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Michigan State University PH.D. 1983

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AN ECONOMIC EVALUATION OF BROILER CHICKEN SUPPLY ORGANIZATION FOR SHIAWASSEE COUNTY MICHIGAN

BY

PAUL WILLIAM AHO

A DISSERTATION

Submitted to
Michigan State University
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ABSTRACT

AN ECONOMIC EVALUATION OF BROILER CHICKEN SUPPLY ORGANIZATION FOR SHIAWASSEE COUNTY MICHIGAN

BY

PAUL WILLIAM AHO

The organization and financing of broiler chicken supply for a proposed processing plant in Shiawassee county Michigan was evaluated. The purpose of the evaluation was to identify a method which was both acceptable to farmers and provided the greatest potential return on investment.

Three sources of data were used in the evaluation. The first was the relevant literature of rural sociology and agricultural economics. The second was from a field survey of farmers in the county and the last was a financial analysis of broiler supply methods. The approach used to evaluate the data, assumed that knowledge is incomplete at the beginning of a project and is built by learning from people in the community.

The relevant literature revealed a concern among sociologists about the effects of corporate owned and operated farms on local communities. Concern was also expressed about contract farms, the most common way of organizing broiler supply, because of the weak bargaining position of the contract grower.

The field survey uncovered three important facts. There was an abundance of underemployed family labor, the inferred price of supplemental income labor was $4 per hour and 98% of the farmers surveyed were unable or unwilling to consider the financial investment required to become a traditional contract grower. An alternative in which a corporation owns but does not operate the buildings and equipment was proposed. Such an arrangement has been designated a "caretaker" farm.

A financial analysis compared the cost of producing broilers by integrator operated versus caretaker arrangements. Lower labor costs slightly outweighed the higher spatial costs of the caretaker alternative. It was recommended that an integrator beginning production in Michigan consider the use of the caretaker farm alternative.

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CHAPTER ONE OVERVIEW OF THE EVALUATION

The purpose of this evaluative study is to identify a method of organizing the supply of broiler chickens for a proposed processing plant in Shiawassee county Michigan which is both acceptable to farmers and provides the greatest potential return on investment. Acceptablity to farmers is determined through the analysis of a field survey and return on investment is determined through a financial analysis.

The broiler industry in the United States consists primarily of large vertically integrated firms, called integrators, which through ownership and/or control, combine two or more of the stages of production and distribution of broiler chickens. The stages are, broiler breeders, hatchery, growout, feedmill, processing and distribution. The broiler breeder stage provides the fertile eggs to the hatchery stage which hatches the broilers and places them on the farms of the growout stage. Feed is provided from the feedmill and the broilers are slaughtered in the processing plant. The stage of production under consideration in this study is the growout stage. At this stage day-old chicks are housed and fed for nearly eight weeks until they reach four to five pounds. This stage is vertically integrated in some areas by integrator ownership of farms and in other areas by

control through the use of contract farms.

In the southern part of the United States where the industry is concentrated, the contract system dominates. In other areas such as California, ownership is also used to vertically integrate the broiler supply stage. It is the purpose of this study to evaluate what would be the best method of organizing broiler supply in Shiawassee county.

Historical Background

Michigan does not now have a broiler industry as it did in the last century when the industry first started. At that time the broilers sold in the United States were the surplus cockerels from the spring hatch of farmyard flocks. These "spring chickens" were a seasonal delicacy that commanded a high price. It wasn't until after World War I that broilers made the transition from seasonal delicacy to year-round source of meat. During World War II, wartime meat rationing provided a stimulus to the expansion of the unrationed poultry. Production which had been 43 million in 1935 reached 366 million in 1945 (Tobin and Arthur, 1964). The next ten years from 1945 to 1955 were a period of intense activity and investment. During that period the breeding of chickens exclusively for their meat qualities began on a massive scale. The Chicken-Of-Tomorrow Program initiated in

1945 under the sponsorship of the Great Atlantic and Pacific Tea Company is often cited as being instrumental in stimulating and reinforcing the efforts of leading breeders.

The post-war period brought rapid progress in nutritional technology, broiler housing, processing plant operations and marketing technology. The intensive application of technological gains brought about an abrupt drop in the total cost of production. The result was that broilers sold for less in the 1950's than in the 1920's. Red meats during that same time period doubled in price. The broiler industry had succeeded in making their product an item of mass consumption by the late 1950's.

During the post World War II growth phase of the industry, production in Michigan declined to insignificant levels. Competition from the southeastern states was the primary reason for the decline. In that region, broilers became a good alternative to the declining cotton industry and the south came to dominate production in the United States for the following reasons:

1) Low cost, low skilled labor available for the processing plants and for the raising of broilers.
2) The ability to rapidly take advantage of technological change in a new production area.
3) Low transportation costs for grain and finished products.
4) Inexpensive housing appropriate to the area.

By the 1960's few states outside the southeast could consider challanging the dominance of the entrenched and efficient southern broiler industry. Nevertheless, it now appears that some production will come back to the midwest due to the changing costs of housing and transportation (Rahn et al.,1982 General Locational Considerations).

Housing costs are one area in which the southeast's advantage is narrowing. In the 50's and 60's when a large percentage of the broiler housing now in use in the south was constructed, the dirt floor, curtain sided, uninsulated shelter was the most appropriate building. Now, with the increasing importance of feed and energy efficiency, environmentally controlled windowless houses may become appropriate even in the deep south. Beyond environmentally controlled houses is the technology of cage reared broilers which could radically change the broiler industry.

Changing transportation costs have been the most threatening to the dominance of the southern broiler industry. Transportation cost increases cut two ways into the south's dominance of broiler production. First, feed costs, which make up 50% of the total ready-to-cook costs, rise faster in areas further from the corn belt. Second, receipts fall faster in areas further from the final market. Michigan has a transportation cost advantage over the south in both the cost of grain and transportation to market.

Contract Farming

If broiler production does return to Michigan, the broiler supply stage will be very different from the way it was in Michigan in earlier years. In those times broiler supply farms were separate and independent businesses. Small broiler growers sought out the best price they could in the market. The way the industry is now organized, this is impossible. The industry closely controls the supply stage primarily by the contract system. Crouse (in Roy, 1972) gives the following reasons for the need to control by contract:

1) The need for large, high quality and steady supplies to meet the demands of the food chains.
2) The need to rapidly adopt changing technology: such changes can be implemented faster with a contract system.
3) The contract farm system can best utilize inexpensive, underemployed farm labor.

The contract system provides an appropriate structure for production in an area of low management skills and availability of capital. Under a contract, growers receive a guaranteed payment per pound for fulfillment of the contract. He or she must provide the buildings and

equipment, follow a rigid schedule and allow for close supervision of activities. The advantage for the grower is that most operating resources are provided and production risks are low. The disadvantages are low returns and the risk of losing the contract. The risk of losing the contract is an important one because contract farms typically have sizable debt obligations. Banks are willing to lend money because the grower holds a contract. Nevertheless if that contract is lost, the farm may also be lost to the bank. The result is a concentration of power in the hands of the integrator.

This concentration of power in integrators is not matched by the contract growers even though they provide a substantial portion of the capital of the industry. The relationship is so one-sided that growers have been working for almost nothing. Many growers are not sophisticated enough in budgeting to realize that a year's net cash flow without deductions for fixed costs such as depreciation is a poor measure of income. As a result, labor return per hour has been as low as minus 36 cents per hour when depreciation is taken into account (Wellford, 1972). The broiler grower is compared to the sharecropper in both status and poverty. Growers are not employees of the firm, they are therefore without retirement, medical benefits and minimum wage protection. The grower keeps birds only if the integrator is

willing, and a new contract is written every eight weeks. The resulting defenselessness of the grower provides incentives for the irresponsible use of economic power, thus the following complaint of Crawford Smith, a contract farmer in Alabama:

> Us folk in the chicken business are the only slaves left in the country (in Wellford, p.101, 1972)

Focus of the Research

As the broiler industry in the midwest begins a period of expansion, it must choose some variation of the contract grower system or the system where the integrator owns and operates the broiler supply. Taking into consideration the interests of both potential investors and broiler growers, the study evaluates which broiler supply method would be more constructive, adaptive and profitable for the farmers of and the investors in Shiawassee county Michigan.

Evaluation Approach

The learning process approach, a concept used in community development is used in the study. In that approach, as described by Kortcon (1980), knowledge is

assumed to be incomplete at the beginning of a project. As knowledge is built by learning from people in the community, errors are discovered in the original assumptions and corrections are made based on the new knowledge. There is a learning process as the development design is made efficient in the local setting.

Borrowing that concept, the study assumes that farmers have a great deal to contribute to the research. As knowledge is built by consultation with farmers, the direction of the research is shifted to reflect that knowledge. The following are two citations which reenforce the logic of consulting farmers:

> Knowledge of farmers' reasoning is as necessary aninput to a successful rural development project as is agronomists or economists' reasoning from a distance (p.177, Gladwin, 1972).

> Rural development is participation of people in a mutual learning experience involving themselves, their local resources, external change agents and outside resources. People are not being developed when they are herded like animals into new ventures
> (p.688, Boeson in Lowdernook and Laitos, 1981).

Besides the opinions of farmers, two other sources of information are used. One is financial analysis and the other is a review of the literature from agricultural economics and rural sociology. Publications from agricultural economics related to the topic are concerned primarily with analyzing the economic effect of the changing structure of American agriculture. This literature deals with issues such as the viability of the family farm and the advantages and disadvantages of vertical integration. The rural sociology literature looks more closely at the social consequences of vertical integration and its effect on farmers and communities.

Importance of the Study

The primary importance of the study is the generalizability of the procedure. The literature does not suggest a method for evaluating broiler supply methods although such studies have been done by integrators with both the procedure and the results kept confidential. The evaluation of potential broiler supply methods may be important to the potential investors in, and the farmers of, Shiawassee county. Beyond Shiawassee, the results could give a clue to the response of farmers in other communities in the mid-west.

Summary

The study evaluates methods of organizing the supply of broiler chickens to a proposed processing plant in Shiawassee county Michigan. The purpose is to identify methods of organization and financing which are at the same time acceptable to farmers and provide the highest possible return on investment. The study utilizes a learning process approach which assumes that the farmers themselves have a great deal to contribute to the research.

Chapter Two LITERATURE REVIEW

To begin a review of the literature relating to the topic of the organization of broiler supply, it is helpful to think of the agricultural structures involved. Hefferman (1972) makes an analogy between the agricultural structures of 20th century America and the major production systems of Europe since the Middle Ages, the guild system, the cottage industry system and the factory system.

The guild system is compared to the family farm system, the cottage industry to the contract farm system and the factory system to the corporate farm system. In both the guild and family farm systems the worker owns both tools and products. These systems are conducive to small close-knit communities where each worker interacts in a variety of face to face relationships with other workers. In the cottage industry or contract farm system the worker owns tools but the entrepreneur supplies the raw materials and owns the finished product. In these systems the close-knit community continues but the relationship between worker and entrepreneur is a new and potentially divisive factor. Finally, the corporate farm system brings the factory system to agriculture. Work is moved out of the home and the economic groupings of management and labor are created.

Just as social philosophers through the ages raised

questions about the changing production systems in Europe, questions are also raised about the changing structure of American agriculture. This study seeks to compare the contract and corporate farm structures, nevertheless the family farm structure is important to consider also because in many respects the contract farm is a family farm.

Agricultral Fundamentalists

One of the most persistent beliefs in the United States is the belief in the value of the family farm. The country began as a nation of small farmers and the architects of American land policy like Jefferson believed that small farms were the seedbed of democracy and guaranteed the competitive structure of the economy. If agriculture remained competitive and characterized by numerous small farms, this was sufficient reference base to give reality to the idea of a competitive economy (Raup in Ball and Heady, 1972). Jefferson also felt that community involvement, especially involvement in the political process, was enhanced by the ownership and social relationships inherent in the family farm structure (Hefferman, 1972).

In this century, agricultural fundamentalists have perceived a threat to the small traditional family farm structure from both the contract system and the corporate

system. Davis(1979), while dismissing corporate farming as a "pernicious organizational form" (p.4), concentrates his criticism on the contract system which he sees as the antithesis of the internally self-contained and externally detached "traditional farm structure." He perceives contracting as binding the family farm to an off-farm firm thereby dissolving the entrepreneurial autonomy of the family farmer. The farm thus becomes an extension of the firm's production process and the farmer is left with "property without power" (p.2).

Most of the fundamentalist's concerns are reserved for corporate farming. In "The Corporate Invasion Of American Agriculture" by Victor Ray (1968), Tony T. Dechant, President of the National Farmer's Union is quoted as saying:

> We in the National Farmer's Union believe the corporate invasion of American Agriculture is real. It is leaving behind wasted towns, deserted communities, depleted resources, empty institutions and people without hope and without a future (Ray, 1968, p. 5).

Ottoson and Vollmar (in Ball and Heady 1972) summarize why corporate farming has been such a controversial issue. They list eight issues:

1) The undesirable effects on a community of absentee ownership and the lack of interest of both employer and employees in education, social life, recreation and churches.

2) Corporate farms may be less concerned about the conservation of natural resources.

3) The reduction of competition by vertical and horizontal integration may result in higher prices in the future.

4) The dangers of concentration of political power.

5) The flight of rural people to urban slums.

6) The possible reduction in local political responsibility.

7) The potential sharpening of class lines.

8) The erosion of the values attributed to family ownership and operation.

Rural Sociology

There have been a number of field research studies which have attempted to look at the social consequences of farm structure. The classic study of this type was the comparison of Arvin and Dinuba, California by Walter Goldschmidt of UCLA in the 1940's.

As reported by the Small Farm Viability Project Publication (1977) Arvin and Dinuba were two communities similar in most ways except that Arvin was and still is

surrounded by large commercial farms and Dinuba was and is surrounded by small family farms. Goldschmidt concluded that the community surrounded by small farms had a more active economic and social life than the community surrounded by large farms.

In 1977 Arvin and Dinuba were reexamined by Steve Peterson, a research assistant with the California Department of Housing and Community Development. In the later study, Goldschmidt's basic thesis was substantiated. Dinuba still generates a more diversified and richer community life than Arvin. It was found that Dinuba supports more businesses, has more public services, more parks, more social and civic organization, more churches, a more accountable decision making process and is less dependent on outside sources of funding. Arvin's population had a much higher percentage of low income, low stability farmworkers with relatively little social integration.

In another study cited in the same report, the Davis branch of the University of California looked at 130 communities in the San Joaquin valley in 1977. The independent variables in that study were land use and system of water jurisdiction. The dependent variable was quality of community life. It was found that in towns surrounded by small-scale farming operations and democratic water systems, there is a significantly greater variety of services and

higher quality of life.

The California report concluded that when small family farms are replaced by large corporate farms, a process of economic and social decay begins in rural communities. As farm families move away, local businesses dry up, social organizations stagnate, public services are constricted and the population becomes less stable as hired labor replaces local labor and average incomes drop.

Harris and Gilbert (1982) reevaluated the Goldschmidt data and looked at the following two hypotheses of his agrarian thesis;

1) As the predominance of large farms increased, the percentage of persons in the lower class increased.
2) Rural farm income is negatively related to farm scale.

The reevaluation confirmed the first hypothesis but not the second. They found that large farms have a positive effect on rural income, "Large scale farming is accompanied by an increase in the ability of workers to capture at least some of the value of their productivity " (Harris and Gilbert, 1982 p.454). They point out that the recent history of other institutions would also suggest a positive relationship between operational scale and labor income.

Hefferman (1972) studied involvement in community and alienation among workers in family farms, contract farms and

corporate farms. He found that the rank and file workers in corporate farms were the most alienated and least involved in the activities of their communities. He found both contract farmers and family farmers to be less alienated and more involved in the activities of their communities. The managers of the corporate farms were the least alienated and most highly involved in the activities of the community. To Hefferman this suggested the development of two distinct classes in that part of rural America dominated by corporate farms, undermining the traditional American ideal of equality. Of particular interest to this study is the fact that he found little difference between contract farmers and family farmers.

Martinson et al. (1976) studied the consequences of a differentiated structure of production for personnel from large scale incorporated farms in Wisconsin. They sought differences in levels of alienation attributable to occupation. They predicted that since the industrialization process has historically led to feelings of alienation through subordinate occupational roles, the same would be true in those parts of agriculture that have industrialized. They divided alienation into powerlessness and social isolation. The results showed that farm workers as expected felt less powerful than did either owners or hired managers. Interestingly, owners and hired workers differed from

managers in feeling of social isolation but did not differ from each other.

Agricultural Economics

There is a large body of literature which discusses the advantages and disadvantages of the contract farm system and integrator owned or corporate farm system. The majority of the recent literature covers the corporate farming system.

Ottoson (in Ball and Heady, 1972) mentions five incentives for the nonfamily corporation to enter farming. These include access to cheaper capital, the ability to use new technologies quickly, the specialization of management, the ability to buy and sell in volume and the possibilites for integration. The greatest disincentive according to Ottoson is in the use of labor. Corporations must pay higher wages with fringe benefits, risk unionization and deal with the problems of supervision. Family famers on the other hand accept lower wages and work overtime for nothing. Other disincentives mentioned include management complexity, high land prices and the yearly variation in rates of return in agriculture.

Ottoson believes that future returns to farm resources will not be impressive for the nonfamily corporation. This is because it would be competing for relatively fixed

markets where the demand is inelastic. Therefore, other alternatives for investment where markets can be expanded may be more profitable. Ottoson also believes that there will be increased interest by family farms in arrangements with nonfamily corporate firms which will supply all or part of the risk capital required. He also mentions leasing as a new and potentially important way to obtain capital goods. He concludes by saying that; " the share of farm production under the control of corporations will not depend on social acceptance or a desire to hold onto tradition: It will depend largely on economic criteria" (p 313).

Galbraith (1967) perceived human resources as being paramount. In "The New Industrial State" he argues that the locus of power has always rested with those who could control the scarcest resource. Since skilled people are now the scarcest resource, a firm must be of sufficient size and proper organization to make use of a critical mass of highly skilled people.

Moore (in Ball et al., 1972) emphasised economies of scale as being the most important factor in the growth of corporate farming. Since economies of scale dictate heavy capital requirements, a high degree of risk and complex decision making, the large corporation is the only institution able to fully take advantage. In a caveat, Moore says that the rates of return must be compatable to those of

other industries.

Cordtz (1972) in a Fortune magazine article "Corporate Farming: A Tough Row to Hoe" said that corporate farming works better in theory than in practice. Citing the fact that several large corporations had left the business, he concluded that the personal day-to-day supervision of a farm requires a person with a substantial stake in the enterprise. A great incentive is needed because such a person must be able to make countless important decisions where there are no standard answers and be willing to work long irregular hours in unpleasant conditions. The person who is right for that job, concludes Corditz, is the family farmer, not the hired supervisors and workers of the corporate farm. He expected that large corporations could make more money in processing and distribution than in production agriculture.

Agreeing with Cortz, Nikolitch (1969) states that the biological nature and spatial dispersion of farm production make a large concentration of capital, management and labor more difficult in farming. He believes that the highest efficiency is attained in farming at a much smaller firm size than in other kinds of production, a firm size adapted to the managerial and working capacities of the family farm.

Roy (1970) lists three reasons why company owned broiler farms will receive more attention in the future. One

is the increasing difficulty of growers in obtaining loans for new buildings and equipment. Another is the need for closer coordination and management. The third is the importance of centralized locations for grower farms due to increasing transportation costs. In spite of these incentives, Roy believes that broiler farms will not be owned by integrators because it would be too expensive, management would be difficult and the work force would need to be paid much higher wages than the the labor return the contract farmer would be willing to accept.

Among those who disagree are Krause and Kyle (1970). They state that a new set of technological, financial, tax and other institutional variables will provide increased incentives for corporate agricultural production. " No longer is the belief tenable that weather, biological processes and the superior incentives of unpaid family members provide impossible barriers to large scale industrial agriculture" (p.752).

Some authors like Aines (in Ball et al. 1972) while agreeing that there are increasing incentives for nonfarm business to control farm resources, expressed concern about the trend. Aines stated that the growing, processing and marketing stages of production are demanding an adequate, timely supply of uniform quality product from the farm which creates incentives for agribusiness management to own the

farm production process. The concerns that Aines raises about this trend are that such enterprises could:

1) Reduce competition in the long run by monopoly behavior
2) Control large tracts of land reducing the number of farmers and destroying rural communities
3) Sharpen class lines by creating a rural management class and a worker class.

Seckler (1969) analysed the class question differently. He saw a new class of agricultural managers emerging who could challange the traditional power structure of rural communities in a beneficial way. Another positive consequence mentioned was the opportunity for work provided to the landless. Also challenging the consensus, Rodefeld (1978) stated that job satisfaction on corporate farms is not as low as commonly assumed.

The broiler contract farm was dealt with exhaustively in a work by Roy, "Contract Farming and Economic Integration" (1972). He stated that contracting would be favored over integrator ownership where:

1) Technological developments are rapid
2) The venture is risky
3) Rapid expansion is desired
4) Capital requirements are high

Roy reported that the attitudes of broiler growers toward contracting are generally favorable due to the stable income, low risk, and family togetherness features of the arrangement. The complaints about contract farming heard most often from growers include;

1) Payments not keeping up with inflation
2) Full documentation not provided by the integrator
3) Delays between flock replacements
4) Variations in quality of feed and chicks
5) Unattainable bonus clauses

The complaints give a clue as to the biggest problem with contract farming, the limited power of the contract growers as cited from Wellford in the first chapter. Roy also mentioned the fact that contract farmers find themselves in a position approaching that of a sharecropper.

In spite of the serious problem of balance of power, contract farms do have advantages to growers. Plouch (1960) made a strong case for contract farming. He stated that the modern farm family's needs are similar to those of their urban counterparts. To satisfy those needs a steady income is required. This factor coupled with the high capital requirements of independent farm operations as well as the wage experience of rural people all contribute to the appeal of contract farming. He concluded that contract farms

provide an opportunity to stay on the farm, give a sense of independence and help strengthen rural institutions by lowering out-migration.

Summary

The majority of authors concluded that family farms in whatever form are more appropriate than non-family farms and that the traditional contract farming system although superior to the corporate farming system has shortcomings. The primary shortcoming is the imbalance in power between the contractor and the integrator.

The studies done by sociologists such as Goldschmidt, Hefferman and Martinson support the family/non-family farm conclusion. Goldschmidt found the small family farm community to be healthier than the community surrounded by large corporate farms. Hefferman found both contract and family farmers less alienated than corporate farm workers. Martinson found farm workers had a high feeling of powerlessness although not social isolation.

Studies by economists also tend to support the family/non-family conclusion. Ottoson and Cordtz both believe that corporate farms just don't provide the necessary return to investment. Roy predicts broiler farms will never be owned by integrators for the same reason.

Nikolitch finds the highest efficiency in the family farm. Plouch finds the contract farm beneficial to the family and community.

