 CANCEL CONTRACT-DECIDE NOT TO RAISE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
REASON	1.00	8	15.7	100.0	100.0
NOT A REASON	7.00	42	82.4	MISSING	
NO ANSWER	9.00	1	2.0	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.000	STD ERR	0	MEDIAN	1.000
MODE	1.000	STD DEV	0	VARIANCE	0
KURTOSIS	0	SKEWNESS	0	RANGE	0
MINIMUM	1.000	MAXIMUM	1.000	SUM	8.000
C.V. PCT	0	.95 C.I.	1.000	TO	1.000
VALID CASES	8	MISSING CASES	43		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

V82 CANCEL CONTRACT-OTHER REASON

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
REASON	1.00	8	15.7	100.0	100.0
NOT A REASON	7.00	42	82.4	MISSING	
NO ANSWER	9.00	1	2.0	MISSING	
	TOTAL	51	100.0	100.0	

MEAN	1.000	STD ERR	0	MEDIAN	1.000
MODE	1.000	STD DEV	0	VARIANCE	0
KURTOSIS	0	SKEWNESS	0	RANGE	0
MINIMUM	1.000	MAXIMUM	1.000	SUM	8.000
C.V. PCT	0	.95 C.I.	1.000	TO	1.000
VALID CASES	8	MISSING CASES	43		

FILE PROGRAM1 (CREATION DATE = 05/06/83)

```
V83       ALLOWED TO SELL CONTRACT

                                             RELATIVE  ADJUSTED    CUM
                                   ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL             CODE      FREQ     (PCT)     (PCT)     (PCT)

YES                        1.00        41      80.4      85.4      85.4

NO                         2.00         7      13.7      14.6     100.0

NO ANSWER                  9.00         3       5.9   MISSING
                                   ------    ------    ------
                          TOTAL        51     100.0     100.0

MEAN            1.146     STD ERR        .051      MEDIAN          1.085
MODE            1.000     STD DEV        .357      VARIANCE         .127
KURTOSIS        2.392     SKEWNESS      2.072      RANGE           1.000
MINIMUM         1.000     MAXIMUM       2.000      SUM            55.000
C.V. PCT       31.128     .95 C.I.      1.042            TO        1.249

VALID CASES        48     MISSING CASES     3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE   93

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V84       HOW SMALL CONTRACT TO INTEREST YOU

                                             RELATIVE  ADJUSTED    CUM
                                   ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL             CODE      FREQ     (PCT)     (PCT)     (PCT)

30,000 LBS.                1.00         4       7.8       8.3       8.3

15,000 LBS.                2.00        17      33.3      35.4      43.8

5,000 LBS.                 3.00        21      41.2      43.8      87.5

1,000 LBS.                 4.00         6      11.8      12.5     100.0

NO ANSWER                  9.00         3       5.9   MISSING
                                   ------    ------    ------
                          TOTAL        51     100.0     100.0

MEAN            2.604     STD ERR        .118      MEDIAN          2.643
MODE            3.000     STD DEV        .818      VARIANCE         .670
KURTOSIS        -.397     SKEWNESS      -.107      RANGE           3.000
MINIMUM         1.000     MAXIMUM       4.000      SUM           125.000
C.V. PCT       31.426     .95 C.I.      2.367            TO        2.842

VALID CASES        48     MISSING CASES     3

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                      05/06/83     SPSS V8.3     .15.06.54.     PAGE   94

FILE    PROGRAM1 (CREATION DATE =  05/06/83 )

V85       HOW ANIMALS GRADED

                                             RELATIVE  ADJUSTED    CUM
                                   ABSOLUTE    FREQ      FREQ      FREQ
CATEGORY LABEL             CODE      FREQ     (PCT)     (PCT)     (PCT)

USDA STANDARDS             1.00        24      47.1      49.0      49.0

ANY STANDARD               2.00         6      11.8      12.2      61.2
```

```
CARCASS GRADED               3.00      18      35.3      36.7     98.0

DEPTH OF BACKFAT             5.00       1       2.0       2.0    100.0

NO ANSWER                    9.00       2       3.9    MISSING
                                    -------  -------   -------
                            TOTAL      51     100.0     100.0

MEAN           1.939     STD ERR        .147      MEDIAN          1.583
MODE           1.000     STD DEV       1.029      VARIANCE        1.059
KURTOSIS       -.474     SKEWNESS       .605      RANGE           4.000
MINIMUM        1.000     MAXIMUM       5.000      SUM            95.000
C.V. PCT      53.071     .95 C.I.      1.643             TO       2.234

VALID CASES       49     MISSING CASES     2

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                   05/06/83    SPSS V8.3    .15.06.54.    PAGE   95

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V86      HOW ANIMALS DISCOUNTED

                                                RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ     (PCT)     (PCT)     (PCT)

WITH EVERY CONTRACT            1.00        6      11.8      12.2      12.2

SET BEFOREHAND                 2.00       43      84.3      87.8     100.0

NO ANSWER                      9.00        2       3.9    MISSING
                                      -------  -------   -------
                              TOTAL       51     100.0     100.0

MEAN           1.878     STD ERR        .047      MEDIAN          1.930
MODE           2.000     STD DEV        .331      VARIANCE         .110
KURTOSIS       3.803     SKEWNESS     -2.377      RANGE           1.000
MINIMUM        1.000     MAXIMUM       2.000      SUM            92.000
C.V. PCT      17.640     .95 C.I.      1.782             TO       1.973

VALID CASES       49     MISSING CASES     2

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                                   05/06/83    SPSS V8.3    .15.06.54.    PAGE   96

FILE   PROGRAM1 (CREATION DATE =  05/06/83 )

V87      WHO ESTABLISH DISCOUNT

                                                RELATIVE  ADJUSTED    CUM
                                       ABSOLUTE   FREQ      FREQ      FREQ
CATEGORY LABEL                 CODE      FREQ     (PCT)     (PCT)     (PCT)

OPERATORS                      1.00        6      11.8      12.0      12.0

PACKERS                        2.00        2       3.9       4.0      16.0

FARMERS                        3.00        2       3.9       4.0      20.0

COMMITTEE                      4.00       34      66.7      68.0      88.0

NEGOTIATED                     6.00        6      11.8      12.0     100.0

NO ANSWER                      9.00        1       2.0    MISSING
                                      -------  -------   -------
                              TOTAL       51     100.0     100.0
```

```
MEAN            3.760     STD ERR         .186     MEDIAN         3.941
MODE            4.000     STD DEV        1.318     VARIANCE       1.737
KURTOSIS         .776     SKEWNESS       -.650     RANGE          5.000
MINIMUM         1.000     MAXIMUM        6.000     SUM          188.000
C.V. PCT       35.053     .95 C.I.       3.385           TO       4.135

VALID CASES        50     MISSING CASES      1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

PRODUCER SURVEY DATA                                        05/06/83     SPSS V8.3    .15.06.54.     PAGE   97

CPU TIME REQUIRED..       1.642 SECONDS


TOTAL CPU TIME USED..       2.460 SECONDS

RUN COMPLETED

NUMBER OF CONTROL CARDS READ 192
NUMBER OF ERRORS DETECTED      0
```

