MULTICHIX, A COMPUTER MODEL THAT PROJECTS RECEIPTS AND EXPENSES FOR EGG PRODUCTION ENTERPRISES

By

Roger Dean Jacobs

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Poultry Science

1978

PLEASE NOTE:
Dissertation contains computer print-outs with broken and indistinct print.
Filmed as received.

UNIVERSITY MICROFILMS

ABSTRACT

MULTICHIX, A COMPUTER MODEL THAT PROJECTS RECEIPTS AND EXPENSES FOR EGG PRODUCTION ENTERPRISES

By

Roger Dean Jacobs

Multichix is a computer simulation model designed to project future receipts and expenses for a single unit or for multi-unit egg production complexes. The model allows the user to include alternative replacement programs (force molted hens versus started pullets) in the analysis as well as various contractual arrangements. The model allows the user to add or subtract production units and to change feed costs, feed consumption and mortality as the run progresses. The model allows the user to sell poultry waste and it projects expenses as input values rather than constants. Production standards used are those produced by the major leghorn breeders. These standards in respect to production averages are adjusted by input. To test the model, three runs were made. The first run looked at three users. The first user took the role of an owner-operator, the second user was a contractor and the third user was an egg producer under contract. The second run was to show the impact of selling poultry waste on net cash income and net income. The third run projected production parameters for a force molted flock and a pullet flock of the same age.

ACKNOWLEDGMENTS

The author wishes to express his sincere appreciation to Dr. C. C. Sheppard as major professor and Dr. C. J. Flegal for their help and guidance during this period of study and research.

The author is grateful to Drs. T. H. Coleman and H. C. Zindel of the Department of Poultry Science and to Drs. T. Pierson and W. H. Vincent of the Department of Agricultural Economics for their valuable criticisms and help in the preparation of this manuscript.

To Dr. H. C. Zindel, Chairman of the Poultry Science Department, the author extends his appreciation for financial support provided.

The author is also grateful to his parents and Mrs. Margaret Granger for their moral support.

Finally, the author is most grateful and indebted to his wife, Barbara, and two sons, John and Joseph, for their sacrifice, help and understanding during this period of study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Multichix is a computer simulation model designed to project future receipts and expenses for a single unit or for multi-unit egg production complexes. The main purpose of the model is to provide flexibility in various situations including alternative replacement programs, various production standards for both pullet flocks (birds in the first production cycle) and hen flocks (birds in a production cycle other than the first) and today's types of financial contracts which include 1-, 2- or 3-way contractual arrangements as well as the traditional owner-operator system. The model looks at poultry waste as a potential source of revenue as well as an expense. It looks at certain expenses of production as input variables rather than constants. Multichix allows the user to increase or decrease the number of production units and to change certain parameters (feed consumption, feed costs, egg loss and mortality) as the run progresses.

Multichix was designed to be used as a tool in the decision making process and was built to be used when changes in endogenous or exogenous variables so dictate.

REVIEW OF LITERATURE

The computer is often thought of as a tool to be used for the analysis of engineering concepts. However, the modern computer can also be used to analyze and solve various agricultural problems. Vincent (1970) and a report of the Proceedings of the Joint Conference of North Central Regional Farm Management Extension and Research (Agricultural Economics Report No. 157, 1970) gave several examples of agricultural computer models designed to analyze and simulate some of these problems. In the poultry industry, Muir (1972) developed a computer model to measure cash flows for market egg farms. Vincent (1969) reported that he had built a model that measures cash flows for various forms of egg production contracts. Arbor Acres Farm, Inc. (1977) reported they had a model that could be used to measure costs and performance for a broiler organization. Larzelere (1970) suggested the development of an electronic egg exchange as a computerized national auction center for egg pricing.

Until recently, the analysis of alternative egg production replacement programs (force molting) by computer simulation had been ignored. Bell (1977) reported that the University of California had developed such a model. This system evaluated 308 different situations facing the producer at five different price levels.

Force Molting

Force molting is a procedure used by many poultrymen to recycle either pullet flocks or previously molted hen flocks. In 1975, according to U.S.D.A. records of the seventeen major egg producing states, an average of 18.3% of hens and pullets of laying age either had been or were in the process of being molted by December of that year (see Table 1). This percentage increased to 19.2 by December of 1976 [Gross (ed.), 1977].

All methods of force molting utilized since the 1930's fall into one of three categories (Swanson and Bell, 1974a and Swanson and Bell, 1974b):

1. Water and/or feed restriction,
2. Low nutrient rations and
3. Anti-ovulatory drugs or feed additives.

The first category has been and still is the most widely used method of force molting. A method that calls for zinc-oxide to be added to the ration at levels of 25,000 ppm (Creger, 1976) has gained in popularity. Most water and/or feed restriction methods are composed of 4 or 5 phases (Swanson and Bell, 1974b and Andrews, 1972).

The first phase (preparatory) precedes the second phase (stress) by up to three weeks. This period, while not included in all methods, allows the producer to get

Table 1. Force molted layers as a percent of hens and pullets of laying age, first of month, selected states 1975-1976 [Gross (ed.), 1977]

State	December 1975	December 1976	December 1975	December 1976
	Percent Being Molted		Percent With Molt Completed	
Ala.	2.0	1.0	12.0	8.0
Ark.	1.0	1.5	6.5	8.0
Cal.	7.5	8.5	38.0	40.5
Fla.	2.0	4.0	18.0	17.0
Ga.	2.0	2.0	16.0	18.5
Ind.	4.6	3.0	4.0	5.0
Iowa	0.5	2.0	2.5	6.5
Miss.	1.0	0.0	0.5	3.5
N.Y.	1.5	1.0	7.0	4.5
N.C.	1.0	1.0	9.0	5.5
Ohio	1.5	0.5	8.5	3.0
Ore.	4.0	5.0	30.0	33.0
Pa.	2.0	2.0	7.0	4.0
S.C.	1.0	1.5	4.0	9.5
Tenn.	4.0	3.0	11.0	10.0
Tex.	1.0	1.0	4.5	5.5
Wash.	9.5	10.0	40.0	34.0
17 States	3.0	3.3	15.3	15.9

the flock ready (revaccination, touch-up debeaking, parasite control, etc.) for the more stressing second phase. The second phase is characterized by water (up to 72 hours) and/or feed withdrawal. Some methods do not call for the water to be removed. The length of this phase lasts up to 10 days and the basic purpose of the phase is to stop egg production. The third phase (rest) runs from 2 to 11 weeks. The purpose of this phase is to keep the birds out of egg production. This is done by keeping the birds on a shortened photoperiod and by feeding the flock a high fiber ration or by restricting the amount of feed to be consumed. The fourth phase (recovery) starts with the resumption of egg production and ends at peak production. Post-molt, the final phase, starts at peak production and terminates at the end of the production cycle.

Characteristics of force molted flocks when compared to started pullet flocks are (Cox, 1964; Bell, 1965; Bell, Swanson and Johnston, 1976; Swanson and Bell, 1974c; Swanson and Bell, 1975; and Adams, 1976):

1. Increased production of large, extra large and jumbo eggs,
2. Lower replacement cost to the producer,
3. A similar egg shell quality at first which declines at a faster rate,
4. A lower total egg production and lower peak egg production,

5. Poorer feed efficiency due to lower egg production and
6. Generally higher mortality.

When considering the possibility of projecting (through use of a computer model) force molted flocks, one must take into consideration size of program and type of contractual arrangement involved, if any.

Contracting

The egg industry in the United States is composed of small egg production units (10,000 birds or less) up to and including very large operations with capacities in excess of one million birds. The programs may consist of various forms of contractual arrangements or owner-operator type systems. Hoyt (1971) estimated that 30 to 50 percent of egg production in the midwestern section of the United States (Michigan, Indiana, Ohio, Illinois and Wisconsin) was under some form of contract. However, the amount of contracting in Michigan may be declining at present (Hoyt, 1978). Many authors (Sheppard, *et al*., 1964; Reed and Jewett, 1966; Skinner and Rieck, 1966; Morris and Harwood, 1968; and Hicks, 1975) have described the various types of egg production contracts in their areas. The purposes of the contracts are to reduce capital needs, to reduce risk for the contractee and to promote expertise in the various areas of egg production. Parties to egg production contracts may include egg producers, feed dealers, hatcherymen, pullet growers, marketing agencies or combinations of these.

In all cases, the contracts dictate the responsibilities for each party to the contract and set up payment schedules. The payment schedule may include:

1. A fixed fee per dozen eggs produced,
2. A fixed fee per bird housed or number of birds in the flock at the start of each period,
3. A fixed percent of returns from egg sales (This fixed payment may be dependent upon egg prices.) and
4. A guaranteed price for designated grades and volumes of eggs produced.

The contract may also prescribe a fee for taking care of the flock prior to a specific age and during the force molting procedure. Contractees may also be paid a bonus at the end of a production cycle for feed efficiency, flock livability, market price and egg grade-out, as defined by the contract.

METHODS AND PROCEDURES

As previously stated, Multichix is a computer simulation projection model to be used for a single unit or for multi-unit egg production programs. In Appendix A is the User Handbook for the model. It describes the input required for the model and gives samples of the various types of output. Multichix, itself, is composed of a main program and eighteen subprograms. Each is described briefly in Appendix B. Egg production and egg distribution constants used in the model can be found in Tables C.1. through C.14. in Appendix C.

The purpose of this section is to present some of the ways the model can be used for projection and analysis. It also outlines the assumptions that were used. Three runs were made:

1. Run 1--The first run projected three potential egg production systems:
    a. Owner-operator,
    b. Contract, where the user took the role of a contractor and
    c. Contract, where the user took the role of a contractee.

2. Run 2--The second run measured the effect of poultry waste as a potential product for sale. In this run, poultry waste was not dehydrated but rather sold at 80% moisture for $10 per ton. The user in this run assumed the role of an owner-operator.
3. Run 3--In the final run, a force molted flock was compared to an identical flock that had not been molted. Production data, feed costs and depletion costs were examined for an owner-operator.

All runs were projected for one year (364 days or 13 periods of 28 days each). Most of the assumptions and costs discussed below are those used by Latimer and Bezpa (1976) in a cash flow projection for a new 30,000 bird operation.

General Assumptions

The production unit simulated was a triple deck cage system with 11,200 square feet of floor space. Bird capacity was 30,000. The unit was new and costs were $64,400 for the house and $94,600 for equipment which included cages, feeders, waterers, egg collectors, cooler, pit cleaners, ventilation, feed bins and a standby generator. Twenty acres of land were purchased at $1,000 per acre. Pullet flocks were purchased at 20 weeks of age at a cost of $2.25 per bird plus 2¢ per bird for hauling and placing in cages. Capital needed for all purchases was borrowed at a 9% annual interest rate. The projected payback period for the house, equipment and land was 10 years while the principal on the pullets was to be paid back over 14 periods (392 days).

To estimate egg prices, an egg pricing generator was used. The starting point on the generator was 52 and the starting price for large eggs was 58¢. The price spreads between large eggs and jumbo plus extra large, medium, small, peewee and chex plus undergrade eggs were +2¢, -6¢, -30¢, -30¢ and -30¢, respectively. All cleanouts lasted two weeks and the length of the force molting procedure was seven weeks (one week for the stress phase and six weeks for the resting phase). For all flocks, DeKalb 231 production standards were used. The accumulated average hen-day egg production was projected at 69% for pullet flocks and 68% for molted hens. Pullet flocks were capitalized at 20 weeks of age; molted flocks were capitalized at 1% production. Twenty-five cents per bird was set aside for salvage value and the projected price per spent hen was 31.5¢ (4 1/2 pounds x 7¢ per pound). Three types of feed were used: 17 1/2% protein ration at $130 per ton, 16 1/2% protein ration at $125 per ton and 15 1/2% protein ration at $120 per ton.

Assumptions for Run 1

All flocks in this simulation were housed at 20 weeks of age (start of run) and sold at the end of 56 weeks of production (75 weeks of age). All flocks were fed 18 pounds of feed per 100 birds through 26 weeks of age and 20 pounds of feed per 100 birds from 27-30 weeks of age. The flocks were then fed 22 pounds of feed per 100 birds for the rest of the production cycle. Birds were fed the 17 1/2% protein ration until 43 weeks of age, the 16 1/2% protein ration from 43-61 weeks of age and the 15 1/2% protein ration through the rest of the production cycle. The projected flock mortality was 1% for the first nine weeks and 0.8% for the remaining weeks of the production cycle. Egg loss due to processing and handling was 2% of all eggs through 40 weeks of age and 3% from then on.

Unit level expenses were projected over 13 periods. Flock level expenses were projected over 14 periods. These expenses were as follows:

1. Unit level expenses
    a. Hired labor--The expense for hired labor was projected as $10,100 (3,640 hours x $2.75/hour).
    b. Maintenance cost for the unit--This cost was projected as $1,883.
    c. Utilities--The projected electrical costs were:

ventilation	$1,932
lights	1,381
feeders	460
egg collectors	69
water pumps	92
refrigeration	230
manure removal	312
miscellaneous	125
total electrical cost	$4,601

d. Taxes--This cost was projected at $1.50 per $100 of the full value as follows:

land	$ 300
building and equipment	2,385
total tax cost	$2,685

e. Insurance on building and equipment--This rate was projected as $1.80 per $100 of insurable value. The insurable value was 80% of full value. Thus, the insurance cost for the building and equipment was projected as $2,290 ($159,000 x 0.0144).

f. Depreciation expense--This expense was calculated using the sum-of-the-years'-digits method. For the laying house the expense was equal to $11,709. The schedule was based on 10 years for depreciation. The depreciation expense for the equipment was $23,650. The schedule for equipment was based on 7 years.

g. Interest expense on land, building and equipment--The amount of interest was based on the average debt for the year:

land (average debt $19,000)	$ 1,710
laying house (average debt $61,180)	5,506
laying house equipment (average debt $89,870)	8,088
total unit interest expense	$15,304

h. Other--Five hundred dollars was the projected cost for parasite and rodent control.

2. Flock level expenses

   a. Taxes and insurance on the flock--The taxes and insurance on the laying flocks were projected at $1.00 per $100 pullet cost or $727.

   b. Interest expense of the flock value--The repayment period was 14 periods (392 days) and the interest expense (average value $34,050) was $3,300.

   c. Medication--Medication expense was calculated at 6 1/2¢ per bird housed or $1,950.

Assumptions for Run 2

The assumptions for Run 2 were exactly the same as for Run 1 as the only difference in this run was that poultry waste was sold.

Assumptions for Run 3

In this run (13 periods), both flocks were started at 56 weeks of age. One flock continued on until the end of the production cycle. The house was then cleaned out, a new flock was housed and the cycle began again. The other flock began the force molting procedure at the start of the run. The production cycle ended when the flock surpassed 96 weeks of age. Then, the flock was sold, the house was cleaned out, a pullet flock was housed and the production cycle began again. The number of birds in each flock at the start of the run was 27,956 and the starting book value of each flock was $29,143. Feed consumption, feed type, mortality and egg loss for the pullet flock were exactly as in previously described pullet flocks. For the molted flock, no feed was given during the stress phase, 14 pounds per 100 were fed during the resting phase and 22 pounds per 100 birds were fed to the flock for the rest of the production cycle. During the resting phase, a 17 1/2% protein ration was fed. When the production cycle began, the flock was fed the 17 1/2% protein ration until the flock surpassed 68 weeks of age. The 16 1/2% protein ration was fed for the next 13 weeks and then the flock was fed the 15 1/2% protein ration. Mortality for the stress phase was equal to 8% per month. It was 2% per month for the rest phase and 1% for the rest of the production cycle. Egg loss was projected at 2% until 81 weeks of age and then it was increased to 3%.

RESULTS AND DISCUSSION

Run 1

As stated previously, the purpose of the first run was to project three potential egg production systems. The first user was an owner-operator who supplied all inputs to the system and received all income. The second user was a contractor who provided the birds and feed and paid a contractee 17% of all sales for his assets and labor. The third user was a contractee. He provided his labor and assets (land, laying house and equipment) in exchange for 17% of egg sales.

In all situations, certain parameters were the same for all three users after 13 periods. They are as follows:

1. Bird inventory

Number of birds housed	30,000
Mortality	2,855
Ending inventory	27,145

2. Egg production and distribution (dozens)

Jumbo plus extra large	115,557
Large	257,737
Medium	158,614
Small	43,311
Peewee	0
Chex plus undergrades	26,279
Total of all eggs produced	601,498

3. Value of eggs produced

Jumbo plus extra large	$ 67,991
Large	147,810
Medium	83,822
Small	12,394
Peewee	0
Chex plus undergrades	7,290
Total for all eggs produced	$319,308

4. Average value (per dozen) of eggs produced

Jumbo plus extra large	$.59
Large	.57
Medium	.53
Small	.29
Peewee	.00
Chex plus undergrades	.28
Average total value	$.53

5. Production analysis

Average hen-day egg production	70%
Average hen-housed egg production	66%
Average eggs per hen (hen-day)	253
Average eggs per hen (hen-housed)	241

6. Feed facts

Total tons of feed consumed	1,104
Average price per ton	$126
Pounds of feed per 100 birds per day	21.28
Pounds of feed per dozen eggs	3.67

Those variables measured that are different for each type system are presented in Tables 2 and 3.

Although it is not the purpose of this thesis to make judgments on the various systems, it is quite obvious that expenses associated with the purchase of land, buildings and equipment were a serious burden to both the owner-operator and contractee. If we estimate the payment on the principal of the outstanding debt (10% x $179,000) of $17,900, it reduces the cash flow for the contractee to -$2,308. Assuming the labor expense is in reality

Table 2. Cash and non-cash expenses for Run 1 (year-to-date, 13 periods)

Variable Measured	Owner-Operator		Contractor		Contractee	
	Cash	Non-cash	Cash	Non-cash	Cash	Non-cash
Contract expense			$ 52,865			
Feed	$139,207		139,207			
Labor	10,010				$10,010	
Maintenance--Bldg. & Equip.	1,883				1,883	
Utilities	4,601				4,601	
Insurance and taxes	5,650		675		4,975	
Interest	18,368		3,064		15,304	
Medication	1,811		1,811			
Depreciation--bird		$56,271		$56,271		
Depreciation--building		11,709				$11,709
Depreciation--equipment		23,650				23,650
Other	500				500	
Totals	$182,030	$91,630	$197,622	$56,271	$37,273	$35,359

Table 3. Financial analysis for Run 1

Variable Measured	Owner-Operator	Contractor	Contractee
Cash sales	$310,968.00	$310,968.00	$52,865.00
Cash sales/bird*	10.91	10.91	1.86
Value loss**	8,340.00	8,340.00	1,411.00
Cash expenses/bird	6.39	6.93	1.31
Non-cash expenses/bird	3.22	1.97	1.23
Total expenses	273,661.00	253,893.00	72,632.00
Total expenses/bird	9.60	8.91	2.54
Net cash income	128,938.00	113,346.00	15,592.00
Net cash income/bird	4.52	3.98	.55
Net income	37,307.00	57,075.00	-19,767.00
Net income/bird	1.31	2.00	-.69

*per bird is equal to the average number of birds in the house (year-to-date)

**value of eggs lost in handling, transit and processing a return to him for his labor, then the cash flow to the contractee becomes $7,762 which can be used to cover his personal needs. It should also be noted that even though the net cash income to the contractor was less than that of the owner-operator by $15,592, his net income was $19,768 greater. This was due primarily to depreciation expense for the building and equipment in the owner-operator system.

The value loss figure (2.6% of the value of eggs produced) can be the result of mishandling of eggs which may be caused on the farm or in transit to the processor. If only 50% of the eggs lost had been sold, the return on net cash income would have increased by 3.1% for the owner-operator, 3.5% for the contractor and about 4.3% for the contractee.

Another group of variables measured were unit efficiency measurements. They represent eggs, receipts and total expenses per square foot of housing. These variables are not normally measured in egg production units although sales per square foot and expenses per square foot are measured in other industries. Eggs per square foot in all three cases were 644.46. Receipts and total expenses per square foot were $27.76 and $24.43 for the owner-operator, $27.76 and $22.67 for the contractor and $4.72 and $6.48 for the contractee.

Run 2

In the second run, the purpose was to project the potential by-product of the unit, poultry waste. The unit selling poultry waste was compared to the owner-operator system projected in Run 1. Poultry waste was sold at 80% moisture for $10 per ton. The average amount of this product excreted per bird per day was projected at .0725 pounds dry weight (Flegal et al., 1974) or .0002537 tons per bird per week. Water was then added back to the dry material to estimate the total weight. This was multiplied by the average number of birds in the flock.

In this run, the projected amount of poultry waste sold was 1,879.8 tons for a value of $18,798. Table 4 shows the effect of this sale in respect to the financial analysis. Selling poultry waste increased cash sales by approximately 6% and increased the net income per bird by 61¢ or 63¢ per bird housed. Looking back to Run 1, if the contractee had been able to sell his poultry waste for the same amount, his net cash income would have better than doubled and his net loss would have been less than $1,000.

Run 3

This run was designed to measure various production parameters. Two units were compared; each used a different replacement program. The first unit (Unit 1) started by force molting 56 week old birds. The force molting period

Table 4. Financial analysis for Run 2

Variable Measured	Unit Not Selling Poultry Waste	Unit Selling Poultry Waste
Cash receipts	$310,968.00	$329,766.00
Cash receipts/bird	10.91	11.57
Cash expenses	182,030.00	182,030.00
Cash expenses/bird	6.39	6.39
Non-cash expenses	91,630.00	91,630.00
Non-cash expenses/bird	3.22	3.22
Total expenses	273,661.00	273,661.00
Total expenses/bird	9.60	9.60
Net cash income	128,939.00	147,736.00
Net cash income/bird	4.52	5.18
Net income	37,307.00	56,106.00
Net income/bird	1.31	1.97

took seven weeks. This flock (Flock 1-1) then proceeded through the production cycle. At the end of 10 periods (33 weeks into production), the flock was sold and after a two week cleanout period, a second flock (Flock 1-2) was housed and production began again. The second unit (Unit 2) started with a pullet flock (Flock 2-1) which was also 56 weeks of age and continued the production cycle. When this flock became 76 weeks of age it was sold. A two week cleanout period occurred and then a second started pullet flock (Flock 2-2) was housed and the production cycle began again.

At the start of this run the number of birds in each flock was 27,956. The book value of each flock was $29,143. Once the first flock started the force molting procedure, however, it was considered a new flock and the number of birds housed was 27,956. Flock 2-1 was not a new flock and here the number of birds housed still remained at 30,000.

Table 5 shows comparisons between the two flocks at the end of two periods. At this point, Flock 1-1 had completed the force molting period and one week of the production cycle. Flock 2-1 had completed 11 periods of production or two periods since the start of the run. The book value of Flock 1-1 was then $38,648 and the book value of Flock 2-1 was $20,281. Flock 1-1 was capitalized following the seven week molting period and the book value at the time of capitalization was $39,487. The difference

Table 5. Flock comparisons for the first two periods of Run 3 only

Variable Measured	Flock 1-1	Flock 2-1
Egg Production in Dozens		
Jumbo plus extra large	104	31,538
Large	298	44,351
Medium	96	8,705
Small	0	0
Peewee	0	0
Chex plus undergrades	21	5,034
Total dozens produced	518	89,628
Blend price per dozen produced	$.55	$.57
Production Analysis		
Hen-day production	3%	69%
Hen-housed production	3%	64%
Eggs per hen (hen-day)	0	39
Eggs per hen (hen-housed)	0	36
Feed Facts		
Total tons of feed consumed	100	171
Average price per ton	$130	$123
Pounds of feed/100 birds/day	13.19	22.00
Pounds of feed/dozen eggs	386.10	3.81

in the blend price per dozen eggs produced was due to the fact that for the first seven weeks, Flock 1-1 did not produce eggs.

Table 6 shows the final flock analysis for Flock 1-1 and Flock 2-1. The major difference in total eggs produced was due to the longer total production period for the force molted flock. The reader should note that these figures represent data from the start of the run only. The percent of eggs size large or greater was about the same, approximately 85%. This was due to the fact that Flock 2-1 showed production data only for the last 20 weeks of the production cycle. Flock 2-1 sold for $8,488 or $1,499 over book value while Flock 1-1 sold for $7,793 or $1,135 over book value.

Table 7 presents the final unit summary for the year. The value of eggs lost was $5,321 for Unit 1 and $7,926 for Unit 2.

This run did not favor using the force molted flock. Final net cash income and net income favored Unit 2 by $49,903 and $34,296, respectively. Most of this difference occurred during the first two periods while the flock in Unit 1 was being force molted. Only during the periods when Unit 2 was going through a changeover from Flock 2-1 to Flock 2-2 and for the following four periods did these two parameters favor Unit 1. Then, Unit 1 went through a changeover from Flock 1-1 to Flock 1-2 and the trend again favored Unit 2.

Table 6. Flock summaries for the first flock of each unit

Variable Measured	Flock 1-1*	Flock 2-1**
Egg Production in Dozens		
Jumbo plus extra large	130,878	87,138
Large	152,094	93,300
Medium	30,828	17,359
Small	0	0
Peewee	0	0
Chex plus undergrades	21,868	14,293
Total dozens produced	335,647	212,091
Blend price per dozen produced	$.56	$.59
Production Analysis		
Hen-day production	68%	66%
Hen-housed production	62%	61%
Eggs per hen (hen-day)	157	93
Eggs per hen (hen-housed)	144	85
Feed Facts		
Total tons of feed consumed	733	423
Average price per ton	$124	$121
Pounds of feed/100 birds/day	20.16	22.00
Pounds of feed/dozen eggs	4.37	3.99

*sold after 33 weeks of production or 40 weeks from start of run

**sold 20 weeks after start of run

Table 7. Unit summaries for Run 3

Variable Measured	Unit 1	Unit 2
Egg Production in Dozens		
Jumbo plus extra large	131,397	115,586
Large	160,811	232,726
Medium	69,832	151,173
Small	38,073	43,311
Peewee	0	0
Chex plus undergrades	24,538	26,420
Total dozens produced	424,650	569,216
Value of Eggs Produced		
Jumbo plus extra large	$ 77,777	$ 71,234
Large	93,026	135,848
Medium	35,747	77,346
Small	10,253	11,364
Peewee	0	0
Chex plus undergrades	6,760	7,487
Total value of eggs produced	$223,562	$303,279
Blend price per dozen produced	$.53	$.53
Financial Analysis		
Cash receipts (eggs plus spent hens)	$226,034	$303,840
Feed expense	$105,893	$132,968
Depletion expense	$45,172	$61,607
Net cash income	$120,142	$170,872
Net income	$74,969	$109,265

If the timing for force molting Flock 1-1 had been delayed or if, on input, the price spreads between medium, large and jumbo plus extra large had been greater, the outcome would have been different. These are two very important points when considering replacement programs. The reader should also note that this was a short-term analysis (13 periods). It is not known what the long-term analysis would have been.