Dissenters to the majority viewpoint include Galbraith and Moore who emphasize the advantages of economies of scale. Another dissenter is Krause who believes institutional variables will provide increasing incentives to corporate agriculture. Seckler and Harris find some social benefits to the changes brought on by corporate farming.

Wellford, Roy and Davis provide the basis of the second conclusion that the traditional contract system is inappropriate. They cite the power imbalance between contractor and integrator and the incentives for exploitation as well as the history of low labor returns.

Broiler Supply Methods

The review of the literature reveals that the authors generally feel the family farm is more appropriate than the non-family farm and that contract farms, although having problems, are better than corporate farms. The traditional family farm organization is not one of the ways that broiler supply can be organized (see chapter one). The alternatives are some sort of contract farms method or a corporate

integrator owned farm method. The predictions of Ottoson suggest an additional contract method, a method where the integrator owns but does not operate the farm buildings.

CHAPTER THREE PROCEDURE

The study uses a learning process approach to analyze data from a review of literature, a field survey of farmers and a financial analysis. The field survey is designed on the basis of information from the review of literature and the financial analysis is modified by the opinions of farmers as revealed in the field survey.

Field Survey

The opinions of farmers are obtained by the use of a two stage field survey. A random sample of farmers are contacted in the first stage of the field survey by telephone to determine their degree of interest in growing broilers. In the second stage of the field survey, personal interviews are conducted with farmers who expressed interest in the first stage. The objective of the second stage is to obtain sufficient feedback from farmers to be able to learn how to organize the financial analysis.

Population and Sampling Procedure

The county Agricultural Stabilization and Conservation Service provided the names and addresses of all of the agricultural land owners in the county. The population frame for the survey was all of the agricultural land owners owning 10 acres or more of land who lived within local dialing distance of the county seat. It was assumed that agricultural landowners are either full-time farmers, part-time farmers, or rural residents who might be interested in an agricultural enterprise. Ten acres was chosen because it would be impractical to put a large poultry building on less than 10 acres. The local dialing area covered from the county seat covers 300 square miles and contains 1000 agricultural landowners or "farmers" as used in the study.

Using the quidelines of Babbie (1973), the frame of 1000 farmers was stratified by number of acres into three stratifications: less than 40 acres, 40 to 160 acres and more than 160 acres. The frame was stratified to organize the population into homogeneous subsets on the basis of number in each subset. Each group was then sampled using a technique which insured that all members had an equal chance of being selected and that 12.5% of the population would be selected with the expectation that at least 10% would eventually be contacted. The technique selected every 8th

name with a random start in each of the acreage categories. The procedure yielded a sample of 125 farmers.

Inquiry Procedure

Each of the 125 farmers was sent a letter to alert him or her that a phone call would be forthcoming and to provide some information about raising broilers. The letter is in Appendix A. An attempt was then made to contact each by phone at which time the first stage of the survey was administered. Seven questions were asked to determine the type of farmer being contacted and the degree of interest in raising broilers. The questions are in Appendix B.

The last two questions asked the farmer to rank interest, on a scale of 1 to 10, in raising broilers and learning more about raising broilers. Those who answered 5 or above to both questions were deemed to be interested and a personal interview was requested at their farm. Before the personal interview, a copy of the USDA publication "Broiler Growing: A Way of Life" (Appendix C) was sent to each cooperating farmer. At the personal interview, the following questions were asked:

1) Please describe your farm in more detail.
2) How do you feel about broiler chickens as supplemental income?

3) How do you feel about taking financial risks?

4) How much capital would you feel comfortable investing in a broiler enterprise?

5) What sort of income would you expect from the enterprise?

6) How would you feel about leasing a portion of your land?

7) How many people over 14 years of age live in your household?

8) Do the members of your farmily have time available to consider this enterprise?

9) How many other family members over 14 live within a few miles of your house?

10) To your knowledge, do nearby family members have time available to consider an additional on-farm job?

11) Would you consider a partnership with other family members for this enterprise?

Using the Field Survey

The telephone stage of the field survey yielded information about how many farmers were interested in raising broilers and what type of farmer was interested. Specifically, the dependent variable is interest expressed and the independent variables are size of farm, type of farm and type of farmer. A chi-square analysis is conducted on the variables.

Interview data from the second stage of the field survey is used to determine the answer to three key questions. First, how realistic it is to expect farmers to finance the broiler growout facilities as the traditional contract farmers do, second, what sort of remumeration do farmers expect and finally, how much labor is available? The data thus obtained from the interviews are used to structure the financial analysis.

The financial analysis determines the variable costs of alternative broiler supply methods and the rate of return possible with different financing alternatives. The financial analysis is aided by the use of data from a synthesized corporation from an earlier study. The final economic evaluation is made on the basis of which broiler supply method is both acceptable to farmers and gives the greatest potential return on investment.

CHAPTER FOUR FINDINGS

The evaluation of financing and organization methods in the study depends on data about costs from the field survey. Therefore, the field survey findings are presented first, followed by the construction of growout costs leading to the evaluation of financing and organization.

Field Survey

The first part of the field survey was a telephone survey which reached 100 of the 1000 agricultural land owners in Shiawassee county in the summer of 1982. The survey found 16 farmers interested in raising broilers. The following are the results of a chi-square analysis of the relationship between farm type, farm size and type of farmer as independent variable and interest in raising broilers as the dependent variable.

Type of Farmer

Michigan agriculture and Shiawassee county agriculture is characterized by a large number of small farm units and relatively few commercial farms. This was reflected by the fact that of the 100 farmers contacted, 44 described themselves as rural residents, 25 as part-time farmers and 31 as full-time farmers. These figures correspond closely to

the figures in Thompson and Hepp (1976) where it was reported that 44% of Michigan farm operators were rural residents, 20% were supplemental income farmers and 36% were full-time farmers. As shown in Table 1, the chi-square was very low for type of farmer. There is no relationship between type of farmer and interest in raising broilers.

Table 1 Type of Farmer and Interest in Raising Broilers

	Interested		Not Interested		
	Number Observed	Number Expected	Number Observed	Number Expected	Total
Full-Time	6	4.9	25	26.0	31
Part-Time	5	4.0	20	21.0	25
Rural Resident	5	7.0	39	37.0	44
Total	16	16	84	84	100

$X^2 = 1.21$ df = 2

Farm Type

Given the large number of rural residents, it is not surprising that 40 of the 100 farmers rented or did not use their land. Of the remaining farms, 17 were primarily livestock farms and 43 were primarily cash crop farms. Almost all of the livestock farms were dairy farms. As shown in Table 2, the chi-square is also very low for farm type. There is little evidence for a relationship between farm type and interest in raising broilers.

Table 2 Farm Type and Interest in Raising Broilers

	Interested		Not Interested		
	Number Observed	Number Expected	Number Observed	Number Expected	Total
Cash Crop	7	6.8	36	36.1	43
Livestock	4	2.7	13	14.2	17
Rented/Unused	5	6.4	35	33.6	40
Total	16	16	84	84	100

$X^2 = 1.09$ 2 d.f.

Farm Size

The farm sizes used in the field survey were 10-40 acres, 40 to 160 acres and 160 acres and above. Thirty of the 100 farmers lived on farms of more than 160 acres, 41 on farms of between 40 and 160 acres and 29 on farms of between 10 and 40 acres. Again the chi-square was very low (table 3). There is no relationship between farm size and interest in raising broilers.

Table 3 Farm Size and Interest in Raising Broilers

	Interested		Not Interested		
	Number Observed	Number Expected	Number Observed	Number Expected	Total
10-40 Acres	5	4.6	24	24.7	29
40-160 Acres	6	6.5	35	34.4	41
160+ Acres	5	4.8	25	25.2	30
Total	16	16	84	84	100

$X^2 = .163$ 2df A=10-40 Acres B=40=160 Acres C=160+ Acres

The telephone survey was unsuccessful in identifing a variable related to interest in raising broilers. One may not have even 70% confidence that the distribution of any of the observed values are different from expected values. The level of interest is relatively low (16%) and dispersed among farm types, type of farmer and sizes of farms.

Personal Interviews

The purpose of the personal interviews was to establish the family labor availability of the interested farmers, the minimum price needed for their labor(reservation price) and their willingness to finance broiler housing. Twelve of the 16 interested farmers participated in the personal interviews. The following findings are based on data from that small sample.

Labor Availability and Price

Labor availability on the 12 farms is high. There were an average of 3.1 persons over the age of 14 in each household. All 12 households stated that there was time available between the household members for another full-time equivalent job (2000 hours). Within a few miles of the households another 4.1 family members over 14 could be found. Ten of the 12 families felt that those other family members had time available to assist with a broiler project

and 11 out of 12 were willing to consider a partnership with relatives living within a few miles.

The reservation price for labor is shown in Table 4. It is interesting to note that dairy farmers in this small sample set a higher price for their labor than did cash crop farmers or rural residents. They wanted to use broilers as an opportunity to "set someone up" in a job that would be the main source of income of a family. One dairy farmer thought $20,000 per year would be the minimum that could be considered. Cash crop farmers and rural residents on the other hand saw the project as a way to use family surplus labor of children, a spouse and other family members. They tended to put a lower value on labor, between 8 and 10 thousand per year for 2000 hours of work. It appears that it would be possible to find contract or caretaker farmers who would be willing to work for $8,000 a year using the broiler enterprise as supplemental income. Nevertheless, the level of interest is low, 4 out of 100, in the 10 mile radius which was covered by the survey. That radius would have to be extended to at least 20 miles to find sufficient numbers of interested families.

Table 4 Labor Return and Type of Farmer

Cash crop farmers	Dairy farmers	Rural Residents	Total
Around $8000	2	0	2	4
Around $10000	4	1	1	6
Around $12000	0	2	0	2
Total	6	3	3	12

The 12 families were questioned about their attitudes toward financial risk. Ten of the 12 families were opposed to any financial exposure or risk in the enterprise. The reasons they gave included:

1) Already being in debt for other farm enterprises

2) Unwilling to risk losing their farm

3) Unsure about the viability of the broiler industry in Michigan

Only one large cash crop farmer and one large dairy farmer were willing to consider investing up to $40,000 of their own capital in the enterprise. The data from the sample suggests that few farmers are interested in a financial risk associated with growout facilities.

The Synthesized Corporation

The synthesized corporation which is used in the study to determine costs and returns of organization and financing alternatives is one that was proposed for a study done earlier at Michigan State and reported by Rahn et.al. (1982). It is an integrated complex with a weekly slaughter capacity of 315,000 broilers. The size corresponds to a one kill line processing plant which can handle 8,400 broilers per hour operating 7.5 hours per day, 5 days a week. All other functions performed within the integrated complex are coordinated with this processing plant (Appendix D). The broiler grow-out function consists of 45 two-story buildings each having a capacity of 64,000 broilers and costing $385,678 (Appendix E). The cost of 45 buildings is over $17 million, almost half of the total capital investment (Appendix F). In the earlier study, the grow-out function was owned and operated by the corporation on 9 farms. Each farm had 5 buildings. There were 9 farms since there would be 8 different ages of broilers a week apart and one farm would be in the process of being cleaned at all times. Ages are separated for disease prevention purposes. In the present study, the alternative of having 45 farmers each with one building is considered. The field survey results indicate that potential growers are not interested in financing the buildings, as in the traditional contract

arrangement. Therefore, the alternative to corporate ownership and operation of the grow-out farms is a systme where the integrator owns but does not operate the growout farms. Such a system could be called a "caretaker" contract farm.

Growout Organization Alternatives

For Shiawassee county, there are two possible grow-out organizations to consider, the company farm alternative and the caretaker farm alternative. The company farm alternative would have 9 farms located on land purchased by the corporation and located within 5 miles of the processing plant, feed mill and hatchery. The labor on company farms would be salaried workers. The caretaker alternative would house broilers on 45 parcels of land leased for a nominal price from a farmer caretaker who operates the broiler house for a fixed price per pound of live broiler. The corporation would own the grow-out buildings.

The following section calculates the variable costs of producing the same number of broilers (16 million) using the company and caretaker alternative farm organizations.

Labor Costs

Lance (1977) suggests that it takes 6.79 hours of labor per thousand broilers placed. To produce the 16 million broilers would require 58 people working full-time or 116,000 hours. In the Michigan State study it was assumed that on company owned and operated farms of many buildings, the efficiency created by the dense population of broilers would mean that fewer workers would be required. This assumption was confirmed by conversations with the Poultry Extension department at the University of California at Davis. Between farm managers and crew 42 people were called for in the Michigan State study as shown in Table 5.

Table 5 Growout Labor Requirements M.S.U. Study

	Cost/year	Total
1 Manager	$30,000	$30,000
2 Servicemen/foremen	$16,000	$32,000
9 Farm Managers	$10,000	$90,000
8 Clean-up crew	$10,000	$80,000
8 Brooding crew	$10,000	$80,000
6 Grow-out crew	$10,000	$60,000
11 Swing crew	$10,000	$110,000
		$482,000
20% Fringe Benefits		$96,400
Total		$578,400

For the caretaker alternative it is assumed that the 6.79 hours per thousand placed is correct and that farmers can be found to work for $8000 per year as the field survey suggested would be possible. For the number of broilers produced in each broiler building placed on a caretaker's land, 2,400 hours of labor would be required per year but 400 hours of that labor is involved in the removal of litter. It is assumed that the value of the litter to the farmer is equal to the value of the 400 hours of labor as well as machinery costs to remove it. Table 6 is a calculation of the labor costs to the integrator of the caretaker alternative for the broiler grow-out stage.

Table 6 Labor Requirements of the Caretaker Option

	Cost/year/each	Total
1 Manager	$30,000	$30,000
2 Servicemen	$16,000	$32,000
Subject to Fringe Benefits		$62,000
20% Fringe Benefits		$12,400
Total		$74,400
45 Caretaker Farmers	$8,000 average	$360,000
Total		$434,400

The caretaker alternative has a $144,000 lower labor cost expenditure. The major difference is between the supplemental caretaker labor cost of $4 per hour and the full-time crew labor cost which is $5 per hour before fringe benefits and $6 per hour after government mandated fringe benefits (unemployment compensation, social security and workman's compensation primarily).

Spatial Costs

In contrast to the labor costs, spatial or transportation costs increase with the caretaker alternative because of the greater radius of the caretaker farms. This section compares the spatial costs of a 5 mile radius complex compared to a 20 mile radius complex.

The spatial costs of a broiler complex consist primarily of the transportation costs of feed, chicks and broilers. To calculate the transportation costs, three equations reported in Henry and Burbee (1964) are used, one for the location of the impound point, one for the relationship of road distance to impound point and one for travel time.

The impound points of a circular supply band is a circle which divides the supply band in half. If the broiler farms to be serviced are located evenly over the surface of

a supply band, then the problem is to find the circle which divides the area of the band in half. This is found with the following equation:

$$P = \sqrt{\frac{Q^2 + N^2}{2}}$$

Where:

P = radial distance in miles from the processing plant at the center to the circle of impound points

N = radial distance in miles from the processing plant at the center to the inner rim of the supply band

Q = radial distance in miles from the processing plant at the center to the outer rim of the supply band

If the inner rim and the processing plant coincide at a point as is assumed in this study, N has a value of zero. For the present study the five mile radius organization has an impound point of 3.54 miles and the 20 mile radius alternative has an impound point of 14.14 miles. In other words, the average farm is located 3.54 and 14.14 miles away, respectively.

The second equation derived from emperical data in North Carolina translates radial distance to road distance. The equation is R= 1.703 + 1.16 A where R is the road distance in miles and A is the air distance or radial distance. Translating radial distance to road distance, the

impound point is really 5.8 and 18.1 road miles away from the center of the complex.

The final equation from Henry and Burbee (1964), calculates travel time in relation to distance. The equation was determined using the running time of egg hauling trucks. $T = 2.865 + 2.6818D - .0102D^2$ Where T= Time in minutes and D= road miles.

For a round trip of 11.6 miles (2 X 5.8), and 36.2 miles (2 X 18.1), travel time would be 32 minutes and 86 minutes, respectively.

Feed Delivery

The amount of feed required for the broiler grow-out function is 67,280 tons per year. At 20 tons per load using a 20 ton capacity semi-tractor and trailer,there are 3364 loads to deliver during the year, approximately 11 loads per day 6 days a week to produce 16,000,000 broilers. Table 7 details the cost and time requirements.

Table 7 Feed Delivery Cost and Time Requirements

	5 Mile Radius	20 Mile Radius
Round trip, miles	11.6	36.2
11 Round trips	127.6	398.2
Cost per mile	$.50	$.50
Daily cost	$63.80	$199.10
Yearly cost	$19,905.00	$62,119.20
Time Required		
Loading	35 minutes	35 minutes
Unloading	55 minutes	55 minutes
Total	90 minutes	90 minutes
Hours per day 11 load/unload	16.5	16.5
Travel time round trip	32 minutes	86 minutes
Hours per day 11 trips	5.8	15.8
Total Hours	22	32

In the case of a complex with a 5 mile radius of grow-out farms, 2 semi-tractors, 2 feed trailers and 3 drivers are needed. The ten extra hours per day required by the 20 mile radius means the purchase of another semi-tractor and trailer as well as another full time driver to operate at

that distance.

Hatchery

From the hatchery, 6 deliveries per year are made to each of the 45 grow-out buildings for a total of 270 deliveries. On each delivery 660 boxes o' 100 chicks are delivered on a specially equipped chick bus. Table 8 shows the costs and time required.

Table 8 Chick Delivery Costs

	5 Mile Radius	20 Mile Radius
Round Trip, miles	11.6	36.2
270 Trip	3132	9774
Yearly cost at $.50 mile	$1561	$4887
Load/Unload minutes	60	60
Round trip	32	86
Total daily time 1 trip per day	92 minutes	146 minutes

For the hatchery no extra bus or driver is needed.

Live Haul

To haul the broilers to the processing plant, 3 semi-tractors and 6 trailers with coops are used. Early each weekday morning all 6 trailers are brought to the farms and

then returned to the processing plant. Later in the morning, 4 trailers are brought back out to the farms and again returned to the processing plant. In all, 10 loads of broilers are brought to the processing plant each day. Table 9 shows the costs and time required. In the case of the live haul, no extra tractor or driver is needed.

Table 9 Live Haul Costs

	5 Mile radius	20 Mile radius
Total Semi round trips each day	12	12
Miles	139	434
@ $.40/mile	$55.60	$173.75
Total trailer round trips/day	10	10
@ $.10/mile	$13.90	$43.40
Total cost/day	$69.50	$217.15
Total cost/year	$18,070.00	$56,459.00
Time for round trip	32 minutes	86 minutes
Round trips/day	12	12
Time each day	6.4 hours	17.2 hours

Table 10 compiles total spacial costs for the two growout alternatives.

Table 10. Total Spacial Costs

	5 mile radius	20 mile radius
Feedmill	$ 19,905	$ 62,119
Hatchery	$ 1,561	$ 4,887
Live Haul	$ 18,070	$ 56,459
Drivers	$172,800	$194,400
Total	$212,336	$317,865

Other Costs

Other costs associated with broiler grow-out will be relatively the same regardless of manner in which it is organized. Table 11 lists the other variable grow-out costs with the exception of feed for raising 16 million broilers.

Table 11. Other Grow-Out Costs

	Company Farms	Caretaker Farms
Utilities	$ 735,732	$ 735,732
Maintanence & Repair	$ 222,107	$ 222,107
Insurance & Taxes	$ 560,625	$ 536,025
Litter	$ 448,168	$ 448,168
Misc.	$ 30,000	$ 30,000
Total	$ 1,996,632	$ 1,972,032

Utilities are calculated at 226 KWT/1000 started chicks X 17,186 thousand X 6 cents per KWT or $233,042 and 45 gallons of L.P. gas per 1000 started chicks X 17,186 thousand X $.65 per gallon or $ 502,690. Maintenence and repair is 1% of building costs and 2% of equipment costs per year. Insurance and taxes are 1% of total fixed assets for insurance and 2% of total fixed assets for taxes. The contract alternative is lower in this category because land and dwellings are not included. Litter is 6400 tons at $70 per ton which is enough for 1 replacement per year and 5 top dressings. Table 12 shows the total costs for both the company farm alternative and the caretaker farm alternative.

Table 12. Total Growout Costs for Company and Caretaker Farm Alternatives

	Company Farms	Caretaker Farms
Labor costs	$ 578,400	$ 434,400
Spatial Costs	$ 212,336	$ 317,865
Other	$1,996,632	$1,972,032
Total	$2,787,368	$2,724,297

The two alternatives are close in total vaiable costs.

Capital Costs

Table 13 shows the capital cost comparison between the company farms and the caretaker farms.

Table 13. Capital Expenditures for Company and Caretaker Farm Alternatives

	Company	Caretaker
Land	$ 630,000	0
Dwellings	$ 270,000	0
Buildings	$12,770,325	$13,408,841
Equipment	$ 4,585,185	$ 4,585,185
Vehicles	$ 522,000	$ 586,000
Total	$18,777,510	$18,580,026

In the caretaker alternative, land and buildings are not included because the caretakers have their own houses. Building costs are estimated to be 2.5% higher to build on 45 sites rather than on 9 sites (Tailored Building Systems of Nunica, Michigan). Although the two alternatives are close in total costs, the caretaker system would require $516,742 less in capital expenditures. The opportunity cost of that capital would be approximately $62,000 per year using 1983 interest rates.

Financing

Three methods of financing the broiler grow-out buildings and equipment are considered: equity, long term debt and leasing. The total cost of the buildings and equipment is assumed to be $17,355,500. The remaining

$19,274,100 needed for the broiler complex is assumed to always be equity in this financing analysis. The internal rate of return after taxes and before inflation to the $19,274,100 is calculated for each financing alternative at 3 different interest rates. For each alternative, revenues and expenditures are fixed (appendix G).

Long Term Debt

With the prime rate of March 1983, 10.5%, banks in the area are willing to lend 100% of the $17,355,500 for a period of 10 years at a rate of 12.25% if the balance sheet contained the $19,274,100 of equity. The tables which show the initial balance sheet, cost recovery schedule, asset categories, net after-tax cash flow calculations and capital expenditure analysis for the 12.25% interest rate as well as for 9.25% and 15.25% can be found in Appendices H1, I1, J1 and K. Internal rates of return to capital after taxes and before inflation are shown in Table 14.

Table 14. Long Term Debt Option Internal Rate of Return

Interest Rates	9.25%	12.25%	15.25%
Internal rate of return after taxes/before inflation	11.55%	10.19%	8.73%

Lease

If the buildings and equipment are leased with a true lease, the following terms apply in March of 1983.

1) 10 year lease allowed
2) Security deposit of one advance payment
3) 10% buy-out after 10 years
4) APR of 12.25% , a factor of .0143

As with the long term debt alternative, the initial balance sheet, the cost recovery schedule, asset categories, net after-tax cash flow calculations and the capital expenditure analysis for the three interest rates can be found in Appendices H2, I2, J2 and L. The factor at 9.25% is 0.012 and the factor at 15.25% is 0.0156. The internal rates of return are shown in Table 15.