APPENDIX C

STATISTICAL COMPARISON OF RESPONDENTS WHO RETURNED SURVEY WITHOUT PROMPTING AND THOSE WHO RESPONDED ONLY AFTER THE SECOND OR THIRD CONTACT

VOGELBACK COMPUTING CENTER
NORTHWESTERN UNIVERSITY

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 8.3 MSU MAY 4, 1982

100000 CM MAXIMUM FIELD LENGTH REQUEST

```
RUN NAME          PRODUCER SURVEY DATA                                          1
FILE NAME         PROGRAM1                                                      2
VARIABLE LIST     ID,V1 TO V87                                                  3
INPUT FORMAT      FIXED(F2.0,F1.0,1X,2F1.0,2F5.0,F2.0,16F1.0,F2.0,F5.0,         4
                  F3.0,11F1.0,8F3.0/3X,43F1.0)                                  5
```

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
ID	F 2. 0	1	1- 2
V1	F 1. 0	1	3- 3
V2	F 1. 0	1	5- 5
V3	F 1. 0	1	6- 6
V4	F 5. 0	1	7- 11
V5	F 5. 0	1	12- 16
V6	F 2. 0	1	17- 18
V7	F 1. 0	1	19- 19
V8	F 1. 0	1	20- 20
V9	F 1. 0	1	21- 21
V10	F 1. 0	1	22- 22
V11	F 1. 0	1	23- 23
V12	F 1. 0	1	24- 24
V13	F 1. 0	1	25- 25
V14	F 1. 0	1	26- 26
V15	F 1. 0	1	27- 27
V16	F 1. 0	1	28- 28
V17	F 1. 0	1	29- 29
V18	F 1. 0	1	30- 30
V19	F 1. 0	1	31- 31
V20	F 1. 0	1	32- 32
V21	F 1. 0	1	33- 33
V22	F 1. 0	1	34- 34
V23	F 2. 0	1	35- 36
V24	F 5. 0	1	37- 41
V25	F 3. 0	1	42- 44
V26	F 1. 0	1	45- 45
V27	F 1. 0	1	46- 46
V28	F 1. 0	1	47- 47
V29	F 1. 0	1	48- 48
V30	F 1. 0	1	49- 49
V31	F 1. 0	1	50- 50
V32	F 1. 0	1	51- 51
V33	F 1. 0	1	52- 52
V34	F 1. 0	1	53- 53
V35	F 1. 0	1	54- 54
V36	F 1. 0	1	55- 55
V37	F 3. 0	1	56- 58
V38	F 3. 0	1	59- 61
V39	F 3. 0	1	62- 64
V40	F 3. 0	1	65- 67
V41	F 3. 0	1	68- 70
V42	F 3. 0	1	71- 73
V43	F 3. 0	1	74- 76
V44	F 3. 0	1	77- 79
V45	F 1. 0	2	4- 4
V46	F 1. 0	2	5- 5
V47	F 1. 0	2	6- 6
V48	F 1. 0	2	7- 7

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
V49	F 1. 0	2	8- 8
V50	F 1. 0	2	9- 9
V51	F 1. 0	2	10- 10
V52	F 1. 0	2	11- 11
V53	F 1. 0	2	12- 12
V54	F 1. 0	2	13- 13
V55	F 1. 0	2	14- 14
V56	F 1. 0	2	15- 15
V57	F 1. 0	2	16- 16
V58	F 1. 0	2	17- 17
V59	F 1. 0	2	18- 18
V60	F 1. 0	2	19- 19
V61	F 1. 0	2	20- 20
V62	F 1. 0	2	21- 21
V63	F 1. 0	2	22- 22
V64	F 1. 0	2	23- 23
V65	F 1. 0	2	24- 24
V66	F 1. 0	2	25- 25
V67	F 1. 0	2	26- 26
V68	F 1. 0	2	27- 27
V69	F 1. 0	2	28- 28
V70	F 1. 0	2	29- 29
V71	F 1. 0	2	30- 30
V72	F 1. 0	2	31- 31
V73	F 1. 0	2	32- 32
V74	F 1. 0	2	33- 33
V75	F 1. 0	2	34- 34
V76	F 1. 0	2	35- 35
V77	F 1. 0	2	36- 36
V78	F 1. 0	2	37- 37
V79	F 1. 0	2	38- 38
V80	F 1. 0	2	39- 39
V81	F 1. 0	2	40- 40
V82	F 1. 0	2	41- 41
V83	F 1. 0	2	42- 42
V84	F 1. 0	2	43- 43
V85	F 1. 0	2	44- 44
V86	F 1. 0	2	45- 45
V87	F 1. 0	2	46- 46