In the studies presented, three ways that the model can be used were shown. We could have changed results simply by altering input.

SUMMARY

Multichix is a computer simulation model designed to be used for making projections with respect to egg production parameters. In this thesis, an attempt was made to show some of the ways the model can be used. In a first run, three possible production systems were compared: owner-operator system, contract system where the user took the position of a contractor and contract system where the user took the position of a contractee. A second run measured the effects of the sale of poultry waste on net cash income and net income while a third run projected production parameters for a force molted flock and a pullet flock of the same age.

The model can be used for sensitivity studies with respect to costs and production parameters. It allows the user to change feed consumption, feed costs, mortality and egg loss as the run progresses. It was designed to project for more than one unit and for up to six flocks per unit in any one run.

APPENDICES

APPENDIX A

APPENDIX A

USER HANDBOOK TO MULTICHIX

The following pages contain a copy of the handbook used to gather input data for Multichix.

USER HANDBOOK

TO

MULTICHIX

1978

Roger D. Jacobs
Department of Poultry Science
Michigan State University
East Lansing, Michigan

SECTION I. DEFINITION OF INPUT

The user should first read through this section and the next section, "Discussion of Input," to determine how his program best fits the model before attempting to use the input forms.

This section is intended to help the user define several specific areas of input.

Sample input forms are included at the end of the handbook. These forms are to be filled in by the user with the answers to the items in Section II. Data on the input forms will later be keypunched on computer cards to be processed by the computer.

Use of the Input Forms

The left-hand numbers on the form refer to the items found in Section II of this handbook. These numbers may be followed by other numbers or letters which refer to the questions for each item. The broken lines on the input form are for the user's answers. Those broken lines that have a small case letter s beneath them are to be used for numerical signs (+ or -). Numbers enclosed by parentheses are used by the keypuncher and should be ignored by the user.

In some questions asking for a percent value a decimal can be found between two broken lines on the input form. All values prior to a decimal point are whole percent values and all values following the decimal point are fractional parts of a percent value. (Example: If the expected management costs will increase by 6 1/2% for the first year of the run at the program level, the input for item 8.A.A. should be $\underset{s}{\underline{+}}\ \underline{0}\ \underline{0}\ \underline{6}.\underline{5}$. A decrease of 5 1/2% would be $\underset{s}{\underline{-}}\ \underline{0}\ \underline{0}\ \underline{5}.\underline{5}$.

Amount of Input

The amount of input required for this model is determined primarily by the size of the user's program (number of farms, units and flocks per unit) and the length of the run in years. The user should follow directions exactly. This model will either ignore unnecessary input or it will create error messages. These error messages will be discussed in Section III, "Output Samples."

Levels of Input

Questions in the next section are presented in four levels:

1. General Program Information
2. General Farm Information
3. General Unit Information
4. General Flock Information

The questions asked at each of these levels may be specific for that level or leading questions for the following level. The input will be read into the computer according to the flowchart shown in Figure A.1.

Definition of Input

1. Capitalization--Multichix uses two different methods for establishing the time for capitalizing bird

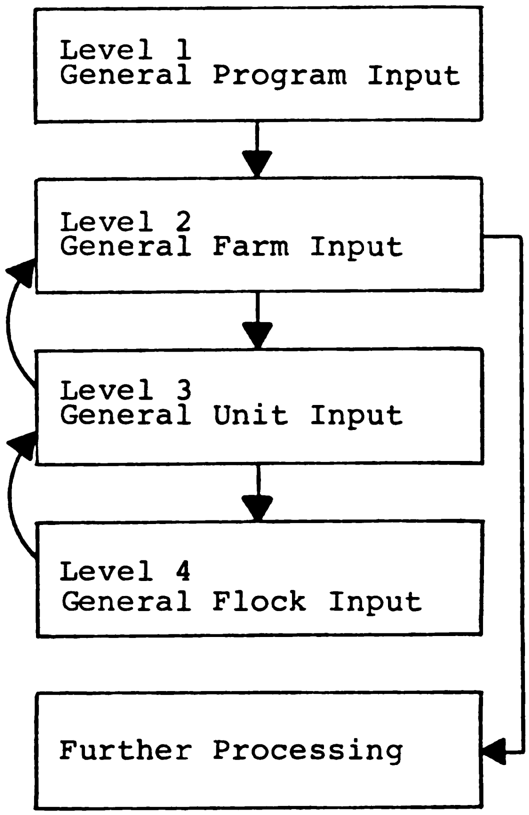


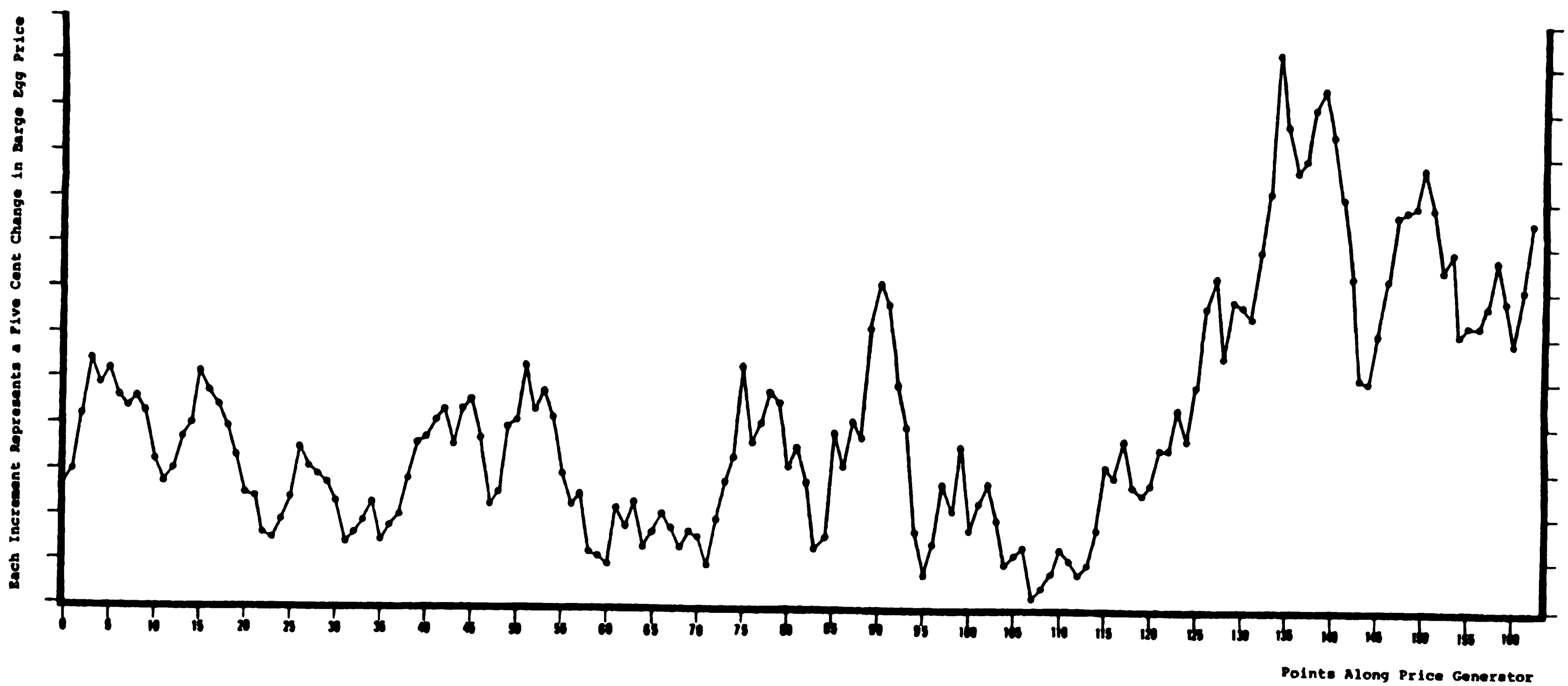
Figure A.1. Flowchart for reading input into memory costs. For pullet flocks (those birds in the first production cycle) this time is simply a chronological age, normally between 20-28 weeks of age. To allow for flexibility in the length of the force molting period, the time of capitalization for force molted flocks (those flocks that have gone through the first production cycle) is represented by a minimum hen-day egg production percent. Normally this percent should be between 0 and 50. The model will capitalize the flock the week this percent is reached or exceeded. The user should note that if this percent production is too high the date of capitalization may never occur. This would cause erroneous output.

2. Reserved Cost--Some users may desire to reserve some part of the pullet or hen cost at the time of capitalization to be applied later against the salvage value of a flock that is to be sold or to the initial cost of a force molted flock. This reserve cost will be established at the time of capitalization.

3. Prices--Multichix allows the user three methods for pricing eggs.

A. Egg pricing generator--Figure A.2. presents a set of data points. These data points represent monthly changes in grade A large shell egg (dozens) prices paid to Iowa egg producers from June 1962 to December 1975 (Armstrong, 1970; Armstrong, 1972; and Armstrong, 1976). This data was taken from supplements to Poultry and Egg Situation published by the Economic Research Service, United States Department of Agriculture.

Figure A.2. Egg pricing generator



If the user wishes to use the generator he should select a point (1-162) along the generator where the following data points will most likely reflect changes in large egg prices for the duration of the run. Item 9.A. is a follow-up to item 6. The computer will convert the user answers for 9.A.3.-9.A.7. to a percent (example: if the user selects a point along the generator at +2.0 and inputs starting point for large eggs at 50¢ per dozen and a medium price of 45¢ per dozen, the computer will divide .45 by .50 giving .90. The first month's average large egg price will be 52¢ and the medium egg price will be .90 x .52 or 46.8¢ per dozen).

B. Blend price--This method prices all eggs sold at the price input for item 9.B.1. for the first year of the run.

C. Input large egg prices--If the user does not wish to use the previously mentioned methods of pricing he can input expected large egg prices for each period of the run. The prices for the other various sizes will be computed as in the price generator.

4. Buy or sell unit--Multichix allows the user to buy a unit or acquire a new contract and/or sell a unit or terminate a contract during the run. The first column under items 27.A. and 27.B. is for the year the unit will be acquired or terminated. The next two columns are for the period that the unit will be acquired or terminated. (Example: If a unit will start at the beginning of the run, the input will be 101. If this unit begins on the thirteenth period of the second year, the input will be 213. If the unit will go to the end of the run, the input will be 113 for a one year run, 213 for a two year run and 313 for a three year run. If the unit is to terminate at the end of the seventh period of the first year the input will be 107 for item 27.B.) <u>Note</u>: If the input for item 27.A. is 201

and the length of the run is one year or if the unit is terminated before it begins, a fatal error will occur.

5. Standards--Multichix contains hen-day production and egg size distribution curves for both pullet and force molted (hen) flocks. The names and number of strains can be found below. Except for general production curves, all stored data was developed by major breeders for each strain. Stored data for each curve is limited; for pullet flocks the ending age of the flock can never be greater than 80 weeks and for hen flocks the maximum number of weeks in production is shown below.

Strain	Maximum Ending Age (hen flocks)
1. General Production	44
2. Babcock B-300	33
3. DeKalb 231	34
4. H & N Nickchick	32
5. Hyline W-36	32
6. Kimber K-137	37
7. Shaver Starcross 288	50

SECTION II. DISCUSSION OF INPUT

This section contains the questions to be answered. Sample input forms for this section can be found following Section III.

General Program Information

Input Items

1. Type of output desired:

   A. A statement for each production unit per period and year-to-date. (Input = 1)

   B. A statement of each production unit per period, year-to-date and a summary of all units combined. (Input = 2)

   C. A summary of all units combined only. (Input = 3)

   A more detailed discussion plus examples of each type of output can be found in Section III. of this handbook.

2. Desired length of run in years. (Input = 1, 2 or 3)

3. Capitalization of flock cost. The flock age at which time depreciation costs will begin to be distributed over the remaining productive life of the flock. This item is more completely defined in Section I. under "Capitalization."

   A. Pullet flock. (Input = chronological age of birds in weeks)

   B. Molted hen flock. (Input = percent production)

4. Undepreciated part of bird cost. This item is defined in Section I. under "Reserved Cost." (Input = cents/bird)

5. Expenses at the program level. These expenses are primarily intended for the larger egg programs with more than one farm. Expenses for each question should be only those normally charged to egg production and

5. continued

should not include expenses at the farm, unit and flock levels. For example, if the user's program is vertically integrated, the managers' expenses should only be partially charged to the egg program. Expenses at this level are dispersed over the entire program. They should be current and not projected costs. If the expenses are not appropriate for the user's program, a single zero for each item is required. The input for each item is in dollars and the costs are annual.

A. Operational management. This expense should include all salaries, expenses and fringe benefits of those in management or supervisory positions. If the program uses more than one layer serviceman, the user can include that expense here or at the farm level.

B. Administration. In this area the costs include the salaries and expenses of secretaries, accountants and other technically skilled people not in management positions. This cost should also include legal and technical fees.

C. Hired labor. Here the user should include any hourly paid employees used on a regular basis at the program level.

D. Maintenance of building(s) and equipment.

E. Maintenance of vehicles owned or leased by the company for the purpose of carrying on the business of the egg production program. This should include gasoline and oil expenses as well as other mechanical maintenance.

F. Utilities.

G. Supplies. This includes the cost of all supplies used for the purpose of egg production.

H. Lease. Record the annual rental fees of office space, equipment and vehicles.

I. Insurance and taxes. This includes taxes and insurance of office space, equipment and vehicles. It may include employee taxes and company paid employee insurance costs.

J. Interest expense. Record the total interest cost on all liabilities.

5. continued

   K. Depreciation of vehicles.

   L. Depreciation of building(s).

   M. Depreciation of equipment.

   N. Other. Record any other program level cash expense not included in the above categories.

6. Egg pricing method. The user must select one method of egg pricing for the entire run. A more complete description of this item can be found in Section I. under "Prices."

   A. Egg Pricing Generator. (Input = 1)

   B. Blend Price. (Input = 2)

   C. Input Price per Dozen Large Eggs. (Input = 3)

7. To simulate phase feeding, the user is allowed up to six (6) types of feeds and their costs per ton in dollars. The input form provides spaces for the particular feed name or code followed by a number, 1-6. The computer refers to the feed by these numbers. If the user does not provide the feed or if he does not wish to use all of the spaces available, he must input zeros in the spaces provided for feed costs per ton.

8. The following items update the expenses for items 5 and 7 for the first year of the run. If the user put zeros in those items or if he does not expect the costs to change the first year, he can answer here with zeros.

   A. Estimate the percent change in the cost of items 5.A. through 5.N. for the first year of the run.

   B. Estimate the percent change in feed costs per ton for item 7 for the first year of the run.

9. The following questions are a result of the user's answer to item 6. Answer only the appropriate question.

   A. If the answer for item 6 is a 1, what is the: (All answers except for the first are in cents per dozen.)

9. continued

1) Starting point for price generator (1-162)?

2) Starting price for large eggs (max = 99 cents)?

3) Average price expected above large egg price for X-large and jumbo eggs?

4) Average price expected below large egg price for medium eggs?

5) Average price expected below large egg price for small eggs?

6) Average price expected below large egg price for peewee eggs?

7) Average price expected below large egg price for chex and undergrade eggs?

B. If the answer for item 6 is a 2, what is the: (This section is also dependent upon the length of the run. If the run is 1 year, any answer for the second and third year will be ignored. All answers are cents per dozen.)

1) Expected blend price for all eggs sold for the first year of the run?

2) Expected blend price for all eggs sold for the second year of the run?

3) Expected blend price for all eggs sold for the third year of the run?

C. If you wish to input expected large egg prices, what is the: (All answers should be in cents per dozen.)

1) Average price expected above large egg price for X-large and jumbo eggs?

2) Average price expected below large egg price for medium eggs?

3) Average price expected below large egg price for small eggs?

4) Average price expected below large egg price for peewee eggs?

5) Average price expected below large egg price for chex and undergrades?

9. continued

   6) Expected large egg price per dozen for 13 periods per year? Use only the appropriate number of columns. One year uses 13 sets of input, two years use 26 sets of input and three years use 39 sets of input.

The input values for the remainder of this section are dependent upon the length of the run. If it is greater than 1 year, answer the appropriate questions; otherwise, go to the next section, General Farm Information.

10. If the length of the run is greater than one year:

    A. Estimate with a percent value the change in expenses for item 5.A. through 5.N. for the second year of the run.

    B. Estimate with a percent value the change in feed costs for item 7 for the second year of the run.

11. If the length of the run is three years:

    A. Estimate with a percent value the change in expenses for item 5.A. through 5.N. for the third year of the run.

    B. Estimate with a percent value the change in feed costs for item 7 for the third year of the run.

General Farm Information

Input Items

The financial system is determined by who owns the major resources of the production cycle. These resources may come from one, two or more sources in a contractual arrangement. Major resources include birds, feed and farm inputs which include daily labor, housing and equipment.

The farm is defined as a sum of units not restricted to a single geographical location; yet, more than one farm can occupy the same location.

The unit is defined as one or more laying house and, like the farm, is not restricted to a single geographical location. The unit is restricted to a flock capacity of 250,000 birds. If the unit is composed of more than one flock, each flock must follow a single production cycle and be the same age.

12. Number of units on this farm.

13. What financial system best fits the farm?

    A. This farm is not part of a production contract program and the user supplies all the major resources. (Input = 1000)

    B. This farm is part of a production contract program. The contractor owns the eggs produced and pays the contractee for his resources put into the system.

        1. The user is the contractor (Input = 2). The user is the contractee (Input = 3).

        2. The user supplies the farm inputs (0 = yes, 1 = no).

13. continued

    3. The user supplies the birds (0 = yes, 1 = no).

    4. The user supplies the feed (0 = yes, 1 = no).

14. This item is to determine how the cost of cleaning out this unit following the end of a production cycle is to be charged. Select the best answer from the following statements.

    A. The additional costs of cleanout are charged to the last flock occupying the unit. (Input = 2)

    B. The additional costs of cleanout are to be charged to the next flock occupying the unit. The costs will be added to the bird cost and be depreciated over the productive life of the flock. (Input = 3)

15. Does the egg production enterprise obtain cash or credit for the sale of dried poultry waste? (0 = yes, 1 = no)

16. Expenses at the farm level. Expenses at this level include all costs of the farm associated with egg production except the costs of the unit or flocks. If the farm engaged in enterprises other than egg production, such costs should be divided with only a certain percent being charged to egg production. If the farm is involved with manure drying, these costs may or may not be charged to egg production. If these costs are to be charged to egg production, then egg production should be credited with the sale value of the end product. If manure drying is to be treated as a separate enterprise, then egg production should be credited for the raw material value of the manure only.

    The costs at this level will be divided by the number of units associated with this farm. These expenses should be current and <u>not</u> projected costs. If the expenses are not appropriate for the user's operation, a single zero for each item is required. The input for each item is in dollars and costs are annual.

    A. Operational management. This expense should include all salaries, expenses and fringe benefits of those in management or supervisory positions. The costs of the layer servicemen responsible for this farm can be included here.

16. continued

    B. Administration. In this area the costs include the salaries, expenses and fringe benefits of secretaries, accountants and other technically skilled people not in management positions. This cost should also include legal and technical fees.

    C. Hired labor. Here the user should include any hourly paid employees used on a regular basis on the farm.

    D. Maintenance of building(s) and equipment.

    E. Maintenance of vehicles. This should include the maintenance of all vehicles owned or leased by the farm for the purpose of carrying on the business of the egg production enterprise. This should include gasoline and oil expenses as well as other mechanical maintenance.

    F. Utilities.

    G. Supplies. This includes the cost of all supplies used for the purpose of egg production.

    H. Lease. Record the annual rental fees of land, building(s), equipment and vehicles.

    I. Insurance and taxes. This includes taxes and insurance of land, building(s), equipment and vehicles. It may include employee taxes and company paid employee insurance costs.

    J. Interest expense. Record the total interest cost on all liabilities.

    K. Depreciation of farm vehicles.

    L. Depreciation of farm building(s).

    M. Depreciation of farm equipment.

    N. Other. Record any other farm level cash expenses not included in the categories above.

17. Cost of egg packing supplies. If the user supplies the materials for egg packing to the processor, input is the average cost per 30 dozen case in cents. If the user does not supply any packing materials, input equals zero. This cost will be updated the same as item 16.G.

18. This item updates with a percent value the expenses for items 16.A. through 16.N. for the first year of the run. If the user answered any question with a zero or he does not expect any change in cost, he should also answer here with a zero. If the user answered question 16.G. with a zero but he pays for egg packing materials, the update value may be something other than zero.

19. One of the purposes of item 13 was to determine who owns the eggs produced. If the user answered 13.A. with a 1000, ignore this item and go to item 21. If the user answered 13.B.1. with a 2, select the best answer from statements A-E. The user is assumed to be a contractor and the answer for item 19 is a contract cost. If the user answered 13.B.1. with a 3, select the best answer from statements A-E. The user is assumed to be a contractee and the answer for item 19 is considered to be payment for the user's resources consumed in the egg production program per period (4 weeks).

    A. The method of payment is a percent of total egg receipts. (Input = 1)

    B. The method of payment is a flat rate per dozen eggs sold. (Input = 2)

    C. The method of payment is a flat rate per dozen eggs sold by size. (Input = 3)

    D. The method of payment is a flat rate per thousand birds at time of housing. (Input = 4)

    E. The method of payment is a flat rate per thousand birds at start of period. (Input = 5)

20. The answers to this item are dependent upon the user's answer to the previous item.

    A. If the input to item 19 was a 1, express the method of payment as a percent.

    B. If the input to item 19 was a 2, express the method of payment as cents per dozen.

    C. If the input to item 19 was a 3, express the method of payment in cents per dozen by size.

        1. Jumbo and extra large

        2. Large

        3. Medium

20. continued

    4. Small

    5. Peewee

    6. Chex and undergrades

    D. If the input to item 19 was a 4 or 5, express the method of payment in dollars per 1,000 birds.

21. If the answer to item 15 (Do you sell dried poultry waste?) was a zero (yes), answer the following. Otherwise, go to the next item.

    A. Input the sale price per ton of poultry waste from the last historical data. (Input = dollars per ton)

    B. What is the percent moisture content of the poultry waste sold? (Non-dried poultry waste averages about 80% moisture.)

    C. Estimate with a percent value the change in price per ton for the first year of the run.

22. If the user indicated in item 13 that he provides the birds for this farm, answer the following. Otherwise, ignore this item.

    A. Input in cents per pound the value of spent hens from the user's last historical data.

    B. Estimate with a percent value the expected change in price per pound for spent hens for the first year of the run.

<u>The input values for the remainder of this section depend upon the length of the run.</u>

23. If the length of run is greater than one year, answer item A with at least a zero. Ignore item B and/or item C if the user does not sell poultry waste or the user does not own the birds used on the farm.

    A. Estimate with a percent value the change in expenses for items 16.A. through 16.N. for the second year of the run.

    B. Estimate with a percent value the change in the price of poultry waste for the second year of the run.

23. continued

    C. Estimate with a percent value the change in the value per pound for spent hens for the second year of the run.

24. If the length of the run is three years, answer item A with at least a zero. Ignore item B and/or item C if the user does not sell poultry waste or the user does now own the birds used on the farm.

    A. Estimate with a percent value the change in expenses for items 16.A. through 16.B. for the third year of the run.

    B. Estimate with a percent value the change in the price of poultry waste for the third year of the run.

    C. Estimate with a percent value the change in the value per pound for spent hens for the third year of the run.

General Unit Information

Input Items

This section defines the expenses and other variables of the laying house(s) that make up the unit. If there is more than one house in the unit all flocks occupying these houses must follow a single production cycle and all costs should be summed. At the end of a production cycle a flock may be sold or molted. In both cases the next flock is considered a separate flock from its predecessor.

25. Unit name. The unit name is limited to 10 characters. The name can either be numeric code or alphabetic. A sample unit name might be BARKER 1. Barker is the unit name and 1 indicates a particular house.

26. Number of flocks that will be housed in this unit for the duration of the run. The maximum number of flocks allowed per unit is five.

27. This model allows a unit to enter or leave the system during the run. A further explanation of this item can be found in Section I. under "Buy or Sell Unit."

    A. Indicate when the unit will begin. The first column is for the year and the next two columns are for the period.

    B. Indicate when this unit will be terminated. The first column is for the year and the next two columns are for the period.

28. Bird capacity of this unit. (Maximum is 250,000 birds.)

29. Average length of time for cleanout in weeks. (Maximum is 9 weeks.)

30. Expenses at the unit level. If the user indicated in item 13.B.2. that he does not supply the farm inputs (Input = 1) into the system, the user should ignore this item. The expenses at this level include the

30. continued

costs of the laying house(s) and equipment. These costs will be distributed over the flocks of this unit. Expenses should be current and not projected. If some of these expenses are not appropriate, a single zero is required. The input for each item is in dollars and costs are annual.

A. Hired labor. Record the total annual labor costs for this unit. Include all the employee benefits and costs paid for by the company. This expense should not include any additional labor costs for moving birds into or from the house(s) nor those additional labor costs associated with the cleanout.