Table 15. Lease Option Internal Rate of Return

Interest Rate	9.25%	12.25%	15.25%
Internal rate of return after taxes and before inflation	10.43%	9.42%	8.59%

Equity

For the purpose of comparison, the rate of return has been calculated for a 100% equity position. The balance sheet, cost recovery schedule, asset categories, net after-

tax cash flow calculations and capital expenditure analysis for this option can be found in appendices H3, I1, J3 and M. The internal rate of return for 100% equity after taxes and before inflation is 9.46%. When comparing long term debt and equity financing there is more to consider than just the internal rate of return. With debt financing there is a fixed payment obligation which increases the risk of insolvency in a cyclical industry like agriculture. That risk must also be taken into consideration in chosing between financing alternatives.

CHAPTER FIVE CONCLUSIONS

The purpose of the study was to identify a method of organizing and financing the supply of broiler chickens to a proposed processing plant in Michigan which is at the same time acceptable to farmers and provides the highest return on investment. Michigan is a potential broiler raising area because of the relatively low cost of feed grains in the area and the increasing cost of transportation to competitors. Rising transportation costs threaten the dominance of the southern broiler industry in two ways. First, feed costs which make up 50% of the total ready to cook costs rise faster in areas further from the corn belt. Second, receipts fall faster in areas further from the final markets. Counter balancing lower transportation and feed grain costs are higher labor, construction and tax costs in Michigan.

The literature review revealed reservations about the effect of corporate farms on rural America. The classic work by Goldschmidt of UCLA compared Arvin and Dinuba California and found the town (Arvin) surrounded by corporate farms to have a less active economic and social life than the town surrounded by family farms. Other issues raised by rural sociologists about corporate farms include: the erosion of values attributed to family ownership, the sharpening of

class lines, possible reduction in local political responsibility, the flight of rural people to urban slums, the dangers of concentration of political power, concern for natural resources and the undesirable effects of absentee ownership. The traditional contract farming system is considered to be better than the corporate farming system but it also has serious shortcomings. The primary shortcoming is the imbalance in power between the contractor and the integrator. Agricultural economists generally conclude that the highest efficiency is found on the family or contract farm and that corporations will not be owning and operating broiler grow-out farms in the future. One economist, Ottoson, stated that, in the future, integrators may provide all or part of the risk capital associated with grow-out housing.

The field survey of farmers uncovered three important facts. First, there was 2000 hours of supplemental family labor available on the farms surveyed. Second, the reservation price of that labor is relatively low at $4 per hour. Finally, 98% of the farmers surveyed would not consider the financial exposure required to become a traditional contract farmer.

The Caretaker Farm

Since the farmers are unable or unwilling to take the financial risks of purchasing poultry housing, the only non-corporate farm alternative is the one suggested by Ottoson. The author has proposed that this contract farm arrangement be called the caretaker farm.

A caretaker grower family would be required to lease, for a long term at a nominal price, 10 acres of their land upon which the integrator would build the growout facilities. The grower would receive contract payments as remuneration for labor services and growout expenditures incurred. In the event of grower default, i.e., being unable or unwilling to perform satisfactorily, contract payments and access to any portion of the leased land would be foregone.

The advantage of the arrangement to the grower is the potential of creating on-farm supplemental income without the financial risk and initial equity requirement of the traditional contract grower arrangement. The grower family would face the risk of temporarily losing the use of a portion of their land and having another family living on their land.

The advantage of the caretaker farm arrangement to the integrator is that it may allow a form of the contract farm

to exist in an area where the traditional contract farm could not exist. The financial analysis showed that the lower labor costs of the caretaker farm give it a slightly lower total cost when compared to the company owned and operated alternative. Other advantages of the caretaker farm to the integrator include possibly a more motivated labor force and the chance of farmers eventually participating in the financing of additional growout facilities. Caretaker labor may be more motivated than company labor because the caretaker would be working under a performance contract and at the homestead.

A disadvantage to the integrator of the caretaker system is the problem of what to do about farmers that don't work out. The farmer has two items at stake, a job which pays the family $8,000 in supplemental income per year and the temporary loss of 10 or more acres of land. If the farmer, in spite of these incentives, is unwilling or unable to continue, the integrator would have the option of bringing another family onto the land. In the case of a farmer being willing to continue but unwilling to do a good enough job, in spite of incentives built into the contract payments, then the case could be arbitrated by a third party. In the case of an extended dispute, the building could be moved for approximately one third of its original cost. Another disadvantage is that of having many growout

managers. Each grower manages his farm in a slightly different manner with the resultant variation in final product.

Evaluative Conclusion

Given the cultural and cost advantages of the family farm and the unwillingness of farmers in Michigan to finance the purchase of broiler grow-out facilities, it is recommended that an integrator in Michigan consider the use of the caretaker variation of the contract farm for broiler supply. Such a farming arrangement is both acceptable to farmers and provides the highest return on investment. At the prime rate of spring 1983, long term debt financing yields a higher rate of return than equity financing but has inherent risks.

Limitations of the Research & Further Research Needed

One limitation of the research is that although a relatively large number of farmers were interviewed, 100, relatively few expressed an interest in raising broilers. Therefore many of the results of the study are based on the opinions of those few farmers. Another limitation of the research is that the survey was conducted in the depths of the 1980-1983 recession which saw unemployment in Michigan

reach the highest level in all 50 states for that period perhapse making farmers more reluctant than usual to risk capital. The field survey should be repeated in more normal economic times and reach greater numbers of interested farmers.

Research should also be directed at ways to lower the financial risk of the contract farmer and still allow the farmer to participate in part of the financing of the buildings. Sociological study should be directed toward the question of future family compositon and goals to predict labor availability. Will young underemployed teenagers and adults be available in the future for supplemental income jobs in Michigan? Will the idea of a supplemental job such as the caretaker farm be appropriate in the future? The future viability of the caretaker system can only be predicted by the construction of a sociological/economic multi-disciplinary forcasting model. Finally, financial analysis is needed to compare the return on investment of an integrated firm in grow-out housing as compared to the other possible investments it could make, such as further processing or retailing.

APPENDICES

APPENDIX A

APPENDIX A

LETTER SENT TO AGRICULTURAL LANDOWNERS

BROILER PROJECT RESEARCHERS
MICHIGAN STATE UNIVERSITY
Affiliated With
Economic Development Corporation of Shiawassee County

PAUL AHO
DIANA LUALHATI

701 S. Norton Street
Corunna, MI 48817
(517) 743-3409

August 2, 1982

Dear Agricultural Landowner,

We are researchers working with Michigan State University and the Shiawassee County Economic Development Corporation. The purpose of our research is to investigate the feasibility of raising broiler chickens as an additional income source for rural households.

A telephone survey will be made to get information about the interest of landowners such as yourself in growing broilers. We would like to call you to get your opinion on the matter. The calls will be made this month and the questions will take about 10 minutes to answer. All answers will be kept confidential.

General Information About Raising Broilers

Raising broilers is an enterprise which involves working 6 hours a day, 7 days a week for 47 weeks a year. It is work which most members of the family can participate in. It is not the kind of work which can be the sole source of income for a family.

A broiler building costs $400,000 and may be owned by the processing plant or by the grower. Chicks, feed and management instructions are provided by the processing plant. The grower cares for the birds during their 8 week life and receives 6 payments a year.

A number of alternative methods of housing the broilers are being considered. We look forward to talking with you. Your time and opinions will be appreciated.

Sincerely yours,

Paul Aho
Diana Lualhati

APPENDIX B

APPENDIX B

QUESTIONNAIRE USED FOR TELEPHONE INTERVIEWS

QUESTIONAIRE

I am calling from the Shiawassee Economic Development Corporation in regard to the Broiler Chicken research project. Is this Mr. X or Mrs. Y (landowner)? _____

I would like to talk to the person in your family who has primary responsibility for your agricultural land.

-----your are that person----- fine
-----you are not that person, when can that person be called?

(When you get the right person)
I am calling from the Shiawassee Economic Development Corporation in regard to the Broiler Chicken research project. I have some questions that will take about 10 minutes to answer. Is this a convenient time?

1) Do you live on a farm? Yes____ No____ If no thank you very much for your time, we want to talk to landowners that live on a farm.

2) What kind of a farm do you live on?_____
_____
_____

3) Would you describe yourself as a
____full time farmer
____part-time farmer
____retired farmer
____employed as a farm manager?

4) Did you receive our letter?
Yes____ No____ IF NO-------

no? I'll give you the general information now that was in the letter. Raising broilers is an enterprise which involves working 6 hours a day for 7 days a week, 47 weeks a year. It

is work which most members of the family can participate in. It is not the kind of work which can be the sole source of income for a family. A broiler building costs $400,000 and may be owned by the company which provides the chicks, feed and management information. The grower cares for the birds during their 8 week life and receives 6 payment per year. Any questions?

_____

_____

5) What is your reaction to the idea of raising broilers?

_____

_____

_____

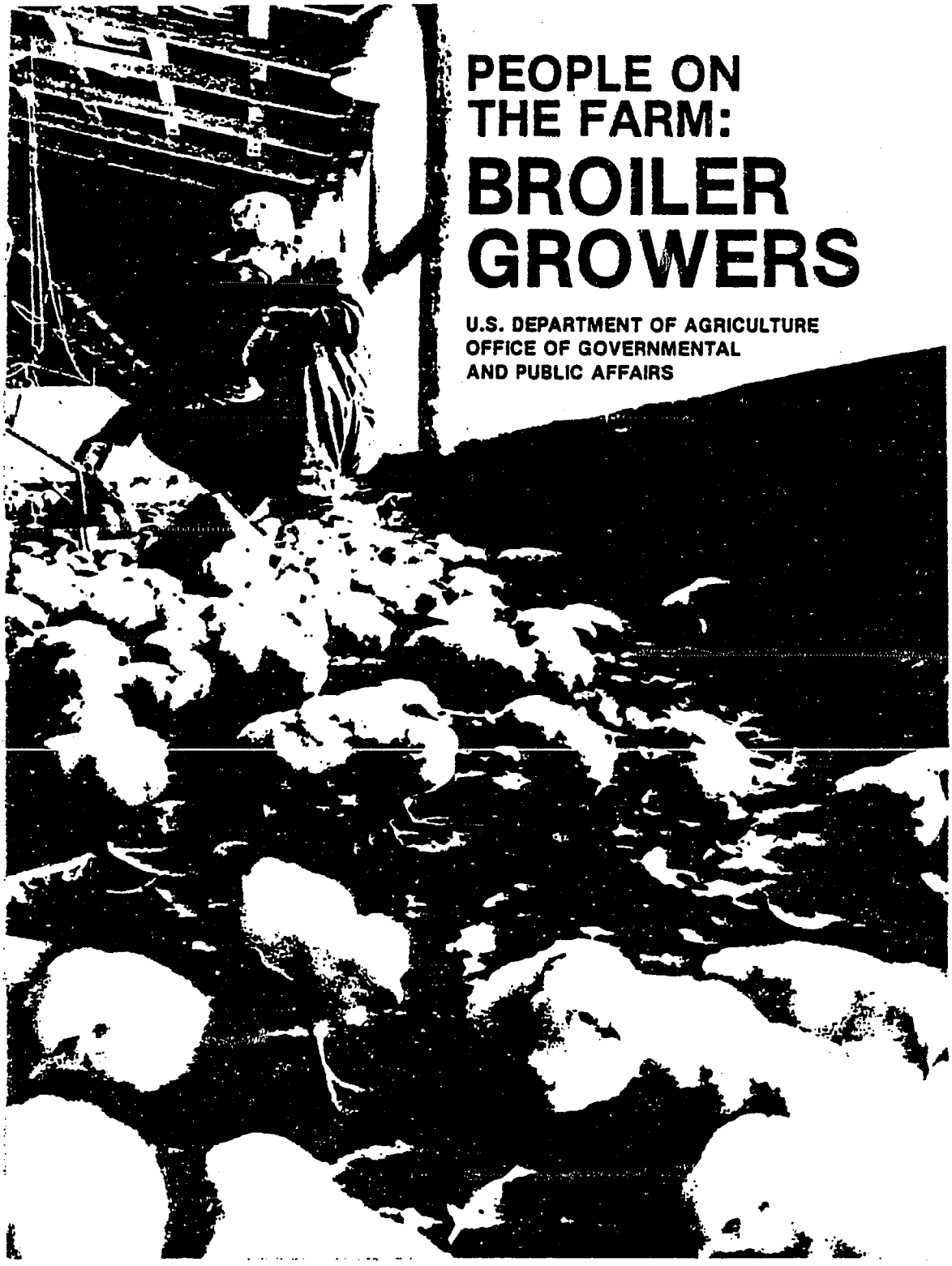
6) On a scale of 1 to 10 how would you rank your interest? (10 being most interested) 1 2 3 4 5 6 7 8 9 10

7) Again on a scale of 1 to 10 how interested would you be in learning more about raising broilers? (1-4 drop, 5-10 continue) 1 2 3 4 5 6 7 8 9 10

APPENDIX C

APPENDIX C

PUBLICATION SENT BEFORE PERSONAL INTERVIEWS



PEOPLE ON THE FARM: BROILER GROWERS

Maurice Layton smiles when a door opens midway in the long narrow broiler house and his wife, Ann, her hair swept back under a protective scarf, joins him in his work.

She takes the small broom from Maurice and starts walking among the chickens. She brushes the 8-foot-long galvanized metal watering troughs clean of any feed, dust, and feathers which might have accumulated in them overnight.

As she walks, the crescendo of the birds' chirping increases.

In the half hour that Maurice has been in the building—which is as long as a football field and a fourth as wide—his chief concern has been with the temperature. Last night's 27 degrees Fahrenheit was the coldest so far this season. "I'm glad I got in some more butane last week," he says as he checks the thermometer. He seems satisfied that it registers 50 degrees.

When Ann joins her husband in the broiler house, he turns to the heavier work—filling a cart with feed and wheeling it among 350 metal feeders from which the chicks eat. At each feeder, he stops, digs into the nutritious meal with a scoop, and transfers the feed into the circular top of the feeder. The feed settles down into trays around the bottom of each feeder at just the right height for the chickens to find their food.

Maurice and Ann can remember when it was different feeding chickens. Years ago, a farmer's wife threw out a few handfuls of grain once or twice a day to a small flock of chickens roaming free in her barnyard. The birds foraged for the rest of their feed. By the time they were 6 months old, such chickens might have become big enough to eat.

NOW IT'S DIFFERENT

Today's broilers are ready for market in one-third that time—at 8 weeks or less—thanks in large part to a scientifically controlled diet.

For years, consumers could buy broilers or frying chickens only in the summer. Then nutritionists discovered vitamin D. Suddenly it was more practical to raise chickens indoors, out of the sun, and all year round by feeding the birds cod liver oil. Other vitamin discoveries helped, too.

Meanwhile, other scientists—disease fighters—helped make it more practical for broilers to be grown in bigger and bigger flocks. The chances of being wiped out financially by some dread poultry ailment became so poor that raising broilers became a reasonable risk.

Such scientific improvements wrought awesome changes in the broiler industry. Now a computerized broiler feed mill, orchestrated by an expert with a Ph.D. degree in nutrition, provides tons of the proper feed mixture at a time. Carbohydrates, vegetable proteins, animal proteins, vitamins, minerals, stabilized fats, antioxidants, antibiotics, and other disease-fighting or nutritional additives are combined correctly down to quantities as small as 3 ounces to the ton.

This sophisticated feed is then delivered to growers such as Maurice and Ann.

Improved feeding isn't the only basis for the revolution in the broiler industry in the last few decades.

Geneticists have been working at fitting together the "perfect broiler" for years. They separated the best laying chicken strains from the best meat-producing strains. Then, producers put the first group to work laying eggs and the second into the broiler business.

Dale Yelverton, right, mill manager for McCarty-Stata Pride, Inc., broiler feed mill in Magee, Miss., and Wiley Kirkland, the firm's nutritionist and ingredient buyer, discuss feed formulations beside panel which diagrams flow of ingredients in the mill, from railroad car inputs to delivery trucks. Machine at rear reads punch cards for correct mixture of several feed ingredients being prepared for broiler growers.

ARING THE GRADE

Although all broilers are inspected for wholesomeness, not all broilers are graded according to quality. Broiler processors are not required by law to grade their birds. That's voluntary.

However, when a consumer sees this symbol on a whole broiler or broiler parts . . .

. . . it tells him the birds are:
—fully fleshed and meaty
—well finished
—attractive in appearance

That symbol means the bird is, or the parts are, from the highest quality broiler.

If the broiler or parts are grade B, they probably wouldn't be grade labeled, as that would identify the product as being of second quality. A bird bearing the only other official U.S. grade for ready-to-eat chicken—grade C—is approved for human consumption, but is diverted at the processing plant for further processing into other chicken foods and so never appears at the market.

The letters "U.S." indicate that a trained Government grader did the grading. The processor is billed for the grader's services.

Only plants which use the USDA grading service may utilize the official grade mark.

Besides grades, there are classes by which broilers are sold.

The following are the various classes of chickens:

a. *Rock Cornish game hen or Cornish game hen.* A Rock Cornish game hen or Cornish game hen is a young immature chicken (usually 5 to 6 weeks of age), weighing not more than 2 pounds ready-to-cook weight, which was prepared from a Cornish chicken or the progeny of a Cornish chicken crossed with another breed of chicken.

b. *Rock Cornish fryer, roaster, or hen.* A Rock Cornish fryer, roaster, or hen is the progeny of a cross between a purebred Cornish and a purebred Rock chicken, without regard to the weight of the carcass involved. However, the term "fryer," "roaster," or "hen," applies only if the carcasses are from birds with ages and characteristics that qualify them for such designation under paragraphs c and d.

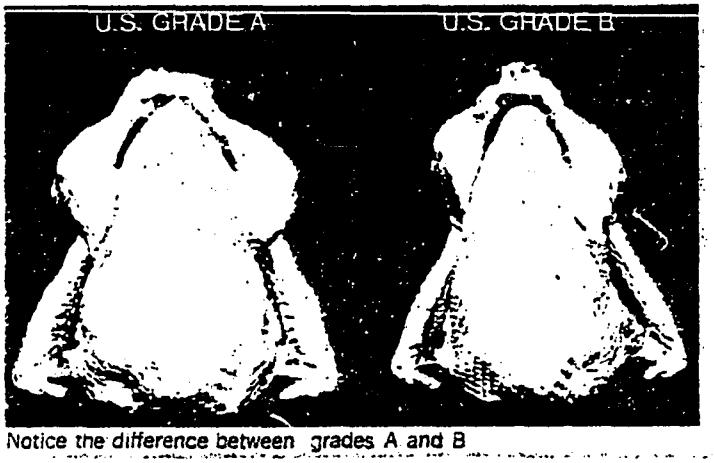
c. *Broiler or fryer.* A broiler or fryer is a young chicken (usually under 13 weeks of age), of either sex, that is tender-meated with soft, pliable, smooth-textured skin and flexible breastbone cartilage.

d. *Roaster or roasting chicken.* A bird of this class is a young chicken (usually 3 to 5 months of age), of either sex, that is tender-meated with soft, pliable, smooth-textured skin and breastbone cartilage that may be somewhat less flexible than that of a broiler or fryer.

e. *Capon.* A capon is a surgically unsexed male chicken (usually under 8 months of age) that is tender-meated with soft, pliable, smooth-textured skin.

f. *Hen, fowl, or baking or stewing chicken.* A bird of this class is a mature female chicken (usually more than 10 months of age) with meat less tender than that of a roaster or roasting chicken and nonflexible breastbone tip.

g. *Cock or rooster.* A cock or rooster is a mature male chicken with coarse skin, toughened and darkened meat, and hardened breastbone tip.



Notice the difference between grades A and B

Inspecting for wholesomeness is the job of at least one U.S. Department of Agriculture inspector, or USDA-approved inspector, in every broiler processing plant in the United States. In Jackson, Miss., one such inspector is James Slay, who inspects the broilers within minutes of their slaughter.

WHAT'S A "PERFECT BROILER?"

The broiler industry wanted birds that grow meat rapidly, especially thick meaty thighs and breasts. So it developed them. It wanted birds with strong bones at an early age to carry the extra weight of this meat. And it got them. It wanted birds that are resistant to disease and that feather rapidly (with white feathers because pulling black feathers leaves spots). Such birds were developed. The industry wanted birds with yellow skins, birds that convert less feed into more meat, birds that yield a high percentage of their weight in usable meat and, finally, meat-type birds that produce a reasonable number of eggs which will hatch into healthy chicks. It got them.

One of the most effective vehicles for improving the type of chicken to be grown as a broiler was the "Chicken of Tomorrow Contest," conducted on a national scale from 1948 to the mid-1950's. Breeders submitted eggs to a central location, where the eggs were hatched and the offspring fed until they were of market weight and then slaughtered. Broilers in the contest were judged on several factors, including their growth rate, the efficiency with which they converted feed to meat, and their shape, especially the amount of meat on the breasts and drumsticks.

The first winner was a cross between California Cornish and New Hampshire breeds. The Cornish strain provided the broad breast and thick drumsticks; the New Hampshire strain provided the fast growth and efficiency.

Other birds and crossbreeds won since then but the trend has been clear: the 1949 winning entry in a junior "Chicken of Tomorrow Contest" was a New Hampshire-Rock Red Cross. It took 13 weeks and 2 days to reach an average weight of 5½ pounds. In 1973, the top entry in the contest for young breeders was a White Cross which averaged 5.7 pounds in only 7 weeks and 5 days.

It was this combination of improved breeding and improved feeding that revolutionized the American broiler industry.

There is a saying in the industry that chickens are better fed and enjoy a more nutritious diet than humans.

But it would be hard to imagine a better breakfast than the Laytons enjoy before starting their work in the broiler houses—bacon, eggs, sausage, grits, toast and muscadine jam, and coffee.

"The kids come out of bed eating," Ann says with a smile.

SAFETY FIRST, LAST, AND ALWAYS

Every poultry processing plant in the United States which ships its products out of State has at least one U.S. Department of Agriculture inspector at work in it—usually more than one, depending on volume. And every poultry plant in the U.S. which ships just within its particular State has either a State or Federal inspector at work inside.