THE INPUT FORMAT PROVIDES FOR 88 VARIABLES. 88 WILL BE READ.
IT PROVIDES FOR 2 RECORDS (*CARDS*) PER CASE.
A MAXIMUM OF 79 *COLUMNS* ARE USED ON A RECORD.

```
*                N OF CASES      UNKNOWN                                                    6
*                VAR LABELS      ID,IDENTIFICATION/                                         7
*                                V1,STATE/                                                  8
*                                V2,TYPE SWINE OPERATION/                                   9
*                                V3,HOW PIGS PRODUCED/                                     10
*                               V4,NUMBER FEEDER PIGS PRODUCED/                            11
*                               V5,NUMBER SLAUGHTER HOGS PRODUCED/                         12
*                               V6,NUMBER OF YEARLY MARKET TRIES/                          13
*                               V7,PORK OPERATION PROVIDE 50 OF INCOME/                    14
*                               V8,ESTIMATE MARKET PRIOR TO BREEDING/                      15
*                               V9,ESTIMATE MARKET AFTER LITTER WEANED/                    16
*                               V10,EST. FUTURE PRICE BY WEIGHTED AVERAGE/                 17
*                               V11,EST. FUTURE PRICE WITH FUTURES MARKET/                 18
*                               V12,EST. FUTURE PRICE WITH USDA FORECAST/                  19
*                               V13,EST. FUTURE PRICE-EXTENSION SERVICE/                   20
*                               V14,EST. FUTURE PRICE-OWN COMPUTER MODEL/                  21
*                               V15,EST. FUTURE PRICE-ANOTHER METHOD/                      22
*                               V16,PERCENT OF ACCURAGE PRICE PREDICTION/                  23
*                               V17,CHANGE PRODUCTION BASED ON PREDICT./                   24
*                               V18,HOG CYCLE PRICE VARIATION/                             25
*                               V19,COVER COSTS AT LOW END OF CYCLE/                       26
*                               V20,WHEN SURE YOU WON'T COVER COSTS/                       27
*                               V21,MORE THAN 75 PCT CAPITAL BORROWED/                     28
*                               V22,UNPLANNED REFINANCING OF LOAN/                         29
*                               V23,NUMBER OF YEARS RAISING HOGS/                          30
*                               V24,ACRES PLANT IN CROPS/                                  31
*                               V25,PERCENT HOG CORN RAISED/                               32
*                               V26,SOLD FUTURES OR FORWARD HOG CONTRACT/                  33
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*                    V27,CURRENTLY USE HEDGING OR CONTRACTED/                                                  34
*                    V28,CONTRACTS TOO LARGE/                                                                  35
*                    V29,NOT OFFERED WHEN I NEED THEM/                                                         36
*                    V30,LARGE CAPITAL POSITION/                                                               37
*                    V31,NOT ENOUGH TIME/                                                                      38
*                    V32,BEGAN DANGEROUS SPECULATING/                                                          39
*                    V33,TOO MUCH DISHONESTY/                                                                  40
*                    V34,DISCOUNT AND FEES TOO LARGE/                                                          41
*                    V35,OTHER REASONS/                                                                        42
*                    V36,RULE FOR PORTION HEDGED/                                                              43
*                    V37,HOGS MARKETED-AUCTION MARKET PCT/                                                     44
*                    V38,HOGS MARKETED-BUYING STATION PCT /                                                    45
*                    V39,HOGS MARKETED-DIRECT PACKER GATE PCT/                                                 46
*                    V40,HOGS MARKETED-PACKER BUYING STATION PCT/                                              47
*                    V41,HOGS MARKETED-FARM ORDER BUYER PCT/                                                   48
*                    V42,HOGS MARKETED-TELEAUCTION MARKET PCT/                                                 49
*                    V43,HOGS MARKETED-TERMINAL MARKET PCT/                                                    50
*                    V44,HOGS MARKETED-OTHER PCT/                                                              51
*                    V45,SELL TO CLOSEST AVAILABLE MARKET/                                                     52
*                    V46,SELL WHEREVER BEST PRICE/                                                             53
*                    V47,HONESTLY TREATED/                                                                     54
*                    V48,OPEN WHEN CONVENIENT/                                                                 55
*                    V49,OTHER REASON/                                                                         56
*                    V50,RELATIONSHIP WITH BUYER IMPORTANT/                                                    57
*                    V51,CONTRACTING IMPROVE PRODUCTION DECISION/                                              58
*                    V52,PRICES/                                                                               59
*                    V53,PLANNING & MANAGEMENT INFORMATION/                                                    60
*                    V54,NUMBER OF BUYERS/                                                                     61
*                    V55,PRICE PREMIUMS FOR SUPERIOR PRODUCT/                                                  62
*                    V56,ACCEPTANCE BY FARMERS/                                                                63
*                    V57,ACCEPTANCE BY BUYERS/                                                                 64
*                    V58,BUYER-SELLER COOPERATION/                                                             65
*                    V59,EFFICIENT USE OF CAPITAL/                                                             66
*                    V60,SATISFACTION WITH MARKETING SYSTEM/                                                   67
*                    V61,CONSIDER SELLING FORWARD CONTRACT/                                                    68
*                    V62,MISS CHANCE AT PROFIT/                                                                69
*                    V63,TOO UNCERTAIN ABOUT PIG WEIGHT/                                                       70
*                    V64,WOULDN'T BE FAIRLY ENFORCED/                                                          71
*                    V65,CONTRACTS LIMIT MY ACTION/                                                            72
*                    V66,OTHER REASONS/                                                                        73
*                    V67,GUARANTEE DELIVERY-20 PCT OF PRODUCTION/                                              74
*                    V68,GUARANTEE DELIVERY-60 PCT OF PRODUCTION/                                              75
*                    V69,PRODUCTION WILLING TO CONTRACT/                                                       76
*                    V70,HOW FAR AHEAD WILLING TO CONTRACT/                                                    77
*                    V71,CAPC DECREASE EXTREMES/                                                               78
*                    V72,CAPC'S CHANGE YOUR PRODUCTION METHODS/                                                79
*                    V73,WHO SHOULD OWN AND OPERATE CAPC/                                                      80
*                    V74,WHO PAY COST OF EXCHANGE/                                                             81
*                    V75,REQUIRED PARTICIPATION/                                                               82
*                    V76,METHOD USED TO INSURE CONTRACT HONORED/                                               83
*                    V77,WHO ALLOWED TO CONTRACT/                                                              84
*                    V78,CANCEL CONTRACT-ACTS OF GOD/                                                          85
*                    V79,CANCEL CONTRACT-DISEASE OUTBREAK/                                                     86
*                    V80,CANCEL CONTRACT-PRICE $10 ABOVE/                                                      87
*                    V81,CANCEL CONTRACT-DECIDE NOT TO RAISE/                                                  88
*                    V82,CANCEL CONTRACT-OTHER REASON/                                                         89
*                    V83,ALLOWED TO SELL CONTRACT/                                                             90
*                    V84,HOW SMALL CONTRACT TO INTEREST YOU/                                                   91
*                    V85,HOW ANIMALS GRADED/                                                                   92
*                    V86,HOW ANIMALS DISCOUNTED/                                                               93
*                    V87,WHO ESTABLISH DISCOUNT/                                                               94
*         VALUE LABELS V1(1)MICHIGAN(2)IOWA(3)NCAROLINA/                                                       95
*                    V2(1)FEEDER PIGS(2)SLAUGHTER HOGS(3)FARROW-FINISH                                         96
*                    (4)SLAUGHTER AND FEEDER(9)NO ANSWER/                                                      97
*                    V3(1)FIELD(2)OPEN LOT(3)SEMI-CONFINEMENT                                                  98
*                    (4)TOTAL CONFINEMENT(9)NO ANSWER/                                                         99
*                    V4 TO V5(99999)NO ANSWER/                                                                100
*                   V6(99)NO ANSWER/                                                                          101
*                   V7(1)YES(2)NO(9)NO ANSWER/                                                                102
*                   V8 TO V9(1)WITHIN TWO DAYS(2)WITHIN WEEK                                                  103