B. Maintenance of laying house(s) and equipment.

C. Utilities.

D. Supplies. This should not include any additional supplies used in the cleanout.

E. Insurance and taxes.

F. Interest expense. This should include the interest cost on the outstanding debt of the laying house(s) and equipment.

G. Depreciation of laying house(s).

H. Depreciation of laying house equipment.

I. Other. Record any other cash expense of the laying house(s) or equipment not included in the above items.

31. Indicate the sum total of the current costs associated with the cleanout of this unit to the user. The input for this item is in dollars.

32. Indicate the average additional current labor cost and/or shipping cost to the user for moving birds from the unit. The input for this item is in dollars.

33. The following items update the expenses for items 30, 31, and 32 for the first year of the run. If the user ignored item 30, he should also ignore 33.A.

A. Estimate with a percent value the change in expenses for items 30.A. through 30.I. for the first year of the run.

33. continued

    B. Estimate with a percent value the change in expenses for item 31 for the first year of the run.

    C. Estimate with a percent value the change in expenses for item 32 for the first year of the run.

34. This item is intended to measure unit efficiency. Calculate the square footage of each house in the unit. This should be the outside dimensions. If there is more than one house, the input equals the sum of all houses. (Square footage equals length x width.) If the user does not wish to have this variable measured he should input a zero.

The next two items are dependent upon the length of the run. If the length of run is one year, ignore these items and go to item 37.

35. If the length of run is greater than one year, answer the following. These items update items 30, 31, and 32 for the second year of the run. If the user ignored item 30, he should ignore 35.A.

    A. Estimate with a percent value the change in expenses for items 30.A. through 30.I. for the second year of the run.

    B. Estimate with a percent value the change in expenses for item 31 for the second year of the run.

    C. Estimate with a percent value the change in expenses for item 32 for the second year of the run.

36. If the length of run is three years, answer the following. These items update items 30, 31, and 32 for the third year of the run. If the user ignored item 30, he should ignore 36.A.

    A. Estimate with a percent value the change in expenses for items 30.A. through 30.I. for the third year of the run.

    B. Estimate with a percent value the change in expenses for item 31 for the third year of the run.

36. continued

    C. Estimate with a percent value the change in expenses for item 32 for the third year of the run.

The following items pertain to the first flock only.

37. The first flock of each unit can enter the run at any age or the houses can be in the process of being cleaned out. Answer either question A or B.

    A. If the unit is presently being cleaned out the input for this item should be the remaining weeks of the cleanout. This value should never be greater than the value for item 29. If this unit is not being cleaned out, Input = 0.

    B. If the unit is presently occupied by a flock of force molted hens and this flock has passed the age of capitalization, Input = 0; otherwise, Input = 1.

38. How many birds have died since the start of the flock? If the house is being cleaned out, Input = 0.

General Flock Information

Input Forms

39. Multichix has built into it egg production standards for six major leghorn strains. For each strain there is production data for both pullet and force molted hens. A description of this data can be found in the first section under "Standards." If the user does not wish to use any of the specific strain standards he must use the general production standard. The input for this item is the value listed under Key.

	Standards	Key
A.	General Production	01
B.	Babcock B-300	02
C.	DeKalb 231	03
D.	H & N Nickchick	04
E.	Hyline W-36	05
F.	Kimber K-137	06
G.	Shaver Starcross 288	07

40. Is this flock started pullets or molted hens? (0 = started pullets, 1 = molted hens)

41. This item deals with the ages of the flock at the start and at the end of the production cycle. The user should refer back to Section I, "Standards", for the maximum allowable weeks for hen flocks. The ending age for pullet flocks should never be greater than 80 weeks.

    A. Starting age of this flock.

    B. Ending age of this flock.

42. Estimate the average body weight per bird at the end of the cycle.

43. At the end of this production cycle, what percent of the remaining flock will be sold? The input must be in a whole percent.

44. At the time of placement or start of the run, how many birds are in or will be in the flock? If this is the first flock for this unit answer part A only, otherwise answer part B.

44. continued

A. If the first flock is a pullet flock answer 1, otherwise answer 2.

1. If this unit is presently being cleaned out, how many birds are to be placed in the house(s)?

2. How many birds are presently in the flock? Your answer should be the number of birds started less the mortality to date (item 38). This answer plus the answer to item 38 should never be greater than the unit capacity (item 28).

B. If this flock is a pullet flock answer 1, otherwise answer 2.

1. Record the number of birds to be placed in the house(s) at the start of the flock. This answer should not be greater than the unit capacity (item 28).

2. If the user wishes only to molt the birds from the previous flock, input = 0. If the user wishes to add birds up to the unit capacity, input = 1.

45. What is the book value of this flock? If this is the first flock for this unit answer part A only, otherwise answer part B.

A. Record the total book value of this flock. Your answer should include the cost of the flock not yet capitalized and any cost reserved for salvage value.

B. If the flock is a pullet flock answer 1, otherwise answer 2.

1. Record the total cost of this flock at the time of placement. This cost may include the purchase price of the flock plus shipping costs and any extra labor cost at time of placement.

2. If the user answered item 44.B.2. with a zero the computer will use only the non-capitalized costs from the previous flock. If the user wishes to add any costs the input should be only those costs, otherwise input should be zero.

45. continued

If the user answered item 44.B.2. with a one, the computer will add the approximate cost of the birds to be added to the flock plus the non-capitalized costs from the previous flock. The input for this item should be only the costs of the birds to be added to the flock. This cost should include the purchase price of the birds to be added to the flock plus hauling costs and any added labor costs for placement.

46. Estimate the flock-end average hen-day egg production expected from this flock.

47. Expenses at the flock level. These expenses will be distributed over the flock from the day of placement or start of molt until the end of its production cycle. The expenses will be added to bird cost until the time of capitalization. If any of these costs are not appropriate, a zero is required. These expenses will <u>not</u> be updated and they should be projected.

    A. Medication. This should include the total cost of medication regardless of how it is administered to the laying flock. If the flock is to be revaccinated prior to force molting, the cost should be charged to the force molted flock.

    B. Insurance and taxes. This should include all insurance and taxes charged to the flock.

    C. Interest expense. Record the cost of capital on the outstanding liability on the flock.

    D. Other. Record any other cash costs not included in the above items.

48. This item is composed of four questions. Each question has five parts with two inputs per part. The user must answer at least the first part of each question and the last age must be greater than the last week of the production cycle for each flock.

    A. Feed consumption. The first input is the pounds of feed per 100 birds per day and the second input is the flock age. This question allows the user to change feed consumption five times during the production cycle.

48. continued

B. Feed type. The first input is the code (1-6) used in item 7 and the second input is the flock age. This question simulates phase feeding. The user can change the type of feed five times during the production cycle.

C. Mortality. The first input is the average (percent) mortality per month and the second input is the flock age. The user can change the percent mortality five times during the production cycle.

D. Egg loss. The first input is the average percent egg loss and the second input is the flock age. The user can change the percent egg loss five times during the production cycle.

49. If this flock is a force molted flock, indicate the age when production of eggs begins. Ignore this item if this flock is a pullet flock.

SECTION III. OUTPUT SAMPLES

This section of the handbook presents samples of output. Shown in Table A.1. is an example of correctly recorded input. Ouput shows item numbers, in parentheses, followed by input values. Table A.2. presents an example of incorrectly recorded input. Error statements appear below lines with errors and indicate which item is incorrect. It is important to note, however, that these error statements only indicate input the model is not designed to handle (e.g., a 3 recorded where the computer is programmed to read a 0, 1 or 2). To determine that his own input is correct, the user must compare his output data against that recorded on input forms.

The third sample of output (Table A.3.) is a statement for each unit, each period of the run. This output will only be presented if the user answers Item 1. with a 1 or 2. The next two samples (Table A.4. and Table A.5.) are farm and program summaries. The first table is a summary for the period and the second is a year-end summary. To get this type of output, the user must put either a 2 or 3 in Item 1.

Table A.1. Example of correctly recorded input

```
FOLLOWING IS A LISTING OF THE INPUT TO THE MODEL
---------------------------------------------------
(1) 1 (2) 1 (3A) 20 (3B) .01 (4)  .250 (5A-5H)       0.      0.      0.      0.      0.      0.      0.      0.
(5I-5N)        0.       0.       0.       0.       0.       0. (6) 1 (7)   130.  125.  120.    0.    0.    0.
(8A,A-M)   0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
(8A,N)  0.000 (8B)  0.000 (9)   52.   .50   .02   .06   .30   .30   .30
***** THIS ENDS GENERAL PROGRAM INPUT, NUMBER OF FATAL ERRORS= 0 *****
(12)   2 (13) 1000 (14) 2 (15) 1 (16,A-H)       0.      0.      0.      0.      0.      0.      0.      0.
(16,I-N)       0.       0.       0.       0.       0.       0. (17)  0.00 (18,A-D)   0.000  0.000  0.000  0.000
(18,E-N)   0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000 (19)
(22,A-B)  .07  0.000
(25) BARKER NO5 (26) 2 (27A) 1 5 (27B) 113 (28)   30000 (29) 2 (30,A-F)       0.      0.      0.      0.      0.      0.
(30,G-I)        0.       0.       0. (31)     0. (32)      0 (33A,A-G)   0.000  0.000  0.000  0.000  0.000  0.000  0.000
(33A,H-I)   0.000  0.000 (33B)  0.000 (33C)  0.000 (34)  11200 (35A,A-H)
(37) 0 (38)       0
(39)  3 (40) 1 (41A)  56 (41B)  96 (42)  4.50 (43)  1.00 (44)  27956 (45)   29143.
(46)   .600 (47,A-D)        0.        0.         0.         0.
(40A)   0.00 14.00 22.00  0.00  0.00  56  62 101   0   0 (40B)    1   2   3   0   0  60  80 101   0   0
(40C)   .000  .020  .010 0.000 0.000  56  62 101   0   0 (40D)  0.000 0.000 0.000 0.000 0.000  80 101   0   0   0 (49)  63
(39)  3 (40) 0 (41A)  20 (41B)  76 (42)  4.50 (43)  1.00 (44)  30000 (45)   60100.
(46)   .690 (47,A-D)        0.        0.         0.         0.
(40A)  10.00 20.00 22.00  0.00  0.00  26  30  80   0   0 (40B)    1   2   3   0   0  42  60  90   0   0
(40C)   .010  .000 0.000 0.000 0.000  20  80   0   0   0 (40D)  0.000 0.000 0.000 0.000 0.000  40  80   0   0   0 (49)
(25) BARKER NO6 (26) 2 (27A) 1 1 (27B) 113 (28)   30000 (29) 2 (30,A-F)       0.      0.      0.      0.      0.      0.
(30,G-I)        0.       0.       0. (31)     0. (32)      0 (33A,A-G)   0.000  0.000  0.000  0.000  0.000  0.000  0.000
(33A,H-I)   0.000  0.000 (33B)  0.000 (33D)  0.000 (34)  11200 (35A,A-H)
(37) 0 (38)    2044
(39)  3 (40) 0 (41A)  56 (41B)  76 (42)  4.50 (43)  1.00 (44)  27956 (45)   29143.
(46)   .690 (47,A-D)        0.        0.         0.         0.
(40A)  10.00 20.00 22.00  0.00  0.00  26  30  80   0   0 (40B)    1   2   3   0   0  42  60  80   0   0
(40C)   .010  .000 0.000 0.000 0.000  20  80   0   0   0 (40D)  0.000 0.000 0.000 0.000 0.000  40  80   0   0   0 (49)
(39)  3 (40) 0 (41A)  20 (41B)  76 (42)  4.50 (43)  1.00 (44)  30000 (45)   60100.
(46)   .690 (47,A-D)        0.        0.         0.         0.
(40A)  10.00 20.00 22.00  0.00  0.00  26  30  80   0   0 (40B)    1   2   3   0   0  42  60  80   0   0
(40C)   .010  .000 0.000 0.000 0.000  20  80   0   0   0 (40D)  0.000 0.000 0.000 0.000 0.000  40  80   0   0   0 (49)
***** THIS ENDS GENERAL FARM,UNIT,FLOCK DATA FOR FARM NO  1, NO OF FATAL ERRORS= 0
```

Table A.2. Example of incorrectly recorded input

```
     FOLLOWING IS A LISTING OF THE INPUT TO THE MODEL
     --------- -- - ------- -- --- ----- -- --- -----
      (1) 4 (2) 4 (3A) 20 (3B) .01 (4)  .250 (5A-5H)       0.       0.       0.       0.       0.       0.       0.       0.
********** ITEM NO 1        IS OUT OF RANGE FATAL ERROR **********
********** ITEM NO 2        IS OUT OF RANGE FATAL ERROR **********
      (5I-5N)        0.       0.       0.       0.       0.       0. (6) 4 (7)   130.  125.  120.    0.    0.    0.
********** ITEM NO 6        IS OUT OF RANGE FATAL ERROR **********
      (8A,A-M)   0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
      (8A,N)  0.000 (8B)  0.000 (9)   .05  .05 0.00 0.00  .03  .03  .03 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
     0.00 0.00 0.00 0.00 0.00 0.00 0.00
      (9)  0.00  .01 0.00  .20 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
     0.00 0.00
      (10A,A-M)   0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
      (10A,N)  0.000 (10B)  0.000 (11A,A-K)   0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000  0.000
      (11A,L-N)   0.000  0.000   .700 (11B)  0.000
***** THIS ENDS GENERAL PROGRAM INPUT, NUMBER OF FATAL ERRORS= 3 *****
RECORD NO. 9        BARKER NO5
                    *.........1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

* ERROR DATA INPUT * ILLEGAL DATA IN FIELD ***
ERROR NUMBER   78   DETECTED BY INCOM=  AT ADDRESS 000285
CALLED FROM KRAKER= AT ADDRESS 000355
CALLED FROM INPC=   AT ADDRESS 000100
CALLED FROM READIN  AT  LINE 122
CALLED FROM MULCHX  AT  LINE 72
```

Table A.3. Example of a detailed unit summary for one period

FARM NO 1 UNIT BARKER NO6 FLOCK NO 1 TYPE PULLET STRAIN DEKALB AGE:ST 68 END 71 BOOK VALUE FLK:ST 15051. END 11420. PD 4 YR 1

BIRD INV	
START	30000
PUR	0
SOLD	0
MORT	2855
END	27145
MORT THIS PERIOD	280

EGG PRODUCTION AND SALES

SIZE	PERIOD DOZENS	PERIOD PRC	PERIOD VALUE	PERIOD TOTAL SALES		YEAR TO DATE DOZENS	YEAR TO DATE PRC	YEAR TO DATE VALUE	YEAR TO DATE TOTAL SALES	
JUM+XLG	18640.	.62	11498.	EGGS	23559.	67936.	.62	42130.	EGGS	100537.
LARGE	16177.	.60	9641.	BIRDS	0.	70922.	.60	47203.	BIRDS	0.
MEDIUM	2827.	.53	1511.	DPW*	0.	14925.	.54	8005.	DPW*	0.
SMALL	0.	.00	0.			0.	.00	0.		
PEEWEE	0.	.00	0.	TOT $	23559.	0.	.00	0.	TOT $	100537.
CX+UND	3162.	.29	910.	LOSS$	0.	11056.	.29	3200.	LOSS$	0.
TOTALS	40814.	$.58	$ 23559.			172038.	$.58	$ 100537.		

PROD ANALYSIS	PERIOD	FLOCK TD
HEN DAY PROD	.64	.67
HEN HSE PROD	.58	.62
EGGS/HEN (HD)	18.	75.
EGGS/HEN (HH)	16.	69.

FEED FACTS	PERIOD	FLOCK TD
TOTAL TONS CON	84.	339.
AVE PRC/TON	$ 120.	$ 122.
PDS/100 BDS/DAY	22.00	22.00
PDS/DOZ EGGS	4.11	3.93

EXPENSES

TYPE	PERIOD CASH	PERIOD NON-CASH	PERIOD DOZ	PERIOD BIRD	YEAR TO DATE CASH	YEAR TO DATE NON-CASH	YEAR TO DATE DOZ	YEAR TO DATE BIRD
CONTRACT	$ 0.	$	$0.00	$0.00	$ 0.		$0.00	$ 0.00
FEED	10070.		.25	.37	41264.		.24	1.50
OPER MGT	0.		0.00	0.00	0.		0.00	0.00
ADMINSTR	0.		0.00	0.00	0.		0.00	0.00
LABOR	0.		0.00	0.00	0.		0.00	0.00
MAINT-BE	0.		0.00	0.00	0.		0.00	0.00
MAINT-VH	0.		0.00	0.00	0.		0.00	0.00
UTILITIE	0.		0.00	0.00	0.		0.00	0.00
SUPPLIES	0.		0.00	0.00	0.		0.00	0.00
RENT+LSE	0.		0.00	0.00	0.		0.00	0.00
INS+TAX	0.		0.00	0.00	0.		0.00	0.00
INTEREST	0.		0.00	0.00	0.		0.00	0.00
MEDICATE	0.		0.00	0.00	0.		0.00	0.00
DEP-BIRD		4431.	.11	.16		17723.	.10	.64
DEP-VEH		0.	0.00	0.00		0.	0.00	0.00
DEP-BLDG		0.	0.00	0.00		0.	0.00	0.00
DEP-EQPT		0.	0.00	0.00		0.	0.00	0.00
OTHER	0.		0.00	0.00	0.		0.00	0.00
TOTALS	$ 10070.	$ 4431.	$ .36	$ .53	$ 41264.	$ 17723.	$ .34	$ 2.14

FINANCIAL ANALYSIS	PERIOD	PER BIRD	YTD	PER BIRD
CASH RECEIPTS	$ 23559.	$ .86	$ 100537.	$ 3.65
CASH EXPENSES	$ 10070.	$ .37	$ 41264.	$ 1.50
NON-CASH EXPENSES	$ 4431.	$ .16	$ 17723.	$ .64
TOTAL EXPENSES	$ 14501.	$ .53	$ 58988.	$ 2.14
NET CASH INCOME	$ 13490.	$ .50	$ 59273.	$ 2.15
NET INCOME	$ 9059.	$ .33	$ 41550.	$ 1.51

BREAK EVEN ANALYSIS**	PERIOD	YEAR TO DATE
PRICE CASH COST	$ .25 /DOZ	$ .24 /DOZ
PRICE TOTAL COST	$ .36 /DOZ	$ .34 /DOZ
PRODUCTION CASH COST	17445. DOZS	70939. DOZS
PRODUCTION TOTAL COST	25121. DOZS	101400. DOZS

UNIT EFFECIENCY RATIOS	PERIOD	YEAR TO DATE
EGGS / SQ FT HOUSING	43.73	185.18
RECEIPTS / SQ FT HOUSING	$ 2.10	$ 8.98
TOT EXP / SQ FT HOUSING	$ 1.29	$ 5.27
SQUARE FEET OF HOUSING	11200	

*DPW refers to either dehydrated or non-dehydrated poultry waste

**reflects only projected production and price of eggs produced

Table A.4. Example of a combined (unit, farm, program) summary for one period (4 weeks)

***** SUMMARY FOR PERIOD 13,YEAR 1 *****

---EGG PRODUCTION AND SALES---

	EGG PRODUCTION BY SIZE IN DOZENS							SALES			
UNIT NAME	JUM+XLG	LARGE	MEDIUM	SMALL	PEEWEE	CX+UND	TOTALS	EGG SALES	BIRD SALES	DPW SALES	TOTAL SALES
BARKER NO5	20148.	15087.	2554.	0.	0.	3396.	41186.	22521.	0.	0.	22521.
BARKER NO6	10198.	28540.	9055.	0.	0.	1991.	49784.	27216.	0.	0.	27216.
FARM NO 1	30346.	43627.	11610.	0.	0.	5388.	90970.	49736.	0.	0.	49736.
PROGRAM	30346.	43627.	11610.	0.	0.	5388.	90970.	49736.	0.	0.	49736.

---EXPENSES---

	CASH EXPENSES													
UNIT NAME	CONTRACT	FEED	OPER MGT	ADMINSTR	LABOR	MAINT-BE	MAINT-VH	UTILITIE	SUPPLIES	RENT+LSE	INS+TAX	INTEREST	MEDICATE	OTHER
BARKER NO5	0.	9271.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BARKER NO6	0.	10923.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
FARM NO 1	0.	20194.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PROGRAM	0.	20194.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	NON-CASH EXPENSES				EXPENSE TOTALS		
UNIT NAME	DEP-BIRD	DEP-VEH	DEP-BLDG	DEP-EQPT	TOTAL CASH EXPENSES	TOTAL NON-CASH EXPENSES	TOTAL ALL EXPENSES
BARKER NO5	3357.	0.	0.	0.	9271.	3357.	12627.
BARKER NO6	4329.	0.	0.	0.	10923.	4329.	15252.
FARM NO 1	7685.	0.	0.	0.	20194.	7685.	27879.
PROGRAM	7685.	0.	0.	0.	20194.	7685.	27879.

	FINANCIAL	
UNIT NAME	NET CASH INCOME	NET INCOME
BARKER NO5	13250.	9893.
BARKER NO6	16292.	11964.
FARM NO 1	29542.	21857.
PROGRAM	29542.	21857.

Table A.5. Example of a combined (unit, farm, program) year-end summary (52 weeks)

***** SUMMARY FOR THE 1ST YEAR OF THE RUN *****

---EGG PRODUCTION AND SALES---

	EGG PRODUCTION BY SIZE IN DOZENS							SALES			
UNIT NAME	JUM+XLG	LARGE	MEDIUM	SMALL	PEEWEE	CX+UND	TOTALS	EGG SALES	BIRD SALES	OPW SALES	TOTAL SALES
BARKER NO5	110837.	138303.	28505.	0.	0.	18294.	295940.	162660.	0.	0.	162660.
BARKER NO6	115586.	232726.	151173.	43311.	0.	26420.	569216.	303279.	8488.	0.	311767.
FARM NO 1	226423.	371029.	179678.	43311.	0.	44714.	865156.	465939.	8488.	0.	474426.
PROGRAM	226423.	371029.	179678.	43311.	0.	44714.	865156.	465939.	8488.	0.	474426.

---EXPENSES---

	CASH EXPENSES													
UNIT NAME	CONTRACT	FEED	OPER MGT	ADMINSTR	LABOR	MAINT-BE	MAINT-VH	UTILITIE	SUPPLIES	RENT+LSE	INS+TAX	INTEREST	MEDICATE	OTHER
BARKER NO5	0.	71614.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BARKER NO6	0.	132968.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
FARM NO 1	0.	204582.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PROGRAM	0.	204582.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	NON-CASH EXPENSES				EXPENSE TOTALS		
UNIT NAME	DEP-BIRD	DEP-VEH	DEP-BLDG	DEP-EQPT	TOTAL CASH EXPENSES	TOTAL NON-CASH EXPENSES	TOTAL ALL EXPENSES
BARKER NO5	24336.	0.	0.	0.	71614.	24336.	95950.
BARKER NO6	61607.	0.	0.	0.	132968.	61607.	194576.
FARM NO 1	85944.	0.	0.	0.	204582.	85944.	290526.
PROGRAM	85944.	0.	0.	0.	204582.	85944.	290526.

	FINANCIAL	
UNIT NAME	NET CASH INCOME	NET INCOME
BARKER NO5	91046.	66710.
BARKER NO6	178798.	117191.
FARM NO 1	269844.	183901.
PROGRAM	269844.	183901.

General Program Information Page__

(__)
1. _ (1)
2. _ (3)
3.A. _ _ (5-6)
3.B. _ _ (8-9)
4. _ _ _ (11-13)
5.A. _ _ _ _ _ _ _ (15-21)
5.B. _ _ _ _ _ _ _ (23-29)
5.C. _ _ _ _ _ _ _ (31-37)
5.D. _ _ _ _ _ _ _ (39-45)
5.E. _ _ _ _ _ _ _ (47-53)
5.F. _ _ _ _ _ _ _ (55-61)
5.G. _ _ _ _ _ _ _ (63-69)
5.H. _ _ _ _ _ _ _ (71-77)
(__)
5.I. _ _ _ _ _ _ _ (1-7)
5.J. _ _ _ _ _ _ _ (9-15)
5.K. _ _ _ _ _ _ _ (17-23)
5.L. _ _ _ _ _ _ _ (25-31)
5.M. _ _ _ _ _ _ _ (33-39)
5.N. _ _ _ _ _ _ _ (41-47)
6. _ (49)
7. ________-1 _ _ _ (51-53)
________-2 _ _ _ (55-57)
________-3 _ _ _ (59-61)
________-4 _ _ _ (63-65)
________-5 _ _ _ (67-69)
________-6 _ _ _ (71-73)
(__)
8.A.A. _ _ _ _._ (1-5) s
8.A.B. _ _ _ _._ (7-11) s
8.A.C. _ _ _ _._ (13-17) s
8.A.D. _ _ _ _._ (19-23) s
8.A.E. _ _ _ _._ (25-29) s
8.A.F. _ _ _ _._ (31-35) s
8.A.G. _ _ _ _._ (37-41) s
8.A.H. _ _ _ _._ (43-47) s
8.A.I. _ _ _ _._ (49-53) s
8.A.J. _ _ _ _._ (55-59) s
8.A.K. _ _ _ _._ (61-65) s
8.A.L. _ _ _ _._ (67-71) s
8.A.M. _ _ _ _._ (73-77) s
(__)
8.A.N. _ _ _ _._ (1-5) s
8.B. _ _ _ _._ (7-11) s
9.A.1. _ _ _ (13-15)
9.A.2. _ _ (17-18)
9.A.3. _ _ (20-21)
9.A.4. _ _ (23-24)
9.A.5. _ _ (26-27)
9.A.6. _ _ (29-30)
9.A.7. _ _ (32-33)
9.B.1. _ _ (13-14)
9.B.2. _ _ (16-17)
9.B.3. _ _ (19-20)
9.C.1. _ _ (13-14)
9.C.2. _ _ (16-17)
9.C.3. _ _ (19-20)
9.C.4. _ _ (22-23)
9.C.5. _ _ (25-26)
9.C.6.