Broilers or broiler parts which have been inspected by Federal inspectors bear a symbol at retail which looks like this:

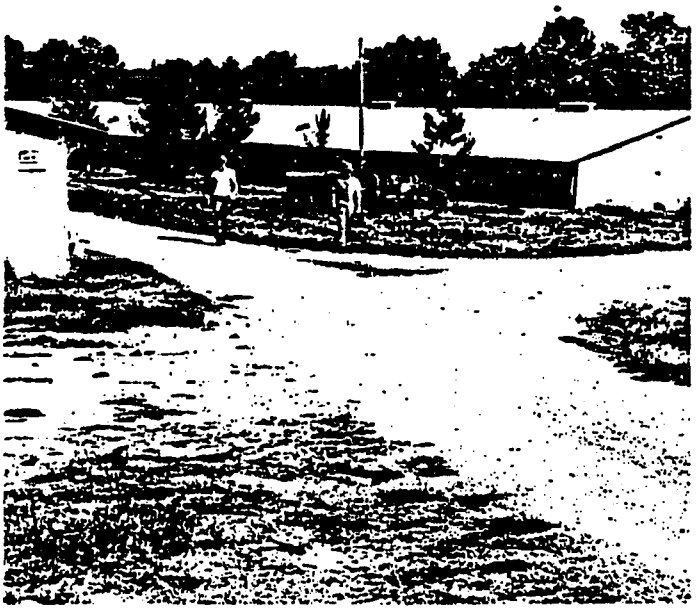
Each processing plant is inspected daily for cleanliness. Earlier, the processing system in each plant has been approved as appropriate.

When the live broilers first arrive at a plant, inspectors immediately remove those birds which have already died, are obviously ill, or are suspected of being ill or carrying a disease harmful to man.

When the accepted bird has been killed in the plant and its viscera pulled out for inspection, the whole bird is examined once again for evidence of breast blisters, bruises, or any other defect which might be unwholesome for use as human food. Breast blisters and bruises are cut out by an expert standing beside the inspector. Occasionally, whole birds may be condemned and taken out of the line.

In 1975, only 2.3 percent of broiler pounds (live weight) had to be condemned.

Other inspectors (Food and Drug Administration, State, and local) take over inspections after the broiler meat leaves the processing plant.



Maurice Layton and his son, Blake, who is home from college, walk from broiler houses toward home, about 200 yards away, after making sure birds in broiler houses are fed and other chores are finished.

Opposite page:
Ann Layton says that tending such young chicks as these day old birds is like tending babies in a nursery . . . they practically "coo" when you feed and water them. Edge of brooder canopy is at left. Young chicks will keep warm under it.

DAY'S WORK BEGINS EARLY

Work begins about 7 a.m. with two members of the family walking the 200 yards from home to the two broiler houses. Usually this is Kelvin Dirk, 14, or Anita, 17, doing their chores before catching the school bus at 7:30 a.m. This morning, Blake 20, is home on vacation from college and is able to help out. He heads toward the newer broiler house.

There are two broiler houses on the Layton farm. The older one, where Maurice begins work, is 40 feet wide and 360 feet long. It is covered with a metal roof that rises to a height of some 12 feet above the dirt floor and is supported by poles. Plastic curtains, which can be raised (to cut off the flow of air) or lowered to increase the flow of air), run the full length of both long sides of the structure.

Inside are 350 metal feeders. Maurice fills half of them in the morning. Kelvin will fill the other half after school. There are also 60 8-foot-long metal waterers with hoses attached to each. They fill with water and stop filling automatically, assuring the chickens a constant supply of water but preventing overflows.

Also in the broiler house are 20 low-hanging metal canopies called brooders, which are spaced near the longer walls of the building. These canopies burn butane gas and can be adjusted in height to bring heat close to the days-old chicks (lower position) or to spread heat throughout the house (higher position). They substitute for a mother hen when the chicks are very young, providing warmth and a place to snuggle.

In the new broiler house, which is parallel to and about 25 yards from the older broiler house, feed is carried automatically by floor level, chain troughs to the chickens throughout the house. This device is a great labor saver. Four automatic feeding troughs wend their way through the building (this building is 50 feet wide and 300 feet long) like the tracks of a toy train.

As Blake turns on the automatic feeder, the computer-formulated meal begins a measured flow from its centralized bin in the broiler house into the separate feeder troughs. The birds jump at the sound of the chains starting to distribute feed, but they soon find feed in one of the troughs near them and begin to eat. Blake keeps the troughs going until they return with some feed in them, indicating the birds have eaten all they wanted. It reduces waste. The feeder usually runs 30 to 45 minutes.

In other respects, the second broiler house is like the first: waterers, curtains, brooders, and all.

HOUSES DIFFER

Across the country, broiler houses look alike and are similarly equipped, though they will vary in length and width as well as in the age and design of their equipment. Many provide a more completely enclosed, controlled environment.

The Laytons look after 15,000 birds in each broiler house—30,000 at a time. The chicks are grown from one day of age until they weigh about 4 pounds and are large enough to be processed into the whole broilers and broiler parts so familiar at groceries and supermarkets across the United States. That is nearly 8 weeks.

From the beginning of each day to its end, it is obvious that growing broilers on the Layton farm is a family affair.

"Everybody in the family knows what needs to be done," Maurice says. "I don't have to tell them. If I'm away from home I don't have to worry."

Both Maurice and Blake check the temperature inside the broiler houses because there is a range within which the birds are most comfortable, eat the most feed, and convert feed into meat most efficiently. If possible, the Laytons like to keep the temperature in the houses somewhere between 60 degrees and 85 degrees, though it is necessary to keep day-old chicks much warmer—about 95 degrees at the edge of the brooder. The heat is gradually reduced as the chicks grow older.

For the best feed efficiency with good growth, a temperature of 75 degrees is recommended after the birds' second week in the house.

The Laytons use various methods to control the temperature in the houses. On cold winter nights they can light and adjust the gas burners in the brooders. They may also raise and lower the plastic curtains along the sides of the buildings to control ventilation. There are also ventilators in the roof of each broiler house which can be adjusted.

Good judgment is what makes good broiler producers—judgment about heat, ventilation, and humidity. The chicks may be chilled if there is too much ventilation. At the same time, the heat, which costs money to build up could be dispersed by too much ventilation. On the other hand, without adequate ventilation, ammonia from the chicken manure may build up enough to affect the eyes of both chicken and grower.

A draft or a wave of cold air directly on the birds must be avoided. So must wide daily fluctuations of temperature of 20 to 30 degrees during the first 6 weeks of growth.

If it gets too hot in the broiler

Broiler production, average producer and retailer price per pound, and civilian per capita consumption, by years (Includes Alaska and Hawaii beginning in 1961)

Year	Liveweight production	Average price received by producers per pound [1]	Retail price per pound [2]	Civilian per capita consumption
	Million pounds	*Cents*	*Cents*	*Pounds*
1935	123	20.0	29.7	.7
1940	413	17.3	29.5	2.0
1945	1,107	29.5	48	5.0
1950	1,945	27.4	59.5	8.7
1955	3,350	25.2	57.4	13.8
1960	6.017	16.9	42.7	23.4
1965	8,111	15.0	39.0	29.6
1970	10,819	13.6	40.8	36.9
1971	10.818	13.7	41.0	36.7
1972	11,480	14.1	41.4	38.4
1973	11,220	24.0	59.6	37.4
1974	11,319	21.5	56.0	37.5
1975	11,034	26.3	63.3	36.9

[1] Since the early 1960's there have been few actual live broiler sales. So this has been reported as a liveweight equivalent price.

[2] Retail prices for 1935, 1940 and 1945 are derived from prices of roasting chickens those years.

Maurice and Ann Layton examine a new batch of broiler chicks. Young birds will cluster around the gas-fired brooder canopies (one is suspended between the Laytons) during the early days of their stay. Curtains on outer walls of the building can be raised or lowered to control air circulation and temperature.

houses, the birds might suffer heat prostration. Besides, broilers don't eat when it gets too hot . . . or even when it gets too dark. Broiler growers leave some lights on at night during the summer so the birds will eat during those cooler hours, and in the winter when the days are short. Lights also help prevent chickens from piling up on one another when they become frightened.

Even if a new person should suddenly be placed in charge of them, broilers will become distressed.

WATERERS AND FEEDERS NEED CHECKING

After checking the temperature and making whatever adjustments are necessary, the Laytons clean the waterers and either turn on the automatic feeding troughs in the newer house or fill half the circular feeders in the older house.

At the same time, they are checking to see if the waterers and feeders are at the correct height. All must be adjusted upward as the birds grow taller. At the right height, the birds are more likely to eat more and spill less. Also, the birds can develop breast blisters if they are able to rest on the edges of feeders or waterers.

When there are 50 waterers and 350 individual feeders, or 50 waterers and 4 long automatic feeder lines in a broiler house, one has a lot of adjusting to do.

On most visits to the broiler house, Maurice or someone else in the family will walk slowly and deliberately among the 15,000 birds, listening and looking for signs of illness among the birds. Usually, there is a low chirping among the birds punctuated by louder chirps of alarm if there is a sudden noise or movement. It's almost as if they are saying "we're getting along, eating and drinking. We don't especially mind you, but don't get rough or hostile."

A startling thing happens when Maurice interrupts this walk to whistle a long single note. An immediate silence falls over the chickens. There is no more chirping at any level. Heads stand upright. Eyes are alert.

Maurice says it's instinct telling the chickens that the whistle might be the sound of a hawk swooping down on them. Maurice takes advantage of the birds' silence to listen attentively for sounds of breathing difficulties or other signs of illness.

The Laytons frequently examine the litter in each house. Litter is a blanket of wood chips, sawdust, or other soft absorbent material upon which the birds walk and rest in the broiler houses. It is removed or covered as it becomes caked and is ultimately removed and replaced with new litter. Caked litter will irritate a bird's breast when it rests, causing blisters which

Cleaning out waterers is essential daily chore in broiler house. Note that each waterer that Anita Layton is sweeping out can be adjusted to growing height of birds.

GETTING DRESSED FOR DINNER

When the broiler firm picks up the finished broilers at the growers, the birds are taken to a modern poultry processing plant. There the birds are disassembled quickly, cleanly, and efficiently.

The aim from the beginning is to get the slaughtered birds washed and cooled as quickly as possible to prevent bacterial spoilage.

Defeathered by machine, after it has been machine-killed, the chicken quickly passes through devices which neatly remove the head and feet. Swiftly it is moved on.

Skilled workers with sharp knives stand shoulder to shoulder swiftly opening the bird for inspection by a U.S. Department of Agriculture (USDA) inspector. A skilled trimmer beside the inspector removes any blistered breast or bruised part that the inspector indicated.

Then, on to the rest of the disassemblers—the liver trimmers, the gizzard cutters, and so on—until finally one more inspector says it's okay to send the broiler into a chiller.

It's been just 20 minutes since the broiler was killed.

After chilling, the broiler carcass is graded for quality, and either packaged as is or sent along to more cutters. If a fast-food chain wants birds that weigh in the range of 2 lb. 6 oz. to 2 lb. 10 oz., a delicate set of scales separates out the carcasses in this weight range and sends them to a special station for custom cutting.

Finally, the whole birds and the parts are packaged for specific markets. Trucks take them to food establishments, distributors, and retailers.

A use is found for every part of the chicken. Some deboned meat, such as from backs, necks, and wings may go into hot dogs and bologna. The feathers, bought with the rest of the residue by a local rendering plant, may go into feather meal or a high protein product used to feed chickens, which may "visit" the same plant several months later. Heads, entrails, and feet may go into poultry feed or pet foods.

reduce the value of the bird in the processing plant.

It takes about an hour and a half each morning for Maurice and Ann to take care of their broilers. They repeat the process about noon, and the children carry on for them in an after-school visit.

After the morning's care of the chickens, Maurice and Ann head for the house and a coffee break.

The brick ranch house that they built themselves for $15,000 replaces their first home, destroyed by fire in 1970. The paneled kitchen is roomy enough for the entire family, yet provides opportunities for two people to converse—at a lunch counter or beside a coffee table before the comfortable couch.

CHURCHILL QUOTED

"Sir Winston Churchill said something to the effect that useful human being are divided into two classes," Maurice muses. "Churchill said there are those whose work is work and whose pleasure is pleasure, and then there are those whose work and pleasure are the same thing.

"That's the way I feel about farming. It's not work. It's a pleasure. I don't want to quit even when the sun goes down."

Then, Maurice, a graduate of Mississippi State University, added: "Jefferson said that those who labor in the earth are the chosen people of God."

"There is no way you could get me back into town," Ann says. And her idea of being crowded is living in the town of 5,000 where she was reared.

Ann, too, holds a degree—from Mississippi University for Women—in bacteriology. That got her into trouble when she first started caring for chickens. She took too much time scrubbing out the waterers—as if they were test tubes in a laboratory. Such scrupulous care wasn't necessary in a chicken house

and took too much time. It was inefficient, and efficiency is a key word in today's broiler industry.

Over the past few decades, the old-fashioned farm where chickens were bred, hatched, fed, slaughtered, and finally sent to market—all on the same farm—has vanished. The business of growing chickens changed so fast it exploded into a half dozen pieces, then recombined into a huge shiny new "chicken machine" with boundaries far beyond the individual farm.

While there may be some question about the independence of today's farmer in the broiler industry, Maurice and Ann Layton are farming, and they love it. For them, the broiler industry is a golden opportunity to live the way they want—on a farm, with the family, all the while building an equity in their property and enjoying life in the country: hunting, fishing, and "listening to the birds go to bed at night," as Ann describes it.

"I always wanted to raise nothing but cattle," Maurice says, "but I can't afford to do it today. My daddy was getting 30 to 35 cents a pound for calves back in 1950 and that's still what I can sell them for, even though the cost of raising them has gone way up."

So the Laytons and many others have chosen to grow broilers as well as raise cattle.

Maurice's father was one of the first in his part of the South to switch from raising cotton to raising feeder cattle—young cattle that are born on the farm and sold at a light weight to others to be fed until large enough to be slaughtered for meat.

Like a lot of other farmers and their sons, Maurice and his dad had an agreement. As he grew to manhood, Maurice would work with his father clearing land of brush and trees, with the understanding that he'd be able to buy 320 acres of it later. "Later" came in 1956 when Maurice was discharged from the Army after 2 years of service.

THE LAYTONS BEGIN FARMING

Maurice and Ann, the girl he married before entering the service, fixed up a tenant house as their home and borrowed $24,000 from the Federal Land Bank to buy their 320 acres. The Land Bank is a farmer-owned financing institution which borrows funds from the Nation's money markets to lend to farmers to buy land.

Maurice and Ann tried raising hogs and cattle, using some animals they had obtained from Maurice's father. But things didn't go well. "The bottom had fallen out of the cattle market," Maurice says. Prices for feeder steers weren't high enough for Maurice and Ann to keep up payments on a $22,000 production loan from the Farmers Home Administration (FmHA). The FmHA, a Government agency, lends millions of dollars each year to thousands of farmers to help them with their farming operations. This often supplements the money lent to farmers by local bankers and other sources.

By 1964—8 years after they started farming—Maurice and Ann were $12,000 behind in payments on that loan. In addition, three children had joined the family, so family living expenses were higher.

That year, Ann went to work as a child welfare worker in nearby Mendenhall, and Maurice became a salesman for the Magee Cooperative—essentially a farm supply store owned by farmers in the community.

"For the next two years," Maurice recalled, "we sold some cattle, raised vegetables for sale, and spent very little." The two older children were in school most of the day; the youngest stayed with his grandmother.

By 1966, because of the jobs in town and a slight increase in cattle prices, the Laytons had caught up on the delinquency on their cattle loan. So Ann quit her job in town.

"We decided that we should give our children the attention that I was giving other people's children," Ann says firmly.

And to make sure she could stay home, they went into the chicken business—to stabilize their income against the ups and downs of the cattle market. They first decided to grow meat-type pullets—young chickens that would grow to maturity and lay eggs that would become broilers.

They borrowed $6,000 from the Federal Land Bank to help build an $8,000 chicken house and another $1,000 from a local bank to help equip it.

Success began to creep into

BIG BUSINESS

Much about the broiler industry is big. The four largest firms together processed 2 billion pounds of broilers (live weight)—or 18 percent of the total market—in 1975. More than half (55 percent) of the total broiler market was processed by 20 firms that year.

A cooperative, Gold Kist, has a total capacity in its several plants to handle an estimated 108,000 birds per *hour*.

Other familiar names like Holly Farms, Kentucky Fried Chicken, Perdue, Swift, Valmac, Tyson Foods, J&M Poultry, Central Soya, Conagra and Wayne Poultry Division of Allied Mills are among those that the industry rates as its top producers.[1]

[1] Firm or product names used in this publication are solely for the purpose of providing specific information. Mention of these names does not constitute warranty of a product by the U. S. Department of Agriculture or an endorsement of it by the Department to the exclusion of other products.

COUNT DOWN

They started counting the farms which grow broilers in 1954. That year, there were 50,094 such farms.

In 1969, the number was down to 33,688. Figures from the 1974 Census of Agriculture were not yet available by publication time.

their lives.

Maurice and Ann stayed in the pullet business—growing chickens for the local cooperative—until late in 1967, when the cooperative went out of the poultry business.

In February 1969, the Laytons signed a contract with McCarty Enterprises (now McCarty-State Pride, Inc.) to grow broilers. They built another chicken house, but this time the cost of construction had gone up to $12,000. Among other reasons, the equipment was more sophisticated. A chain feeder, for instance, would help the Layton family care for more chickens.

Within a year, Maurice had quit his job in town . . . broilers were providing the income security he thought he needed to back up his cattle operation.

Across the country, few farmers are full-time broiler growers. For the most, broiler growing is combined with other farming operations or a job "in town."

CONTRACT SPELLS OUT TERMS

This is how broiler growing works for the Laytons.

The birds that the Laytons raise from one day to about 7½ weeks of age are actually owned, beginning to end, by McCarty-State Pride Farms, Inc., of Mississippi. McCarty-State Pride is a firm created by combining companies (once separately owned) which produced live broilers under one ownership and processed them under another. McCarty Enterprises was one of the original companies.

The Laytons sign a new contract with McCarty-State Pride for each group of broilers brought to their farm. In late 1975, the contracts called for the Laytons to be paid 2¾ cents a pound for the final live weight of the birds that they raised.

There are two other important aspects of the contract.

First, there is a guaranteed minimum payment that McCarty-State Pride pays the Laytons in case disaster should strike the flock on the Layton farm.

Second, there is the bonus payment the Laytons receive if the birds they raise convert feed into meat at a better than average rate.

In the fall of 1975 the minimum payment was 6½ cents for each bird placed in the broiler house.

However, when the birds are taken by McCarty-State Pride for processing, the Laytons are paid by the pound, which adds up to more than the guaranteed minimum. Their payments usually average 10 cents a bird.

The minimum payment is designed to cover the cash expenses of raising the bird: heating bills, mortgage payment,

It paid off when a major crisis hit the Laytons in 1974. Small but unacceptable levels of the toxic pesticide dieldrin were found in some chickens being slaughtered in Mississippi. Broilers being grown by McCarty Enterprises (as the original firm was named) and others had to be destroyed.

"I wasn't thinking so much of the $2,000 to $3,000 of anticipated income we lost that year; it was just the waste of those birds," Ann says.

The dieldrin in the birds was discovered as the U.S. Department of Agriculture monitored the level of some 50 chemicals in the carcasses of livestock and poultry.

Earlier, in 1973, McCarty had experienced an exceptionally good year in profits, so the firm had raised its contracts from 2.25 to 2.75 cents a pound and then made the increase retroactive for 8 months and paid their growers the difference. Retroactive reductions are not legal.

After the dieldrin incident—and also because of market conditions—McCarty cut its contracts to 2.34 cents, or 15 percent. Since then, contracts have returned to 2.75 cents a pound.

FEED-TO-MEAT RATE VITAL

One of the tipoffs of good broiler care is the rate at which the broilers convert their feed into meat. Broilers convert, on the average, 2.1 pounds of feed into 1 pound of meat. McCarty-State Pride growers average about 2.05 pounds of feed to 1 pound of meat.

Feed conversion ratio for broilers, United States, selected years.

Year	Ratio [1]
1940	4.22
1950	3.27
1955	2.80
1960	2.41
1964	2.39
1975	2.10

[1] Pounds of feed per pound of broiler meat.

If the Laytons should achieve a conversion rate of .05 pounds lower than the average of those farmers contracting with McCarty-State Pride during the 3 weeks before, during, and after the firm takes the birds to processing, they will be paid another quarter of a cent a pound (for a total of 3 cents) for the birds they raised under that contract.

Beef cows and calves are the other half of the Laytons' major sources of income. Broilers don't keep Laytons occupied full time. Neither do these beef cattle. Together, they offer Laytons opportunity to stay on the farm. Calves are sold to others to be fed to market weight.

However, if the Laytons require more feed than the average to make a pound of broiler meat, it lowers their payment by a quarter of a cent a pound (making the payments 2.5 cents a pound).

So the idea is to raise a larger bird but with the least amount of feed. The Laytons once made an average of 1 pound of broiler meat from 1.95 pounds of feed with one batch of birds which averaged 3.9 pounds each. "We've been trying to achieve that again ever since," Ann says.

FIRMS COMBINE ASPECTS OF PRODUCTION

Broiler production requires vast investments of money and skilled management.

These are two reasons the broiler industry is an industry of concentrated ownership and increasing vertical integration.

What is vertical integration?

What were once independent feed dealers or feed manufacturers on one side of the farmer and processors on the other side are now combined under one ownership and involved in nearly all aspects of broiler production. In addition to providing the feed for growing the broilers under his control, a feed manufacturer may also take care of financing the entire enterprise, hatching the broiler chicks and processing the birds when they are ready for market. Like the farmer of old, he retains ownership of the bird from birth to death. That's vertical integration.

Some firms are integrated horizontally—owning more than one processing plant, feed mill, or hatchery.

Even in cooperatives, the broilers are owned by the integrator, which is the cooperative, and the farmer-growers sign contracts for raising the birds. Broiler cooperatives operate in much the same manner as other integrators—even dropping inefficient growers when necessary—but are owned by the farmer-growers, who share in successes or failures.

Essentially, there is no open market for live broilers in the United States. Probably 99 percent of the broilers grown in the United States are grown under some type of vertical integration or contractual arrangement. The other one percent is produced by small independent growers who continue to supply a select market, probably in a nearby city, and who charge a little more for their birds because each bird costs more to raise.

The industry is a productive chain, with the housewife or

diner at one end and the producers of better poultry lines at the other. Broiler growers such as Maurice and Ann Layton are indispensable links about mid way.