*                   (3)WITHIN MONTH(9)NO ANSWER/                                                              104
*                   V10 TO V15(8)DO NOT USE(9)NO ANSWER/                                                      105
*                   V16(1)0-10 PCT(2)10-25 PCT(3)25-40 PCT                                                    106
*                   (4)40 PCT OR MORE(9)NO ANSWER/                                                            107
*                   V17(1)YES(2)NO(9)NO ANSWER/                                                               108
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*                       V18(1)HELP(2)HINDERANCE(9)NO ANSWER/                                                    110
*                       V19(1)YES(2)NO(9)NO ANSWER/                                                             111
*                       V20(1)PRIOR TO BREEDING(2)GROWER STAGE(3)BEFORE MARKETING

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PRODUCER SURVEY DATA                                          05/06/83     SPSS V8.3    .14.59.07.     PAGE    4

*                       (8)DOES NOT APPLY(9)NO ANSWER/                                                          112
*                       V21 TO V22(1)YES(2)NO(9)NO ANSWER/                                                      113
*                       V23(99)NO ANSWER/                                                                       114
*                       V24(99999)NO ANSWER/                                                                    115
*                       V25(999)NO ANSWER/                                                                      116
*                       V26 TO V27(1)YES(2)NO(9)NO ANSWER/                                                      117
*                       V28 TO V35(1)REASON(7)NOT A REASON(8)DOES NOT APPLY                                     118
*                       (9)NO ANSWER/                                                                           119
*                       V36(1)YES(2)NO(8)DOES NOT APPLY(9)NO ANSWER/                                            120
*                       V37 TO V44(99)NO ANSWER/                                                                121
*                       V45 TO V49(1)REASON(2)NOT A REASON(9)NO ANSWER/                                         122
*                       V50(1)YES(2)NO(9)NO ANSWER/                                                             123
*                       V51(1)YES(2)NO(3)HAVEN'T CONTRACTED(9)NO ANSWER/                                        124
*                       V52 TO V60(1)PRESENT SUPERIOR(2)CAPC SUPERIOR                                           125
*                       (9)NO ANSWER/                                                                           126
*                       V61(1)YES(2)NO(9)NO ANSWER/                                                             127
*                       V62 TO V66(1)REASON(7)NOT A REASON(8)DOES NOT APPLY                                     128
*                       (9)NO ANSWER/                                                                           129
*                       V67 TO V68(1)WITHIN ONE DAY(2)WITHIN TWO DAYS                                           130
*                       (3)WITHIN A WEEK(4)WITHIN A MONTH(9)NO ANSWER/                                          131
*                       V69(1)100 PCT(2)75 PCT(3)50 PCT(4)25 PCT                                                132
*                       (5)0 PCT(9)NO ANSWER/                                                                   133
*                       V70(1)PRIOR TO BREEDING(2)ONLY AFTER BIRTH                                              134
*                       (3)ONLY AFTER WEANING(4)MONTH BEF. MKT. WT.                                             135
*                       (9)NO ANSWER/                                                                           136
*                       V71 TO V72(1)YES(2)NO(9)NO ANSWER/                                                      137
*                       V73(1)SELLERS(2)BUYERS(3)GOVERNMENT(4)ANOTHER PARTY                                     138
*                       (9)NO ANSWER/                                                                           139
*                       V74(1)FARMERS(2)BUYERS(3)COST SPLIT(9)NO ANSWER/                                        140
*                       V75(1)YES(2)NO(9)NO ANSWER/                                                             141
*                       V76(1)BONDING AGENCY(2)AGREED PENALTIES(3)COURTS                                        142
*                       (4)ARBITRATOR(5)AGENT OF BOARD(9)NO ANSWER/                                             143
*                       V77(1)ANYONE(2)RAISED HOGS IN PAST(3)CERTIFIED TO DELIVER                               144
*                       (4)FIVE YEARS EXPER.(9)NO ANSWER/                                                       145
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*                       (9)NO ANSWER/                                                                           149
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CPU TIME REQUIRED..        .869 SECONDS
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          00040000 CM NEEDED FOR T-TEST

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CONTENTS OF CASE NUMBER      1
SEQNUM          1.00     SUBFILE    PROGRAM1        3.00     CASWGT     1.0000     ID        75.00     V1          1.00
V2              4.00     V3             3.00        4.00     V4       200.00       V5       400.00     V6         20.00
V7              1.00     V8             3.00        3.00     V9         3.00       V10        8.00     V11         2.00
V12             3.00     V13            8.00        8.00     V14        8.00       V15        1.00     V16         2.00
V17             1.00     V18            2.00        1.00     V19        1.00       V20        3.00     V21         1.00
V22             1.00     V23            6.00        6.00     V24      150.00       V25      100.00     V26         2.00
V27             9.00     V28            1.00        7.00     V29        7.00       V30        7.00     V31         7.00
V32             7.00     V33            7.00        7.00     V34        7.00       V35        1.00     V36         8.00
V37                0     V38           95.00           0     V39           0       V40           0     V41            0
V42                0     V43               0        5.00     V44        5.00       V45        1.00     V46         1.00
V47             7.00     V48            7.00        1.00     V49        1.00       V50        1.00     V51         3.00
V52             2.00     V53            2.00        2.00     V54        2.00       V55        2.00     V56         1.00
V57             1.00     V58            2.00        2.00     V59        2.00       V60        2.00     V61         1.00
V62             8.00     V63            8.00        8.00     V64        8.00       V65        8.00     V66         8.00
V67             4.00     V68            4.00        3.00     V69        3.00       V70        1.00     V71         2.00
V72             1.00     V73            4.00        3.00     V74        3.00       V75        2.00     V76         3.00
V77             3.00     V78            1.00        7.00     V79        7.00       V80        7.00     V81         7.00
V82             7.00     V83            1.00        3.00     V84        3.00       V85        1.00     V86         2.00
V87             4.00     RESPOND        1.00

CONTENTS OF CASE NUMBER      2
SEQNUM          2.00     SUBFILE    PROGRAM1        4.00     CASWGT     1.0000     ID        67.00     V1          1.00
V2              3.00     V3             4.00           0     V4            0       V5      1400.00     V6         52.00
V7              1.00     V8             3.00        3.00     V9         3.00       V10        8.00     V11         1.00
V12             8.00     V13            8.00        8.00     V14        8.00       V15        8.00     V16         9.00
V17             1.00     V18            1.00        2.00     V19        2.00       V20        9.00     V21         2.00
V22             2.00     V23           15.00      180.00     V24      180.00       V25      100.00     V26         1.00
V27             2.00     V28            7.00        7.00     V29        7.00       V30        1.00     V31         7.00
V32             7.00     V33            7.00        7.00     V34        7.00       V35        7.00     V36         2.00
V37                0     V38          100.00           0     V39           0       V40           0     V41            0
V42                0     V43               0           0     V44           0       V45        1.00     V46         7.00
V47             7.00     V48            1.00        7.00     V49        7.00       V50        1.00     V51         2.00
V52             1.00     V53            2.00        1.00     V54        1.00       V55        9.00     V56         9.00
V57             9.00     V58            9.00        9.00     V59        9.00       V60        1.00     V61         1.00
V62             8.00     V63            8.00        8.00     V64        8.00       V65        8.00     V66         8.00
V67             4.00     V68            4.00        4.00     V69        4.00       V70        3.00     V71         9.00
V72             2.00     V73            1.00        3.00     V74        3.00       V75        2.00     V76         2.00
V77             2.00     V78            1.00        1.00     V79        1.00       V80        7.00     V81         1.00
V82             7.00     V83            1.00        2.00     V84        2.00       V85        1.00     V86         2.00
V87             1.00     RESPOND        1.00

END OF FILE ON FILE INPUT
AFTER READING     51 CASES FROM SUBFILE PROGRAM1

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PRODUCER SURVEY DATA                                                  05/06/83     SPSS V8.3     .14.59.07.      PAGE     6
FILE    PROGRAM1 (CREATION DATE =  05/06/83 )
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GROUP 1 - RESPOND  EQ       1.00
GROUP 2 - RESPOND  EQ       2.00
                                                                                 * POOLED VARIANCE ESTIMATE * SEPARATE VARIANCE ESTIMATE
                                                                                 *                          *
VARIABLE          NUMBER                 STANDARD    STANDARD  *     F   2-TAIL *     T   DEGREES OF 2-TAIL *     T    DEGREES OF  2-TAIL
```