YEAR 1

1 _ _ (28-29)
2 _ _ (31-32)
3 _ _ (34-35)
4 _ _ (37-38)
5 _ _ (40-41)
6 _ _ (43-44)
7 _ _ (46-47)
8 _ _ (49-50)
9 _ _ (52-53)
10 _ _ (55-56)
11 _ _ (58-59)
12 _ _ (61-62)
13 _ _ (64-65)

General Program Information continued Page__

YEAR 2

14 _ _ (67-68)
15 _ _ (70-71)
16 _ _ (73-74)
17 _ _ (76-77)

(__)

18 _ _ (1-2)
19 _ _ (4-5)
20 _ _ (7-8)
21 _ _ (10-11)
22 _ _ (13-14)
23 _ _ (16-17)
24 _ _ (19-20)
25 _ _ (22-23)
26 _ _ (25-26)

YEAR 3

27 _ _ (28-29)
28 _ _ (31-32)
29 _ _ (34-35)
30 _ _ (37-38)
31 _ _ (40-41)
32 _ _ (43-44)
33 _ _ (46-47)
34 _ _ (49-50)
35 _ _ (52-53)
36 _ _ (55-56)
37 _ _ (58-59)
38 _ _ (61-62)
39 _ _ (64-65)

(__)

10.A.A. _ _ _ _ _._ (1-5)
s

10.A.B. _ _ _ _ _._ (7-11)
s

10.A.C. _ _ _ _ _._ (13-17)
s

10.A.D. _ _ _ _ _._ (19-23)
s

10.A.E. _ _ _ _ _._ (25-29)
s

10.A.F. _ _ _ _ _._ (31-35)
s

10.A.G. _ _ _ _ _._ (37-41)
s

10.A.H. _ _ _ _ _._ (43-47)
s

10.A.I. _ _ _ _ _._ (49-53)
s

10.A.J. _ _ _ _ _._ (55-59)
s

10.A.K. _ _ _ _ _._ (61-65)
s

10.A.L. _ _ _ _ _._ (67-71)
s

10.A.M. _ _ _ _ _._ (73-77)
s

(__)

10.A.N. _ _ _ _ _._ (1-5)
s

10.B. _ _ _ _ _._ (7-11)
s

11.A.A. _ _ _ _ _._ (13-17)
s

11.A.B. _ _ _ _ _._ (19-23)
s

11.A.C. _ _ _ _ _._ (25-29)
s

11.A.D. _ _ _ _ _._ (31-35)
s

11.A.E. _ _ _ _ _._ (37-41)
s

11.A.F. _ _ _ _ _._ (43-47)
s

11.A.G. _ _ _ _ _._ (49-53)
s

11.A.H. _ _ _ _ _._ (55-59)
s

11.A.I. _ _ _ _ _._ (61-65)
s

11.A.J. _ _ _ _ _._ (67-71)
s

11.A.K. _ _ _ _ _._ (73-77)
s

(__)

11.A.L. _ _ _ _ _._ (1-5)
s

11.A.M. _ _ _ _ _._ (7-11)
s

11.A.N. _ _ _ _ _._ (13-17)
s

11.B. _ _ _ _ _._ (19-23)
s

General Farm Information Page__

(__)
12. _ _ _ (1-3)
13.A. _ _ _ _ (5-8)
13.B.1. _ (5)
13.B.2. _ (6)
13.B.3. _ (7)
13.B.4. _ (8)
14. _ (10)
15. _ (12)
16.A. _ _ _ _ _ _ _ (14-20)
16.B. _ _ _ _ _ _ _ (22-28)
16.C. _ _ _ _ _ _ _ (30-36)
16.D. _ _ _ _ _ _ _ (38-44)
16.E. _ _ _ _ _ _ _ (46-52)
16.F. _ _ _ _ _ _ _ (54-60)
16.G. _ _ _ _ _ _ _ (62-68)
16.H. _ _ _ _ _ _ _ (70-76)
(__)
16.I. _ _ _ _ _ _ _ (1-7)
16.J. _ _ _ _ _ _ _ (9-15)
16.K. _ _ _ _ _ _ _ (17-23)
16.L. _ _ _ _ _ _ _ (25-31)
16.M. _ _ _ _ _ _ _ (33-39)
16.N. _ _ _ _ _ _ _ (41-47)
17. _ _ _ (49-51)
18.A. _ _ _ _._ (53-57)
s
18.B. _ _ _ _._ (59-63)
s
18.C. _ _ _ _._ (65-69)
s
18.D. _ _ _ _._ (71-75)
s
(__)
18.E. _ _ _ _._ (1-5)
s
18.F. _ _ _ _._ (7-11)
s
18.G. _ _ _ _._ (13-17)
s
18.H. _ _ _ _._ (19-23)
s
18.I. _ _ _ _._ (25-29)
s
18.J. _ _ _ _._ (31-35)
s
18.K. _ _ _ _._ (37-41)
s
18.L. _ _ _ _._ (43-47)
s

18.M. _ _ _ _._ (49-53)
s
18.N. _ _ _ _._ (55-59)
s
19. _ (61)
20.A. _ _ (63-64)
20.B. _ _ (63-64)
20.C.1. _ _ (63-64)
20.C.2. _ _ (66-67)
20.C.3. _ _ (69-70)
20.C.4. _ _ (72-73)
20.C.5. _ _ (75-76)
20.C.6. _ _ (78-79)
20.D. _ _ _ (63-65)
(__)
21.A. _ _ _ (1-3)
21.B. _ _ (5-6)
21.C. _ _ _ _._ (8-12)
s
22.A. _ _ (14-15)
22.B. _ _ _ _._ (17-21)
s
23.A.A. _ _ _ _._ (23-27)
s
23.A.B. _ _ _ _._ (29-33)
s
23.A.C. _ _ _ _._ (35-39)
s
23.A.D. _ _ _ _._ (41-45)
s
23.A.E. _ _ _ _._ (47-51)
s
23.A.F. _ _ _ _._ (53-57)
s
23.A.G. _ _ _ _._ (59-63)
s
23.A.H. _ _ _ _._ (65-69)
s
23.A.I. _ _ _ _._ (71-75)
s
(__)
23.A.J. _ _ _ _._ (1-5)
s
23.A.K. _ _ _ _._ (7-11)
s
23.A.L. _ _ _ _._ (13-17)
s
23.A.M. _ _ _ _._ (19-23)
s

General Farm Information continued Page__

23.A.N. _ _ _ _._ (25-29)
s

23.B. _ _ _ _._ (31-35)
s

23.C. _ _ _ _._ (37-41)
s

24.A.A. _ _ _ _._ (43-47)
s

24.A.B. _ _ _ _._ (49-53)
s

24.A.C. _ _ _ _._ (55-59)
s

24.A.D. _ _ _ _._ (61-65)
s

24.A.E. _ _ _ _._ (67-71)
s

24.A.F. _ _ _ _._ (73-77)
s

(__)
24.A.G. _ _ _ _._ (1-5)
s

24.A.H. _ _ _ _._ (7-11)
s

24.A.I. _ _ _ _._ (13-17)
s

24.A.J. _ _ _ _._ (19-23)
s

24.A.K. _ _ _ _._ (25-29)
s

24.A.L. _ _ _ _._ (31-35)
s

24.A.M. _ _ _ _._ (37-41)
s

24.A.N. _ _ _ _._ (43-47)
s

24.B. _ _ _ _._ (49-53)
s

24.C. _ _ _ _._ (55-59)
s

General Unit Information   Page__

Item	Entry	Columns
(__)		
25.	_ _ _ _ _ _ _ _ _ _	(1-10)
26.	_	(12)
27.A.	_ _ _	(14-16)
27.B.	_ _ _	(18-20)
28.	_ _ _ _ _ _	(22-27)
29.	_	(29)
30.A.	_ _ _ _ _ _ _	(31-37)
30.B.	_ _ _ _ _ _ _	(39-45)
30.C.	_ _ _ _ _ _ _	(47-53)
30.D.	_ _ _ _ _ _ _	(55-61)
30.E.	_ _ _ _ _ _ _	(63-69)
30.F.	_ _ _ _ _ _ _	(71-77)
(__)		
30.G.	_ _ _ _ _ _ _	(1-7)
30.H.	_ _ _ _ _ _ _	(9-15)
30.I.	_ _ _ _ _ _ _	(17-23)
31.	_ _ _ _ _	(25-29)
32.	_ _ _ _ _	(31-35)
33.A.A.	_ _ _ _._ s	(37-41)
33.A.B.	_ _ _ _._ s	(43-47)
33.A.C.	_ _ _ _._ s	(49-53)
33.A.D.	_ _ _ _._ s	(55-59)
33.A.E.	_ _ _ _._ s	(61-65)
33.A.F.	_ _ _ _._ s	(67-71)
33.A.G.	_ _ _ _._ s	(73-77)
(__)		
33.A.H.	_ _ _ _._ s	(1-5)
33.A.I.	_ _ _ _._ s	(7-11)
33.B.	_ _ _ _._ s	(13-17)
33.C.	_ _ _ _._ s	(19-23)
34.	_ _ _ _ _ _	(25-30)
35.A.A.	_ _ _ _._ s	(32-36)
35.A.B.	_ _ _ _._ s	(38-42)
35.A.C.	_ _ _ _._ s	(44-48)
35.A.D.	_ _ _ _._ s	(50-54)
35.A.E.	_ _ _ _._ s	(56-60)
35.A.F.	_ _ _ _._ s	(62-66)
35.A.G.	_ _ _ _._ s	(68-72)
35.A.H.	_ _ _ _._ s	(74-78)
(__)		
35.A.I.	_ _ _ _._ s	(1-5)
35.B.	_ _ _ _._ s	(7-11)
35.C.	_ _ _ _._ s	(13-17)
36.A.A.	_ _ _ _._ s	(19-23)
36.A.B.	_ _ _ _._ s	(25-29)
36.A.C.	_ _ _ _._ s	(31-35)
36.A.D.	_ _ _ _._ s	(37-41)
36.A.E.	_ _ _ _._ s	(43-47)
36.A.F.	_ _ _ _._ s	(49-53)
36.A.G.	_ _ _ _._ s	(55-59)
36.A.H.	_ _ _ _._ s	(61-65)
36.A.I.	_ _ _ _._ s	(67-71)
36.B.	_ _ _ _._ s	(73-77)
(__)		
36.C.	_ _ _ _._ s	(1-5)
37.	_	(7)
38.	_ _ _ _ _ _	(9-14)

General Flock Information Page__

(__)

39.	_ _	(1-2)		
40.	_	(4)		
41.A.	_ _ _	(6-8)		
41.B.	_ _ _	(10-12)		
42.	_._ _	(14-16)		
43.	_ _ _	(18-20)		
44.	_ _ _ _ _ _	(22-27)		
45.	_ _ _ _ _ _ _	(29-35)		
46.	_ _._	(37-39)		
47.A.	_ _ _ _ _ _ _	(41-47)		
47.B.	_ _ _ _ _ _ _	(49-55)		
47.C.	_ _ _ _ _ _ _	(57-63)		
47.D.	_ _ _ _ _ _ _	(65-72)		

(__)

48.A.1.	_ _	(1-2)	_ _ _	(16-18)
48.A.2.	_ _	(4-5)	_ _ _	(20-22)
48.A.3.	_ _	(7-8)	_ _ _	(24-26)
48.A.4.	_ _	(10-11)	_ _ _	(28-30)
48.A.5.	_ _	(13-14)	_ _ _	(32-34)
48.B.1.	_ _	(36-37)	_ _ _	(51-53)
48.B.2.	_ _	(39-40)	_ _ _	(55-57)
48.B.3.	_ _	(42-43)	_ _ _	(59-61)
48.B.4.	_ _	(45-46)	_ _ _	(63-65)
48.B.5.	_ _	(48-49)	_ _ _	(67-69)

(__)

48.C.1.	_._	(1-2)	_ _ _	(16-18)
48.C.2.	_._	(4-5)	_ _ _	(20-22)
48.C.3.	_._	(7-8)	_ _ _	(24-26)
48.C.4.	_._	(10-11)	_ _ _	(28-30)
48.C.5.	_._	(13-14)	_ _ _	(32-34)
48.D.1.	_._	(36-37)	_ _ _	(51-53)
48.D.2.	_._	(39-40)	_ _ _	(55-57)
48.D.3.	_._	(42-43)	_ _ _	(59-61)
48.D.4.	_._	(45-46)	_ _ _	(63-65)
48.D.5.	_._	(48-49)	_ _ _	(67-69)
49.	_ _ _	(71-73)		

APPENDIX B

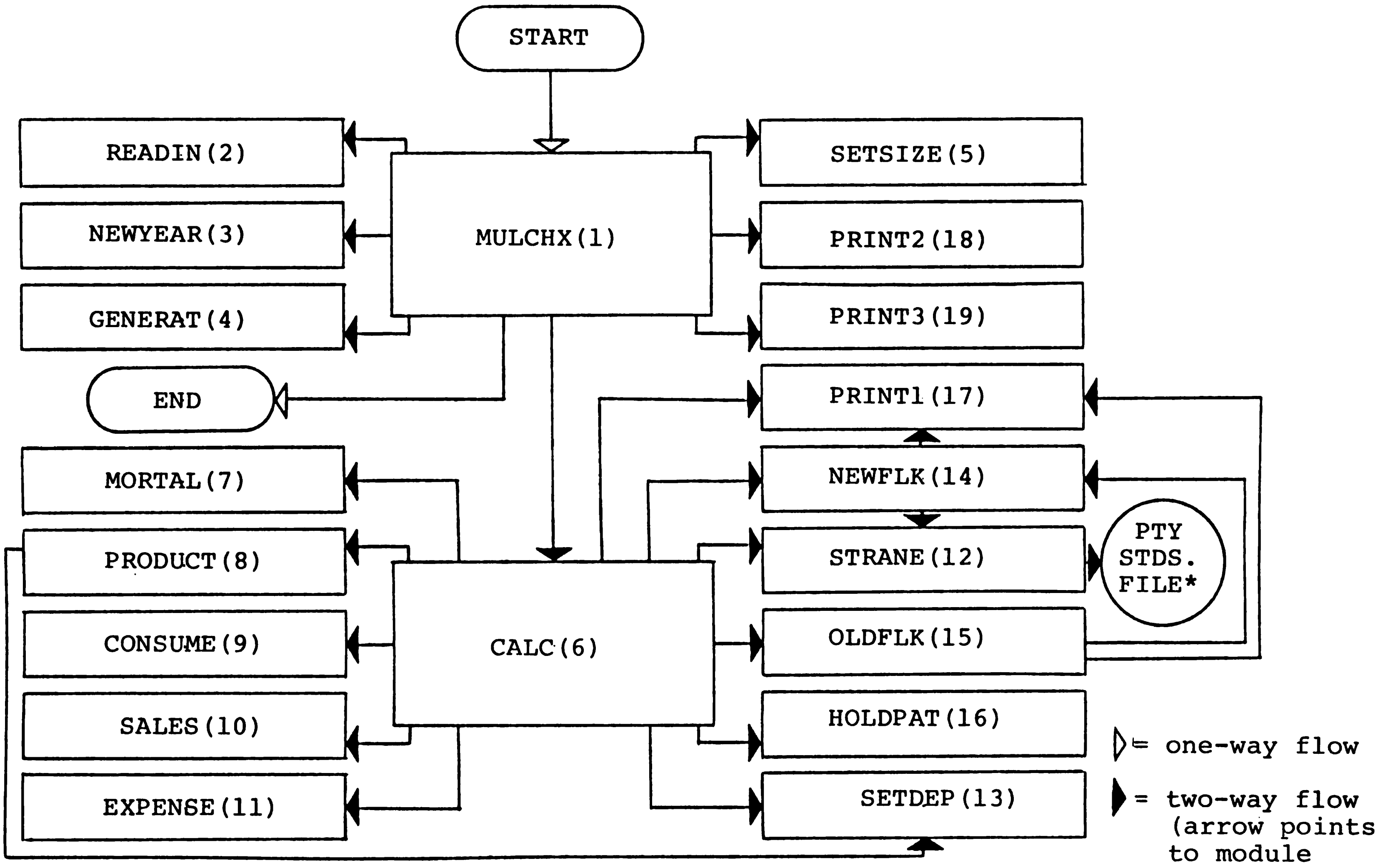
APPENDIX B

STRUCTURE AND LOGIC OF MULTICHIX

Multichix is a structured computer simulation model composed of a main program and eighteen subprograms. The model is written in the artificial language Fortran and is designed to be run on a C.D.C. 6500 digital computer.

The purpose of this appendix is to describe the modules (main program and subprograms) and indicate how each fits into the total program. Module names and variable names are capitalized.

Figure B.1. presents a flowchart of the model. Note it both starts and ends in the main program, MULCHX. Numbers beside module names indicate the order in which each module is discussed but do not necessarily indicate the order in which each is called by the model. On the right side of the flowchart is a circle representing a permanent file in which poultry standards are stored. This file is attached to the program and can only be read by the subprogram STRANE.



*Permanent file "Poultry Standards"

Figure B.1. Basic flowchart of the program Multichix

In the following discussion, modules 2-5 and modules 12 and 13 are preparatory modules. They define various variables used in later subprograms. Module 7 (MORTAL) through module 11 (EXPENSE) execute when the flock is housed and during egg production. Module 14 (NEWFLK) through module 16 (HOLDPAT) execute when flocks are being changed in a unit or when being force molted. The final three modules (PRINT1, PRINT2, and PRINT3) are used for output formats and definition of output variables.

To avoid confusion between the listing of the model and this discussion, the following arguments are constant. The model, in many cases, uses "dummy" arguments to represent real arguments: I = farm, J = unit, K = flock, M = year of the run, and X = nonspecific subscripts normally found in looping procedures. A numeric argument defines X. Some variables are used for the sole purpose of routing execution. Those variables that contain the word "KEY" or "FLAG" are used for this purpose. Variables that contain the words "TEMP" or "TEST" are nonspecific variables and may, during execution, have various definitions.

All variable names that are preceded by the characters I, J, K, L, M or N contain interger (whole number) values. Any variable preceded by a character other than those above is used as a real (fractional number) value. All variable names that end with the alphabetic characters "PD" are used for period or four-week analyses. All variables that end with the alphabetic characters "YTD" are used for flock-to-date or year-to-date analyses.

1. MULCHX

MULCHX, as mentioned earlier, is the main program. This module has three primary purposes which are:

1. To establish data blocks by use of labeled commons and to define many of the subscripted variables by means of data statements.
2. To start four of the five major loops in the model.
    a) The most outer loop (M) runs from 1 to the length (LENTH) of the run in years as determined by the user.
    b) The next inner loop (N) starts at 1 and runs to 13 periods for each year.
    c) The third loop (I) runs from 1 to the number of farms (NOF) in the run.
    d) The fourth and most inner loop (J) in this module tests each of the production units under each farm to determine if the unit is in the run for period N. If the test is positive, subprogram CALC is called. (The last of the five major loops is in the module CALC.)

3. To call several subprograms. The modules called by MULCHX are:
   a) READIN,
   b) NEWYEAR,
   c) GENERAT,
   d) SETSIZE,
   e) CALC,
   f) PRINT2, and
   g) PRINT3.

2. READIN

This first subprogram called by MULCHX has three primary purposes. First, it reads into memory the user input. It makes several calculations from this input and also tests many of the input values for "out of range" type errors.

As stated earlier, one of the prime objectives of this model is to allow all users, regardless of size of program or type of contractual arrangement, access to the model for purposes of projecting or budgeting. To do this, input was developed on four levels:

1. General Program Information,
2. General Farm Information,
3. General Unit Information, and
4. General Flock Information.

Figure A.1. in the handbook (Appendix A) shows how input data is read into memory. Three straight arrows indicate change of control from a higher to a lower level of input. Two semi-circular arrows indicate a looping procedure from a lower to a higher level of input. The arrow on the right side of the page is executed when an end of file (EOF) card is read and control then again returns to MULCHX.

As suggested by the flowchart, the general program or level 1 data is read into memory first. Execution then proceeds to read into memory data for the first farm at level 2. Execution continues to read into memory data for unit 1 under farm 1 at level 3. All the flock data under unit 1 at level 4 is then read into memory. Execution next returns to level 3 to test for data of a second unit under farm 1. If there is no data for a second unit, execution returns to level 2 to test for data of a second farm. If data for a second farm is found, execution begins a second downward movement until all input data has been read into memory.

Calculations made in this module are:

1. Change all projected egg prices [EGGPRC(X)] other than projected large egg prices to a percent of projected large egg price.
2. Test when a unit will enter [KEYST(J)] or leave [KEYND(J)] the run.

3. Change projected expenses at the program level [CSTPROG(X)], farm level [CSTFARM(I,X)], and unit level [CSTUNIT(J,X)] from yearly costs to weekly costs.
4. Change the projected costs at the flock level [CSTFLK(J,K,X)] to weekly costs.
5. Change the projected costs of cleaning out a unit [CSTKLN(J)] to an average projected weekly cost.

3. NEWYEAR

NEWYEAR was developed to change or update expenses. The user of the model is asked to input current yearly expenses [CSTPROG(X), CSTFARM(I,X), CSTUNIT(J,X)] based on his most recent historical data or his most recent income statement for the egg production program. He is then asked to project how each of these costs will change [UPPROG(X), UPFARM(I,X), UPUNIT(J,X)] for each year of the run. From this data NEWYEAR then adds 1.0 to the percent change and multiplies this sum by the expense for each year of the run. Following is a summary of how a starting management cost of $30,000 would change over a three year run.

Year	Starting Cost/Week	Yearly Change (%)	Average Management Cost/Week
1	$576.92	+6.5	$614.42
2	614.42	-5.0	583.70
3	583.70	+9.0	636.23

Other expenses which are updated in this subroutine are:

1. Feed prices [CSTFEED(X)],
2. Egg packing supplies [CSTEPS(I)],
3. House cleaning costs [CSTKLN(J)], and
4. Labor charges for removing birds from the unit [CSTLBR(J)].

NEWYEAR also updates two potential sales items:

1. If the user sells dried poultry waste [DPW(J,1) = 0], NEWYEAR updates the selling price per ton [DPW(J,2)] for each year of the run.
2. If the user owns the birds [IFS(I,3) = 0], projected changes in spent hen prices [BRVL(I)] per pound are updated each year.

4. GENERAT

Multichix allows the user three ways to project farm egg prices (MTDPRC). The first method utilizes historical data and is referred to as the "egg pricing generator" [GEN(X)]. As noted in Appendix A, data for the generator was calculated from average grade A large shell egg (per dozen) prices paid to Iowa egg producers from June 1972 to December 1975 (Armstrong, loc. cit.).

If the user chooses to use the generator (MTDPRC = 1), he selects a point along the generator (Figure A.2.)

and inputs the following data in dozens:

1. Starting point for price generator [EGGPRC(1)],
2. Starting price for large eggs [EGGPRC(2)],
3. Average price expected above large egg price for X-large and jumbo eggs [EGGPRC(3)],
4. Average price expected below large egg price for medium eggs [EGGPRC(4)],
5. Average price expected below large egg price for small eggs [EGGPRC(5)],
6. Average price expected below large egg price for peewee eggs [EGGPRC(6)], and
7. Average price expected below large egg price for chex and undergrade eggs [EGGPRC(7)].

As mentioned in the discussion of the module READIN, all prices are calculated as a percent of the large egg price. This eliminates the possibility of egg prices falling below zero unless the projected large egg price falls below zero.

The second method of pricing eggs is to project a yearly blend price (MTDPRC = 2). If the user chooses this method, he inputs a projected blend price [EGGPRC(M)] for each year of the run and all eggs are sold at this projected price.

The third method (MTDPRC = 3) is a combination of the first two methods. If he chooses this method, the user must input a projected large egg price for each period of the run [EGGPRC(X)] as well as the expected egg prices for other sizes.

Subprogram GENERAT has but two objectives and they are: 1) to determine the method the user chooses and 2) to determine the projected large egg price for each period.

5. SETSIZE

Multichix allows the user to buy a production unit or acquire a new contract and/or sell a production unit or terminate a contract during the run. The user is asked to input for each unit its beginning and ending period [JPD(J), NPD(J)] and year [JYR(J), NYR(J)].

SETSIZE tests the variables KEYST(J) and KEYND(J) to see if the unit is in the run for the present period. If the test is positive, the capacity of the unit in question [KAPUN(J)] is added to the variable KAPROG which contains the bird capacity of all units in the program. KAPUN(J) is also added to the variable KAPFARM(I) which contains the bird capacity for each farm. These variables are used later in the distribution of expenses in the subprogram EXPENSE.

6. CALC

Subprogram CALC, like the module MULCHX, was developed to control execution and not to perform analytical routines. This module makes several tests to determine the flock status of each unit which has entered the subprogram and the route of execution. As mentioned in MULCHX, the fifth of the five major loops (K) both starts and ends in this module. This loop cycles four times, once for each week of the period. It can be prematurely ended only if the unit is terminated prior to the end of each period.

This module calls ten subprograms:

1. NEWFLK,
2. OLDFLK,
3. HOLDPAT,
4. SETDEP,
5. STRANE,
6. MORTAL,
7. PRODUCT,
8. SALES,
9. EXPENSE, and
10. PRINT 1.

7. MORTAL

MORTAL was developed for the purpose of inventory control and consists of only twelve executable statements. The subprogram can be entered only from CALC and only if the flock being considered is in egg production. For flocks which are being force molted, inventory control is maintained by the subprogram HOLDPAT.

To measure the weekly bird mortality [LOSTPD(J)], the local variable MO is made equal to the variable KEYMO(J) (defined as 1 at the start of each flock in NEWFLK). The present flock age [IAGE(J,K)] is tested to see if it is less than or equal to MRTAGE(J,K,MO) (the maximum flock age at which the percent mortality [ORT(J,K,MO)] is to be used). If the test is negative, KEYMO(J) is incremented by 1 and the test occurs again. If the test is positive, TEMLOST becomes equal to NUMBER(J) or the present number of birds in the flock times ORT(J,K,MO). LOST is set equal to TEMLOST plus 0.5 to change the mortality from a real value to an integer value. LOSTPD(J) is incremented by LOST.