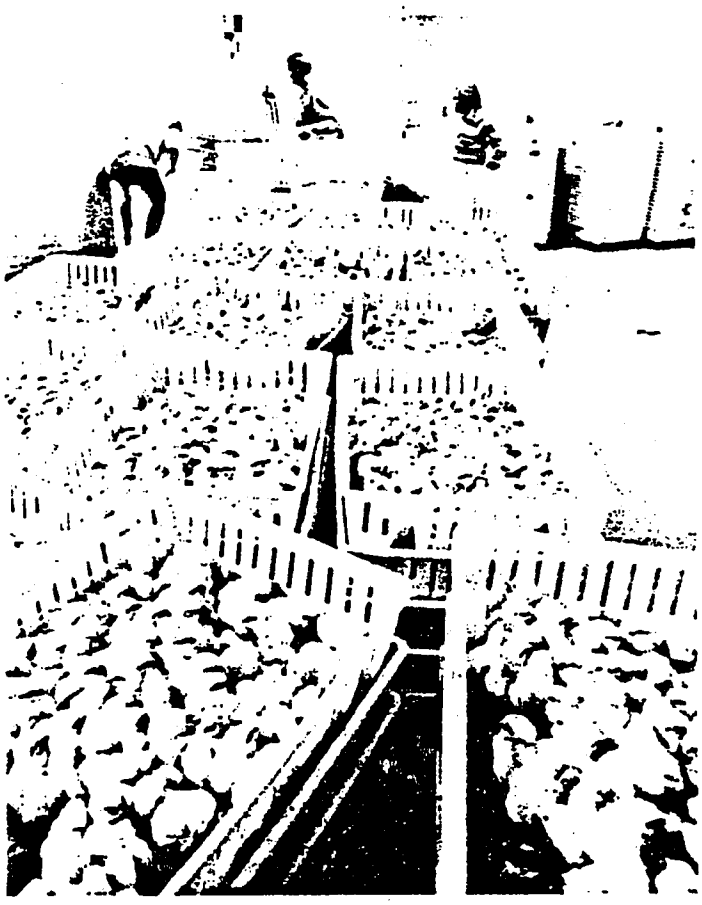
Extension specialist, Dr. Robert L. "Bo" Haynes of Mississippi State University, explains that if the grower can't make enough money to survive, then the integrator will be hurt . . . and so will the agency which lent the farmer the money to build his houses and grow the birds.

Even so, most farmers are not in a strong bargaining position to change integrators—shop around, so to speak, for the best contract. Integrators are forbidden by law, from dividing up the territories that they will serve, although if a grower should wish to change integrators, the integrator he approaches makes the final decision on whether to handle his business.

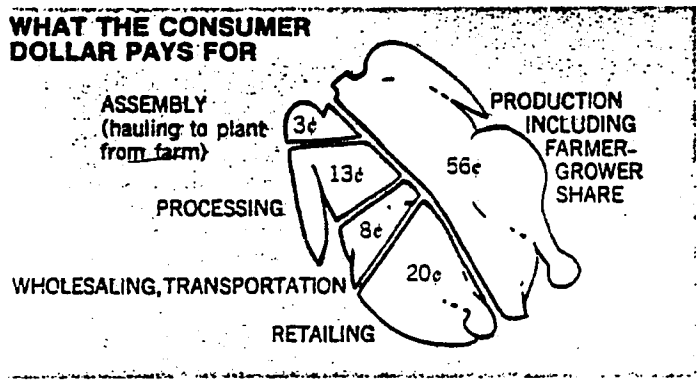
Farming is significantly different for the Maurice Layton who raises cattle than it is for the Maurice Layton who grows broilers. As a cattle raiser, he owns the animals he is feeding as well as the feed which goes into them. He makes all the traditional decisions that cattlemen make: how many to raise, what kind to raise, how to raise them, when and how to sell them.

The Maurice Layton who grows broilers, however, doesn't own the birds or their feed; he makes none of the major financial decisions concerning them, though he tends them very carefully each day.

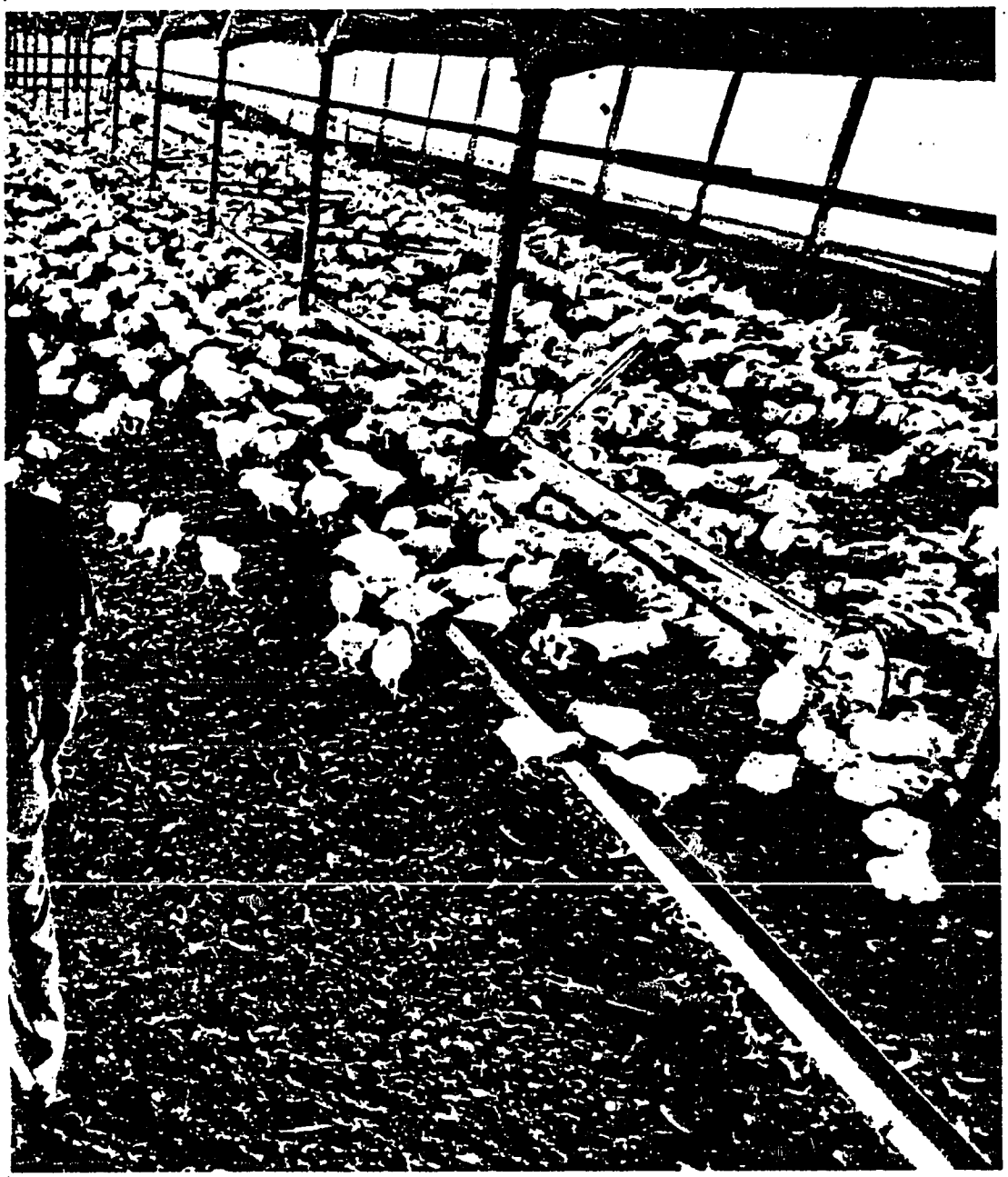
McCarty-State Pride—and the other integrators around the country—have assumed the financial responsibilities and many of the management decisions such as the feed to use, when to sell and where, what chicks to buy and in what numbers.



A batch of 30,000 day-old chicks headed for the Layton farm are moved out of McCarty-State Pride hatchery under guidance of Magee hatchery manager Eddie Loftin, right.



Broilers seem to explode like popcorn to fill their houses during the 7 to 8 weeks of their stay on the Layton farm. These 5-week-old birds surveyed by Maurice Layton occupied only a third of this space the day of their arrival on the farm. Devouring the scientifically formulated and mixed feed brought to them by long chain feeders (only half



the length of the Layton's newer broiler house is shown), the chicks convert every 2 pounds of feed into about 1 pound of meat, growing to a weight of nearly 4 pounds in less than 8 weeks. At 8 weeks of age, broilers weigh 43.7 times their original hatching weight. If humans grew at the same rate, an 8-week-old baby would weigh 349 lbs.

PRODUCTION BEGINS WITH PULLETS

At the beginning of the production line, McCarty-State Pride buys breeder pullets that will be raised by specialized farmers until they are hens ready to lay eggs. Another group of farmers on contract oversees the production of these breeder hens' eggs, which are picked up by McCarty-State Pride's trucks for delivery to the company's hatchery. Such layers produce eggs for hatching into broiler chicks for about 40 weeks. Then they are sold, some ending up in stores as baking hens and some being used in soups and pot pies.

(Usually in the industry, breeder pullets will be raised by the same farmers who later handle the production of hatching eggs from these birds.)

Hatched, vaccinated, and partially debeaked (just enough to prevent them from causing much harm to other chickens) the broilers-to-be are delivered at one day of age to broiler growers such as the Laytons. The birds are delivered in specially built, temperature-controlled chick buses that look like school buses.

In anticipation of such a delivery, the Laytons turn on the gas heaters in the brooders to warm the house. Earlier, they have cleaned and disinfected the broiler houses with special equipment during the 2 or 3 weeks the houses are empty between flocks.

After the Laytons have fed the broilers until ready for market, McCarty-State Pride sends out crews of catchers at night because chickens squat in the dark, become less excited, and are easier to catch. The catchers place the broilers in coops, put them aboard trucks, and haul them to McCarty-State Pride's processing plants, where they are inspected and prepared in appropriate ways for supermarket meat counters and other uses. The U.S. market in 1975 (as measured at federally-inspected processing plants) took 4.8 billion pounds of whole broilers, 2.6 billion pounds of cut up broiler meat and 541 million pounds of broiler meat that was further processed. Many of the whole broilers that left the processing plant were cut up into pieces before reaching meat counters in stores.

The expected market for broilers affects everything McCarty-State Pride does—weeks, months, even years in advance.

Eleven weeks before Christmas, McCarty-State Pride reduces the number of chicks hatched because people buy fewer broilers at Christmas time. Another cutback begins before Labor Day, when children start eating their lunches at school.

McCarty-State Pride's charts show that the biggest demand each year is around the Fourth of July, which is the high point for picnics and barbecues.

In November 1975, McCarty-State Pride's marketing people told the production boss, Tom Sparks, how many broilers they expected to sell every week in 1977. Then Sparks went through his system, determining how many eggs would be needed to produce the pullets that would become layers of eggs that would become broilers.

"The farmer's livelihood depends on how accurate I am," Sparks said. "If a broiler house lies empty for a month between batches, the farmer is losing money."

Normally, the houses are empty only 2 or 3 weeks between growing periods.

Naturally, Sparks and others in his position watch the prices

HOW CHICKEN IS PROCESSED FOR MARKET

Ninety percent of all broiler-fryer chickens produced in this country are sold as fresh or processed, and are shipped after being ice packed, CO_2 packed, or deep chilled. The rest is frozen or fully cooked. What do these terms mean to the consumer?

ICE PACK: The birds are plucked, eviscerated, USDA-inspected, and chilled. They are then shipped fresh, packed in containers filled with shaved ice. In a CO_2 pack, carbon dioxide "snow" is used as the refrigerant. This process is essentially the same as the ice pack method.

DEEP CHILL, CHILL PACK, OR CRYSTAL PACK (more and more replacing ice pack methods): Chicken is rapidly cooled to 28° to 32° F, but not frozen. The chickens are usually packaged at the processor level and shipped dry-packed without ice in refrigerated trucks. This method of processing may result in some crystal formation. The flesh should be soft enough so that the shopper can depress the surface with his fingers.

FROZEN: The chicken is quick-frozen at the processing plant, shipped, and sold frozen. It is available in many forms—whole, parts, and precooked.

FRESH, FULLY COOKED: Chicken is fried, pan fried, roasted, barbecued at the store or in fast-food outlets, or is sold as delicatessen products in supermarkets.

Sometimes a package of chicken will bear the label "ready to cook." This means simply that the chicken has been plucked, eviscerated, chilled, and is ready for the consumer to cook as soon as removed from the package.

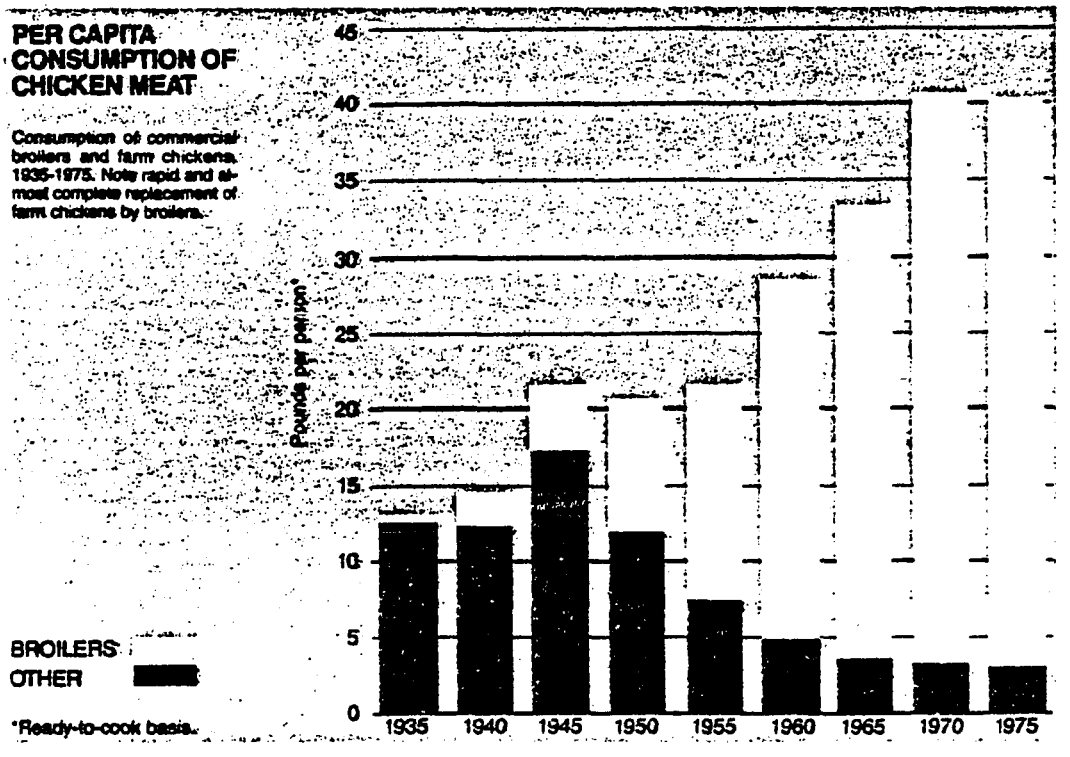
The time between processing and delivery to the consumer of unfrozen broilers is shortening. The elapsed time from live bird to retail store can be as short as 1 day but may be as much as 2 to 4 days.

being paid for broilers and try to anticipate what those prices will be in the future. They know that the prices will depend not only on the number of broilers for sale but also on per capita income in the Nation, as well as the available quantities of competing foods—such as beef and pork—and their prices.

The availability and price of feed also affect the integrator's decision on how many broilers to grow. If the cost of production goes up, the integrator might cut back on his production.

Relieved of such marketing problems, today's broiler grower is still out on the farm and enjoying it.

Like other farm wives, Ann Layton has to juggle a lot of activities to get everything done. After preparing the noon meal for family and visitors, she takes a call from a friend concerning her art activities.

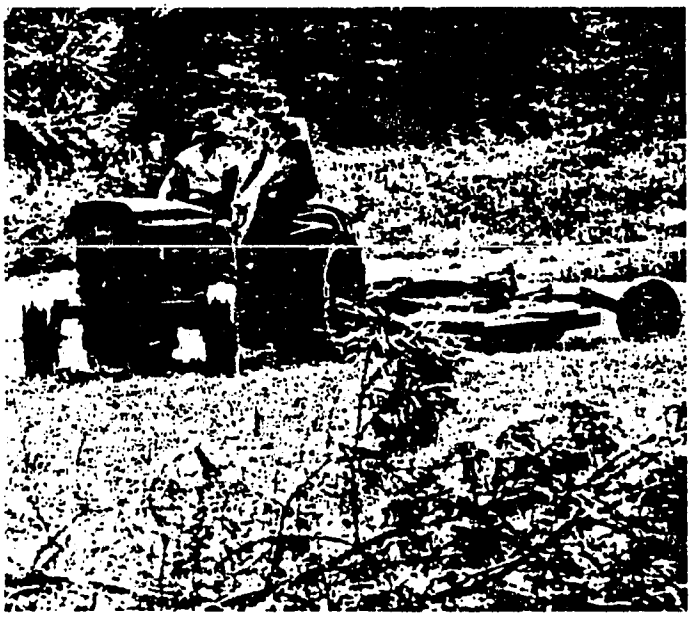


LAYTONS BUSY IN MANY WAYS

In December 1975, Maurice Layton was grazing three bulls, 100 brood cows, and 125 steers of his own, and taking care of another 75 cows and 75 steers for his mother. Each of his sons also is financially and physically responsible for a junior herd of 10 animals of his own, unless, as in Blake's case, college studies keep him away from the farm.

While Maurice brings hay to the cattle and checks on their condition each morning—"making sure they're all up and able to move"—Ann cleans the house and starts cooking the noon meal.

A typical noon meal at the Laytons might include fried chicken (they have it two or three times a week, buying it at the grocery), pinkeyed purple-hull peas, sweet potato pudding with raisins, candied sweet potatoes, pickled beets, fruit salad, rolls, iced tea, and jam cake. If guests



Noontime television news is important to most farmers, who must keep an eye and an ear tuned to current prices —of the goods they're buying and of the products they're selling. Maurice Layton, in a chair next to his kitchen, checks the prices of farm products in the Jackson, Miss., area.

Kelvin Layton joins brotner Blake on tractor hauling a pasture clipper. Benind them is family woodlot which provides timber to meet some expenses, including Blake's college education.

are expected, Ann might add corn bread, turnip greens, and potliquor (the liquid left in a pot after cooking meats or vegetables).

But even such good food can't keep the Laytons from the noon television reports on weather and markets.

The noon meal is timed so that the Laytons can switch on the television in the living room at 12:10 p.m. to hear weather predictions on channel 3 out of Jackson, Miss., followed by the markets at 12:15 p.m. The day's prices are quoted on such farm products as canner and cutter cows, heifer calves, and "good young stocker cows." Comments are heard from the set, such as "well, the hog market is up today" (followed by details) and "in Georgia poultry, the broiler market remained unsettled" (again followed by details). Local farm market prices are examined in great detail by the television announcer.

After the noon meal, the Laytons return to the chicken houses to repeat the morning routine and also check on the cattle.

Sometimes the calves are vaccinated. Other times, cattle are moved from one pasture to another. This can be done anytime the chickens aren't being cared for. From December until spring the cows are calving and need special attention.

There are a lot of chores on a farm—routine work that needs attention, sometimes daily, sometimes three times a day, sometimes according to the season of the year.

The Laytons need to cut the hay three or four times from May until October. They bale the hay in 1200- to 1500-pound bales, and keep the hay in the field for feeding the cattle from November through March. (The bales, thanks to modern machinery, are much larger than the familiar smaller ones stored under cover.)

Friendly banter is typical of relationship between Maurice Layton and company serviceman, Tim Waller. Behind them is bin which provides feed for chain feeding troughs in the Laytons' newer broiler house.

Two other activities directly concerned with the chickens occur anytime during the week. One is the delivery of feed from McCarty-State Pride.

In addition, the company's serviceman comes by twice a week.

SERVICEMAN KEY LINK WITH INTEGRATOR

The serviceman is the broiler owner's representative. He drops in regularly to see how the birds are doing. He "talks shop" with the farmer, offering advice, perhaps on how to make the best use of the integrator's feed. He brings medicine and checks on flock losses. He listens and looks for any signs of stress in the flocks. He's on call 24 hours a day to help growers with any problem in growing the birds.

The serviceman is an expert. He's probably a college graduate with a specialty in poultry. He also needs to be a diplomat. Some growers think they already know how to raise chickens without advice.

"Chicks don't need as much physical labor as they need 'tending to,'" Maurice explains. "You have to move through them slowly, or they'll crowd up against a wall and smother."

Chicks that carry bruises from such a feathered stampede aren't worth as much at the processing plant.

Once, Ann recalls, a helicopter circled over the farm and the Laytons found 150 dead chickens huddled in one corner of their house.

In effect, the Laytons are operating a finely tuned production machine (within another finely tuned machine, the broiler industry).

"Growing broilers is a continuous process that one man or a few people can handle better than a lot of people," Maurice said, "and if you turn your back on it very long, something is sure to go wrong."

Even when they are in their home, the Laytons have an ear tuned to the broiler houses and any unusual sounds.

Ann says that when the chicks are new, entering the broiler house is like walking into a nursery.

"The chicks are all chirping and busy when you come in, but by the time you leave, after cleaning out the waterers and feeding them, they're all settled down—cooing, sort of," she explains.

Maurice says that by the time the chicks are 6 to 7 weeks old, a half dozen "pet" chickens will come to meet him at the door as he enters.

FARM BECAUSE THEY WANT TO

"Ninety percent of the people farming today do so because they want to farm," Maurice says. "Back in the Thirties, they farmed because they didn't know anything else to do."

Now the Laytons' eldest child is learning that his "something else" is entomology—a science that deals with insects. Ann says he doesn't have that "chemistry" between animal and human that a broiler grower needs.

Obviously, his parents do.

Ann used to help with the cattle as well as the chickens. Before the boys got older and could take her place, she was out there herding and vaccinating with the best of them.

"Nowadays they've retired Mama," Ann said somewhat ruefully at the kitchen sink. "I'd rather be out there than in here. The quicker I get through with the housework and onto something else, the better."

Ann, like the rest of the family, is devoted to the outdoor life.

"We keep a 'corner' of the farm for wildlife and timber," Ann says. "Actually, we have several spots set aside for wildlife. They're part of the farm plan."

Does Maurice recommend broiler growing to others?

"Only if they have a real desire to do it," he replies.

Maurice and Ann figure they have a quarter of a million dollars invested in their enterprise, most of that in the price of their land. Besides land (which was valued at an average of $382 an acre in Mississippi in 1975), the Laytons have a $30,000 investment in cattle, about $40,000 in broiler houses and broiler house equipment (estimated cost of replacement today), $15,000 in their own home, and $25,000 in other equipment, such as two tractors, a hay baler, a disc, a pasture clipper, harrows, plows, planter-cultivator, and two hay mowers.

With this investment and a lot of work, they gross about $30,000 to $35,000 a year—including $16,000 on the cattle, $12 to $15,000 on the broilers, and $1,500 on timber sales.

In 1973, the Laytons netted about $18,000 after operating expenses, before taking out depreciation and debt payment (about $6,000 and $3,000, respectively).

Annual depreciation is the amount a farmer figures his buildings and machinery have lost in value in a year. He still has the cash equal to the depreciation and may spend it for operating the farm or anything else he wishes. However, if he doesn't have that money when the building or machinery needs to be replaced, he may need to borrow to pay for them.

In 1974, the Laytons netted only about $9,800 (and depreciation as well as debt payment still had to be subtracted).

In 1975, with a gross income of $31,565, the Laytons netted $11,665; but again, depreciation and debt payment whittled that down to about $3,000. That's what the Laytons make for their management and labor and return on their investment.

"What the farmer is trying to do," Maurice said, "is to accumulate something for retirement or for the kids—not put money in the bank."