		OF CASES	MEAN	DEVIATION	ERROR	VALUE	PROB.	VALUE	FREEDOM	PROB.	VALUE	FREEDOM	PROB.
V3	HOW PIGS PRODUCED												
	GROUP 1	24	3.4583	.658	.134	2.49	.030	1.11	49	.274	1.13	44.51	.263
	GROUP 2	27	3.1852	1.039	.200								
V4	NUMBER FEEDER PIGS PRODUCED												
	GROUP 1	24	70.8333	170.623	34.828	4.50	.001	-1.09	49	.280	-1.14	37.93	.263
	GROUP 2	27	159.2963	362.145	69.695								
V5	NUMBER SLAUGHTER HOGS PRODUCED												
	GROUP 1	24	4704.1667	14394.209	2938.206	1.12	.783	.06	49	.952	.06	48.81	.952
	GROUP 2	27	4451.4444	15255.772	2935.975								
V6	NUMBER OF YEARLY MARKET TRIES												
	GROUP 1	23	27.3478	24.841	5.180	2.19	.068	-.02	45	.986	-.02	38.42	.986
	GROUP 2	24	27.4583	16.777	3.425								
V7	PORK OPERATION PROVIDE 50 OF INCOME												
	GROUP 1	24	1.3750	.495	.101	1.99	.099	-1.05	49	.297	-1.07	46.79	.288
	GROUP 2	27	1.5556	.698	.134								
V8	ESTIMATE MARKET PRIOR TO BREEDING												
	GROUP 1	24	2.7500	.532	.109	1.18	.698	.50	43	.617	.50	41.04	.619
	GROUP 2	21	2.6667	.577	.126								
V9	ESTIMATE MARKET AFTER LITTER WEANED												
	GROUP 1	24	2.6667	.482	.098	2.30	.057	1.83	43	.074	1.78	33.85	.084
	GROUP 2	21	2.3333	.730	.159								
V10	EST. FUTURE PRICE BY WEIGHTED AVERAGE												
	GROUP 1	10	3.3000	1.567	.496	1.36	.656	.39	18	.698	.39	17.60	.698
	GROUP 2	10	3.0000	1.826	.577								
V11	EST. FUTURE PRICE WITH FUTURES MARKET												
	GROUP 1	19	1.5263	1.429	.328	1.09	.857	-.37	34	.714	-.37	33.19	.715
	GROUP 2	17	1.7059	1.490	.361								
V12	EST. FUTURE PRICE WITH USDA FORECAST												
	GROUP 1	16	2.2500	.856	.214	3.83	.018	-.69	26	.498	-.63	15.30	.538
	GROUP 2	12	2.5833	1.676	.484								
V13	EST. FUTURE PRICE-EXTENSION SERVICE												
	GROUP 1	8	4.1250	1.458	.515	1.02	.945	-.05	12	.959	-.05	10.86	.959
	GROUP 2	6	4.1667	1.472	.601								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