Accumulated flock mortality [LOSTYTD(J)] is measured by incrementing LOSTYTD(J) by LOST. The average number of birds in the flock for the week (KONBRD) is equal to the difference between NUMBER(J) and LOST divided by two. Subtracting LOST from NUMBER(J) gives the number of birds in the flock less weekly bird mortality.

8. PRODUCT

This module was designed to project weekly egg production for each flock entering this module older than 20 weeks of age. If the flock is a pullet flock, the variable KK is determined by subtracting 19 from the age of the flock [IAGE(J,K)]. If the flock is a hen flock, KK is measured by subtracting MOLT(J) less 1 from

IAGE(J,K). The reason for doing this is that production standards [PROD(X_1,X_2)] in memory for pullet flocks have a range for X_1 of 1 to 61 which correspond to pullet ages of 20 to 80 weeks. For force molted hens, X_1 has a range of 1 to 50 which corresponds to egg production for the weeks starting at the end of the force molting procedure. The subscript X_2 has a range of 1 to 8 (see Table B.1.) which corresponds to egg distribution for each week. For molted flocks the value of MOLT(J) less one minus IAGE(J,K) is the number of weeks since the start of egg production and for these flocks PRODUCT will never be executed unless the flocks have completed the molting phase and egg production has begun.

The next step, once KK has been calculated, is to find the weekly hen-day production average [TEMPAVE] which is the sum of PROD(KK,1) and the egg production adjustment [ADJAVE(J)]. ADJAVE(J) will be discussed in NEWFLK.

At this point in the execution if the flock is a force molted flock, the module SETDEP has never been entered by this flock and TEMPAVE is greater than or equal to CAPHEN, the subprogram SETDEP is called and a capitalization schedule is determined for this flock.

The next step in PRODUCT is to increment several groups of variables which will later be used as output variables in the print routines.

Table B.1. Production averages and egg distribution for the array PROD(KK,X)

Value of X	Definition of X
1	Average hen-day egg production
2	Accumulated average hen-day egg production
3	Percent jumbo and extra large eggs
4	Percent large eggs
5	Percent medium eggs
6	Percent small eggs
7	Percent peewee eggs
8	Percent chex and undergrade eggs

1. The variables KEYPD(J), KEYYTD(J) and KEYYTD2(J) are incremented by 1 which counts the times this module is entered.
2. The variables KBRDPD(J), KBRDYTD(J) and KBRDYTD2 are incremented by the average number of birds in the flock for that week (KONBRD).

If TEMPAVE is greater than zero, the following three variables, PRODPD(J,1), PRODYTD(J,1) and PRODAN(J,1), are incremented by the value of TEMPAVE. The testing of TEMPAVE eliminates the summing of negative production values since TEMPAVE can have a negative value if the sum of PROD(KK,1) and ADJAVE(J) is negative.

Total dozens of eggs produced is then measured by DOZ which is equal to the product of KONBRD times TEMPAVE divided by 12.0 (eggs per dozen) times 7 (days in a week). The three variables, PRODPD(J,2), PRODYTD(J,2) and PRODAN(J,2), are incremented by DOZ.

The final routine in PRODUCT calculates egg production in dozens for each of the other sizes and grades (EGG). EGG is measured by the product of DOZ times PROD(J,X). The two variables, PRODPD(J,X) and PRODYTD(J,X), are incremented by EGG.

9. CONSUME

The subprogram CONSUME has but one purpose and that is to measure the total tons of feed consumed by a flock for each week the flock is in egg production. Like the routine used in MORTAL, a local variable, KO, is made equal to KEYKO(J). IAGE(J,K) is then tested to see if it is less than or equal to MRTAGE(J,K,KO), the maximum flock age at which the user input [CON(J,K,KO)] can be used. CON(J,K,KO) carries the value of feed consumed per 100 birds per day. If the test is negative, KEYKO(J) is incremented by 1 and the test occurs again. If the test is positive, the variable TONCON(J) is measured. TONCON(J), the weekly feed consumption in tons, is found by determining the product of 7 (days of the week) times CON(J,K,KO) times KONBRD and dividing this by 200,000.0 (100 times 2,000 pounds). The two variables TONPD(J) and TONYTD(J) are incremented by TONCON(J). KEYFD1(J) and KEYFD2(J), which are counters, are incremented by 1 and the variables KFDPD(J) and KFDYTD(J) are incremented by KONBRD.

10. SALES

This model operates on the assumption that each unit has three potential products for sale: eggs, poultry waste and spent hens. The projected sale value of spent hens is calculated only in the module OLDFLK and only in the module SALES is the production value of eggs and poultry waste estimated.

SALES calculates the production value for each size or grade of egg (egg distribution) in dozens. The egg distribution includes jumbo plus extra large, large, medium, small, peewee and chex plus undergrades.

As previously discussed in the module GENERAT, a user is allowed a choice of three possible ways to project egg prices (MTDPRC) and the routine to be executed is dependent upon the method selected. If the user selected either the price generator (MTDPRC = 1) or the large egg price input (MTDPRC = 2), the routines followed are very similar. The production value for each grade or size of the egg distribution except large size eggs is measured by multiplying DOZ (calculated in PRODUCT) times PROD(X,1) times VAL (calculated in GENERAT) times EGGPRC(X) (calculated in READIN from user input) to give the variable VALUE. To calculate the production value of the large eggs produced, EGGPRC(X) is ignored.

If the user selected the blend price method (MTDPRC = 3) for projecting egg production values, the variable VALUE is calculated as the product of DOZ times PROD(X_1,X_2) times VAL where X_1 is KK as calculated in PRODUCT and X_2 is as described in Table B.1.

Each time VALUE is calculated the values of TVALPD(J,X) and TVALYTD(J,X) are incremented by VALUE and the variable SALTEM(X) is made equal to VALUE. SALTEM(X) will be used in the next subprogram, EXPENSE.

If the user indicated on input that poultry waste is a salable product of the farm [MANURE(I) = 0], the following routine is then executed. The average weekly tons of dry poultry waste produced (TEMPDRY) is made equal to the product of KONBRD times the constant 0.0002537:

7 days times .0725 (the average pounds of dry material excreted per bird per day) divided by the constant 2,000.0 (pounds per ton). TEMPDRY is equal to 1.0 less the percent moisture content of the product sold [DPW(J,2)]. The value of DPW(J,2) comes from user input. The ratio of the percent moisture to the percent dry material (TEMPRAT) is calculated by dividing DPW(J,2) by TEMPDRY. Total tons of the final material to be sold (SALTON) is calculated by adding to TEMPDPW the product of TEMPRAT times TEMPDPW. The final value of the product produced (PRCDPW) is determined by the product of the projected sale price of the poultry waste [DPW(J,1)], from user input, times SALTON. Two variables, DPWPD(J) and DPWYTD(J), are incremented by SALTON and two variables, PDPWPD(J) and PDPWYTD(J), are incremented by PRCDPW.

11. EXPENSE

The purpose of this module is to process the various projected expenses into the output arrays CSTPD(J,X) and TEXPD(J). In most cases if the value of FLAGDEP(J,K) is equal to 1, the output arrays CSTYTD(J,X) and TEXYTD(J) are also incremented. CSTPD(J,X) and CSTYTD(J,X) are defined in Table B.2. The arrays TEXPD(J) and TEXYTD(J) are used to accumulate all expenses. For program, farm, unit and flock level expenses the values of X will not be defined as they are processed in looping routines. The categories of expense for these levels can be found in

Table B.2. Definition of expenses for the arrays CSTPD(J,X) and CSTYTD(J,X)

Value of X	Definition of X
1	Operational management
2	Administration
3	Hired labor
4	Maintenance of buildings and equipment
5	Maintenance of vehicles
6	Utilities
7	Supplies
8	Lease
9	Insurance and taxes
10	Interest
11	Depreciation of vehicles
12	Depreciation of buildings
13	Depreciation of equipment
14	Other
15	Feed
16	Contract
17	Medication
18	Depreciation of flock

Table B.3. or in Appendix A. In calculating feed expense, contract expense, egg packing supplies expense and capitalization expense, X will be defined as the routines used are designed specifically for these expenses.

This module also calculates the egg loss value which is the difference between the value of eggs produced and those sold. Also, the contract payments to producers are measured in this module.

Program and farm level expenses. The routine used to categorize expenses at these two levels is the same since the only difference between these two levels is distribution of the expenses. Program level expenses are distributed over all units in the program. The variable measured is PCTEXP which is the relationship between KAPUN(J) and KAPROG (calculated in SETSIZE). The total amount of expense for each category (EXP) is equal to PCTEXP times CSTPROG(X). For farm level expenses, the costs are distributed only to those units associated with the farm. For these expenses, KAPFARM(I) which was also calculated in SETSIZE is substituted for KAPROG for the calculation of PCTEXP. CSTFARM(I,X) is substituted for CSTPROG(X) in the calculation of EXP. Output arrays are incremented by EXP.

Unit level and farm level expenses. Two different routines were designed to categorize these two levels of expense because of the differences in number and types of

Table B.3. Categories of expenses for the four levels of input

Category of Expense	General Program Level CSTPROG(X)	General Farm Level CSTFARM(I,X)	General Unit Level CSTUNIT(J,X)	General Flock Level CSTFLK(J,K,X)
Operational management	1	1		
Administration	2	2		
Hired labor	3	3	1	
Maintenance of buildings and equipment	4	4	2	
Maintenance of vehicles	5	5		
Utilities	6	6	3	
Supplies	7	7	4	
Lease	8	8		
Insurance and taxes	9	9	5	2
Interest expense	10	10	6	3
Depreciation of vehicles	11	11		
Depreciation of buildings	12	12	7	
Depreciation of equipment	13	13	8	
Other	14	14	9	4
Medication				1

expenses (9 categories of expenses at the unit level and 4 categories of expenses at the flock level). To move these different categories of expenses into the proper variable of the output arrays, the subscript X is changed by the use of "computed go to" statements.

For unit level expenses the variable incremented by the output arrays is CSTUNIT(J,X) and for flock level expenses the variable is CSTFLK(J,K,X).

<u>Egg packing supplies expense</u>. This routine was designed to allow egg packing supplies to be included as a cost of production. It is executed if the user, on input, defined the variable CSTEPS(I) with a value greater than zero. Here, the total expense charges (EXP) are equal to the product of CSTEPS(I) times DOZ (calculated in PRODUCT) divided by 30 (dozens of eggs per case). Output arrays are incremented by EXP and the value of X in these arrays is 7.

<u>Feed expense</u>. To enter this routine the user must own the feed consumed [IFS(I,4) = 0] by the flock. Once entered, the type of feed consumed and the cost per ton of feed consumed must be determined. To do this the local variable IP (to be used as a subscript) is set to equal KEYTP(J). If IAGE(J,K) is less than or equal to IPEAGE(J,K,IP), the last age that a specific type of feed will be fed to the flock, the local variable KP (to be used as a subscript) is set equal to the type of feed

to be consumed by the flock [IYPE(J,K,IP)]. EXP is then computed by multiplying CSTFEED(KP) times TONCON(J). The output arrays (X = 16) are then incremented by EXP. Another variable, FDYTD(J), is also incremented by EXP. This variable is used for flock analysis. If IAGE(J,K) is greater than IPEAGE(J,K,IP), the variable KEYTD(J) is incremented by 1 and the test is made again.

Egg value lost. The author defines "egg value lost" as the difference in the value between eggs produced and eggs sold. These losses occur during handling of the product on the farm, loss of the product in transit and loss of the product during processing. Losses can be large; consequently, the model attempts to measure this difference.

The routine used to determine this loss is essentially the same as used to measure mortality, feed consumption and feed type. The local variable L (to be used as a subscript) is set equal to KEYLO(J) which was defined at the start of each flock in NEWFLK. If IAGE(J,K) is less than LOSSAGE(J,K,LO), SALOS (value of eggs produced) is equal to SALOS times the difference between 1.0 and OSS(J,K,LO) which is the projected egg loss expressed as a percent. The arrays SALPD(J) and SALYTD(J) are incremented by SALOS.

Contract expenses and receipts. In this model, a user can be an owner-operator, contractor, or contractee (see Item 13 of Appendix A). If the user is a contractor [IFS(I,1) = 2], he pays the contractee [IFS(I,1) = 3], for services and assets used in egg production. This is classified as a contract expense to the contractor and a contract payment to the contractee. Neither a contractee nor owner-operator incur a contract expense.

The routines used by this module for measuring the contract expense or contract receipts are the same with only the variable name being different. In any production contract the expense (SALEXP) to one party must equal the payment (SALOS) to the second party. The discussion here centers around two variables, METHOD(I) and PAY(I,X). For a further explanation of each, see Items 19 and 20 in Appendix A. Y represents either SALEXP or SALOS and only the calculations for each are shown.

Value of METHOD(I)	Y Equals
1	SALOS x PAY(I,1)
2	DOZ x [1.0 - OSS(J,K,LO] x PAY(I,1)
3	Y + [DOZ x PROD(KK,X)] x PAY(I,X)
4 or 5	FLKNO/1,000.0 x PAY(I,1)

The variable FLKNO, when METHOD(I) equals 4, is equal to NMBR((J,K). When METHOD(I) equals 5, the value of FLKNO equals NUMBER(J) plus LOSTPD(J). If Y is an expense, the arrays CSTPD(J,16) and CSTYTD(J,16) are incremented by

SALEXP. If Y is a payment to the contractee, SALPD(J) and SALYTD(J) are incremented by SALOS. If FLAGDEP(J,K) is equal to 1.0, TOTYTD1(J) is also incremented by SALOS. TOTYTD1(J) is used in the flock analysis.

Depreciation expense. This expense is the cost of capitalization as computed in SETDEP and the weekly depreciation expense is the value of PDDEP(J). If the flock has not yet been capitalized or the user does not own the flock, PDDEP(J) is equal to zero. If the module SETDEP has been executed for a flock, the value of PDDEP(J) may be greater than zero. The routine used for processing depreciation expense increments CSTPD(J,18), CSTYTD(J,18), TEXPD(J) and TEXYTD(J) by PDDEP(J).

The last routine of this module updates the book value of the flock [FLKCST(J,K)]. If the flock has been capitalized, the ending book value of the flock [FLKCST2(J,K)] is equal to FLKCST(J,K) minus PDDEP(J). If the flock has not yet been capitalized, FLKCST2(J,K) equals FLKCST(J,K) plus TEXPD(J) minus SALPD(J).

12. STRANE

Subprogram STRANE was developed for a single purpose: to move desired areas of production data from the permanent file POULTRYSTANDARDS to memory.

This module can be called from either of two subprograms, CALC or NEWFLK. It is only called if the variable IFLK(J,K) is not equal to MEMSTRN(1) and if

ISTRN(J,K) is not equal to MEMSTRN(2). Both IFLK(J,K) and ISTRN(J,K) are input variables. The first comparison tells whether the flock is a pullet or hen flock and the second comparison represents a "Key" (see page 53 in Appendix A).

The permanent file POULTRYSTANDARDS is composed of 787 poultry standard production records. The first 427 records on the file (7 strain standards times 61 records per standard) are for pullet flocks while the remaining 350 records (7 strain standards times 50 records) are for hen flocks. Each record contains 8 production constants which are defined in Table B.1. The constants themselves can be found in Tables C.1.-C.14. in Appendix C.

To move sections of this data from the file to memory, a series of routines are necessary. The local variable KA becomes equal to KEYFLK(J) and the local variable KB becomes equal to ISTRN(J,KA) less 1. If IFLK(J,KA) is equal to zero (pullet flock), the local variable KC becomes equal to KB times 61 and KD equals 61. If IFLK(J,KA) is equal to one (hen flock), KC becomes equal to 427 plus the product of KB times 50 and KD equals 50. If the value of KC equals zero, the routine reads the records from 1 to KD into the array PROD. Otherwise, the routine reads the records of 1 to KC into the "dummy" variable DUMP and then proceeds to read the records from 1 to KD into the array PROD. This routine continues and makes MEMSTRN(1) equal to IFLK(J,KA) and MEMSTRN(2) equal to ISTRN(J,KA). The tape is then rewound and execution returns to the calling module.

Using this simple routine reduces the total amount of memory required for the program by 5,656 locations.

13. SETDEP

This module can be called from two subprograms depending upon the flock status. It is called from subprogram CALC if 1) the flock is a pullet flock [IFLK(J,K) = 0], 2) the user owns the flock [IFS(I,3) = 0] and 3) the age of the flock [IAGE(J,K)] is equal to the age of the pullets (KAPUL) the user indicated for capitalization. On the other hand, SETDEP is called from subprogram PRODUCT if 1) the flock is a hen flock [IFLK(J,K) = 1], 2) the user owns the flock [IFS(I,3) = 0] and 3) the egg production [PRODPD(J,1)] for that week is greater than or equal to the egg production (CAPHEN) that the user indicated for hen capitalization.

The purpose of this module is to establish the capitalization schedule. First, SETDEP determines how much of the asset is to be set aside as a reserved cost [SETASID(J)] to be later applied against salvage value of the flock. This is done by multiplying the present number of birds in the flock [NUMBER(J)] times the amount of money (cents/bird) to be reserved (UNDEP). If this value [SETASID(J)] is greater than or equal to the book value of the flock [FLKCST(J,K)], SETASID(J) is made equal to FLKCST(J,K) and the weekly cost schedule for depreciation of the flock [PDDEP(J)] is set to 0.0. If the value of SETASID(J) is less than FLKCST(J,K), the difference between the age at which the flock will be sold [NDAGE(J,K)] and the the present age [IAGE(J,K)] is determined (ITEST). PDDEP(J) is then calculated by subtracting SETASID(J) from FLKCST(J,K) and dividing by ITEST. To prevent execution from returning again to this module for the flock being considered, a "flag," FLAGDEP(J,K), is changed from the value of 0.0 to 1.0.

14. NEWFLK

NEWFLK is the first of three modules designed to "change over" flocks and can be called from one of two subprograms, CALC or OLDFLK. It is called from CALC only if KEYFLK(J), a variable that carries the flock number of 0-5 for each unit, is equal to zero. This occurs only the first time each unit enters CALC. NEWFLK can be called from OLDFLK each time a house has been cleaned out and is ready to receive a flock of pullets or each time a flock of hens or pullets is about to begin the "stress" phase of force molting.

The only reason for flocks to enter NEWFLK from OLDFLK is to set up data banks (as described later) with one exception and that is pullet flocks about to begin the production cycle. In this case the variable KEYOLD(J) is assigned a value of 12.

If NEWFLK is entered from CALC, the first decision to be made is whether the first flock is a pullet or hen flock.

First flock is a pullet flock. At this point the decision is made whether the unit is being cleaned out [KLEN(J) > 0] or the pullet flock is presently in production [KLEN(J) = 0]. When the unit is being cleaned out, the variable KLEN(J) is first incremented by 1 and if the user does not own the flock [IFS(I,3 = 1], the variable KEYOLD(J) is made equal to 7. If the user owns the flock [IFS(I,3) = 0] and if the user charges all cleanout costs to the last flock occupying the unit [KLNOUT(I) = 2], the variable KEYOLD(J) is made equal to 8. If the user owns the flock and charges all cleanout costs to the next flock occupying the unit [KLNOUT(I) = 3], the variable KEYOLD(J) is made equal to 9. Once KEYOLD(J) has been defined execution returns to CALC.

KEYOLD(J) is a very important variable in the model. It controls the route of execution in this module and totally dominates control in the next two modules.

When the unit is not being cleaned out [KLEN(J) = 0], the assumption is made that the first flock of the unit is somewhere in the production cycle and execution transfers to a routine designed to prepare data banks for the production cycle. To do this for the first flock of the unit, the variables KEYFLK(J) and K are given the value of 1 and if the user does not own the flock [IFS(I,3) = 3], the variable FLAGDEP(J) is set at 1.0. At this point in the routine, execution for pullet flocks coming from either CALC or OLDFLK merge. The variable KK is determined as described in the module PRODUCT. ADJAVE(J) is calculated to be equal to AVE(J,K) less PROD(KK,2) if the array PROD contains the appropriate production constants. If the array does not contain the appropriate constants, subprogram STRANE is called.

ADJAVE(J) is an adjustment to the standard production curve in relationship to the user's recorded input [AVE(J,K)] for projected accumulated average hen-day egg production for the flock. In many instances PROD(KK,2) and AVE(J,K) will not agree and this adjustment shifts the standard production curve up or down to fit AVE(J,K).

The variables KEYMO(J), KEYKO(J), KEYLO(J) and KEYTP(J) are initialized with a value of 1 and for the first flock only, LOSTYTD(J) and NMBR(J,K) are incremented by MORT(J) while the value of NUMBER(J) takes on the value of NMBR(J,K) less MORT(J). For pullet flocks other than the first flock for each unit, the value of NUMBER(J) is made equal to NMBR(J).

<u>First flock is a force molted flock</u>. Once it has been determined that the first flock is a force molted flock, the next decision to be made is whether the value of IAGE(J,1) is less than the value of MOLT(J) or greater than or equal to the value of MOLT(J). If the value of

IAGE(J,1) is less than MOLT(J), the flock has not yet finished the force molting procedure.

If it has been determined that the flock will begin or has already begun to be force molted, the variable KLEN(J) is used to control the number of weeks left in the molting procedure which is the difference between MOLT(J,1) and IAGE(J,1). The variable KEYOLD(J) is given the value of 10 unless the user does not own the flock in which case the value of KEYOLD(J) becomes 11.

At this point in the routine, execution for force molted flocks coming from either CALC or OLDFLK merge. The value of KK is determined as NDAGE(J,K) less MOLT(J,K). If the user owns the flock, the book value of FLKCST(J,K) is incremented by SETASID(J) which, if this is the first flock, was defined as 0.0 in MULCHX. If this is not the first flock, SETASID(J) still has the value reserved for salvage value, as described in SETDEP, from the previous flock in the unit. If the user does not own the flock, the variable FLKCST(J,K) takes on the value of 0.0. ADJAVE(J) is calculated if the production constants in the array PROD are correct. However, if the array PROD does not contain the correct production constants, subprogram STRANE is called.

At this point the routines for molted flocks and pullet flocks merge. Execution for this has previously been discussed.

When the <u>first flock has previously completed the force molting procedure</u>, variables K and KEYFLK(J) are incremented by 1 and execution then goes immediately to the routine for setting up data banks, as previously described.

<u>15. OLDFLK</u>

OLDFLK is called from CALC only if KEYOLD(J) is greater than zero or if IAGE(J,K) is equal to NDAGE(J,K). It was suggested in NEWFLK that the route of execution for this module is dominated by the value of KEYOLD(J). The value of KEYOLD(J) is dependent upon three parameters:

1. Flock status,
2. Ownership of flock, and
3. Additional information.

Under three conditions, ownership of the flock is not applicable (see Table B.4.). The value of zero for KEYOLD(J) is nonexistent once the flock has entered this module and egg production ceases. KEYOLD(J) takes on a value other than zero and it takes on a value of 12 or 13 only after the next flock for the unit has been housed following a cleanout or the flock has finished the force molting process and is ready to resume the egg production cycle. To avoid repetition in the comments of this module, further discussion will center primarily around the aforementioned parameters.

Table B.4. Definitions of the array KEYOLD

Value of KEYOLD	Flock Status	Ownership of Flock	Additional Information
0	In egg production	N.A.	
1	Flock sold	Contractor	Costs of cleanout charged to flock sold.
2	Flock sold	Owner-operator	Print flock summary at end of cleanout. Costs of cleanout charged to next flock.
3	Flock sold	Owner-operator	Print flock summary at time of sale.
4	Flock transferred for force molting	Owner-operator	Print flock summary at time of transfer.
5	Flock transferred for force molting	Contractor	Print flock summary at time of transfer.
6	Flock sold	Owner-operator or Contractor	Print flock summary at time of sale. Terminate unit.
7	Flock not yet housed	Contractor	Unit being cleaned out.

Table B.4. (cont'd.).

Value of KEYOLD	Flock Status	Ownership of Flock	Additional Information
8	Flock not yet housed	Owner-operator	Unit being cleaned out. Cleanout costs to be charged to next flock in unit.
9	Flock not yet housed	Owner-operator	Unit being cleaned out. Cleanout costs to be charged to last flock in unit.
10	Flock being force molted	Owner-operator	
11	Flock being force molted	Contractor	User paying contractee 1¢ per bird per week.
12	Flock housed	N.A.	Flock begins egg production cycle.
13	Force molting process complete	N.A.	Flock begins egg production cycle.

If the unit enters this module because IAGE(J,K) is greater than NDAGE(J,K), the status of the flock can be either: the flock is to be sold or the flock is to be transferred for force molting.

<u>Flock is to be sold</u>. The variable KLEN(J) is made equal to KLNWKS(J) plus 1 and the number of birds to be sold [IBRDSLD(J)] becomes equal to NUMBER(J). The two variables CSTPD(J,14) and CSTYTD(J,14) are incremented by CSTLBR(J). If the user does not own the flock, the value of NUMBER(J) is set to zero and PRINT1 is called. If the user owns the flock, the value of the flock to be sold [SLBDPD(J)] is defined by the product of NUMBER(J) times the projected average weight [WT(J,K)] of each bird to be sold times BRVL(I). The variable SLBDYTD(J) is then incremented by SLBDPD(J) and the difference between SLBDPD(J) and SETASID(J) or PROFIT(J) is the measure of the profit or loss on the sale of the flock. If PROFIT(J) is positive, the variable LORG(J) takes on the alphabetic value of "GAIN" while if PROFIT(J) is negative, the variable LORG(J) is made equal to "LOSS."

The variables CSTPD(J,18) and CSTYTD(J,18) are each incremented by SETASID(J). NUMBER(J) is then made equal to zero. If the costs of the cleanout are to be charged to the next flock housed [KLNOUT(I) = 3], PRINT1 is called. Otherwise, PRINT1 is called just prior to the housing of the next flock.