He smiled and added, "From

MAURICE AND ANN'S INCOME AND EXPENSES, 1975

Income from:	
broilers	$14,000
cattle	16,000
timber	1,565
TOTAL	$31,565

Expenses	
seed	$ 1,500
feed	2,500
fertilizer	5,000
butane	1,500
electricity	150
repairs, broiler house	1,000
interest	3,000
income tax, social security	600
general repairs	1,450
other fuels	1,500
worming medicine, cattle	500
insurance	1,200
depreciation	5,600
debt payment	3,000
TOTAL	$28,500

Income	$31,565
Expenses	$28,500
Net	$ 3,065

Net covers management, labor, and return on investment

A university graduate who loves the country life. Ann Layton finds time between broiler care and other activities to express herself artistically.

Blake Layton studies entomology, a science that deals with insects, in college. Even when home, he's working on it—as well as helping around the farm and holding down another job.

a financial standpoint, I'm sure we'd be better off to sell out, invest the money for the interest, and find jobs doing something else; however, with us, farming is a way of life that we really enjoy."

At the end of 1975, the Laytons owed about $10,000 on their cattle, $10,000 on feeder calves, and $25,000 on the real estate.

BUILDING EQUITY WITH LABOR

Broiler growers with limited capital can build equity (an estate—property ownership—call it what you will) with family labor.

"The broiler industry is the salvation of the small farmer," Sparks says.

Compared with the farmer who raises just crops and no livestock or poultry, the broiler grower gets four or five paydays a year rather than just one or two big ones when the farmer sells his crops after harvest (assuming the crop grower has a good growing season).

Watching a feed truck being unloaded into his storage bin, Maurice says "That's what looks good to me. I don't pay out cash for feed, and I know I'm going to get something for my labor. Before I started growing broilers, I wasn't sure I was going to get anything for my labor OR my investment."

FAMILY HAS VARIED INTERESTS

The lives of Maurice and Ann Layton generally center around their children, but they have succeeded in maintaining some time for their own pursuits. For instance, Ann is caught up in crocheting, needlepoint, hooking rugs, painting and ceramics. Another of her projects is to establish better research facilities at their community library in nearby Magee.

Maurice is not only busy in promoting the conservation of land and wildlife in his area but attends university evening classes in political science, psychology, and sociology in nearby Raleigh.

Together, the Laytons are active in 4-H, the Farm Bureau, the Mississippi Cattle Association, and the Poultry Producers Association. The 4-H is a nationwide program coordinated by the Cooperative Extension Service. It involves young people and their parents in a great variety of activities—often outside of agriculture. The Farm Bureau is an independent general farm organization, the

Anita Layton and her Tennessee Walking Horse, Breezy, like to pause in one of the Layton farm's many ponds after riding over open fields. Riding is one of the reasons Anita likes the country life.

largest farm organization by far in the Nation.

As a part of 4-H activities, Anita, the daughter, has visited Washington, D.C., Chicago, Ill., and East Lansing, Mich. She'd like to be an anthropologist or an archeologist.

Her older brother, Blake, helped organize the Junior Soil Conservation Commissioners of Mississippi in 1972 and was named State youth conservationist of that year.

The farm permits Kelvin to be close to the nature that he loves. When a man once came to the Layton home and inquired if it were for sale, Kelvin, the only Layton at home, declared, "No way. This home will never be for sale."

"Life's to be lived and enjoyed," Maurice says "In the spring of the year, when everything is green and the grass is growing food, that's heaven on earth."

It was for the children that Maurice and Ann left their jobs in town to return to the farm. It is for them they are building an equity in land, buildings, and cattle.

The children, for their part, make it possible for Maurice and Ann to raise broilers and cattle without hiring outside help —a condition most satisfactory to Maurice who, like many farmers, has trouble finding skillful, conscientious help.

WHAT ABOUT TOMORROW?

What tomorrow will bring the Laytons and the rest of the broiler industry is anyone's guess.

Dynamic in the recent past, the industry continues to change.

Broiler experts say Americans cannot expect efficiencies to be achieved as rapidly as they were in the past . . . that improvements in feed conversion rates will come harder. Improvements in productivity may not stay ahead of rising costs, they warn.

Whatever happens in the industry, the results will show up not only on the supermarket shelves and in the food-serving establishments of the Nation but on thousands of farms like the Layton farm.

WHAT IT TAKES TO GROW BROILERS

To get into the broiler-growing business the prospective grower must first find an integrator.

When the National Broiler Council (NBC) receives an inquiry from a potential grower, its response, a spokesman said, follows the following lines:

"Of primary importance is whether a slaughter/processing plant is located within about 25 miles . . . or 50 miles at a maximum. All the feed has to be transported to the farm, and the market-weight chickens have to be hauled to the processing plant. Without a compact production area, the transportation costs increase excessively.

"Local county extension agents can advise potential growers on whether a plant is nearby. It is best to go directly to the company and discuss specifically what is involved in the contractual agreement.

"In some cases where the producer/processor company is expanding production and is looking for more growers, the company will advertise for additional growout capacity. In this situation, it generally means the contract payments will have to be increased across the board to attract new growers or additional housing on the current growers' farms."

Not every broiler-growing area—most of them are south of the Mason-Dixon Line—is looking for growers. In early 1976, the Delmarva Peninsula (made up of parts of Delaware, Maryland, and Virginia) was looking for more growers. In Arkansas, the Nation's largest broiler-producing State, integrators were reported to have enough growers on contract.

There are many kinds of production contracts across the country. Some contracts—typically in the State of Maine—call for the farmer to be paid on the basis of the number of square feet in his broiler houses—specifically, how many square feet used each week. Some contracts are based on what the birds sell for. Some call for the growers to pay for the heating fuel; others do not.

Sometimes houses are leased by the company and the grower is paid wages. Other variations cover an allowance for putting in insulation, floor space per chick started, a distribution of profits, penalties for condemnation losses, the cost of disinfectants and of applying them, the cost of litter or of cleaning out the house, and the cost of catching the birds and hauling them to market.

Maurice and Ann Layton's contract with McCarty-State Pride has been adjusted upward with the price of fuel, which tripled in cost locally from 10 cents a gallon in 1968 to 30 cents a gallon in 1975.

A prospective grower needs a contract before approaching a lending institution for the money to build broiler houses and install equipment. Most people considering it already occupy the land they will build upon.

Nearly every grower across the country has a source of income other than that from growing broilers. In many areas, as with the Layton family in Mississippi, growing broilers fits in well with growing feeder calves. For one thing, high nitrogen chicken litter can be spread as fertilizer on grazing land.

Whether the farmer grower makes enough money on his operation (or doesn't lose too much) is a question of his values, his contract, and his accounting procedure. One agricultural economist makes a case that a farmer producer in the Delmarva Peninsula who invests $2.50 per bird capacity in the operation (the rule of thumb for today's operation in that area), would lose money if paid 10 cents a bird.

On the other hand, he would make money if he were paid 12 cents a bird. That money would pay him for his labor and management.

By growing broilers, the farmer-producer is building something to leave behind or to sell when the time comes. He is living where he wants to live while his net worth is increasing in value.

What kind of attitude and capabilities should the prospective grower possess?

The National Broiler Council suggests:

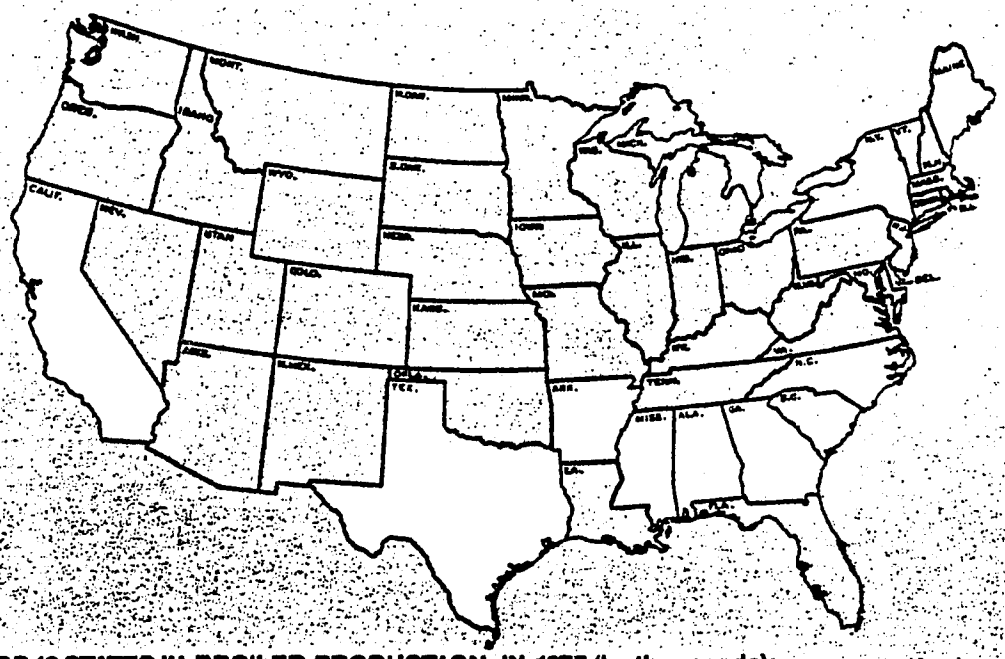
- A desire to grow chickens
- The financial capability to provide adequate housing for the chickens
- Adequate and dependable labor
- Willingness to meet contractual obligations
- A mind for business
- An open mind—to accept improvements in growing chickens as the improvements become known.

In some areas, integrators actually prefer the prospective growers to have little or no experience in growing chickens—at least as they were grown in years past. They'd rather teach the grower the system the integrator considers best.

In the evening, when they can hear the evening songs of birds in the trees nearby, and watch the sun set over a rolling countryside, the Laytons like to get together out in the yard in warm weather. Anita may pick up her guitar and start singing a current tune, while her brothers, her parents, and her dog Kim listen.

The contractual arrangements between integrator and producer, while left to the signing parties to work out, must follow certain rules spelled out by regulations under the Packers and Stockyards Act (P&SA). Primarily for the protection of the farmer-grower, the contract must be written and signed, spelling out clearly several specific terms such as the method of figuring feed conversion ratios (with examples) and who's liable if the birds must be condemned. Full and complete accounting must be furnished the grower at time of settlement. The scales used to weigh the birds must be tested for accuracy twice a year.

The relationship between grower and integrator has seen rough days in some parts of the country in years past. However, adoption of the P&SA rules seems to have reduced significantly the misunderstandings between integrator and farmer. Fewer complaints have been received by the U.S. Department of Agriculture since the regulations concerning contracts went into effect in 1971. A good business relationship all along the line of broiler production is the rule, not the exception.



TOP 10 STATES IN BROILER PRODUCTION IN 1975 (by thousands):

Arkansas	481,886	Mississippi	231,301	California	95,825
Georgia	416,599	Maryland	179,769	Maine	81,035
Alabama	395,769	Texas	162,769		
North Carolina	283,986	Delaware	136,278		

WHY THE SOUTH?

The center of broiler production has moved South—to the Southeastern States of Georgia and North Carolina and the South Central States of Arkansas, Alabama, Mississippi, and Texas.

The earlier production center—the Delmarva Peninsula (made up of parts of the States of Delaware, Maryland, and Virginia)—still maintains a strong activity, however.

Why the South?

Well, heating fuel isn't so great an expense. Beyond that, Raymond T. Parkhurst, then director of the South Central Poultry Research Laboratory, wrote in 1967:

"The competition for labor can be a very important factor in the growth of broiler production in an area. If broiler growers have no alternative, they will probably continue to operate when prices are depressed and income is low. However, when industries offer an alternative revenue, the wage offered, the relative 'pleasantness' of the jobs, the time of year, the duration of the job, and the skill and responsibility required all become factors. In the South, historically, there have been fewer agricultural alternatives and less industrial demand for labor."

GLOSSARY

Broiler
A young chicken, usually under 13 weeks old, that is tender-meated with soft, pliable, smooth-textured skin and flexible breastbone cartilage.

Broiler house
The building in which broilers are grown. Its design depends upon the climate, age of the house, and money the owner can invest in it. One of the common designs is a long, low building having windows or curtains along its sides to control ventilation, and larger doors at the ends to permit the entrance of house-cleaning vehicles. However, environmentally controlled houses with no windows are coming into wider use. Fans and insulation provide the proper atmosphere with less labor and management time involved.

Farmer-grower
People, such as the Laytons, who have contracted with the owner of the broilers to grow the broilers from 1 day of age to marketing time, about 7½ to 8 weeks later. Farmer-growers usually live on the land.

Feed conversion ratio
The pounds of feed required to produce a pound of live broiler. If a broiler consumes 8 pounds of feed and weighs 3.33 pounds when marketed, the feed conversion is 2.4 (8 divided by 3.33). If it takes 6 pounds of feed to bring a broiler to a market weight of 3.33 pounds, the feed conversion is 1.8. If feed were $4.50 per hundred pounds in both instances, it would cost 27 cents to feed the broiler with a ratio of 1.8, compared with 36 cents to feed a broiler with a ratio of 2.4. With a flock of 30,000 chickens, the difference in feed cost is $2,700.

Fryer
Another name for broiler.

Integrator
A firm, cooperative, or a person that controls more than one stage in the production of broilers . . . usually everything from broiler egg production through processing. It owns the broilers. It contracts with farmer-growers to grow them. Large integrators may also own more than one unit of important phases of the production—more than one processing plant, for instance. Sometimes a firm, cooperative, or person that mixes feed for commercial sale also owns the broilers and contracts with farmer-growers to raise the broilers, using the manufacturer's feed. Some big feed manufacturers who got involved in this form of integration have ceased broiler operations in recent years.

Litter
The blanket of wood chips, sawdust, or other absorbent material upon which the birds walk and rest in the broiler houses. It is removed or covered as it becomes caked. When a new batch of broilers enters the broiler house, it is removed and replaced with new litter.

Processor
The person or firm that kills and processes chickens for retail use, usually the integrator.

Producer
The person or firm that owns the broilers, usually an integrator.

Retailer
The person or firm who sells ready-to-cook broilers to the consumer.

Serviceman
An employee of the producer who visits the farmer-grower regularly—perhaps twice weekly—to see how the broilers are progressing toward market weight. He checks the entire system of growing the chickens on each farm for disease-free, efficient production of high-quality birds.

SUCCESS AT THE TOP

How many firms are producing broilers in the United States? How much of total production is turned out by, say, the top 20?

One close measure of the number of firms producing broilers is the number which are processing them. In 1975, there were 154 firms processing young chickens under Federal inspection (less than 2 percent of broiler production comes through the other plants—State-inspected plants which meet Federal standards).

The trend in the number of processing firms has generally been downward. In 1960 there were 286 firms processing broilers. In 1964, there were 201 and in 1968 there were 153. But in 1972, the number bounced back up to 227 (only to come down again later).

In 1975, the 20 largest firms processing broilers turned out 55 percent of the total production in federally inspected plants. The same number turned out only 32 percent in 1960. Their share generally has been increasing through the years.

Since 1964, the four largest firms have generally produced 17 or 18 percent of the total market.

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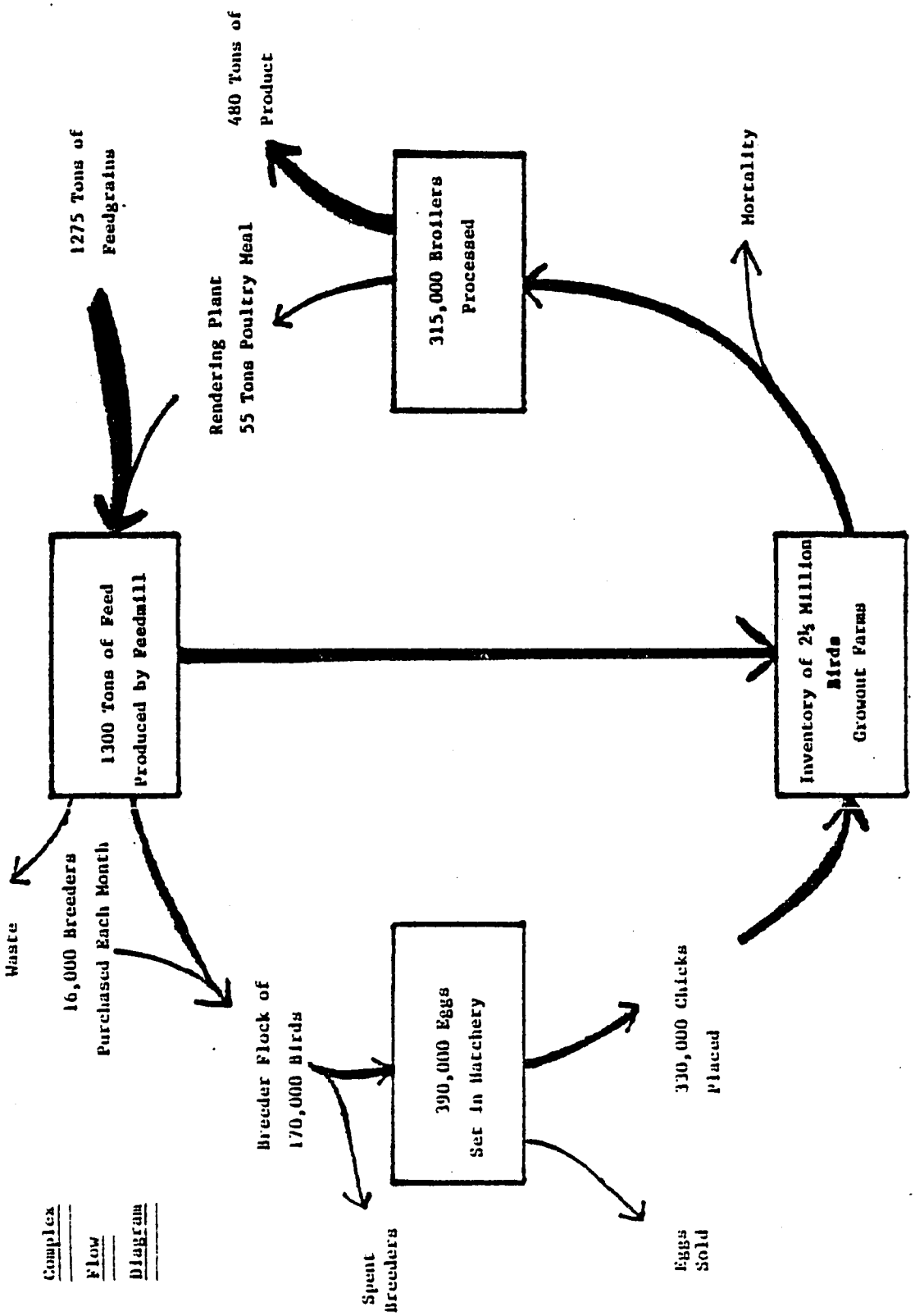
APPENDIX D

APPENDIX D

FLOW DIAGRAM FROM THE M.S.U. BROILER STUDY



APPENDIX E

APPENDIX E

MICHIGAN BROILER GROWOUT HOUSE COSTS

Summary Schedule of Broiler Growout House Costs[1/]

Item	Cost		
	Unit	/Ft^2	/Bird
Buildings			
Structures	196,725		
Electrical	13,000		
Plumbing for Gas Heating	4,000		
Plumbing for Water System	1,500		
Concrete Floor	38,400		
Attic Insulation	15,360		
Concrete for Bins and Incinerators	400		
Sub Total	269,385	5.61	4.21
Equipment, Building			
Feed Bin and Delivery System	6,972		
Feeding System	19,465		
Brooder/Heating System	7,652		
Plasson Waterers	12,452		
Ventilation	43,059		
Partial Brooding/Curtain	553		
Sub Total	90,153	1.88	1.41
Equipment, Other			
G-64/TC Round-Dual Burner Natural Gas Incinerators	440		
Alarm System	1,300		
Stand-By Generator	10,000		
Sub Total	11,740	0.25	0.18
Well & Pump	2,400	0.05	0.04
Site Development			
Office and Restrooms	4,000		
Site Preparation	8,000		
Sub Total	12,000	0.25	0.19
TOTAL	385,678	8.04	6.03

1/ One 40' x 600' x 17' 2-story house with 64,000 bird capacity at 0.75ft^2 per bird. Building cost quotes provided by Tailored building systems; The POST BUILDING & SUPPLY Company; 11335 Apple Drive; Nunica, Michigan 49448. Equipment cost quotes provided by Hurst Equipment Inc.; 845 Interstate Drive; Napoleon, Ohio 43545.

APPENDIX F

Projected Capital Investment Summary ($)

	Item						
	Land	Dwellings	Buildings	Equipment	Vehicles	Total	Pct. Dist.
Function:							
Replacements	30,000	90,000	1,010,050	326,400	14,000	1,470,450	4.44
Breeders	64,000	240,000	1,947,240	578,928	47,000	2,877,168	8.68
Growout	630,000	270,000	12,770,325	4,585,185	32,000	18,287,510	55.20
Sub Total	724,000	600,000	15,727,615	5,490,513	93,000	22,635,128	68.32
Hatchery			710,000	489,388	72,000	1,271,388	3.84
Feedmill			918,800	1,363,200	198,000	2,480,000	7.49
Processing			1,428,000	1,579,702	308,000	3,315,702	10.01
Rendering			422,400	2,000,000		2,422,400	7.31
Marketing					173,000	173,000	0.52
G & A	105,000		220,000	400,000	107,000	832,000	2.51
Sub Total	105,000		3,699,200	5,832,290	858,000	10,494,490	31.68
TOTAL	829,000	600,000	19,426,815	11,322,803	951,000	33,129,618	100.00

APPENDIX G

Projected Annual Operating Expenditure Summary($)

Item	Function									
	Replacement	Breeders	Hatchery	Growout	Feedmill	Procesng	Rendering	Mkting	Gen&Adm	Total
Chicks 1/	194618									194618
Feed Ingred 2/	47628	131040		10766080						10944748
Labor	92400	207000	346800	578400	211200	1781250	48000	198000	607200	4070250
Transportation	8400	10700	19600		39920	33700		65600	36400	214320
Utilities 3/	4380	12098	60000	533462	100000	839800	93600		22000	1665340
Maint & Repair 4/	17529	33451	16888	222107	36456	45874	44424		12340	429069
Insur & Taxes 5/	44115	86315	38640	548625	74406	99471	72672	5190	24960	994394
Pkging 6/						655200				655200
Misc	62263	17365	133225	476850	223748	312672			20000	1246123
TOTAL	471333	497969	615153	13125524	685730	3767967	258696	268790	722900	20414062

1/ Pullet chicks were assumed to cost $1.12 each and cockerel chicks $2.25 each.
2/ Assumes average ingredient costs of $147, $140 and $160 per ton for replacement rearing, layer and growout rations, respectively
3/ Based on natural gas price of $3 per thousand cubic feet and 5.5 cents per kilowatt hour for electricity.
4/ One percent of initial building costs plus two percent of initial equipment costs.
5/ Three percent of the initial investments in fixed assets.
6/ Assumed to average 4 cents per bird processed.