- T - T E S T -

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	POOLED VARIANCE ESTIMATE DEGREES OF FREEDOM	POOLED VARIANCE ESTIMATE 2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	SEPARATE VARIANCE ESTIMATE DEGREES OF FREEDOM	SEPARATE VARIANCE ESTIMATE 2-TAIL PROB.
V14	EST. FUTURE PRICE-OWN COMPUTER MODEL												
	GROUP 1	5	4.0000	2.828	1.265	1.27	.823	.35	8	.732	.35	7.89	.732
	GROUP 2	5	3.4000	2.510	1.122								
V15	EST. FUTURE PRICE-ANOTHER METHOD												
	GROUP 1	5	5.0000	2.550	1.140	1.83	.456	2.34	11	.039	2.18	6.75	.066
	GROUP 2	8	2.1250	1.885	.666								
V16	PERCENT OF ACCURAGE PRICE PREDICTION												
	GROUP 1	20	2.2500	.910	.204	1.31	.555	-.31	39	.756	-.31	37.73	.757
	GROUP 2	21	2.3333	.796	.174								
V17	CHANGE PRODUCTION BASED ON PREDICT.												
	GROUP 1	24	1.7500	.442	.090	1.05	.918	.15	48	.880	.15	47.83	.880
	GROUP 2	26	1.7308	.452	.089								
V18	HOG CYCLE PRICE VARIATION												
	GROUP 1	23	1.6087	.499	.104	1.03	.948	.34	46	.739	.34	45.78	.739
	GROUP 2	25	1.5600	.507	.101								
V19	COVER COSTS AT LOW END OF CYCLE												
	GROUP 1	24	1.4583	.509	.104	1.12	.793	.87	46	.387	.87	45.86	.387
	GROUP 2	24	1.3333	.482	.098								
V20	WHEN SURE YOU WON'T COVER COSTS												
	GROUP 1	12	2.1667	.835	.241	1.32	.608	-.92	26	.368	-.90	21.89	.379
	GROUP 2	16	2.4375	.727	.182								
V21	MORE THAN 75 PCT CAPITAL BORROWED												
	GROUP 1	24	1.7083	.464	.095	1.58	.276	1.39	48	.171	1.40	47.02	.167
	GROUP 2	26	1.5000	.583	.114								
V22	UNPLANNED REFINANCING OF LOAN												
	GROUP 1	24	1.7083	.464	.095	8.10	.000	-.50	49	.616	-.53	33.00	.600
	GROUP 2	27	1.8519	1.322	.254								
V23	NUMBER OF YEARS RAISING HOGS												
	GROUP 1	24	15.2083	8.939	1.825	1.47	.351	-.47	49	.643	-.47	48.74	.639
	GROUP 2	27	16.5185	10.850	2.088								
V24	ACRES PLANT IN CROPS												
	GROUP 1	24	454.7917	314.039	64.103	2.26	.052	-.11	49	.912	-.11	45.58	.910
	GROUP 2	27	467.4074	471.800	90.798								

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
V25	PERCENT HOG CORN RAISED												
	GROUP 1	24	87.6250	29.143	5.949	1.16	.725	1.34	49	.185	1.35	48.89	.183
	GROUP 2	27	76.1852	31.376	6.038								
V26	SOLD FUTURES OR FORWARD HOG CONTRACT												
	GROUP 1	24	1.5833	.504	.103	5.26	.000	-.76	49	.449	-.79	36.43	.432
	GROUP 2	27	1.7778	1.155	.222								
V27	CURRENTLY USE HEDGING OR CONTRACTED												
	GROUP 1	23	1.7826	.422	.088	6.49	.000	-.91	48	.367	-.97	34.91	.340
	GROUP 2	27	2.0000	1.074	.207								
V28	CONTRACTS TOO LARGE												
	GROUP 1	3	1.0000	0	0	0	1.000	0	8	1.000	0	0	.500
	GROUP 2	7	1.0000	0	0								
V29	NOT OFFERED WHEN I NEED THEM												
	GROUP 1	0	0	0	0	0	1.000	0	1	1.000	0	0	.500
	GROUP 2	2	1.0000	0	0								
V30	LARGE CAPITAL POSITION												
	GROUP 1	6	1.0000	0	0	0	1.000	0	8	1.000	0	0	.500
	GROUP 2	4	1.0000	0	0								
V31	NOT ENOUGH TIME												
	GROUP 1	3	1.0000	0	0	0	1.000	0	7	1.000	0	0	.500
	GROUP 2	6	1.0000	0	0								
V32	BEGAN DANGEROUS SPECULATING												
	GROUP 1	0	0	0	0	0	1.000	0	0	.500	0	0	.500
	GROUP 2	1	1.0000	0	0								
V33	TOO MUCH DISHONESTY												
	GROUP 1	3	1.0000	0	0	0	1.000	0	2	1.000	0	0	.500
	GROUP 2	1	1.0000	0	0								
V34	DISCOUNT AND FEES TOO LARGE												
	GROUP 1	3	1.0000	0	0	0	1.000	0	5	1.000	0	0	.500
	GROUP 2	4	1.0000	0	0								
V35	OTHER REASONS												
	GROUP 1	8	1.0000	0	0	0	1.000	1.07	13	.302	1.00	6.00	.356
	GROUP 2	7	.8571	.378	.143								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