Once execution has returned from PRINT1, the following variables are set to zero: LOSTYTD(J), KEYYTD2(J), KBRYTD2(J), KFDYTD(J), TONYTD(J), FDYTD(J), PRODAN(J,1) and PRODAN(J,2). If the value of KEYOLD(J) is equal to 6, the value of KEYND(J) is set to 3 which will terminate the unit from further analysis. KEYOLD(J) can only be 6 if KEYFLK(J) is equal to NUMFL(J) or the flock sold is the last flock in the run for this unit.

Flock is to be transferred for force molting. KLEN(J), for flocks that are to be force molted, carries the value of the number of weeks the flock will be out of production. This value is equal to the difference between the age of the flock when egg production will begin [MOLT(J,K)] and IAGE(J,K). IBRDSLD(J) represents the number of birds to be transferred for force molting which is equal to NUMBER(J). If the number of birds to be force molted is to be the remaining birds from the previous flock, the number of birds to be added [IBRDPUR(J)] becomes zero. If the user indicated on input [NMBR(J,K) = 1] that birds are to be added to equal the unit flock capacity [KAPUN(J)], the variable IBRDPUR(J) becomes the difference between KAPUN(J) and NUMBER(J). NUMBER(J) then becomes NUMBER(J) plus IBRDPUR(J) or equal to KAPUN(J). Following this routine, PRINT1 is called and upon return the variables LOSTYTD(J), KEYYTD2(J), KBRYTD2(J), KFDYTD(J), TONYTD(J), FDYTD(J), PRODAN(J,1) and PRODAN(J,2) are set to zero.

To prepare memory banks for this new flock, NEWFLK is called, NMBR(J,K) is set equal to NUMBER(J) and the starting age of the flock (IAGEST) becomes equal to IAGE(J,K). At this point execution merges with the following routines.

The following routines are executed only if KEYOLD(J) is greater than zero. Again, the routine executed is dependent upon flock status. Either the unit is being cleaned out and the next flock has not been housed or the present flock is in the process of being force molted. The first executable statement is: the value of KLEN(J) is reduced by the value of 1.

When a <u>unit is being cleaned out and the flock has not yet been housed</u>, the value of CSTKLN(J) is added to CSTPD(J,14) and to TEXPD(J). If the user does not own the next flock or if the user owns the next flock but the costs of the cleanout are to be charged to the flock that was sold, the value of CSTKLN(J) is added to CSTYTD(J,14) and also to TEXYTD(J). If the user owns the flock and the costs of cleanout are to be charged to the next flock occupying the house, CSTKLN(J) is added to FLKCST(J,K, + 1).

If the value of KLEN(J) is equal to zero, the user owns the flock and the costs of cleanout are to be charged to the flock sold, PRINT1 is called. Upon return from PRINT1, the variables LOSTYTD(J), KEYYTD2(J), KBRYTD2(J), KFDYTD(J), TONYTD(J), FDYTD(J), PRODAN(J,1) and PRODAN(J,2) are made equal to zero. The module NEWFLK is then called and upon return from NEWFLK, IAGEST is made equal to IAGE(J,K) and the module is exited. If the value of KLEN(J) is greater than zero, the module is simply exited.

When a <u>flock is presently being force molted</u>, the only test is to find the value of KLEN(J). If KLEN(J) is equal to zero, KEYOLD(J) is made equal to 13 and the module is exited. If the value of KLEN(J) is greater than zero, the module is simply exited.

<u>16. HOLDPAT</u>

HOLDPAT is the last of the three modules designed for the changing over of flocks. It is called from the sub-program CALC providing the value of KEYOLD(J) is greater than zero but less than twelve. Unlike all other modules in the program, this module exits to a statement other than the statement following the call statement. It does this to avoid entering modules 7 through 11.

Most of the routines in this module were copied from other modules. HOLDPAT accumulates program level expenses, farm level expenses and unit level expenses exactly as described in EXPENSE. If the value of KEYOLD(J) is equal to 10, it also accumulates flock level expenses as in the module EXPENSE.

If the unit is occupied by a flock being force molted, the routine followed to measure flock mortality is exactly the same as used in MORTAL and the routines measuring feed consumption and cost of feed consumed are the same as those used in CONSUME.

Two routines in this module differ from others in the program. If the user is a contractor, as defined in Appendix A, the values of CSTPD(J,16) and TEXPD(J) are each incremented by SALEXP. SALEXP is a cost of having the flock cared for during the force molting period which is equal to NUMBER(J) times 1¢ per week. If the user is a contractee, the variables SALPD(J) and SALYTD(J) are incremented by SALOS which is measured exactly like SALEXP. SALOS is the payment to the contractee for services rendered to the flock during force molting.

By developing the module HOLDPAT, a great amount of efficiency was achieved by allowing execution to ignore entering the modules MORTAL, PRODUCT, CONSUME, SALES and EXPENSE. It also reduces the number of tests in those modules.

17., 18. and 19. PRINT1, PRINT2 and PRINT3

PRINT1, PRINT2 and PRINT3 are output modules. Samples of the various types of output can be found in Section III of the handbook in Appendix A. PRINT1 was designed to provide a summary each period for each unit and most output variables are calculated in this module. PRINT2 was designed to combine the variables calculated in PRINT1 to give farm and program sums and averages for each period of the year. PRINT3 does the same for each year of the run.

This section discusses the output variables calculated in PRINT1. Some are used for further calculations. They are:

1. Average number of birds in each flock per week for the period [KABPD(J)] which equals KBRDPD(J) divided by KEYPD(J),
2. Average number of birds in each flock per week for year-to-date analysis [KABYTD(J)] which equals KBRDYTD(J) divided by KEYYTD(J) and
3. Average number of birds in each flock per week for flock-to-date analysis [KABYTD2(J) which equals KBRDYTD2(J) divided by KEYYTD2(J).

Many of the variables measured in PRINT1 are calculated in a looping procedure. Those variables measured where X has a range from 1 to 18 are:

1. Cost per dozen eggs produced per period [XDOZPD(X)] which is equal to CSTPD(J,X) divided by PRODPD(J,2),
2. Cost per dozen eggs produced for the year to date [XDOZYTD(X)] which is equal to CSTYTD(J,X) divided by PRODYTD(J,2),
3. Cost per bird each period [XBRDPD(X)] which is equal to CSTPD(J,X) divided by KABPD(J) and
4. Cost per bird for the year to date [XBRDYTD(X)] which is equal to CSTYTD(J,X) divided by KABYTD(J).

Those variables measured where X has a range from 1 to 6 are:

1. Price per dozen eggs per period [PRCPD(X)] which is equal to TVALPD(J,X) divided by PRODPD(J,X+2) and
2. Price per dozen eggs for the year to date [PRCYTD(X)] which is equal to TVALYTD(J,X) divided by PRODYTD(J,X+2).

The remaining variables calculated in PRINT1 can be found in Table B.5.

Table B.5. Other variables measured in PRINT1

Variable Name	Definition of Variable Name	Arithmetical Statement
PRCPD(7)	ave. price/dozen eggs--period	TVALPD(J,7)/PRODPD(J,2)
PRCYTD(7)	ave. price/dozen eggs--year-to-date	TVALYTD(J,7)/PRODYTD(J,2)
AVEPD(J)	ave. hen day production--period	PRODPD(J,1)/KEYPD(J)
AVEYTD(J)	ave. hen day production--flock-to-date	PRODAN(J,1)/KEYYTD2(J)
AVEPD2(J)	ave. hen housed production--period	((PRODPD(J,2)*12.0)/(KEYPD(J)*7))/NMBR(J,K)
AVEYTD2(J)	ave. hen housed production--flock-to-date	(PRODAN(J,2)*12.0)/KEYYTD2(J)*7))/NMBR(J,K)
EPHDPD(J)	eggs per hen (HD)--period	(PRODPD(J,2)*12.0)/KABPD(J)
EPHDYTD(J)	eggs per hen (HD)--flock-to-date	(PRODAN(J,2)*12.0)/KABYTD2(J)
EPHHPD(J)	eggs per hen (HH)--period	(PRODPD(J,2)*12.0)/NMBR(J,K)
EPHHYTD(J)	eggs per hen (HH)--flock-to-date	(PRODAN(J,2)*12.0)/NMBR(J,K)
TNPRPD(J)	ave. price/ton of feed--period	CSTPD(J,15)/TONPD(J)
TNPRYTD(J)	ave. price/ton of feed--flock-to-date	FDYTD(J)/TONYTD(J)
FDHNPD(J)	pds. of feed/100 hens/day--period	(100*TONPD(J)*2000.0)/(7*KFDPD(J))
FDHNYTD(J)	pds. of feed/100 hens/day--flock-to-date	(100*TONYTD(J)*2000.0)/(7*KFDYTD(J))
FDEGPD(J)	pds. of feed/dozen eggs--period	(TONPD(J)*2000.0)/PRODPD(J,2)
FDEGYTD(J)	pds. of feed/dozen eggs--flock-to-date	(TONYTD(J)*2000.0)/PRODAN(J,2)
TOTPD(J)	cash receipts--period	SALPD(J)+PDPWPD(J)+SLBDPD(J)
TOTYTD(J)	cash receipts--year-to-date	SALYTD(J)+PDPWYTD(J)+SLBDYTD(J)
SLPBPD(J)	cash receipts/bird--period	TOTPD(J)/KABPD(J)
SLPBYTD(J)	cash receipts/bird--year-to-date	TOTYTD(J)/KABYTD(J)
CSXPD(J)	cash expenses--period	TEXPD(J)-(CSTPD(J,11)+CSTPD(J,12)+CSTPD(J,13)+CSTPD(J,18))
CSXYTD(J)	cash expenses--year-to-date	TEXYTD(J)-(CSTYTD(J,11)+CSTYTD(J,12)+CSTYTD(J,13)+CSTYTD(J,18))
CXBRPD(J)	cash expenses/bird--period	CSXPD(J)/KABPD(J)
CXBRYTD(J)	cash expenses/bird--year-to-date	CSXYTD(J)/KABYTD(J)
ONCSPD(J)	non-cash expenses--period	TEXPD(J)-CSXPD(J)
ONCSYTD(J)	non-cash expenses--year-to-date	TEXYTD(J)-CSXYTD(J)
ONBRPD(J)	non-cash expenses/bird--period	ONCSPD(J)/KABPD(J)
ONBRYTD(J)	non-cash expenses/bird--year-to-date	ONCSYTD(J)/KABYTD(J)
ETCSPD(J)	net cash income--period	TOTPD(J)-CSXPD(J)
ETCSYTD(J)	net cash income--year-to-date	TOTYTD(J)-CSXYTD(J)
ECIBPD(J)	net cash income/bird--period	ETCSPD(J)/KABPD(J)
ECIBYTD(J)	net cash income/bird--year-to-date	ETCSYTD(J)/KABYTD(J)
ETINPD(J)	net income--period	TOTPD(J)-TEXPD(J)
ETINYTD(J)	net income--year-to-date	TOTYTD(J)-TEXYTD(J)
EINBPD(J)	net income/bird--period	ETINPD(J)/KABPD(J)
EINBYTD(J)	net income/bird--year-to-date	ETINYTD(J)/KABYTD(J)
PCCPD(J)	price cash cost--period	CSXPD(J)/PRODPD(J,2)
PCCYTD(J)	price cash cost--year-to-date	CSXYTD(J)/PRODYTD(J,2)
PTCPD(J)	price total cost--period	TEXPD(J)/PRODPD(J,2)

* = times HD = hen day HH = hen housed

Table B.5. (cont'd.).

Variable Name	Definition of Variable Name	Arithmetical Statement
PTCYTD(J)	price total cost--year-to-date	TEXYTD(J)/PRODYTD(J,2)
PDCCPD(J)	production cash cost--period	CSXPD(J)/PRCPD(7)
PDCCYTD(J)	production cash cost--year-to-date	CSXYTD(J)/PRCYTD(7)
PDTCPD(J)	production total cost--period	TEXPD(J)/PRCPD(7)
PDTCYTD(J)	production total cost--year-to-date	TEXYTD(J)/PRCYTD(7)
ESFTPD(J)	eggs/square foot of housing--period	(PRODPD(J,2)*12.0)/MESUR(J)
ESFTYTD(J)	eggs/square foot of housing--year-to-date	(PRODYTD(J,2)*12.0)/MESUR(J)
SQFTPD(J)	sales/square foot of housing--period	TOTPD(J)/MESUR(J)
SQFTYTD(J)	sales/square foot of housing--year-to-date	TOTYTD(J)/MESUR(J)
EXFTPD(J)	expenses/square foot of housing--period	TEXPD(J)/MESUR(J)
EXFTYTD(J)	expenses/sq. foot of housing--year-to-date	TEXYTD(J)/MESUR(J)
TOXDPD(J)	total expenses/dozen eggs--period	TEXPD(J)/PRODPD(J,2)
TOXDYTD(J)	total expenses/dozen eggs--year-to-date	TEXYTD(J)/PRODYTD(J,2)
TOXBPD(J)	total expenses/bird--period	TEXPD(J)/KABPD(J)
TOXBYTD(J)	total expenses/bird--year-to-date	TEXYTD(J)/KABYTD(J)
SLVPD(J)	production loss--period	TVALPD(J,7)-TOTPD(J)+SLBDPD(J)+PDPWPD(J)
SLVYTD(J)	production loss--year-to-date	TVALYTD(J,7)-TOTYTD(J)+SLBDYTD(J)+PDPWYTD(J)

* = times HD = hen day HH = hen housed

APPENDIX C

APPENDIX C

PRODUCTION STANDARDS

The following tables contain the production standards used in the poultry computer simulation model, Multichix.

Table C.1. Production standards--general production (pullets)

	Hen Day Egg Production		Egg Distribution					
Flock Age (Weeks)	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
20	.0000	.0000	.0000	.0300	.2000	.7400	.0000	.0300
21	.0500	.0250	.0000	.0300	.2000	.7400	.0000	.0300
22	.1050	.0517	.0000	.0400	.2600	.6700	.0000	.0300
23	.2500	.1012	.0000	.0700	.3200	.5800	.0000	.0300
24	.3800	.1570	.0000	.0900	.4000	.4800	.0000	.0300
25	.5100	.2158	.0000	.1100	.4500	.4100	.0000	.0300
26	.6500	.2779	.0000	.1400	.4900	.3400	.0000	.0300
27	.7900	.3419	.0000	.1700	.5400	.2600	.0000	.0300
28	.8600	.3994	.0100	.2200	.5600	.1900	.0000	.0300
29	.8700	.4465	.0100	.2400	.5700	.1500	.0000	.0300
30	.8650	.4845	.0100	.2900	.5700	.1000	.0000	.0300
31	.8600	.5158	.0100	.3400	.5700	.0500	.0000	.0300
32	.8550	.5419	.0150	.3900	.5300	.0450	.0000	.0300
33	.8450	.5636	.0300	.4100	.4900	.0400	.0000	.0300
34	.8400	.5820	.0300	.4450	.4650	.0300	.0000	.0300
35	.8350	.5978	.0500	.4850	.4150	.0200	.0000	.0300
36	.8300	.6115	.0700	.5050	.3650	.0200	.0000	.0400
37	.8250	.6233	.0800	.5250	.3450	.0100	.0000	.0400
38	.8150	.6334	.0800	.5350	.3350	.0100	.0000	.0400
39	.8100	.6422	.0900	.5550	.3050	.0100	.0000	.0400
40	.8000	.6498	.0960	.5750	.2850	.0040	.0000	.0400
41	.7950	.6564	.1180	.5850	.2550	.0020	.0000	.0400
42	.7900	.6622	.1380	.5700	.2500	.0020	.0000	.0400
43	.7850	.6673	.1550	.5750	.2300	.0000	.0000	.0400
44	.7800	.6718	.1750	.5750	.2100	.0000	.0000	.0400
45	.7700	.6756	.1900	.5800	.1900	.0000	.0000	.0400
46	.7650	.6789	.2150	.5750	.1600	.0000	.0000	.0500
47	.7550	.6816	.2200	.5750	.1550	.0000	.0000	.0500
48	.7500	.6840	.2500	.5700	.1300	.0000	.0000	.0500
49	.7450	.6860	.2800	.5700	.1000	.0000	.0000	.0500
50	.7400	.6877	.2850	.5700	.0950	.0000	.0000	.0500
51	.7300	.6891	.2950	.5600	.0950	.0000	.0000	.0500
52	.7250	.6902	.3100	.5400	.0900	.0000	.0000	.0600
53	.7200	.6910	.3200	.5300	.0900	.0000	.0000	.0600
54	.7150	.6917	.3300	.5200	.0900	.0000	.0000	.0600
55	.7050	.6921	.3400	.5200	.0800	.0000	.0000	.0600
56	.7000	.6923	.3500	.5100	.0800	.0000	.0000	.0600
57	.6950	.6924	.3500	.5000	.0900	.0000	.0000	.0600
58	.6900	.6923	.3600	.4900	.0800	.0000	.0000	.0700
59	.6800	.6920	.3800	.4500	.0700	.0000	.0000	.0700
60	.6750	.6916	.3800	.4800	.0700	.0000	.0000	.0700
61	.6700	.6911	.3800	.4800	.0700	.0000	.0000	.0700
62	.6650	.6905	.3800	.4800	.0700	.0000	.0000	.0700
63	.6600	.6898	.3800	.4800	.0600	.0000	.0000	.0800
64	.6550	.6890	.3800	.4800	.0600	.0000	.0000	.0800
65	.6450	.6880	.3800	.4800	.0600	.0000	.0000	.0800
66	.6400	.6870	.3800	.4800	.0600	.0000	.0000	.0800
67	.6300	.6858	.3800	.4600	.0800	.0000	.0000	.0800
68	.6250	.6846	.3800	.4600	.0800	.0000	.0000	.0800
69	.6200	.6833	.3800	.4600	.0800	.0000	.0000	.0800
70	.6150	.5820	.3800	.4600	.0800	.0000	.0000	.0800
71	.6050	.6805	.3800	.4600	.0700	.0000	.0000	.0900
72	.6000	.6790	.3800	.4600	.0700	.0000	.0000	.0900
73	.5950	.6774	.3800	.4600	.0700	.0000	.0000	.0900
74	.5900	.6758	.3800	.4600	.0700	.0000	.0000	.0900
75	.5850	.5742	.3800	.4600	.0700	.0000	.0000	.0900
76	.5750	.6725	.3800	.4600	.0700	.0000	.0000	.0900
77	.5700	.6707	.3800	.4600	.0700	.0000	.0000	.0900
78	.5650	.6689	.3800	.4600	.0700	.0000	.0000	.0900
79	.5500	.6669	.3800	.4600	.0700	.0000	.0000	.0900
80	.5550	.6651	.3800	.4600	.0700	.0000	.0000	.0900

Table C.2. Production standards--Babcock B-300 (pullets)

	Hen Day Egg Production		Egg Distribution					
Flock Age (Weeks)	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
20	.0600	.0600	.0000	.0000	.1200	.7500	.0800	.0500
21	.1600	.1100	.0000	.0000	.4000	.5000	.0500	.0500
22	.3000	.1733	.0000	.0200	.4800	.4000	.0500	.0500
23	.4400	.2400	.0000	.0300	.5800	.3000	.0400	.0500
24	.5600	.3040	.0000	.1000	.6100	.2000	.0400	.0500
25	.6800	.3667	.0000	.2000	.5700	.1500	.0300	.0500
26	.8000	.4286	.0000	.3000	.4750	.1500	.0250	.0500
27	.8900	.4862	.0000	.4000	.4350	.1000	.0150	.0500
28	.8900	.5311	.0000	.5000	.3600	.0800	.0100	.0500
29	.8800	.5660	.0000	.5500	.3600	.0400	.0000	.0500
30	.8700	.5936	.0000	.6000	.3200	.0300	.0000	.0500
31	.8650	.6162	.0000	.6500	.2700	.0300	.0000	.0500
32	.8600	.6350	.0000	.7000	.2300	.0200	.0000	.0500
33	.8500	.6504	.0000	.7200	.2150	.0150	.0000	.0500
34	.8400	.6630	.0000	.7400	.2000	.0100	.0000	.0500
35	.8400	.6741	.0000	.7500	.1800	.0100	.0000	.0500
36	.8300	.6832	.0000	.7700	.1750	.0050	.0000	.0500
37	.8200	.6908	.0000	.7800	.1700	.0000	.0000	.0500
38	.8200	.6976	.0000	.7900	.1600	.0000	.0000	.0500
39	.8100	.7032	.0000	.8100	.1400	.0000	.0000	.0500
40	.8000	.7079	.0000	.8200	.1300	.0000	.0000	.0500
41	.7950	.7118	.0000	.8200	.1300	.0000	.0000	.0500
42	.7900	.7152	.0000	.8300	.1200	.0000	.0000	.0500
43	.7800	.7179	.0000	.8400	.1100	.0000	.0000	.0500
44	.7800	.7204	.0000	.8400	.1100	.0000	.0000	.0500
45	.7700	.7223	.0000	.8500	.0900	.0000	.0000	.0600
46	.7600	.7237	.0000	.8500	.0900	.0000	.0000	.0600
47	.7550	.7248	.0000	.8600	.0800	.0000	.0000	.0600
48	.7500	.7257	.0000	.8600	.0800	.0000	.0000	.0600
49	.7400	.7262	.0000	.8700	.0700	.0000	.0000	.0600
50	.7300	.7263	.0000	.8700	.0700	.0000	.0000	.0600
51	.7250	.7262	.0000	.8800	.0600	.0000	.0000	.0600
52	.7200	.7261	.0000	.8800	.0600	.0000	.0000	.0600
53	.7100	.7256	.0000	.8900	.0500	.0000	.0000	.0600
54	.7050	.7250	.0000	.8900	.0500	.0000	.0000	.0600
55	.7000	.7243	.0000	.8900	.0500	.0000	.0000	.0600
56	.6900	.7234	.0000	.8900	.0500	.0000	.0000	.0600
57	.6850	.7224	.0000	.8900	.0400	.0000	.0000	.0700
58	.6800	.7213	.0000	.8900	.0400	.0000	.0000	.0700
59	.6700	.7200	.0000	.8900	.0400	.0000	.0000	.0700
60	.6650	.7187	.0000	.8900	.0400	.0000	.0000	.0700
61	.6600	.7173	.0000	.8900	.0300	.0000	.0000	.0800
62	.6500	.7157	.0000	.8900	.0300	.0000	.0000	.0800
63	.6400	.7140	.0000	.8900	.0300	.0000	.0000	.0800
64	.6350	.7122	.0000	.8900	.0300	.0000	.0000	.0800
65	.6300	.7104	.0000	.8800	.0200	.0000	.0000	.1000
66	.6200	.7085	.0000	.8800	.0200	.0000	.0000	.1000
67	.6150	.7066	.0000	.8800	.0200	.0000	.0000	.1000
68	.6100	.7046	.0000	.8800	.0200	.0000	.0000	.1000
69	.6000	.7025	.0000	.8600	.0200	.0000	.0000	.1200
70	.5950	.7004	.0000	.8600	.0200	.0000	.0000	.1200
71	.5900	.6983	.0000	.8600	.0200	.0000	.0000	.1200
72	.5800	.6960	.0000	.8600	.0200	.0000	.0000	.1200
73	.5750	.6938	.0000	.8600	.0200	.0000	.0000	.1200
74	.5650	.6915	.0000	.8600	.0200	.0000	.0000	.1200
75	.5600	.6891	.0000	.8600	.0200	.0000	.0000	.1200
76	.5550	.6868	.0000	.8600	.0200	.0000	.0000	.1200
77	.5450	.6843	.0000	.8500	.0200	.0000	.0000	.1200
78	.5400	.6819	.0000	.8600	.0200	.0000	.0000	.1200
79	.5300	.6793	.0000	.8600	.0200	.0000	.0000	.1200
80	.5250	.6768	.0000	.8600	.0200	.0000	.0000	.1200

Table C.3. Production standards--DeKalb 231 (pullets)