Projected Annual Operating Receipt Summary ($)

Item	Function				
	Replacement	Breeders	Rendering	Marketing	Cumulative Total
Spent Fowl[1/]	1,157	130,103	--	--	131,260
Unset Eggs[2/]	--	52,465	--	--	183,725
Poultry By-Product[3/] Meal	--	--	807,206	--	990,931
RTC Broilers[4/]	--	--	--	@ 45¢ 22,555,260	23,546,191
				@ 50¢ 25,061,400	26,052,331
				@ 55¢ 27,567,540	28,558,471

1/ Spent hens were assumed to average 7.45 pounds and roosters to average 9.75 pounds with a net price of 15 cents and 5 cents per pound, respectively.

2/ Unset eggs were assumed to average a net price of 40 cents per dozen.

3/ Based on a 55.44 ton per week poultry-by-product meal yield at a net value of $280 per ton.

4/ Receipts from rtc broiler meat sales were calculated at three alternative blend price levels. The 50 cent per pound (current dollars) price level is inferred to be the "most likely" average price projection. The 45 cent and the 55 cent per pound average price projections are considered to represent "pessimistic" and "optimistic" price levels, respectively.

APPENDIX H

INITIAL BALANCE SHEETS

APPENDIX H1

INITIAL BALANCE SHEET - DEBT FINANCING OPTION

INITIAL BALANCE SHEET

ASSETS

WORKING CAPITAL	$3.500.000
LAND	$829.000
DWELLINGS	$600.000
REPLBLDG	$1.010.050
BRDBLDG	$1.947.240
GROTBLDG	$12.770.300
HATCHBLDG	$710.000
FDMILLBLDG	$918.800
PPLTBLDG	$1.428.000
RENDBLDG	$422.400
G&ABLDG	$220.000
REPLEQUIP	$326.400
BRDEQUIP	$578.928
GROTEQUIP	$4.585.190
HATCHEQUIP	$489.388
FDMILEQUIP	$1.363.200
PPLTEQUIP	$1.579.700
RENDEQUIP	$2.000.000
G&AEQUIP	$400.000
REPLVCH	$14.000
BRDVCH	$47.000
GROTVCH	$32.000
HATCHVCH	$72.000
FDMILLVCH	$198.000
PPLTVCH	$308.000
MKTVCH	$173.000
G&AVCH	$107.000
TOTAL	$36.629.600

LIABILITIES & NET WORTH

LONG TERM DEBT	$17.355.500
NET WORTH	$19.274.100
TOTAL	$36.629.600

APPENDIX H2

INITIAL BALANCE SHEET - LEASE OPTION

INITIAL BALANCE SHEET

ASSETS

WORKING CAPITAL	$3,500,000
LAND	$829,000
DWELLINGS	$600,000
REPLBLDG	$1,010,050
BRDBLDG	$1,947,240
GROWOUT(DEPOSIT)	$867,775
HATCHBLDG	$710,000
FDMILLBLDG	$918,800
PPLTBLDG	$1,428,000
RENDBLDG	$422,400
G&ABLDG	$220,000
REPLEQUIP	$326,400
BRDEQUIP	$578,928
HATCHEQUIP	$489,388
FDMILEQUIP	$1,363,200
PPLTEQUIP	$1,579,700
RENDEQUIP	$2,000,000
G&AEQUIP	$400,000
REPLVCH	$14,000
BRDVCH	$47,000
GROTVCH	$32,000
HATCHVCH	$72,000
FDMILLVCH	$198,000
PPLTVCH	$308,000
MKTVCH	$173,000
G&AVCH	$107,000
TOTAL	$20,141,900

LIABILITIES & NET WORTH

LONG TERM DEBT	$0
NET WORTH	$20,141,900
TOTAL	$20,141,900

APPENDIX H3

INITIAL BALANCE SHEET - 100% EQUITY OPTION

INITIAL BALANCE SHEET

ASSETS

WORKING CAPITAL	$3,500,000
LAND	$829,000
DWELLINGS	$600,000
REPLBLDG	$1,010,050
BRDBLDG	$1,947,240
GROTBLDG	$12,770,300
HATCHBLDG	$710,000
FDMILLBLDG	$918,800
PPLTBLDG	$1,428,000
RENDBLDG	$422,400
G&ABLDG	$220,000
REPLEQUIP	$326,400
BRDEQUIP	$578,928
GROTEQUIP	$4,585,190
HATCHEQUIP	$489,388
FDMILEQUIP	$1,363,200
PPLTEQUIP	$1,579,700
RENDEQUIP	$2,000,000
G&AEQUIP	$400,000
REPLVCH	$14,000
BRDVCH	$47,000
GROTVCH	$32,000
HATCHVCH	$72,000
FDMILLVCH	$198,000
PPLTVCH	$308,000
MKTVCH	$173,000
G&AVCH	$107,000
TOTAL	$36,629,600

LIABILITIES & NET WORTH

LONG TERM DEBT	$0
NET WORTH	$36,629,600
TOTAL	$36,629,600

APPENDIX I

COST RECOVERY SCHEDULES

APPENDIX I1

COST RECOVERY SCHEDULE - DEBT AND 100% EQUITY OPTION

COST RECOVERY SCHEDULE

YEAR	LAND	DWELLINGS	REPLBLDG	BRDBLDG	GROTBLDG	HATCHBLDG
1	$0	$45600	$39981	$77078	$505492	$28104
2	$0	$79800	$79962	$154157	$1010980	$56208
3	$0	$68400	$79962	$154157	$1010980	$56208
4	$0	$57000	$79962	$154157	$1010980	$56208
5	$0	$57000	$79962	$154157	$1010980	$56208
6	$0	$57000	$79962	$154157	$1010980	$56208
7	$0	$51300	$79962	$154157	$1010980	$56208
8	$0	$51300	$79962	$154157	$1010980	$56208
9	$0	$51300	$79962	$154157	$1010980	$56208
10	$0	$51300	$79962	$154157	$1010980	$56208
11	$0	$0	$79962	$154157	$1010980	$56208
12	$0	$0	$79962	$154157	$1010980	$56208
13	$0	$0	$39981	$77078	$505492	$28104
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	FDMILLBLDG	PPLTBLDG	RENDBLDG	G&ABLDG	REPLEQUIP	BRDEQUIP
1	$36369	$56525	$16720	$8708	$46512	$82497
2	$72738	$113050	$33440	$17417	$68218	$120996
3	$72738	$113050	$33440	$17417	$65117	$115496
4	$72738	$113050	$33440	$17417	$65117	$115496
5	$72738	$113050	$33440	$17417	$65117	$115496
6	$72738	$113050	$33440	$17417	$0	$0
7	$72738	$113050	$33440	$17417	$0	$0
8	$72738	$113050	$33440	$17417	$0	$0
9	$72738	$113050	$33440	$17417	$0	$0
10	$72738	$113050	$33440	$17417	$0	$0
11	$72738	$113050	$33440	$17417	$0	$0
12	$72738	$113050	$33440	$17417	$0	$0
13	$36369	$56525	$16720	$8708	$0	$0
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	GROTEQUIP	HATCHEQUIP	FDMILEQUIP	PPLTEQUIP	RENDEQUIP	G&AEQUIP
1	$653389	$69738	$194256	$225108	$285000	$57000
2	$958304	$102282	$284909	$330158	$418000	$83600
3	$914744	$97633	$271958	$315151	$399000	$79800
4	$914744	$97633	$271958	$315151	$399000	$79800
5	$914744	$97633	$271958	$315151	$399000	$79800
6	$0	$0	$0	$0	$0	$0
7	$0	$0	$0	$0	$0	$0
8	$0	$0	$0	$0	$0	$0
9	$0	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$0	$0
11	$0	$0	$0	$0	$0	$0
12	$0	$0	$0	$0	$0	$0
13	$0	$0	$0	$0	$0	$0
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	REPLVCH	BRDVCH	GROTVCH	HATCHVCH	FDMILLVCH	PPLTVCH
1	$3395	$11398	$7760	$17460	$48015	$74690
2	$5160	$17324	$11795	$26539	$72983	$113529
3	$5025	$16868	$11485	$25841	$71062	$110541
4	$0	$0	$0	$0	$0	$0
5	$0	$0	$0	$0	$0	$0
6	$5143	$17265	$11755	$26448	$72732	$113138
7	$7817	$26242	$17867	$40201	$110552	$171970
8	$7611	$25552	$17397	$39143	$107643	$167445
9	$0	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$0	$0
11	$7556	$25367	$17271	$38861	$106867	$166237
12	$11485	$38558	$26253	$59068	$162438	$252681
13	$11183	$37544	$25562	$57514	$158163	$246031
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	MKTVCH	G&AVCH	TOT RECOVR	REMAIN VAL
1	$41953	$25948	$2658700	$28850000
2	$63768	$39440	$4334760	$24515300
3	$62090	$38402	$4206570	$20308700
4	$0	$0	$3853860	$16454900
5	$0	$0	$3853860	$12601000
6	$63548	$39305	$1944290	$12054000
7	$96594	$59743	$2120240	$9933800
8	$94052	$58171	$2106270	$7827530
9	$0	$0	$1589260	$6238280
10	$0	$0	$1589260	$4649020
11	$93374	$57751	$2051240	$4650920
12	$141928	$87782	$2318150	$2332770
13	$138193	$85472	$1528640	$804131
14	$0	$0	$0	$804131
15	$0	$0	$0	$804131

APPENDIX I2

COST RECOVERY SCHEDULE - LEASE OPTION

COST RECOVERY SCHEDULE

YEAR	LAND	DWELLINGS	REPLBLDG	BRDBLDG	GROWOUT	HATCHBLDG
1	$0	$45600	$39981	$77078	$0	$28104
2	$0	$79800	$79962	$154157	$0	$56208
3	$0	$68400	$79962	$154157	$0	$56208
4	$0	$57000	$79962	$154157	$0	$56208
5	$0	$57000	$79962	$154157	$0	$56208
6	$0	$57000	$79962	$154157	$0	$56208
7	$0	$51300	$79962	$154157	$0	$56208
8	$0	$51300	$79962	$154157	$0	$56208
9	$0	$51300	$79962	$154157	$0	$56208
10	$0	$51300	$79962	$154157	$0	$56208
11	$0	$0	$79962	$154157	$260333	$56208
12	$0	$0	$79962	$154157	$381821	$56208
13	$0	$0	$39981	$77078	$364466	$28104
14	$0	$0	$0	$0	$364466	$0
15	$0	$0	$0	$0	$364466	$0

YEAR	FDMILLBLDG	PPLTBLDG	RENDBLDG	G&ABLDG	REPLEQUIP	BRDEQUIP
1	$36369	$56525	$16720	$8708	$46512	$82497
2	$72738	$113050	$33440	$17417	$68218	$120996
3	$72738	$113050	$33440	$17417	$65117	$115496
4	$72738	$113050	$33440	$17417	$65117	$115496
5	$72738	$113050	$33440	$17417	$65117	$115496
6	$72738	$113050	$33440	$17417	$0	$0
7	$72738	$113050	$33440	$17417	$0	$0
8	$72738	$113050	$33440	$17417	$0	$0
9	$72738	$113050	$33440	$17417	$0	$0
10	$72738	$113050	$33440	$17417	$0	$0
11	$72738	$113050	$33440	$17417	$0	$0
12	$72738	$113050	$33440	$17417	$0	$0
13	$36369	$56525	$16720	$8708	$0	$0
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	HATCHEQUIP	FDMILEQUIP	PPLTEQUIP	RENDEQUIP	G&AEQUIP	REPLVCH
1	$69738	$194256	$225108	$285000	$57000	$3395
2	$102282	$284909	$330158	$418000	$83600	$5160
3	$97633	$271958	$315151	$399000	$79800	$5025
4	$97633	$271958	$315151	$399000	$79800	$0
5	$97633	$271958	$315151	$399000	$79800	$0
6	$0	$0	$0	$0	$0	$5143
7	$0	$0	$0	$0	$0	$7817
8	$0	$0	$0	$0	$0	$7911
9	$0	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$0	$0
11	$0	$0	$0	$0	$0	$7556
12	$0	$0	$0	$0	$0	$11485
13	$0	$0	$0	$0	$0	$11193
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	BRDVCH	GRDTVCH	HATCHVCH	FDMILLVCH	PPLTVCH	MKTVCH
1	$11398	$7760	$17460	$48015	$74690	$41953
2	$17324	$11795	$26539	$72983	$113529	$63768
3	$16868	$11485	$25841	$71062	$110541	$62090
4	$0	$0	$0	$0	$0	$0
5	$0	$0	$0	$0	$0	$0
6	$17265	$11755	$26448	$72732	$113138	$63548
7	$26242	$17867	$40201	$110552	$171970	$96594
8	$25552	$17397	$39143	$107643	$167445	$94052
9	$0	$0	$0	$0	$0	$0
10	$0	$0	$0	$0	$0	$0
11	$25367	$17271	$38861	$106867	$166237	$93374
12	$38558	$26253	$59068	$162438	$252681	$141928
13	$37544	$25562	$57514	$158163	$246031	$138193
14	$0	$0	$0	$0	$0	$0
15	$0	$0	$0	$0	$0	$0

YEAR	G&AVCH	TOT RECOVR	REMAIN VAL
1	$25948	$1499810	$13521200
2	$39440	$2365470	$11155700
3	$38402	$2280840	$8874880
4	$0	$1928130	$6946750
5	$0	$1928130	$5018620
6	$39305	$933305	$5482650
7	$59743	$1109260	$4373390
8	$58171	$1095280	$3278100
9	$0	$578272	$2699830
10	$0	$578272	$2121560
11	$57751	$1300590	$4609660
12	$87782	$1688990	$2920670
13	$85472	$1387610	$1533060
14	$0	$364466	$1168600
15	$0	$364466	$804131

APPENDIX J

ASSET CATEGORIES

APPENDIX J1

ASSET CATEGORIES - DEBT OPTION

DATA IN ASSET CATAGORIES

****

ASSET NAME	LAND	DWELLINGS	REPLBLDG	BRDBLDG	GROTBLDG
INITL COST	$829,000	$600,000	$1,010,050	$1,947,240	$12,770,300
PROP CLASS	3	10	5	5	5
REC METHOD	-NONE-	-ACRS-	-S.L.-	-S.L.-	-S.L.-
REC PEROID	-$-	10	12	12	12
INVEST CRD	N	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	100%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	
RETIREMENT	0	0	0	0	15
SALV(%or$)	100%	$120,000	$202,010	$389,448	$2,554,060

ASSET NAME	HATCHBLDG	FDMILLBLDG	PPLTBLDG	RENDBLDG	G&ABLDG
INITL COST	$710,000	$918,800	$1,428,000	$422,400	$220,000
PROP CLASS	5	5	5	5	5
REC METHOD	-S.L.-	-S.L.-	-S.L.-	-S.L.-	-S.L.-
REC PEROID	12	12	12	12	12
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$142,000	$183,760	$285,600	$84,480	$44,000

ASSET NAME	REPLEQUIP	BRDEQUIP	GROTEQUIP	HATCHEQUIP	FDMILEQUIP
INITL COST	$326,400	$378,928	$4,585,190	$489,388	$1,363,200
PROP CLASS	5	5	5	5	5
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	5	5	5
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	100%	0%	0%
DEBTINT(%)	0.0%	0.0%		0.0%	0.0%
RETIREMENT	0	0	15	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	PPLTEQUIP	RENDEQUIP	B&AEQUIP	REPLVCH	BRDVCH
INITL COST	$1,579,700	$2,000,000	$400,000	$14,000	$47,000
PROP CLASS	5	5	5	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	5	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	5	5
%PRICE CHG	0.0%	0.0%	0.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	BROTVCH	HATCHVCH	FDMILLVCH	PPLTVCH	MKTVCH
INITL COST	$32,000	$72,000	$198,000	$308,000	$173,000
PROP CLASS	3	3	3	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	3	3	3	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	5	5	5	5	5
%PRICE CHG	8.0%	8.0%	8.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	B&AVCH
INITL COST	$107,000
PROP CLASS	3
REC METHOD	-ACRS-
REC PEROID	3
INVEST CRD	Y1
USEFULLIFE	5
%PRICE CHG	8.0%
% FINANCED	0%
DEBTINT(%)	0.0%
RETIREMENT	0
SALV(%or$)	$0

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APPENDIX J2

ASSET CATEGORIES - LEASE OPTION

DATA IN ASSET CATAGORIES

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ASSET NAME	LAND	DWELLINGS	REPLBLDG	BRDBLDG	GROWOUT
INITL COST	$829,000	$600,000	$1,010,050	$1,947,240	-LEASED-
PROP CLASS	3	10	5	5	5
REC METHOD	-NONE-	-ACRS-	-S.L.-	-S.L.-	-ACRS-
REC PEROID	-*-	10	12	12	5
INVEST CRD	N	Y1	Y1	Y1	N
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	100%	$120,000	$202,010	$389,448	$0
L. DEPOSIT	-*-	-*-	-*-	-*-	$867,775
$ PAYMENTS	-*-	-*-	-*-	-*-	$234,299
# PAYMENTS	-*-	-*-	-*-	-*-	120
PAY FREQCY	-*-	-*-	-*-	-*-	- monthly -
$ PAY/YEAR	$0	$0	$0	$0	$2811590
L. BUYOUT	-*-	-*-	-*-	-*-	$1735550

ASSET NAME	HATCHBLDG	FDMILLBLDG	PPLTBLDG	RENDBLDG	G&ABLDG
INITL COST	$710,000	$918,800	$1,429,000	$422,400	$220,000
PROP CLASS	5	5	5	5	5
REC METHOD	-S.L.-	-S.L.-	-S.L.-	-S.L.-	-S.L.-
REC PEROID	12	12	12	12	12
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$142,000	$183,760	$285,800	$84,480	$44,000
L. DEPOSIT	-*-	-*-	-*-	-*-	-*-
$ PAYMENTS	-*-	-*-	-*-	-*-	-*-
# PAYMENTS	-*-	-*-	-*-	-*-	-*-
PAY FREQCY	-*-	-*-	-*-	-*-	-*-
$ PAY/YEAR	$0	$0	$0	$0	$0
L. BUYOUT	-*-	-*-	-*-	-*-	-*-

ASSET NAME	REPLEQUIP	BRDEQUIP	HATCHEQUIP	FDMILEQUIP	PPLTEQUIP
INITL COST	$326,400	$578,928	$489,388	$1,363,200	$1,579,700
PROP CLASS	5	5	5	5	5
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	5	5	5
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0
L. DEPOSIT	-*-	-*-	-*-	-*-	-*-
$ PAYMENTS	-*-	-*-	-*-	-*-	-*-
# PAYMENTS	-*-	-*-	-*-	-*-	-*-
PAY FREQCY	-*-	-*-	-*-	-*-	-*-
$ PAY/YEAR	$0	$0	$0	$0	$0

ASSET NAME	RENDEQUIP	G&AEQUIP	REPLVCH	BRDVCH	GROTVCH
INITL COST	$2,000,000	$400,000	$14,000	$47,000	$32,000
PROP CLASS	5	5	3	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	3	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	5	5	5
%PRICE CHG	0.0%	0.0%	8.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0
L. DEPOSIT	-*-	-*-	-*-	-*-	-*-
$ PAYMENTS	-*-	-*-	-*-	-*-	-*-
# PAYMENTS	-*-	-*-	-*-	-*-	-*-
PAY FREQCY	-*-	-*-	-*-	-*-	-*-
$ PAY/YEAR	$0	$0	$0	$0	$0
L. BUYOUT	-*-	-*-	-*-	-*-	-*-

ASSET NAME	HATCHVCH	FDMILLVCH	PPLTVCH	MKTVCH	G&AVCH
INITL COST	$72,000	$198,000	$308,000	$173,000	$107,000
PROP CLASS	3	3	3	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	3	3	3	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	5	5	5	5	5
%PRICE CHG	8.0%	8.0%	8.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0
L. DEPOSIT	-*-	-*-	-*-	-*-	-*-
$ PAYMENTS	-*-	-*-	-*-	-*-	-*-
# PAYMENTS	-*-	-*-	-*-	-*-	-*-
PAY FREQCY	-*-	-*-	-*-	-*-	-*-
$ PAY/YEAR	$0	$0	$0	$0	$0
L. BUYOUT	-*-	-*-	-*-	-*-	-*-

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APPENDIX J3

ASSET CATEGORIES - 100% EQUITY OPTION

DATA IN ASSET CATAGORIES

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ASSET NAME	LAND	DWELLINGS	REPLBLDG	BRDBLDG	GROTBLDG
INITL COST	$829,000	$600,000	$1,010,050	$1,947,240	$12,770,300
PROP CLASS	3	10	5	5	5
REC METHOD	-NONE-	-ACRS-	-S.L.-	-S.L.-	-S.L.-
REC PEROID	-$-	10	12	12	12
INVEST CRD	N	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	100%	$120,000	$202,010	$389,448	$2,554,060

ASSET NAME	HATCHBLDG	FDMILLBLDG	PPLTBLDG	RENDBLDG	G&ABLDG
INITL COST	$710,000	$918,800	$1,428,000	$422,400	$220,000
PROP CLASS	5	5	5	5	5
REC METHOD	-S.L.-	-S.L.-	-S.L.-	-S.L.-	-S.L.-
REC PEROID	12	12	12	12	12
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$142,000	$183,760	$285,600	$84,480	$44,000

ASSET NAME	REPLEQUIP	BRDEQUIP	GROTEQUIP	HATCHEQUIP	FDMILEQUIP
INITL COST	$326,400	$578,928	$4,585,190	$489,388	$1,363,200
PROP CLASS	5	5	5	5	5
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	5	5	5
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	15	15
%PRICE CHG	0.0%	0.0%	0.0%	0.0%	0.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	PPLTEQUIP	RENDEQUIP	G&AEQUIP	REPLVCH	BRDVCH
INITL COST	$1,579,700	$2,000,000	$400,000	$14,000	$47,000
PROP CLASS	5	5	5	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	5	5	5	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	15	15	15	5	5
%PRICE CHG	0.0%	0.0%	0.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	GROTVCH	HATCHVCH	FDMILLVCH	PPLTVCH	MKTVCH
INITL COST	$32,000	$72,000	$198,000	$308,000	$173,000
PROP CLASS	3	3	3	3	3
REC METHOD	-ACRS-	-ACRS-	-ACRS-	-ACRS-	-ACRS-
REC PEROID	3	3	3	3	3
INVEST CRD	Y1	Y1	Y1	Y1	Y1
USEFULLIFE	5	5	5	5	5
%PRICE CHG	8.0%	8.0%	8.0%	8.0%	8.0%
% FINANCED	0%	0%	0%	0%	0%
DEBTINT(%)	0.0%	0.0%	0.0%	0.0%	0.0%
RETIREMENT	0	0	0	0	0
SALV(%or$)	$0	$0	$0	$0	$0