T - T E S T

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
V36	RULE FOR PORTION HEDGED												
	GROUP 1	10	1.6000	.516	.163	1.87	.363	.36	18	.722	.36	16.47	.723
	GROUP 2	10	1.5000	.707	.224								
V37	HOGS MARKETED-AUCTION MARKET PCT												
	GROUP 1	24	13.6250	31.947	6.521	1.27	.568	-.55	49	.585	-.55	49.00	.583
	GROUP 2	27	18.8889	35.984	6.925								
V38	HOGS MARKETED-BUYING STATION PCT												
	GROUP 1	24	29.1667	43.556	8.891	1.15	.741	-.42	49	.679	-.42	48.87	.678
	GROUP 2	27	34.4444	46.685	8.985								
V39	HOGS MARKETED-DIRECT PACKER GATE PCT												
	GROUP 1	24	29.7083	45.275	9.242	1.15	.731	.43	49	.670	.43	47.32	.671
	GROUP 2	27	24.4444	42.275	8.136								
V40	HOGS MARKETED-PACKER BUYING STATION PCT												
	GROUP 1	24	13.5417	33.766	6.893	1.60	.246	.72	49	.473	.71	43.71	.479
	GROUP 2	27	7.4074	26.688	5.136								
V41	HOGS MARKETED-FARM ORDER BUYER PCT												
	GROUP 1	24	.8333	4.082	.833	5.56	.000	-.48	49	.633	-.50	35.93	.619
	GROUP 2	27	1.8519	9.623	1.852								
V42	HOGS MARKETED-TELEAUCTION MARKET PCT												
	GROUP 1	24	0	0	0	0	1.000	0	49	1.000	0	0	.500
	GROUP 2	27	0	0	0								
V43	HOGS MARKETED-TERMINAL MARKET PCT												
	GROUP 1	24	3.5417	15.357	3.135	3.02	.009	-.62	49	.536	-.64	42.34	.524
	GROUP 2	27	7.4074	26.688	5.136								
V44	HOGS MARKETED-OTHER PCT												
	GROUP 1	24	9.5833	24.179	4.935	6.16	.000	1.46	49	.152	1.39	29.57	.173
	GROUP 2	27	2.2222	9.740	1.875								
V45	SELL TO CLOSEST AVAILABLE MARKET												
	GROUP 1	12	1.0000	0	0	0	1.000	0	22	1.000	0	0	.500
	GROUP 2	12	1.0000	0	0								
V46	SELL WHEREVER BEST PRICE												
	GROUP 1	14	1.0000	0	0	0	1.000	0	22	1.000	0	0	.500
	GROUP 2	10	1.0000	0	0								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

T - T E S T

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
V47	HONESTLY TREATED												
	GROUP 1	3	1.0000	0	0	0	1.000	0	8	1.000	0	0	.500
	GROUP 2	7	1.0000	0	0								
V48	OPEN WHEN CONVENIENT												
	GROUP 1	10	1.0000	0	0	0	1.000	0	16	1.000	0	0	.500
	GROUP 2	8	1.0000	0	0								
V49	OTHER REASON												
	GROUP 1	3	1.0000	0	0	0	1.000	0	4	1.000	0	0	.500
	GROUP 2	3	1.0000	0	0								
V50	RELATIONSHIP WITH BUYER IMPORTANT												
	GROUP 1	24	1.5000	.511	.104	1.02	.967	.41	47	.682	.41	46.88	.682
	GROUP 2	25	1.4400	.507	.101								
V51	CONTRACTING IMPROVE PRODUCTION DECISION												
	GROUP 1	24	2.4167	.776	.158	1.32	.510	.57	47	.570	.57	46.57	.569
	GROUP 2	25	2.2800	.891	.178								
V52	PRICES												
	GROUP 1	20	1.5500	.510	.114	1.18	.708	-.97	41	.336	-.97	39.04	.339
	GROUP 2	23	1.6957	.470	.098								
V53	PLANNING & MANAGEMENT INFORMATION												
	GROUP 1	21	1.7143	.463	.101	1.06	.885	-.18	42	.858	-.18	41.37	.858
	GROUP 2	23	1.7391	.449	.094								
V54	NUMBER OF BUYERS												
	GROUP 1	23	1.7826	.422	.088	1.18	.695	-.36	44	.718	-.36	43.69	.718
	GROUP 2	23	1.8261	.388	.081								
V55	PRICE PREMIUMS FOR SUPERIOR PRODUCT												
	GROUP 1	20	1.4500	.510	.114	1.01	.997	-.32	40	.753	-.32	39.64	.753
	GROUP 2	22	1.5000	.512	.109								
V56	ACCEPTANCE BY FARMERS												
	GROUP 1	21	1.2857	.463	.101	1.00	1.000	0	40	1.000	0	40.00	1.000
	GROUP 2	21	1.2857	.463	.101								
V57	ACCEPTANCE BY BUYERS												
	GROUP 1	19	1.4211	.507	.116	1.02	.979	-.49	39	.624	-.49	38.23	.624
	GROUP 2	22	1.5000	.512	.109								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

T - T E S T

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
V58	BUYER-SELLER COOPERATION												
	GROUP 1	21	1.3333	.483	.105	1.04	.935	-.20	41	.840	-.20	40.97	.840
	GROUP 2	22	1.3636	.492	.105								
V59	EFFICIENT USE OF CAPITAL												
	GROUP 1	19	1.6316	.496	.114	1.22	.653	-.74	40	.465	-.73	36.83	.470
	GROUP 2	23	1.7391	.449	.094								
V60	SATISFACTION WITH MARKETING SYSTEM												
	GROUP 1	22	1.4091	.503	.107	1.00	1.000	-1.20	42	.238	-1.20	42.00	.238
	GROUP 2	22	1.5909	.503	.107								
V61	CONSIDER SELLING FORWARD CONTRACT												
	GROUP 1	24	1.2083	.415	.085	1.29	.546	-.79	48	.434	-.79	47.91	.432
	GROUP 2	26	1.3077	.471	.092								
V62	MISS CHANCE AT PROFIT												
	GROUP 1	2	1.0000	0	0	0	1.000	0	5	1.000	0	0	.500
	GROUP 2	5	1.0000	0	0								
V63	TOO UNCERTAIN ABOUT PIG WEIGHT												
	GROUP 1	3	1.0000	0	0	0	1.000	0	5	1.000	0	0	.500
	GROUP 2	4	1.0000	0	0								
V64	WOULDN'T BE FAIRLY ENFORCED												
	GROUP 1	2	1.0000	0	0	0	1.000	0	3	1.000	0	0	.500
	GROUP 2	3	1.0000	0	0								
V65	CONTRACTS LIMIT MY ACTION												
	GROUP 1	5	1.0000	0	0	0	1.000	0	7	1.000	0	0	.500
	GROUP 2	4	1.0000	0	0								
V66	OTHER REASONS												
	GROUP 1	0	0	0	0	0	1.000	0	0	.500	0	0	.500
	GROUP 2	1	1.0000	0	0								
V67	GUARANTEE DELIVERY-20 PCT OF PRODUCTION												
	GROUP 1	24	2.8750	.947	.193	1.16	.729	-.32	49	.752	-.32	48.89	.751
	GROUP 2	27	2.9630	1.018	.196								
V68	GUARANTEE DELIVERY-60 PCT OF PRODUCTION												
	GROUP 1	24	3.5000	.885	.181	1.65	.226	-.69	48	.494	-.68	43.45	.499
	GROUP 2	26	3.6538	.689	.135								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