Flock Age (Weeks)	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
20	.0000	.0000	.0000	.0250	.1600	.7850	.0000	.0300
21	.0600	.0300	.0000	.0250	.1600	.7950	.0000	.0300
22	.1950	.0850	.0000	.0300	.2000	.7400	.0000	.0300
23	.3500	.1513	.0000	.0300	.2500	.6900	.0000	.0300
24	.5000	.2210	.0000	.0400	.3000	.6300	.0000	.0300
25	.6500	.2925	.0050	.0600	.3900	.5150	.0000	.0300
26	.8000	.3650	.0070	.0900	.4500	.4230	.0000	.0300
27	.8300	.4231	.0070	.1150	.5000	.3480	.0000	.0300
28	.8400	.4694	.0080	.1400	.5400	.2820	.0000	.0300
29	.8450	.5070	.0100	.1650	.5500	.2450	.0000	.0300
30	.8400	.5373	.0300	.2200	.5450	.1750	.0000	.0300
31	.8400	.5625	.0300	.2800	.5500	.1100	.0000	.0300
32	.8350	.5835	.0350	.3400	.5400	.0550	.0000	.0300
33	.8250	.6007	.0430	.3800	.5300	.0170	.0000	.0300
34	.8200	.6153	.0450	.4250	.4950	.0050	.0000	.0300
35	.8150	.6270	.0550	.4400	.4750	.0000	.0000	.0300
36	.8100	.6365	.0600	.4800	.4300	.0000	.0000	.0300
37	.8000	.6475	.0700	.5050	.3950	.0000	.0000	.0300
38	.8000	.6555	.0800	.5200	.3700	.0000	.0000	.0300
39	.7900	.6622	.0900	.5400	.3300	.0000	.0000	.0400
40	.7850	.6681	.1000	.5600	.3000	.0000	.0000	.0400
41	.7800	.6732	.1150	.5750	.2700	.0000	.0000	.0400
42	.7750	.6776	.1250	.5700	.2650	.0000	.0000	.0400
43	.7650	.6812	.1350	.5700	.2550	.0000	.0000	.0400
44	.7600	.6844	.1450	.5750	.2400	.0000	.0000	.0400
45	.7550	.6871	.1700	.5750	.2150	.0000	.0000	.0400
46	.7500	.6894	.1800	.5750	.2050	.0000	.0000	.0400
47	.7450	.6914	.2000	.5750	.1850	.0000	.0000	.0400
48	.7400	.6931	.2150	.5730	.1720	.0000	.0000	.0400
49	.7350	.6945	.2250	.5700	.1650	.0000	.0000	.0400
50	.7300	.6956	.2400	.5650	.1550	.0000	.0000	.0400
51	.7250	.6966	.2500	.5600	.1500	.0000	.0000	.0400
52	.7200	.6973	.2600	.5550	.1450	.0000	.0000	.0400
53	.7150	.6978	.2750	.5450	.1400	.0000	.0000	.0400
54	.7100	.6981	.2850	.5430	.1220	.0000	.0000	.0500
55	.7050	.6983	.3000	.5350	.1150	.0000	.0000	.0500
56	.7000	.6984	.3100	.5250	.1150	.0000	.0000	.0500
57	.6950	.6983	.3250	.5150	.1100	.0000	.0000	.0500
58	.6900	.6981	.3300	.5100	.1100	.0000	.0000	.0500
59	.6850	.6977	.3400	.5050	.0950	.0000	.0000	.0600
60	.6800	.6973	.3550	.4950	.0900	.0000	.0000	.0600
61	.6750	.6968	.3700	.4800	.0900	.0000	.0000	.0600
62	.6700	.6962	.3850	.4700	.0850	.0000	.0000	.0600
63	.6650	.6955	.4050	.4550	.0800	.0000	.0000	.0600
64	.6600	.6947	.4150	.4450	.0800	.0000	.0000	.0600
65	.6550	.6938	.4050	.4400	.0850	.0000	.0000	.0700
66	.6500	.6929	.4200	.4300	.0800	.0000	.0000	.0700
67	.6450	.6919	.4350	.4200	.0750	.0000	.0000	.0700
68	.6400	.6908	.4400	.4100	.0720	.0000	.0000	.0700
69	.6350	.6897	.4500	.4000	.0700	.0000	.0000	.0800
70	.6300	.6885	.4600	.3900	.0700	.0000	.0000	.0800
71	.6250	.6873	.4700	.3850	.0650	.0000	.0000	.0800
72	.6700	.6860	.4800	.3750	.0650	.0000	.0000	.0800
73	.6150	.6847	.4920	.3650	.0630	.0000	.0000	.0800
74	.6100	.6834	.4900	.3700	.0600	.0000	.0000	.0800
75	.6050	.6820	.4950	.3550	.0600	.0000	.0000	.0900
76	.6000	.6805	.5000	.3510	.0590	.0000	.0000	.0900
77	.5950	.6791	.5020	.3500	.0580	.0000	.0000	.0900
78	.5900	.6775	.5050	.3460	.0590	.0000	.0000	.0900
79	.5850	.6760	.5120	.3400	.0580	.0000	.0000	.0900
80	.5800	.6744	.5200	.3340	.0560	.0000	.0000	.0900

Table C.4. Production standards--H & N Nickchick (pullets)

Flock Age (Weeks)	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
20	.0000	.0000	.0000	.0000	.0600	.9000	.0000	.0400
21	.0000	.0000	.0000	.0000	.0600	.9000	.0000	.0400
22	.0200	.0067	.0000	.0000	.0600	.9000	.0000	.0400
23	.1400	.0400	.0000	.0000	.1100	.8500	.0000	.0400
24	.3000	.0920	.0000	.0000	.3100	.6600	.0000	.0300
25	.4700	.1550	.0000	.0100	.4800	.4800	.0000	.0300
26	.6250	.2221	.0000	.0400	.6300	.3000	.0000	.0300
27	.8200	.2969	.0000	.0800	.7000	.1900	.0000	.0300
28	.8850	.3622	.0000	.1500	.7200	.1000	.0000	.0300
29	.9030	.4163	.0000	.2300	.6900	.0500	.0000	.0300
30	.9100	.4612	.0000	.3200	.6300	.0200	.0000	.0300
31	.9100	.4986	.0100	.3800	.5800	.0000	.0000	.0300
32	.9080	.5301	.0100	.4400	.5200	.0000	.0000	.0300
33	.9000	.5565	.0200	.5000	.4400	.0000	.0000	.0400
34	.8970	.5792	.0300	.5300	.4000	.0000	.0000	.0400
35	.8900	.5986	.0400	.5700	.3500	.0000	.0000	.0400
36	.8820	.6153	.0500	.6000	.3100	.0000	.0000	.0400
37	.8770	.6298	.0700	.6300	.2600	.0000	.0000	.0400
38	.8700	.6425	.0900	.6400	.2200	.0000	.0000	.0500
39	.8640	.6535	.1100	.6400	.2000	.0000	.0000	.0500
40	.8570	.6632	.1300	.6300	.1900	.0000	.0000	.0500
41	.8500	.6717	.1500	.6200	.1800	.0000	.0000	.0500
42	.8440	.6792	.1700	.6200	.1600	.0000	.0000	.0500
43	.8370	.6858	.1900	.6100	.1400	.0000	.0000	.0600
44	.8300	.6916	.2100	.6000	.1300	.0000	.0000	.0600
45	.8240	.6967	.2300	.5900	.1200	.0000	.0000	.0600
46	.8170	.7011	.2400	.5900	.1100	.0000	.0000	.0600
47	.8100	.7050	.2500	.5800	.1000	.0000	.0000	.0700
48	.8040	.7084	.2600	.5700	.1000	.0000	.0000	.0700
49	.7970	.7114	.2700	.5600	.1000	.0000	.0000	.0700
50	.7900	.7139	.2800	.5600	.0900	.0000	.0000	.0700
51	.7840	.7161	.2900	.5500	.0800	.0000	.0000	.0800
52	.7770	.7179	.3000	.5400	.0800	.0000	.0000	.0800
53	.7700	.7195	.3100	.5300	.0800	.0000	.0000	.0800
54	.7640	.7207	.3200	.5200	.0800	.0000	.0000	.0800
55	.7570	.7217	.3300	.5000	.0800	.0000	.0000	.0900
56	.7500	.7225	.3500	.5000	.0600	.0000	.0000	.0900
57	.7440	.7231	.3700	.4800	.0600	.0000	.0000	.0900
58	.7370	.7234	.3800	.4800	.0500	.0000	.0000	.0900
59	.7300	.7236	.4000	.4700	.0400	.0000	.0000	.0900
60	.7240	.7236	.4100	.4500	.0400	.0000	.0000	.1000
61	.7170	.7235	.4200	.4400	.0400	.0000	.0000	.1000
62	.7100	.7231	.4300	.4300	.0400	.0000	.0000	.1000
63	.7040	.7227	.4300	.4200	.0400	.0000	.0000	.1100
64	.6970	.7221	.4300	.4700	.0400	.0000	.0000	.1100
65	.6900	.7214	.4400	.4200	.0300	.0000	.0000	.1100
66	.6840	.7206	.4500	.4100	.0300	.0000	.0000	.1100
67	.6770	.7197	.4500	.4100	.0300	.0000	.0000	.1100
68	.6700	.7187	.4500	.4000	.0300	.0000	.0000	.1200
69	.6640	.7176	.4500	.4000	.0300	.0000	.0000	.1200
70	.6570	.7164	.4500	.4000	.0300	.0000	.0000	.1200
71	.6500	.7152	.4600	.3800	.0300	.0000	.0000	.1300
72	.6440	.7138	.4600	.3800	.0300	.0000	.0000	.1300
73	.6370	.7124	.4600	.3800	.0300	.0000	.0000	.1300
74	.6300	.7109	.4600	.3800	.0300	.0000	.0000	.1300
75	.6240	.7093	.4600	.3800	.0300	.0000	.0000	.1300
76	.6170	.7077	.4600	.3800	.0300	.0000	.0000	.1300
77	.6100	.7060	.4600	.3800	.0300	.0000	.0000	.1300
78	.6040	.7043	.4600	.3800	.0300	.0000	.0000	.1300
79	.5970	.7025	.4600	.3800	.0300	.0000	.0000	.1300
80	.5900	.7007	.4600	.3800	.0300	.0000	.0000	.1300

Table C.5. Production standards--Hyline W-36 (pullets)

	Hen Day Egg Production		Egg Distribution					
Flock Age (Weeks)	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
20	.0000	.0000	.0000	.0100	.2200	.5600	.1700	.0400
21	.0000	.0000	.0000	.0100	.2200	.5600	.1700	.0400
22	.0200	.0067	.0000	.0100	.2200	.5600	.1700	.0400
23	.0600	.0200	.0000	.0200	.2900	.5500	.1000	.0400
24	.2500	.0660	.0000	.0300	.3800	.4800	.0700	.0400
25	.4800	.1350	.0000	.0500	.3600	.4800	.0700	.0400
26	.5800	.1986	.0000	.0600	.4600	.4000	.0400	.0400
27	.6800	.2507	.0000	.1100	.5100	.3300	.0100	.0400
28	.8000	.3189	.0000	.1400	.5700	.2400	.0100	.0400
29	.8500	.3720	.0000	.2300	.5600	.1700	.0000	.0400
30	.8700	.4173	.0100	.2600	.5900	.1000	.0000	.0400
31	.8700	.4550	.0200	.2900	.5500	.1000	.0000	.0400
32	.8600	.4862	.0400	.3700	.4900	.0600	.0000	.0400
33	.8600	.5129	.0500	.4200	.4600	.0300	.0000	.0400
34	.8600	.5360	.0600	.4600	.4100	.0300	.0000	.0400
35	.8500	.5556	.0700	.4700	.3900	.0300	.0000	.0400
36	.8400	.5724	.0900	.4800	.3700	.0200	.0000	.0400
37	.8300	.5867	.1000	.5100	.3200	.0200	.0000	.0500
38	.8200	.5989	.1100	.5200	.3100	.0100	.0000	.0500
39	.8200	.6100	.1200	.5400	.2800	.0100	.0000	.0500
40	.8100	.6195	.1300	.5500	.2600	.0100	.0000	.0500
41	.8000	.6277	.1400	.5500	.2500	.0100	.0000	.0500
42	.7900	.6348	.1600	.5400	.2400	.0100	.0000	.0500
43	.7700	.6404	.1600	.5500	.2300	.0100	.0000	.0500
44	.7700	.6456	.1600	.5600	.2200	.0100	.0000	.0500
45	.7600	.6500	.1900	.5400	.2100	.0000	.0000	.0600
46	.7500	.6537	.2100	.5300	.2000	.0000	.0000	.0600
47	.7500	.6571	.2100	.5400	.1900	.0000	.0000	.0600
48	.7300	.6597	.2300	.5300	.1800	.0000	.0000	.0600
49	.7200	.6617	.2400	.5300	.1700	.0000	.0000	.0600
50	.7100	.6632	.2400	.5400	.1600	.0000	.0000	.0600
51	.7100	.6647	.2500	.5400	.1500	.0000	.0000	.0600
52	.7000	.6658	.2500	.5500	.1400	.0000	.0000	.0600
53	.6900	.6665	.2700	.5400	.1200	.0000	.0000	.0700
54	.6800	.6669	.2800	.5400	.1100	.0000	.0000	.0700
55	.6700	.6669	.2800	.5500	.1000	.0000	.0000	.0700
56	.6700	.6670	.2900	.5500	.1000	.0000	.0000	.0700
57	.6600	.6668	.3000	.5300	.0900	.0000	.0000	.0800
58	.6600	.6667	.3300	.5100	.0800	.0000	.0000	.0800
59	.6500	.6662	.3300	.5100	.0800	.0000	.0000	.0800
60	.6400	.6656	.3400	.5000	.0800	.0000	.0000	.0800
61	.6400	.6650	.3700	.4800	.0700	.0000	.0000	.0800
62	.6300	.6642	.4000	.4600	.0600	.0000	.0000	.0800
63	.6200	.6632	.4100	.4500	.0600	.0000	.0000	.0800
64	.6200	.6622	.4100	.4500	.0600	.0000	.0000	.0800
65	.6200	.6613	.4200	.4400	.0400	.0000	.0000	.1000
66	.6100	.6602	.4500	.4100	.0400	.0000	.0000	.1000
67	.6000	.5590	.4500	.4100	.0400	.0000	.0000	.1000
68	.6000	.6578	.4500	.4100	.0400	.0000	.0000	.1000
69	.6000	.6566	.4600	.3900	.0400	.0000	.0000	.1100
70	.6000	.6555	.4600	.3900	.0400	.0000	.0000	.1100
71	.5900	.6542	.4800	.3700	.0400	.0000	.0000	.1100
72	.5800	.6528	.4800	.3700	.0400	.0000	.0000	.1100
73	.5700	.6513	.4800	.3700	.0300	.0000	.0000	.1200
74	.5700	.6498	.4800	.3700	.0300	.0000	.0000	.1200
75	.5600	.6482	.4900	.3600	.0300	.0000	.0000	.1200
76	.5600	.6467	.4900	.3600	.0300	.0000	.0000	.1200
77	.5500	.6450	.5100	.3400	.0300	.0000	.0000	.1200
78	.5500	.6434	.5100	.3400	.0300	.0000	.0000	.1200
79	.5500	.6418	.5300	.3200	.0300	.0000	.0000	.1200
80	.5400	.5402	.5300	.3700	.0300	.0000	.0000	.1200

Table C.6. Production standards--Kimber K-137 (pullets)

Flock Age (Weeks)	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
20	.0000	.0000	.0000	.0300	.2000	.7400	.0000	.0300
21	.0500	.0250	.0000	.0300	.2000	.7400	.0000	.0300
22	.1050	.0517	.0000	.0400	.2500	.6700	.0000	.0300
23	.2500	.1013	.0000	.0700	.3200	.5800	.0000	.0300
24	.3800	.1570	.0000	.0900	.4000	.4800	.0000	.0300
25	.5100	.2150	.0000	.1100	.4500	.4100	.0000	.0300
26	.6500	.2779	.0000	.1400	.4900	.3400	.0000	.0300
27	.7300	.3419	.0000	.1700	.5400	.2600	.0000	.0300
28	.8600	.3994	.0100	.2700	.5600	.1800	.0000	.0300
29	.8700	.4465	.0100	.2400	.5700	.1500	.0000	.0300
30	.8650	.4845	.0100	.2900	.5700	.1000	.0000	.0300
31	.8600	.5158	.0100	.3400	.5700	.0500	.0000	.0300
32	.8550	.5419	.0150	.3800	.5300	.0450	.0000	.0300
33	.8450	.5636	.0300	.4100	.4900	.0400	.0000	.0300
34	.8400	.5820	.0300	.4450	.4650	.0300	.0000	.0300
35	.8350	.5978	.0500	.4650	.4150	.0200	.0000	.0300
36	.8300	.6115	.0700	.5050	.3650	.0200	.0000	.0400
37	.8250	.6233	.0900	.5250	.3450	.0100	.0000	.0400
38	.8150	.6334	.0900	.5350	.3350	.0100	.0000	.0400
39	.8100	.6422	.0900	.5550	.3050	.0100	.0000	.0400
40	.8000	.6498	.0960	.5750	.2950	.0040	.0000	.0400
41	.7950	.6564	.1100	.5850	.2550	.0020	.0000	.0400
42	.7900	.6622	.1300	.5700	.2500	.0020	.0000	.0400
43	.7850	.6673	.1550	.5750	.2300	.0000	.0000	.0400
44	.7800	.5718	.1750	.5750	.2100	.0000	.0000	.0400
45	.7700	.6756	.1900	.5800	.1900	.0000	.0000	.0400
46	.7600	.6787	.2150	.5750	.1600	.0000	.0000	.0500
47	.7550	.6814	.2200	.5750	.1550	.0000	.0000	.0500
48	.7550	.5840	.2500	.5700	.1300	.0000	.0000	.0500
49	.7550	.6863	.2800	.5700	.1000	.0000	.0000	.0500
50	.7400	.6881	.2850	.5700	.0950	.0000	.0000	.0500
51	.7300	.6894	.2950	.5600	.0950	.0000	.0000	.0500
52	.7250	.6905	.3100	.5400	.0900	.0000	.0000	.0600
53	.7200	.6913	.3200	.5300	.0900	.0000	.0000	.0600
54	.7050	.6917	.3300	.5200	.0900	.0000	.0000	.0600
55	.7050	.6921	.3400	.5200	.0800	.0000	.0000	.0600
56	.7000	.6923	.3500	.5100	.0800	.0000	.0000	.0600
57	.6950	.6924	.3500	.5000	.0900	.0000	.0000	.0600
58	.6900	.6923	.3600	.4900	.0800	.0000	.0000	.0700
59	.6800	.6920	.3800	.4800	.0700	.0000	.0000	.0700
60	.6750	.5916	.3800	.4800	.0700	.0000	.0000	.0700
61	.6700	.6911	.3800	.4800	.0700	.0000	.0000	.0700
62	.6650	.5905	.3800	.4800	.0700	.0000	.0000	.0700
63	.6600	.6898	.3800	.4800	.0600	.0000	.0000	.0800
64	.6550	.6890	.3800	.4800	.0600	.0000	.0000	.0800
65	.6450	.5880	.3800	.4800	.0600	.0000	.0000	.0800
66	.6400	.6870	.3800	.4800	.0600	.0000	.0000	.0800
67	.6300	.6858	.3800	.4600	.0800	.0000	.0000	.0800
68	.6250	.6846	.3800	.4600	.0800	.0000	.0000	.0800
69	.6200	.5833	.3800	.4600	.0800	.0000	.0000	.0800
70	.6150	.6820	.3800	.4600	.0800	.0000	.0000	.0800
71	.6050	.6805	.3800	.4600	.0700	.0000	.0000	.0900
72	.6000	.5790	.3800	.4600	.0700	.0000	.0000	.0900
73	.5950	.6774	.3800	.4600	.0700	.0000	.0000	.0900
74	.5900	.6758	.3800	.4600	.0700	.0000	.0000	.0900
75	.5850	.6742	.3800	.4600	.0700	.0000	.0000	.0900
76	.5700	.6708	.3800	.4600	.0700	.0000	.0000	.0900
77	.5900	.6725	.3800	.4600	.0700	.0000	.0000	.0900
78	.5600	.6689	.3800	.4600	.0700	.0000	.0000	.0900
79	.5550	.6670	.3800	.4600	.0700	.0000	.0000	.0900
80	.5500	.6651	.3800	.4600	.0700	.0000	.0000	.0900

Table C.7. Production standards--Shaver Starcross 288 (pullets)

Flock Age (Weeks)	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
20	.0000	.0000	.0000	.0100	.3500	.5000	.1000	.0400
21	.0000	.0000	.0000	.0100	.3500	.5000	.1000	.0400
22	.0880	.0293	.0000	.0100	.3500	.5000	.1000	.0400
23	.2570	.0862	.0000	.0400	.4600	.4000	.0600	.0400
24	.3380	.1366	.0100	.0800	.5400	.3000	.0300	.0400
25	.4870	.1950	.0100	.1230	.5700	.2500	.0070	.0400
26	.5980	.2526	.0200	.1850	.6500	.1000	.0050	.0400
27	.7530	.3157	.0200	.1980	.7160	.0230	.0030	.0400
28	.8880	.3793	.0500	.2370	.6500	.0230	.0000	.0400
29	.9170	.4331	.0600	.3270	.5500	.0230	.0010	.0400
30	.9380	.4790	.0600	.3800	.5000	.0000	.0000	.0400
31	.9170	.5155	.0800	.4800	.4000	.0000	.0000	.0400
32	.9170	.5464	.0800	.5300	.3500	.0000	.0000	.0400
33	.9070	.5721	.1000	.5600	.3000	.0000	.0000	.0400
34	.9070	.5945	.1000	.6500	.2000	.0000	.0000	.0400
35	.9080	.6141	.1100	.7000	.1500	.0000	.0000	.0400
36	.8990	.6308	.1200	.7500	.0900	.0000	.0000	.0400
37	.8890	.6452	.1200	.7500	.0900	.0000	.0000	.0400
38	.8780	.6574	.1250	.7500	.0850	.0000	.0000	.0400
39	.8780	.6684	.1250	.7500	.0850	.0000	.0000	.0400
40	.8680	.6780	.1300	.7500	.0800	.0000	.0000	.0400
41	.8680	.6866	.1300	.7500	.0800	.0000	.0000	.0400
42	.8590	.6941	.1450	.7450	.0700	.0000	.0000	.0400
43	.8590	.7010	.1500	.7400	.0700	.0000	.0000	.0400
44	.8460	.7068	.1600	.7400	.0600	.0000	.0000	.0400
45	.8380	.7119	.1650	.7350	.0500	.0000	.0000	.0500
46	.8290	.7162	.1650	.7350	.0500	.0000	.0000	.0500
47	.8190	.7199	.1700	.7300	.0500	.0000	.0000	.0500
48	.8190	.7233	.1750	.7250	.0500	.0000	.0000	.0500
49	.8190	.7265	.1800	.7200	.0500	.0000	.0000	.0500
50	.8100	.7292	.1850	.7150	.0500	.0000	.0000	.0500
51	.8090	.7317	.1900	.7100	.0400	.0000	.0000	.0600
52	.7990	.7337	.1950	.7050	.0400	.0000	.0000	.0600
53	.8000	.7357	.2000	.7000	.0400	.0000	.0000	.0600
54	.7890	.7372	.2000	.6900	.0400	.0000	.0000	.0700
55	.7800	.7384	.2050	.6850	.0400	.0000	.0000	.0700
56	.7690	.7392	.2200	.6800	.0300	.0000	.0000	.0700
57	.7690	.7400	.2200	.6800	.0300	.0000	.0000	.0700
58	.7600	.7405	.2300	.6700	.0300	.0000	.0000	.0700
59	.7600	.7410	.2400	.6600	.0300	.0000	.0000	.0700
60	.7500	.7412	.2500	.6500	.0200	.0000	.0000	.0800
61	.7500	.7414	.2500	.6500	.0200	.0000	.0000	.0800
62	.7400	.7414	.2500	.6500	.0200	.0000	.0000	.0800
63	.7400	.7414	.2550	.6450	.0200	.0000	.0000	.0800
64	.7310	.7411	.2550	.6450	.0200	.0000	.0000	.0800
65	.7200	.7407	.2600	.6400	.0100	.0000	.0000	.0900
66	.7210	.7403	.2600	.6400	.0100	.0000	.0000	.0900
67	.7100	.7396	.2600	.6400	.0100	.0000	.0000	.0900
68	.7110	.7390	.2700	.6200	.0100	.0000	.0000	.1000
69	.7010	.7383	.2700	.6200	.0100	.0000	.0000	.1000
70	.6900	.7373	.2800	.6100	.0100	.0000	.0000	.1000
71	.6800	.7362	.2800	.6000	.0100	.0000	.0000	.1100
72	.6700	.7350	.2800	.5900	.0100	.0000	.0000	.1200
73	.6700	.7338	.2800	.5900	.0100	.0000	.0000	.1200
74	.6710	.7326	.2800	.5900	.0100	.0000	.0000	.1200
75	.6710	.7315	.2800	.5900	.0100	.0000	.0000	.1200
76	.6610	.7303	.2800	.5900	.0100	.0000	.0000	.1200
77	.6510	.7289	.2800	.5900	.0100	.0000	.0000	.1200
78	.6510	.7276	.2800	.5900	.0100	.0000	.0000	.1200
79	.6410	.7262	.2800	.5900	.0100	.0000	.0000	.1200
80	.6420	.7248	.2800	.5900	.0100	.0000	.0000	.1200

Table C.8. Production standards--general production (molted hens)

	Hen Day Egg Production		Egg Distribution					
Weeks into Production*	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
1	.0100	.0100	.0800	.5250	.3450	.0100	.0000	.0400
2	.0600	.0350	.0800	.5350	.3350	.0100	.0000	.0400
3	.1150	.0617	.0900	.5550	.3050	.0100	.0000	.0400
4	.2600	.1112	.0960	.5750	.2850	.0040	.0000	.0400
5	.3900	.1202	.1180	.5850	.2550	.0020	.0000	.0400
6	.5200	.1868	.1380	.5700	.2500	.0020	.0000	.0400
7	.6100	.2473	.1550	.5750	.2300	.0000	.0000	.0400
8	.7300	.3076	.1750	.5750	.2100	.0000	.0000	.0400
9	.8000	.3623	.1900	.5800	.1900	.0000	.0000	.0400
10	.8100	.4071	.2150	.5750	.1600	.0000	.0000	.0500
11	.8050	.4433	.2200	.5750	.1550	.0000	.0000	.0500
12	.7900	.4722	.2500	.5700	.1300	.0000	.0000	.0500
13	.7800	.4958	.2800	.5700	.1000	.0000	.0000	.0500
14	.7700	.5154	.2850	.5700	.0950	.0000	.0000	.0500
15	.7600	.5317	.2950	.5600	.0950	.0000	.0000	.0500
16	.7500	.5454	.3100	.5400	.0900	.0000	.0000	.0600
17	.7400	.5568	.3200	.5300	.0900	.0000	.0000	.0600
18	.7300	.5664	.3300	.5200	.0900	.0000	.0000	.0600
19	.7250	.5748	.3400	.5200	.0800	.0000	.0000	.0600
20	.7200	.5820	.3500	.5100	.0800	.0000	.0000	.0600
21	.7100	.5881	.3500	.5000	.0900	.0000	.0000	.0600
22	.7000	.5932	.3600	.4900	.0800	.0000	.0000	.0700
23	.6900	.5974	.3800	.4800	.0700	.0000	.0000	.0700
24	.6800	.6009	.3800	.4800	.0700	.0000	.0000	.0700
25	.6700	.6036	.3800	.4800	.0700	.0000	.0000	.0700
26	.6600	.6058	.3800	.4800	.0700	.0000	.0000	.0700
27	.6500	.6074	.3800	.4800	.0600	.0000	.0000	.0800
28	.6450	.6088	.3800	.4800	.0600	.0000	.0000	.0800
29	.6400	.6099	.3800	.4800	.0600	.0000	.0000	.0900
30	.6350	.6107	.3800	.4800	.0600	.0000	.0000	.0800
31	.6300	.6113	.3800	.4600	.0800	.0000	.0000	.0800
32	.6250	.6117	.3800	.4600	.0800	.0000	.0000	.0800
33	.6200	.6120	.3800	.4600	.0800	.0000	.0000	.0800
34	.6150	.6121	.3800	.4600	.0800	.0000	.0000	.0800
35	.6100	.6120	.3800	.4600	.0700	.0000	.0000	.0900
36	.6050	.6118	.3800	.4600	.0700	.0000	.0000	.0900
37	.5950	.6114	.3800	.4600	.0700	.0000	.0000	.0900
38	.5900	.6108	.3800	.4600	.0700	.0000	.0000	.0900
39	.5850	.6102	.3800	.4600	.0700	.0000	.0000	.0900
40	.5800	.6094	.3800	.4600	.0700	.0000	.0000	.0900
41	.5750	.6086	.3800	.4600	.0700	.0000	.0000	.0900
42	.5700	.6076	.3800	.4500	.0700	.0000	.0000	.0900
43	.5650	.6067	.3800	.4600	.0700	.0000	.0000	.0900
44	.5600	.6056	.3800	.4600	.0700	.0000	.0000	.0900
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.9. Production standards--Babcock B-300 (molted hens)