ASSET NAME	G&AVCH
INITL COST	$107,000
PROP CLASS	3
REC METHOD	-ACRS-
REC PEROID	3
INVEST CRD	Y1
USEFULLIFE	5
%PRICE CHG	8.0%
% FINANCED	0%
DEBTINT(%)	0.0%
RETIREMENT	0
SALV(%or$)	$0

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APPENDIX K

CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS

DEBT OPTION

APPENDIX K1

DEBT OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 9.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	1605380	1500970	1386900	1262280	1126130
BEFORE TAX CASH FLOW	4032820	4137230	4251300	4375920	4512070
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
TAXABLE INCOME	1374120	-197530	44730	522060	658210
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1374120	-197530	44730	522060	658210
INCOME TAX AT @C	611845	0	7301	219898	282527
INVEST. TAX CREDIT	3241760	2696690	2696690	2689390	2477480
NET INCOME	1307340	-197530	44730	514075	640831
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
AFTER TAX CASH FLOW	3966040	4137230	4251300	4367940	4494690
DEBT RETIREMENT	1128790	1233200	1347270	1471890	1608040
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2837250	2904030	2904030	2896050	1489320

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	977385	814882	637348	443392	231495
BEFORE TAX CASH FLOW	4660820	4823320	5000850	5194810	5406710
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
TAXABLE INCOME	2716530	2703080	2894580	3605550	3817450
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	2716530	2703080	2894580	3605550	3817450
INCOME TAX AT @C	1229350	1223170	1311260	1638300	1735770
INVEST. TAX CREDIT	2296170	1226220	161530	0	0
NET INCOME	2557120	2544600	1744850	1967250	2081670
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
AFTER TAX CASH FLOW	4501410	4664840	3851120	3556510	3670930
DEBT RETIREMENT	1756790	1919290	2096820	2290780	2502680
EQUITY REINVESTMENT	0	0	0	0	2053140
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2744620	2745550	1754300	1265730	-884690

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	2051240	2318150	1528640	0	0
TAXABLE INCOME	3586960	3320050	4109560	5638200	5638200
[TAX LOSS CARRY FORWARD]	0	0	0	0	-2437880
ADJUSTED TAXABLE INCOME]	3586960	3320050	4109560	5638200	8076080
INCOME TAX AT 3C	1629750	1506970	1870150	2573320	3694750
INVEST. TAX CREDIT	123188	0	0	0	0
NET INCOME	2080400	1813080	2239410	3064880	1943450
DEPRECIATION	2051240	2318150	1528640	0	0
AFTER TAX CASH FLOW	4131640	4131230	3768050	3064880	1943450
DEBT RETIREMENT	0	0	0	0	-50
EQUITY REINVESTMENT	0	0	0	0	-4834360
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	4131640	4131230	3768050	3064880	10277900

CAPITAL EXPENDITURE ANALYSIS

3 DISCOUNT RATE	PER	PEC	NPV	AENPV
0	46029700	19274100	26755600	1783700
2	38444300	19274100	19170200	1491930
4	32527300	19274100	13253200	1192010
6	27863300	19274100	8589200	884368
8	24148700	19274100	4874550	569492
10	21159600	19274100	1885510	247895
12	18730000	19274100	-544100	-79887
14	16735400	19274100	-2538710	-413324
16	15082000	19274100	-4192140	-751891
18	13698400	19274100	-5575720	-1095090
20	12530000	19274100	-6744130	-1442450
25	10296300	19274100	-8977780	-2326290

APPENDIX K2

DEBT OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 12.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	2126050	2006360	1872000	1721180	1551890
BEFORE TAX CASH FLOW	3512150	3631840	3766200	3917020	4086310
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
TAXABLE INCOME	853450	-702920	-440370	63160	232450
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	853450	-702920	-440370	63160	232450
INCOME TAX AT 35%	372337	0	0	12198	86677
INVEST. TAX CREDIT	3241760	2900270	2900270	2900270	2888080
NET INCOME	822600	-702920	-440370	63160	232450
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
AFTER TAX CASH FLOW	3481300	3631840	3766200	3917020	4086310
DEBT RETIREMENT	977100	1096790	1231150	1381970	1551260
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2504200	2535050	2535050	2535050	1137720

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	1361860	1148550	909116	640346	338653
BEFORE TAX CASH FLOW	4276340	4489650	4729080	4997850	5299550
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
TAXABLE INCOME	2332050	2369410	2622810	3408590	3710290
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	2332050	2369410	2622810	3408590	3710290
INCOME TAX AT 45%	1052490	1069680	1186240	1547700	1686480
INVEST. TAX CREDIT	2985240	1965620	1031390	0	0
NET INCOME	2199180	2233960	2467960	1860890	2023810
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
AFTER TAX CASH FLOW	4143470	4354200	4574230	3450150	3613070
DEBT RETIREMENT	1741290	1954600	2194030	2462800	2764500
EQUITY REINVESTMENT	0	0	0	0	2053140
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2402180	2399600	2380200	987351	-1204580

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	2051240	2318150	1528640	0	0
TAXABLE INCOME	3586960	3320050	4109560	5638200	5638200
[TAX LOSS CARRY FORWARD]	0	0	0	0	-2437880
ADJUSTED TAXABLE INCOME]	3586960	3320050	4109560	5638200	8076080
INCOME TAX AT @C	1629750	1506970	1870150	2573320	3694750
INVEST. TAX CREDIT	123188	0	0	0	0
NET INCOME	2080400	1813080	2239410	3064880	1943450
DEPRECIATION	2051240	2318150	1528640	0	0
AFTER TAX CASH FLOW	4131640	4131230	3768050	3064880	1943450
DEBT RETIREMENT	0	0	0	0	10
EQUITY REINVESTMENT	0	0	0	0	-4834360
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	4131640	4131230	3768050	3064880	10277800

CAPITAL EXPENDITURE ANALYSIS

@ DISCOUNT RATE	PER	PEC	NPV	AENPV
0	43585400	19274100	24311300	1620750
2	36197100	19274100	16923000	1317050
4	30452500	19274100	11178400	1005400
6	25940100	19274100	6666020	686353
8	22359500	19274100	3085420	360469
10	19489600	19274100	215520	28035
12	17166400	19274100	-2107700	-309462
14	15267200	19274100	-4006880	-652356
16	13699700	19274100	-5574350	-999802
18	12393900	19274100	-6880220	-1351290
20	11296000	19274100	-7978090	-1706370
25	9212730	19274100	%-10061400	-2607070

APPENDIX K3

DEBT OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 15.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	2646720	2517940	2369530	2196490	2001360
BEFORE TAX CASH FLOW	2991480	3120260	3268670	3439710	3636840
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
TAXABLE INCOME	332780	-1214500	-937900	-414150	-217020
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	332780	-1214500	-937900	-414150	-217020
INCOME TAX AT 0%	132829	0	0	0	0
INVEST. TAX CREDIT	3241760	3108930	3108930	3108930	3108930
NET INCOME	332780	-1214500	-937900	-414150	-217020
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
AFTER TAX CASH FLOW	2991480	3120260	3268670	3439710	3636840
DEBT RETIREMENT	844417	973191	1121600	1292650	1489780
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2147060	2147070	2147070	2147060	749730

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	1774170	1512330	1210560	862775	461950
BEFORE TAX CASH FLOW	3864030	4125870	4427640	4775430	5176250
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
TAXABLE INCOME	1919740	2005630	2321370	3186170	3586990
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1919740	2005630	2321370	3186170	3586990
INCOME TAX AT 0%	862830	902340	1047580	1445390	1629770
INVEST. TAX CREDIT	3192770	2434370	1642380	726934	0
NET INCOME	1815320	1895280	2189230	2467710	1957220
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
AFTER TAX CASH FLOW	3759610	4015520	4295500	4056970	3546480
DEBT RETIREMENT	1716970	1978800	2280570	2628360	3029180
EQUITY REINVESTMENT	0	0	0	0	2053140
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2042640	2036720	2014930	1428610	-1533840

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	2051240	2318150	1528640	0	0
TAXABLE INCOME	3586960	3320050	4109560	5638200	5638200
[TAX LOSS CARRY FORWARD]	0	0	0	0	-2437880
ADJUSTED TAXABLE INCOME]	3586960	3320050	4109560	5638200	8076080
INCOME TAX AT @C	1629750	1506970	1870150	2573320	3694750
INVEST. TAX CREDIT	123188	0	0	0	0
NET INCOME	2080400	1813080	2239410	3064880	1943450
DEPRECIATION	2051240	2318150	1528640	0	0
AFTER TAX CASH FLOW	4131640	4131230	3768050	3064880	1943450
DEBT RETIREMENT	0	0	0	0	-18
EQUITY REINVESTMENT	0	0	0	0	-4834360
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	4131640	4131230	3768050	3064880	10277800

CAPITAL EXPENDITURE ANALYSIS

@ DISCOUNT RATE	PER	PEC	NPV	AENPV
0	40698700	19274100	21424600	1428310
2	33549200	19274100	14275100	1110970
4	28014400	19274100	8740290	786113
6	23687100	19274100	4413040	454379
8	20270600	19274100	996534	116425
10	17546800	19274100	-1727340	-227100
12	15354000	19274100	-3920110	-575568
14	13571800	19274100	-5702330	-928391
16	12109500	19274100	-7164580	-1285020
18	10898700	19274100	-8375450	-1644960
20	9886800	19274100	-9387300	-2007780
25	7986030	19274100	-11288100	-2924930

APPENDIX L

CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS

LEASE OPTION

APPENDIX L1

LEASE OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 9.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23059100	23059100	23059100	23059100	23059100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2993230	2993230	2993230	2993230	2993230
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
TAXABLE INCOME	1493420	627760	712390	1065100	1065100
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1493420	627760	712390	1065100	1065100
INCOME TAX AT 0C	666723	268520	307449	469696	469696
INVEST. TAX CREDIT	1506210	914495	661254	374922	0
NET INCOME	1418410	612482	691273	970326	595404
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
AFTER TAX CASH FLOW	2918220	2977950	2972110	2898460	2523530
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2918220	2977950	2972110	2898460	1126200

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23059100	23059100	23059100	23059100	23059100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2993230	2993230	2993230	2993230	2993230
DEPRECIATION	933305	1109260	1095280	578272	578272
TAXABLE INCOME	2059930	1883970	1897950	2414960	2414960
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	2059930	1883970	1897950	2414960	2414960
INCOME TAX AT 0C	927315	846376	852807	1090630	1090630
INVEST. TAX CREDIT	83840	0	0	0	0
NET INCOME	1216450	1037590	1045140	1324330	1324330
DEPRECIATION	933305	1109260	1095280	578272	578272
AFTER TAX CASH FLOW	2149750	2146850	2140420	1902600	1902600
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	3788690
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2149750	2146850	2140420	1902600	-1886090

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	1300590	1688990	1387610	364466	364466
TAXABLE INCOME	4337610	3949210	4250590	5273730	5273730
[TAX LOSS CARRY FORWARD]	0	0	0	0	-751588
ADJUSTED TAXABLE INCOME]	4337610	3949210	4250590	5273730	6025320
INCOME TAX AT 3C	1975050	1796390	1935020	2405670	2751400
INVEST'. TAX CREDIT	123188	0	0	0	0
NET INCOME	2485750	2152820	2315570	2868070	2522340
DEPRECIATION	1300590	1688990	1387610	364466	364466
AFTER TAX CASH FLOW	3786340	3841810	3703180	3232530	2886800
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	-2280300
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	3786340	3841810	3703180	3232530	8667100

CAPITAL EXPENDITURE ANALYSIS

3 DISCOUNT RATE	PER	PEC	NPV	AENPV
0	42577500	19494500	23083000	1538860
2	35698100	19494500	16203600	1261060
4	30324100	19494500	10829600	974031
6	26081700	19494500	6587220	678239
8	22697400	19494500	3202860	374189
10	19969400	19494500	474856	62431
12	17747800	19494500	-1746670	-256454
14	15920500	19494500	-3574030	-581884
16	14402500	19494500	-5091960	-913280
18	13129600	19494500	-6364920	-1250090
20	12052200	19494500	-7442350	-1591780
25	9984110	19494500	-9510390	-2464300

APPENDIX L2

LEASE OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 12.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23392300	23392300	23392300	23392300	23392300
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2660010	2660010	2660010	2660010	2660010
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
TAXABLE INCOME	1160200	294540	379170	731880	731880
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1160200	294540	379170	731880	731880
INCOME TAX AT 0C	513442	115238	154168	316415	316415
INVEST. TAX CREDIT	1506210	1044780	929546	775378	481425
NET INCOME	1108180	294540	379170	709418	709418
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
AFTER TAX CASH FLOW	2607990	2660010	2660010	2637550	2637550
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2607990	2660010	2660010	2637550	1240220

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23392300	23392300	23392300	23392300	23392300
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2660010	2660010	2660010	2660010	2660010
DEPRECIATION	933305	1109260	1095280	578272	578272
TAXABLE INCOME	1726710	1550750	1564730	2081740	2081740
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1726710	1550750	1564730	2081740	2081740
INCOME TAX AT 0C	774034	693095	699526	937349	937349
INVEST. TAX CREDIT	271313	0	0	0	0
NET INCOME	1223980	857655	865204	1144390	1144390
DEPRECIATION	933305	1109260	1095280	578272	578272
AFTER TAX CASH FLOW	2157290	1966920	1960480	1722660	1722660
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	3788690
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2157290	1966920	1960480	1722660	-2066030

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	1300590	1688990	1387610	364466	364466
TAXABLE INCOME	4337610	3949210	4250590	5273730	5273730
[TAX LOSS CARRY FORWARD]	0	0	0	0	-751588
ADJUSTED TAXABLE INCOME]	4337610	3949210	4250590	5273730	6025320
INCOME TAX AT @C	1975050	1796390	1935020	2405670	2751400
INVEST. TAX CREDIT	123188	0	0	0	0
NET INCOME	2485750	2152820	2315570	2868070	2522340
DEPRECIATION	1300590	1688990	1387610	364466	364466
AFTER TAX CASH FLOW	3786340	3841810	3703180	3232530	2886800
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	-2280300
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	3786340	3841810	3703180	3232530	8667100

CAPITAL EXPENDITURE ANALYSIS

@ DISCOUNT RATE	PER	PEC	NPV	AENPV
0	40778100	19522300	21255800	1417050
2	34054700	19522300	14532400	1131000
4	28814900	19522300	9292550	835784
6	24688300	19522300	5166040	531910
8	21404800	19522300	1882470	219928
10	18765000	19522300	-757344	-99571
12	16621000	19522300	-2901270	-425976
14	14862300	19522300	-4659960	-758683
16	13405500	19522300	-6116810	-1097100
18	12187100	19522300	-7335170	-1440650
20	11158700	19522300	-8363560	-1788820
25	9193710	19522300	%-10328600	-2676310

APPENDIX L3

LEASE OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS
AT A 15.25% INTEREST RATE

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23663100	23663100	23663100	23663100	23663100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2389250	2389250	2389250	2389250	2389250
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
TAXABLE INCOME	889440	23780	108410	461120	461120
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	889440	23780	108410	461120	461120
INCOME TAX AT 0C	388892	3367	29619	191865	191865
INVEST. TAX CREDIT	1506210	1150650	1147080	1117470	929381
NET INCOME	856106	23780	108410	457340	457340
DEPRECIATION	1499810	2365470	2280840	1928130	1928130
AFTER TAX CASH FLOW	2355920	2389250	2389250	2385470	2385470
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2355920	2389250	2389250	2385470	988140

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	23663100	23663100	23663100	23663100	23663100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	2389250	2389250	2389250	2389250	2389250
DEPRECIATION	933305	1109260	1095280	578272	578272
TAXABLE INCOME	1455950	1279990	1293970	1810980	1810980
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	1455950	1279990	1293970	1810980	1810980
INCOME TAX AT 0C	649485	568545	574976	812800	812800
INVEST. TAX CREDIT	825135	248073	0	0	0
NET INCOME	1383520	959518	718994	998178	998178
DEPRECIATION	933305	1109260	1095280	578272	578272
AFTER TAX CASH FLOW	2316830	2068780	1814270	1576450	1576450
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	3788690
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	2316830	2068780	1814270	1576450	-2212240

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	1300590	1688990	1387610	364466	364466
TAXABLE INCOME	4337610	3949210	4250590	5273730	5273730
[TAX LOSS CARRY FORWARD]	0	0	0	0	-751508
ADJUSTED TAXABLE INCOME]	4337610	3949210	4250590	5273730	6025320
INCOME TAX AT 3C	1975050	1796390	1935020	2405670	2751400
INVEST. TAX.CREDIT	123188	0	0	0	0
NET INCOME	2485750	2152820	2315570	2868070	2522340
DEPRECIATION	1300590	1688990	1387610	364466	364466
AFTER TAX CASH FLOW	3786340	3841810	3703180	3232530	2886800
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	-2280300
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	3786340	3841810	3703180	3232530	8667100

CAPITAL EXPENDITURE ANALYSIS

% DISCOUNT RATE	PER	PEC	NPV	AENPV
0	39303100	19544900	19758200	1317210
2	32694300	19544900	13149400	1023360
4	27553900	19544900	8009020	720342
6	23514500	19544900	3969580	408719
8	20307600	19544900	762662	89101
10	17735600	19544900	-1809250	-237869
12	15652200	19544900	-3892690	-571541
14	13947700	19544900	-5597210	-911276
16	12539600	19544900	-7005300	-1256450
18	11365300	19544900	-8179570	-1606490
20	10377000	19544900	-9167910	-1960850
25	8497620	19544900	%-11047300	-2962540

APPENDIX M

APPENDIX M

EQUITY OPTION
CASH FLOW CALCULATIONS AND CAPITAL EXPENDITURE ANALYSIS

	1	2	3	4	5
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
TAXABLE INCOME	2979500	1303440	1431630	1784340	1784340
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	2979500	1303440	1431630	1784340	1784340
INCOME TAX AT @C	1350320	579332	638300	800546	800546
INVEST. TAX CREDIT	3241760	2068990	1351560	984001	278536
NET INCOME	2801950	1241540	1360890	1689260	1262330
DEPRECIATION	2658700	4334760	4206570	3853860	3853860
AFTER TAX CASH FLOW	5460650	5576300	5567460	5543120	5116190
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	1397330
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	5460650	5576300	5567460	5543120	3718860

	6	7	8	9	10
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
TAXABLE INCOME	3693910	3517960	3531930	4048940	4048940
[TAX LOSS CARRY FORWARD]	0	0	0	0	0
ADJUSTED TAXABLE INCOME]	3693910	3517960	3531930	4048940	4048940
INCOME TAX AT @C	1678950	1598010	1604440	1842260	1842260
INVEST. TAX CREDIT	83840	0	0	0	0
NET INCOME	2098800	1919950	1927490	2206680	2206680
DEPRECIATION	1944290	2120240	2106270	1589260	1589260
AFTER TAX CASH FLOW	4043090	4040190	4033760	3795940	3795940
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	2053140
WORKING CAPITAL CHGS	0	0	0	0	0
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	4043090	4040190	4033760	3795940	1742800

	11	12	13	14	15
OPERATING RECEIPTS	26052300	26052300	26052300	26052300	26052300
OPER. EXPENDITURES	20414100	20414100	20414100	20414100	20414100
INTEREST ON DEBT	0	0	0	0	0
BEFORE TAX CASH FLOW	5638200	5638200	5638200	5638200	5638200
DEPRECIATION	2051240	2318150	1528640	0	0
TAXABLE INCOME	3586960	3320050	4109560	5638200	5638200
[TAX LOSS CARRY FORWARD]	0	0	0	0	-2437880
ADJUSTED TAXABLE INCOME]	3586960	3320050	4109560	5638200	8076080
INCOME TAX AT ③C	1629750	1506970	1870150	2573320	3694750
INVEST. TAX CREDIT	123188	0	0	0	0
NET INCOME	2080400	1813080	2239410	3064880	1943450
DEPRECIATION	2051240	2318150	1528640	0	0
AFTER TAX CASH FLOW	4131640	4131230	3768050	3064880	1943450
DEBT RETIREMENT	0	0	0	0	0
EQUITY REINVESTMENT	0	0	0	0	-4834360
WORKING CAPITAL CHGS	0	0	0	0	-3500000
OPERATOR LABOR	0	0	0	0	0
NET AFTER TAX CASH FLOW (CURRENT $)	4131640	4131230	3768050	3064880	10277800

CAPITAL EXPENDITURE ANALYSIS

③ DISCOUNT RATE	PER	PEC	NPV	AENPV
0	68895800	36629600	32266200	2151080
2	59057700	36629600	22428100	1745490
4	51211900	36629600	14582300	1311550
6	44887000	36629600	8257380	850204
8	39734200	36629600	3104570	362706
10	35493300	36629600	-1136350	-149400
12	31968300	36629600	-4661260	-684386
14	29010700	36629600	-7618900	-1240420
16	26506600	36629600	%-10123100	-1815650
18	24368100	36629600	%-12261500	-2408200
20	22526800	36629600	%-14102800	-3016330
25	18899800	36629600	%-17729800	-4594080

APPENDIX N

APPENDIX N

ABBREVIATIONS IN THE APPENDICES

Initial Balance Sheet

REPLBLDG	Replacement breeder buildings
BRDBLDG	Breeder buildings
GROTBLDG	Growout buildings
HATCHBLDG	Hatchery building
FDMILLBLDG	Feed mill building
PPLTBLDG	Processing Plant building
RENDBLDG	Rendering Building
G&ABLDG	General & Administrative Building
REPLEQUIP	Replacement breeder equipment
BRDEQUIP	Breeder equipment
GROTEQUIP	Growout equipment
HATCHEQUIP	Hatchery equipment
FDMILEQUIP	Feed Mill equipment
PPLTEQUIP	Processing Plant equipment
RENDEQUIP	Rendering equipment
G&AEQUIP	General and Administrative equipment
REPLVCH	Replacement breeder vehicles
BRDVCH	Breeder vehicles
GROTVCH	Growout vehicles
HATCHVCH	Hatchery vehicles
FDMILLVCH	Feed Mill vehicles
PPLTVCH	Processing plant vehicles
MKTVCH	Marketing vehicles
G&AVCH	General & Administrative vehicles

Asset Categories

INITL COST	Initial Cost
PROP CLASS	Property class (Accelerated Cost Recovery System)
REC METHOD	Cost recovery method (ACRS)
REC PERIOD	Recovery period
INVEST CRD	Investment credit yes or no and type of yes
USEFULLIFE	Usefull life of the asset
%PRICE CHG	Percent price change, for calculating inflation
% FINANCED	Percent financed
DEBTINT(%)	Debt interest percent
RETIREMENT	Debt retirement period
SALV(%or$)	Salvage value in percent or dollar value

Capital Expenditure Analysis

PER	Present equivalent revenues
PEC	Present equivalent costs
NPV	Net present value
AENPV	Annual equivalent net present value

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