T - T E S T

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
V69	PRODUCTION WILLING TO CONTRACT												
	GROUP 1	24	3.3333	.868	.177	1.71	.206	-.14	46	.887	-.14	43.05	.887
	GROUP 2	24	3.3750	1.135	.232								
V70	HOW FAR AHEAD WILLING TO CONTRACT												
	GROUP 1	24	2.4583	.833	.170	1.49	.338	-.74	48	.463	-.75	47.35	.460
	GROUP 2	26	2.6538	1.018	.200								
V71	CAPC DECREASE EXTREMES												
	GROUP 1	22	1.3182	.477	.102	1.03	.942	.08	46	.939	.08	44.50	.939
	GROUP 2	26	1.3077	.471	.092								
V72	CAPC'S CHANGE YOUR PRODUCTION METHODS												
	GROUP 1	24	1.8333	.381	.078	1.11	.797	.23	48	.818	.23	47.96	.818
	GROUP 2	26	1.8077	.402	.079								
V73	WHO SHOULD OWN AND OPERATE CAPC												
	GROUP 1	24	1.9583	1.429	.292	1.02	.958	-1.31	46	.198	-1.31	45.99	.198
	GROUP 2	24	2.5000	1.445	.295								
V74	WHO PAY COST OF EXCHANGE												
	GROUP 1	23	2.4783	.898	.187	1.02	.964	.77	46	.447	.77	45.60	.447
	GROUP 2	25	2.2800	.891	.178								
V75	REQUIRED PARTICIPATION												
	GROUP 1	24	1.8750	.338	.069	1.37	.446	.58	49	.564	.59	48.93	.561
	GROUP 2	27	1.8148	.396	.076								
V76	METHOD USED TO INSURE CONTRACT HONORED												
	GROUP 1	24	2.2917	.999	.204	1.35	.480	-.61	47	.546	-.61	46.48	.545
	GROUP 2	25	2.4800	1.159	.232								
V77	WHO ALLOWED TO CONTRACT												
	GROUP 1	22	2.3182	1.171	.250	1.27	.581	.03	46	.977	.03	45.88	.977
	GROUP 2	26	2.3077	1.320	.259								
V78	CANCEL CONTRACT-ACTS OF GOD												
	GROUP 1	20	1.0000	0	0	0	1.000	0	38	1.000	0	0	.500
	GROUP 2	20	1.0000	0	0								
V79	CANCEL CONTRACT-DISEASE OUTBREAK												

GROUP 1	18	1.0000	0	0	0	1.000	0	32	1.000	0	0	.500
GROUP 2	16	1.0000	0	0								

FILE PROGRAM1 (CREATION DATE = 05/06/83)

T - T E S T

GROUP 1 - RESPOND EQ 1.00
GROUP 2 - RESPOND EQ 2.00

VARIABLE		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	POOLED VARIANCE ESTIMATE F VALUE	POOLED VARIANCE ESTIMATE 2-TAIL PROB.	POOLED VARIANCE ESTIMATE T VALUE	POOLED VARIANCE ESTIMATE DEGREES OF FREEDOM	POOLED VARIANCE ESTIMATE 2-TAIL PROB.	SEPARATE VARIANCE ESTIMATE T VALUE	SEPARATE VARIANCE ESTIMATE DEGREES OF FREEDOM	SEPARATE VARIANCE ESTIMATE 2-TAIL PROB.
V80	CANCEL CONTRACT-PRICE $10 ABOVE												
	GROUP 1	3	1.0000	0	0	0	1.000	0	3	1.000	0	0	.500
	GROUP 2	2	1.0000	0	0								
V81	CANCEL CONTRACT-DECIDE NOT TO RAISE												
	GROUP 1	6	1.0000	0	0	0	1.000	0	6	1.000	0	0	.500
	GROUP 2	2	1.0000	0	0								
V82	CANCEL CONTRACT-OTHER REASON												
	GROUP 1	2	1.0000	0	0	0	1.000	0	6	1.000	0	0	.500
	GROUP 2	6	1.0000	0	0								
V83	ALLOWED TO SELL CONTRACT												
	GROUP 1	23	1.1304	.344	.072	1.18	.699	-.28	46	.778	-.29	46.00	.777
	GROUP 2	25	1.1600	.374	.075								
V84	HOW SMALL CONTRACT TO INTEREST YOU												
	GROUP 1	22	2.5000	.802	.171	1.09	.846	-.81	46	.423	-.81	45.27	.422
	GROUP 2	26	2.6923	.838	.164								
V85	HOW ANIMALS GRADED												
	GROUP 1	23	1.9130	.949	.198	1.37	.455	-.16	47	.871	-.16	46.95	.870
	GROUP 2	26	1.9615	1.113	.218								
V86	HOW ANIMALS DISCOUNTED												
	GROUP 1	23	1.9130	.288	.060	1.63	.250	.70	47	.486	.71	46.36	.480
	GROUP 2	26	1.8462	.368	.072								
V87	WHO ESTABLISH DISCOUNT												
	GROUP 1	23	3.6087	.941	.196	2.81	.016	-.75	48	.459	-.78	43.33	.442
	GROUP 2	27	3.8889	1.577	.304								

CPU TIME REQUIRED.. 1.131 SECONDS