Weeks into Production*	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
1	.0323	.0320	.0000	.7600	.1800	.0100	.0000	.0500
2	.1323	.0820	.0000	.7700	.1750	.0050	.0000	.0500
3	.2723	.1453	.0000	.7800	.1700	.0000	.0000	.0500
4	.4120	.2120	.0000	.7900	.1600	.0000	.0000	.0500
5	.5320	.2760	.0000	.8100	.1400	.0000	.0000	.0500
6	.6460	.3277	.0000	.8200	.1300	.0000	.0000	.0500
7	.7600	.3980	.0000	.8200	.1300	.0000	.0000	.0500
8	.8455	.4539	.0000	.8300	.1200	.0000	.0000	.0500
9	.8455	.4974	.0000	.8400	.1100	.0000	.0000	.0500
10	.8360	.5313	.0000	.8400	.1100	.0000	.0000	.0500
11	.8265	.5581	.0000	.8500	.0900	.0000	.0000	.0600
12	.8217	.5801	.0000	.8500	.0900	.0000	.0000	.0600
13	.8170	.5982	.0000	.8600	.0800	.0000	.0000	.0600
14	.8075	.6133	.0000	.8600	.0800	.0000	.0000	.0600
15	.7983	.6256	.0000	.8700	.0700	.0000	.0000	.0600
16	.7983	.6364	.0000	.8700	.0700	.0000	.0000	.0600
17	.7885	.6453	.0000	.8800	.0600	.0000	.0000	.0600
18	.7793	.6527	.0000	.8800	.0600	.0000	.0000	.0600
19	.7790	.6594	.0000	.8900	.0500	.0000	.0000	.0600
20	.7695	.6649	.0000	.8900	.0500	.0000	.0000	.0600
21	.7600	.6694	.0000	.8900	.0500	.0000	.0000	.0600
22	.7552	.6733	.0000	.8900	.0500	.0000	.0000	.0600
23	.7505	.6767	.0000	.8900	.0400	.0000	.0000	.0700
24	.7410	.6784	.0000	.8900	.0400	.0000	.0000	.0700
25	.7410	.6818	.0000	.8900	.0400	.0000	.0000	.0700
26	.7315	.6837	.0000	.8900	.0400	.0000	.0000	.0700
27	.7223	.6851	.0000	.8900	.0300	.0000	.0000	.0800
28	.7172	.6863	.0000	.8900	.0300	.0000	.0000	.0800
29	.7125	.6872	.0000	.8900	.0300	.0000	.0000	.0800
30	.7030	.6877	.0000	.8900	.0300	.0000	.0000	.0800
31	.6935	.6879	.0000	.8800	.0200	.0000	.0000	.1000
32	.6887	.6879	.0000	.8800	.0200	.0000	.0000	.1000
33	.6848	.6878	.0000	.8800	.0200	.0000	.0000	.1000
34	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
35	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
37	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
38	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
39	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
43	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
44	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.10. Production standards--DeKalb 231 (molted hens)

	Hen Day Egg Production		Egg Distribution					
Weeks into Production*	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
1	.0350	.0350	.2000	.5750	.1850	.0000	.0000	.0400
2	.1700	.1025	.2150	.5730	.1720	.0000	.0000	.0400
3	.3250	.1767	.2250	.5700	.1650	.0000	.0000	.0400
4	.4750	.2513	.2400	.5650	.1550	.0000	.0000	.0400
5	.6175	.3245	.2500	.5600	.1500	.0000	.0000	.0400
6	.7600	.3971	.2600	.5550	.1450	.0000	.0000	.0400
7	.7885	.4530	.2750	.5450	.1400	.0000	.0000	.0400
8	.7980	.4961	.2850	.5430	.1220	.0000	.0000	.0500
9	.8027	.5302	.3000	.5350	.1150	.0000	.0000	.0500
10	.7980	.5570	.3100	.5250	.1150	.0000	.0000	.0500
11	.7380	.5789	.3250	.5150	.1100	.0000	.0000	.0500
12	.7933	.5968	.3300	.5100	.1100	.0000	.0000	.0500
13	.7838	.6111	.3400	.5050	.0950	.0000	.0000	.0600
14	.7790	.6231	.3550	.4950	.0900	.0000	.0000	.0600
15	.7743	.6332	.3700	.4800	.0900	.0000	.0000	.0600
16	.7695	.6417	.3850	.4700	.0850	.0000	.0000	.0600
17	.7690	.6487	.4050	.4550	.0800	.0000	.0000	.0600
18	.7600	.6549	.4050	.4400	.0650	.0000	.0000	.0700
19	.7505	.6599	.4050	.4400	.0850	.0000	.0000	.0700
20	.7458	.6642	.4200	.4300	.0800	.0000	.0000	.0700
21	.7410	.6679	.4350	.4200	.0750	.0000	.0000	.0700
22	.7363	.6709	.4480	.4100	.0720	.0000	.0000	.0700
23	.7268	.6734	.4500	.4000	.0700	.0000	.0000	.0800
24	.7220	.6754	.4600	.3900	.0700	.0000	.0000	.0800
25	.7173	.6771	.4700	.3850	.0650	.0000	.0000	.0800
26	.7125	.6785	.4800	.3750	.0650	.0000	.0000	.0800
27	.7078	.6795	.4920	.3650	.0630	.0000	.0000	.0800
28	.7030	.6804	.4900	.3700	.0600	.0000	.0000	.0800
29	.6983	.6810	.4950	.3550	.0600	.0000	.0000	.0900
30	.6935	.6814	.5000	.3510	.0590	.0000	.0000	.0900
31	.6888	.6817	.5020	.3500	.0580	.0000	.0000	.0900
32	.6840	.6817	.5050	.3460	.0590	.0000	.0000	.0900
33	.6793	.6817	.5120	.3400	.0580	.0000	.0000	.0900
34	.6745	.6814	.5200	.3340	.0560	.0000	.0000	.0900
35	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
37	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
38	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
39	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
43	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
44	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.11. Production standards--H & N Nickchick (molted hens)

Weeks into Production*	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
1	.0200	.0200	.0700	.6300	.2600	.0000	.0000	.0400
2	.1400	.0800	.0900	.6400	.2200	.0000	.0000	.0500
3	.2637	.1412	.1100	.6400	.2000	.0000	.0000	.0500
4	.4237	.2118	.1300	.6300	.1900	.0000	.0000	.0500
5	.5937	.2682	.1500	.6200	.1800	.0000	.0000	.0500
6	.7790	.3700	.1700	.6200	.1600	.0000	.0000	.0500
7	.8417	.4373	.1900	.6100	.1400	.0000	.0000	.0600
8	.8578	.4898	.2100	.6000	.1300	.0000	.0000	.0600
9	.8645	.5315	.2300	.5900	.1200	.0000	.0000	.0600
10	.8645	.5648	.2400	.5900	.1100	.0000	.0000	.0600
11	.8626	.5918	.2500	.5800	.1000	.0000	.0000	.0700
12	.8550	.6138	.2600	.5700	.1000	.0000	.0000	.0700
13	.8521	.6321	.2700	.5600	.1000	.0000	.0000	.0700
14	.8455	.6473	.2800	.5600	.0900	.0000	.0000	.0700
15	.8379	.6600	.2900	.5500	.0800	.0000	.0000	.0800
16	.8331	.6709	.3000	.5400	.0800	.0000	.0000	.0800
17	.8265	.6800	.3100	.5300	.0800	.0000	.0000	.0800
18	.8208	.6878	.3200	.5200	.0800	.0000	.0000	.0800
19	.8141	.6945	.3300	.5000	.0800	.0000	.0000	.0900
20	.8075	.7001	.3500	.5000	.0600	.0000	.0000	.0900
21	.8018	.7050	.3700	.4800	.0600	.0000	.0000	.0900
22	.7951	.7091	.3800	.4800	.0500	.0000	.0000	.0900
23	.7885	.7125	.4000	.4700	.0400	.0000	.0000	.0900
24	.7828	.7155	.4100	.4500	.0400	.0000	.0000	.1000
25	.7761	.7179	.4200	.4400	.0400	.0000	.0000	.1000
26	.7695	.7199	.4300	.4300	.0400	.0000	.0000	.1000
27	.7638	.7215	.4300	.4200	.0400	.0000	.0000	.1100
28	.7571	.7228	.4300	.4200	.0400	.0000	.0000	.1100
29	.7505	.7237	.4400	.4200	.0300	.0000	.0000	.1100
30	.7448	.7244	.4500	.4100	.0300	.0000	.0000	.1100
31	.7381	.7249	.4500	.4100	.0300	.0000	.0000	.1100
32	.7315	.7251	.4500	.4000	.0300	.0000	.0000	.1200
33	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
34	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
35	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
37	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
38	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
39	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
43	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
44	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.12. Production standards--Hyline W-36 (molted hens)

Weeks into Production*	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
1	.0020	.0020	.2400	.5300	.1700	.0000	.0000	.0600
2	.1920	.0970	.2400	.5400	.1600	.0000	.0000	.0600
3	.4220	.2053	.2500	.5400	.1500	.0000	.0000	.0600
4	.5220	.2845	.2500	.5500	.1400	.0000	.0000	.0600
5	.6120	.3500	.2700	.5400	.1200	.0000	.0000	.0700
6	.7200	.4117	.2800	.5400	.1100	.0000	.0000	.0700
7	.7650	.4621	.2800	.5500	.1000	.0000	.0000	.0700
8	.7830	.5023	.2800	.5500	.1000	.0000	.0000	.0700
9	.7830	.5334	.3000	.5300	.1000	.0000	.0000	.0700
10	.7740	.5575	.3300	.5100	.0800	.0000	.0000	.0800
11	.7740	.5772	.3300	.5100	.0800	.0000	.0000	.0800
12	.7740	.5936	.3400	.5000	.0800	.0000	.0000	.0800
13	.7650	.6068	.3700	.4800	.0700	.0000	.0000	.0800
14	.7560	.6174	.4000	.4600	.0600	.0000	.0000	.0800
15	.7470	.6261	.4100	.4500	.0600	.0000	.0000	.0800
16	.7380	.6331	.4100	.4500	.0600	.0000	.0000	.0800
17	.7380	.6392	.4200	.4400	.0600	.0000	.0000	.0800
18	.7290	.6442	.4500	.4100	.0400	.0000	.0000	.1000
19	.7200	.6482	.4500	.4100	.0400	.0000	.0000	.1000
20	.7110	.6514	.4500	.4100	.0400	.0000	.0000	.1000
21	.6930	.6533	.4600	.3900	.0400	.0000	.0000	.1100
22	.6930	.6551	.4600	.3900	.0400	.0000	.0000	.1100
23	.6840	.6564	.4800	.3700	.0400	.0000	.0000	.1100
24	.6750	.6572	.4800	.3700	.0400	.0000	.0000	.1100
25	.6750	.6579	.4800	.3700	.0400	.0000	.0000	.1100
26	.6570	.6578	.4800	.3700	.0300	.0000	.0000	.1200
27	.6480	.6575	.4900	.3600	.0300	.0000	.0000	.1200
28	.6390	.6568	.4900	.3600	.0300	.0000	.0000	.1200
29	.6390	.6562	.5100	.3400	.0300	.0000	.0000	.1200
30	.6300	.6553	.5100	.3400	.0300	.0000	.0000	.1200
31	.6210	.6542	.5300	.3200	.0300	.0000	.0000	.1200
32	.6120	.6529	.5300	.3200	.0300	.0000	.0000	.1200
33	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
34	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
35	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
36	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
37	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
38	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
39	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
43	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
44	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.13. Production standards--Kimber K-137 (molted hens)

Weeks into Production*	Hen Day Egg Production: Weekly Average	Hen Day Egg Production: Accumulated Weekly Average	Egg Distribution: Jumbo and Extra Large	Egg Distribution: Large	Egg Distribution: Medium	Egg Distribution: Small	Egg Distribution: Peewee	Egg Distribution: Chex and Undergrades
1	.0245	.0245	.1750	.5750	.2100	.0000	.0000	.0400
2	.0795	.0520	.1900	.5800	.1900	.0000	.0000	.0400
3	.2245	.1095	.1900	.5800	.1900	.0000	.0000	.0400
4	.3545	.1708	.2150	.5750	.1600	.0000	.0000	.0500
5	.4845	.2335	.2500	.5700	.1300	.0000	.0000	.0500
6	.6175	.2975	.2800	.5700	.1000	.0000	.0000	.0500
7	.7505	.3622	.2850	.5700	.0950	.0000	.0000	.0500
8	.8170	.4191	.2950	.5600	.0950	.0000	.0000	.0500
9	.8265	.4643	.3100	.5400	.0900	.0000	.0000	.0600
10	.8218	.5001	.3200	.5300	.0900	.0000	.0000	.0600
11	.8173	.5289	.3300	.5200	.0900	.0000	.0000	.0600
12	.8123	.5525	.3400	.5200	.0800	.0000	.0000	.0600
13	.8027	.5718	.3500	.5100	.0800	.0000	.0000	.0600
14	.7980	.5879	.3600	.4900	.0800	.0000	.0000	.0700
15	.7933	.6016	.3800	.4800	.0700	.0000	.0000	.0700
16	.7885	.6133	.3800	.4800	.0700	.0000	.0000	.0700
17	.7838	.6233	.3800	.4800	.0700	.0000	.0000	.0700
18	.7743	.6317	.3800	.4800	.0600	.0000	.0000	.0800
19	.7695	.6390	.3800	.4800	.0600	.0000	.0000	.0800
20	.7600	.6450	.3800	.4800	.0600	.0000	.0000	.0800
21	.7552	.6503	.3800	.4800	.0600	.0000	.0000	.0800
22	.7505	.6548	.3800	.4800	.0600	.0000	.0000	.0800
23	.7458	.6588	.3800	.4800	.0600	.0000	.0000	.0800
24	.7410	.6622	.3800	.4600	.0800	.0000	.0000	.0800
25	.7315	.6650	.3800	.4600	.0800	.0000	.0000	.0800
26	.7220	.6672	.3800	.4600	.0800	.0000	.0000	.0800
27	.7173	.6690	.3800	.4600	.0800	.0000	.0000	.0800
28	.7173	.6707	.3800	.4600	.0700	.0000	.0000	.0900
29	.7173	.6723	.3800	.4600	.0700	.0000	.0000	.0900
30	.7030	.6734	.3800	.4600	.0700	.0000	.0000	.0900
31	.6935	.6740	.3800	.4600	.0700	.0000	.0000	.0900
32	.6888	.6745	.3800	.4600	.0700	.0000	.0000	.0900
33	.6840	.6748	.3800	.4600	.0700	.0000	.0000	.0900
34	.6698	.6746	.3800	.4600	.0700	.0000	.0000	.0900
35	.6698	.6745	.3800	.4600	.0700	.0000	.0000	.0900
36	.6650	.6742	.3800	.4600	.0700	.0000	.0000	.0900
37	.6603	.6738	.3800	.4600	.0700	.0000	.0000	.0900
38	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
39	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
40	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
41	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
42	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
43	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
44	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
45	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
46	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
47	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
48	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
49	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000
50	*****	.0000	.0000	.0000	.0000	.0000	.0000	.0000

*Number of weeks since end of force molting procedure

Table C.14. Production standards--Shaver Starcross 288 (molted hens)

	Hen Day Egg Production		Egg Distribution					
Weeks into Production*	Weekly Average	Accumulated Weekly Average	Jumbo and Extra Large	Large	Medium	Small	Peewee	Chex and Undergrades
1	.0511	.0511	.0800	.4800	.4000	.0000	.0000	.0400
2	.1391	.0951	.0800	.5300	.3500	.0000	.0000	.0400
3	.3081	.1661	.1000	.5600	.3000	.0000	.0000	.0400
4	.4191	.2294	.1000	.6600	.2000	.0000	.0000	.0400
5	.5681	.2971	.1100	.7000	.1500	.0000	.0000	.0400
6	.7261	.3676	.1200	.7500	.0900	.0000	.0000	.0400
7	.8436	.4356	.1200	.7500	.0900	.0000	.0000	.0400
8	.8711	.4900	.1250	.7500	.0850	.0000	.0000	.0400
9	.8911	.5346	.1250	.7500	.0850	.0000	.0000	.0400
10	.8711	.5683	.1300	.7500	.0800	.0000	.0000	.0400
11	.8711	.5958	.1300	.7500	.0800	.0000	.0000	.0400
12	.8616	.6179	.1450	.7450	.0700	.0000	.0000	.0400
13	.8616	.6367	.1500	.7400	.0700	.0000	.0000	.0400
14	.8626	.6528	.1600	.7400	.0600	.0000	.0000	.0400
15	.8540	.6662	.1650	.7350	.0500	.0000	.0000	.0500
16	.8445	.6774	.1650	.7350	.0500	.0000	.0000	.0500
17	.8341	.6866	.1700	.7300	.0500	.0000	.0000	.0500
18	.8341	.6948	.1750	.7250	.0500	.0000	.0000	.0500
19	.8246	.7016	.1800	.7200	.0500	.0000	.0000	.0500
20	.8246	.7078	.1850	.7150	.0500	.0000	.0000	.0500
21	.8160	.7129	.1900	.7100	.0400	.0000	.0000	.0600
22	.8160	.7176	.1950	.7050	.0400	.0000	.0000	.0600
23	.8056	.7214	.2000	.7000	.0400	.0000	.0000	.0600
24	.7961	.7245	.2000	.6900	.0400	.0000	.0000	.0700
25	.7875	.7271	.2050	.6850	.0400	.0000	.0000	.0700
26	.7780	.7290	.2200	.6800	.0300	.0000	.0000	.0700
27	.7780	.7308	.2200	.6800	.0300	.0000	.0000	.0700
28	.7780	.7325	.2300	.6700	.0300	.0000	.0000	.0700
29	.7695	.7338	.2400	.6600	.0300	.0000	.0000	.0700
30	.7685	.7350	.2500	.6500	.0200	.0000	.0000	.0800
31	.7590	.7357	.2500	.6500	.0200	.0000	.0000	.0800
32	.7600	.7365	.2500	.6500	.0200	.0000	.0000	.0800
33	.7495	.7369	.2550	.6450	.0200	.0000	.0000	.0800
34	.7410	.7370	.2550	.6450	.0200	.0000	.0000	.0800
35	.7305	.7368	.2600	.6400	.0100	.0000	.0000	.0900
36	.7305	.7366	.2600	.6400	.0100	.0000	.0000	.0900
37	.7220	.7362	.2600	.6400	.0100	.0000	.0000	.0900
38	.7220	.7359	.2700	.6200	.0100	.0000	.0000	.1000
39	.7125	.7353	.2700	.6200	.0100	.0000	.0000	.1000
40	.7125	.7347	.2800	.6100	.0100	.0000	.0000	.1000
41	.7030	.7339	.2800	.6000	.0100	.0000	.0000	.1100
42	.7030	.7332	.2800	.5900	.0100	.0000	.0000	.1200
43	.6944	.7323	.2800	.5900	.0100	.0000	.0000	.1200
44	.6840	.7312	.2800	.5900	.0100	.0000	.0000	.1200
45	.6849	.7302	.2800	.5900	.0100	.0000	.0000	.1200
46	.6745	.7290	.2800	.5900	.0100	.0000	.0000	.1200
47	.6754	.7278	.2800	.5900	.0100	.0000	.0000	.1200
48	.6659	.7265	.2800	.5900	.0100	.0000	.0000	.1200
49	.6555	.7251	.2800	.5900	.0100	.0000	.0000	.1200
50	.6460	.7235	.2800	.5900	.0100	.0000	.0000	.1200

*Number of weeks since end of force molting procedure

BIBLIOGRAPHY

BIBLIOGRAPHY

Adams, R. L., 1976. Force molting layers. Summary of talk given at Egg Day (4-14-76). Purdue University.

Agricultural Economics Report No. 157, 1970. Simulation uses in agricultural economics. Department of Agricultural Economics, Michigan State University.

Andrews, D. K., 1972. Force molting. Poultry Pointers, Vol. 7, No. 7, July. Cooperative Extension Service, Washington State University.

Arbor Acres Farm, Inc., 1977. Electronic forecasting: a breeding tool. Arbor Acres Review, Vol. 21, No. 1. Arbor Acres Farm, Inc., Glastonbury, CT.

Armstrong, E. O., 1970. Selected statistical series for poultry and eggs through 1968, January. Economic Research Service Bulletin 232, United States Department of Agriculture.

Armstrong, E. O., 1972. Poultry and egg statistics through 1972, February. Economic Research Service Bulletin 525, United States Department of Agriculture.

Armstrong, E. O., 1976. Poultry and egg statistics, 1972-75, August. Economic Research Service Bulletin 557, United States Department of Agriculture.

Bell, D., 1965. Pros and cons of forced molting. Progress in Poultry, June 10. Cooperative Extension, University of California.

Bell, D., 1977. Improve your profits 43 percent. Poultry Tribune 83:20-23.

Bell, D., M. Swanson and G. Johnston, 1976. A comparison of one, two and three cycles of egg production. Progress in Poultry, July. Cooperative Extension, University of California.

Cox, J., 1964. Force molting of layers. Poultry Husbandry 2-1, Circular 540, October. Cooperative Extension Service, University of Georgia.

Creger, C. R., 1976. The use of zinc as a method of resting laying hens. Technical Services Bulletin PS-N-67. Babcock Industries, Inc., Box 280, Ithaca, NY 14850.

Flegal, C. J., M. L. Esmay, J. B. Gerrish, J. E. Dixon, C. C. Sheppard, H. C. Zindel and T. S. Chang, 1974. A complete system for collecting, handling, air-drying and machine dehydration of poultry manure in a caged layer production unit. Proc. Cornell Agricultural Waste Management Conference. New York State College of Agriculture & Life Sciences, Cornell University.

Gross, S. (ed.), 1977. Force molting becoming a more precise technique. Feedstuffs, January 24.

Hicks, F. W., 1975. Egg production contracts. Poultry Science Today. Agricultural and Home Economics Extension Service, The Pennsylvania State University.

Hoyt, C. C., 1971. Egg production contract innovation, the key to equitability. Poultry Science 50:1657-1667.

Hoyt, C. C., 1978. Personal communication. College of Agriculture, Michigan State University, P. O. Box 79, Zeeland, MI 49464.

Larzelere, H., 1970. The electronic egg exchange. Agricultural Economics Report No. 164, February. Department of Agricultural Economics, Michigan State University.

Latimer, R. G. and J. Bezpa, 1976. Projections and cash flow for a 30,000 and 60,000 bird commercial table egg operation. Extension Bulletin 418, January. Cooperative Extension Service, Cook College, Rutgers.

Morris, T. B. and D. G. Harwood, Jr., 1968. Commercial egg production contracts. Poultry Pointers, May. Agricultural Extension Service, North Carolina State University.

Muir, F., 1972. A computerized cash flow for market egg farms. 570 CES. University of Maine.

Reed, F. D. and L. J. Jewett, 1966. Economic characteristics of Maine's contract and independent table egg farms. Maine Agricultural Experiment Bulletin 642, University of Maine.

Sheppard, C. C., C. C. Hoyt, J. H. Wolford and H. E. Larzelere, 1964. Egg production contracts. Extension Bulletin 475. Cooperative Extension Service, Michigan State University.

Skinner, J. L. and R. E. Rieck, 1966. Egg production contracts. Cooperative Extension Service Fact Sheet, Poultry Series No. 50. Agricultural Extension Service, University of Wisconsin.

Swanson, M. H. and D. D. Bell, 1974a. Force molting of chickens I. introduction. AXT-410. Cooperative Extension, University of California.

Swanson, M. H. and D. D. Bell, 1974b. Force molting of chickens II. methods. AXT-411. Cooperative Extension, University of California.

Swanson, M. H. and D. D. Bell, 1974c. Force molting of chickens III. performance characteristics. AXT-412. Cooperative Extension, University of California.

Swanson, M. H. and D. D. Bell, 1975. Force molting of chickens IV. egg quality. AXT-413. Cooperative Extension, University of California.

Vincent, W. H., 1969. Better management decisions through computer simulation. Feed Management, Vol. 20, No. 10, October. Garden State Publishing Co., Sea Isle City, NJ 08243.

Vincent, W. H., 1970. Simfarm I: a farm business simulator and farm management game. Agricultural Economics Report No. 164, May. Department of Agricultural Economics, Michigan State University.

MICHIGAN STATE UNIVERSITY LIBRARIES
3 1293 03083 2392