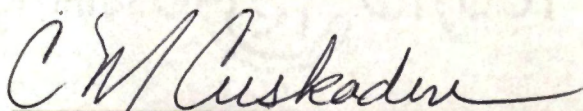
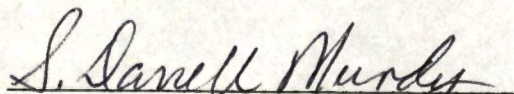
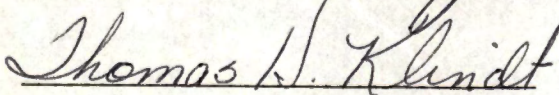


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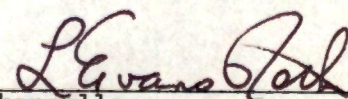
I am submitting herewith a thesis written by Gary Gene Hunter entitled "An Analysis of Contract Broiler Production in Tennessee." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.


C. M. Cuskaden, Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:


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AN ANALYSIS OF CONTRACT BROILER PRODUCTION IN TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

GARY GENE HUNTER

JUNE 1978

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ABSTRACT

The purpose of this study was to (1) obtain a description of broiler growers and their enterprises in Tennessee, (2) to determine the provisions of the contracts being used, and (3) evaluate grower attitude toward, and degree of satisfaction with, existing conditions in Tennessee's broiler industry.

A random sample of 88 Tennessee broiler growers and the managers from all four of the agribusiness firms located in Tennessee which were involved in contract broiler production in the state were personally interviewed.

The average broiler grower was almost 47 years old, had a ninth-grade education, and over 9 years' experience producing broilers. He averaged starting into production about 74,663 chicks in 1976 and earned an income of about \$6,100 from this production.

Overall, the growers were not satisfied with their contract. Only about 45% of the growers in the sample gave their contract a favorable rating. Almost 46% of them did not think they received an equitable payment. Almost 14% of the broiler growers interviewed indicated they planned to discontinue broiler production.

Different perceptions of broiler production contract provisions by growers and contractors may lead to production and marketing inefficiencies. Several broiler production contract provisions were identified in this study which growers and contractors perceived differently. These differences in grower and contractor perceptions of broiler production contract provisions indicate a need for improved communication between these two parties and for changes in contract provisions.

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CHAPTER I

INTRODUCTION

Practically all of the broilers produced in Tennessee are grown on contract. Some of the broilers are contracted for by companies located outside the state, but this report does not deal with these companies or their growers.

The broiler industry in Tennessee is only a small part of the entire U.S. industry. Tennessee produced less than 2% of the 3,280,122,000 broilers produced in the U.S. in 1976.¹ Tennessee growers' gross income from broilers in 1976 was \$30,755,000; a little more than 1% of the total U.S. gross income from broiler production.

Broiler production in Tennessee accounted for less than 10% of total farm sales in Tennessee.² However, broilers are grown in only a few counties in the state, and in those counties they account for a significant portion of the value of farm products sold. In 1974, poultry accounted for over 59% of the total value of farm products sold in Grundy County (Table A-1, Appendix).³ During the same year, poultry accounted for over 50% of the total value of farm products sold in Bradley,

¹ Poultry Disposition and Income 1975-1976, United States Department of Agriculture, Crop Reporting Service, Statistical Reporting Service (Washington, D.C., April 1977), p. 11.

² Included are poultry and poultry products. 1974 Tennessee Census of Agriculture. Volume 1, Part 42, U.S. Department of Commerce, Bureau of The Census (Washington, D.C., 1977).

³ All tables throughout this report will be found in the Appendix.

Fentress, and Hamilton counties. Poultry accounted for over 70% of the value of farm products sold in both Grundy and Scott counties in 1969 (Table A-2) and for more than 50% of the value of farm products sold in Fentress, Hamilton, and Marion counties in that same year.

In the last few years, broiler production in Tennessee has failed to keep pace with the production of broilers in the rest of the nation. From 1969 to 1976 the number of broilers produced increased almost 18% in the U.S., but during the same period, the number of broilers produced in Tennessee declined almost 17%.⁴ In 1969 Tennessee ranked 11th in broiler production in the U.S. and produced about 1.65% of the total U.S. production. In 1976 Tennessee ranked 15th among the states in broiler production and produced about 1.17% of the total U.S. production.

I. OBJECTIVES

In 1965 B. D. Raskopf published a report on contract broiler production in Tennessee.⁵ Since that time, there have been many changes in the industry. Recent changes in production costs and returns to broiler growers and technological changes suggest that previous reports may be obsolete. Therefore, the objectives of this project are: (1) to obtain a description of the broiler growers and their enterprises in

⁴Chickens and Eggs, United States Department of Agriculture, U.S. Crop Reporting Board (Washington, D.C., 1959-1973); Poultry Disposition and Income 1975-1976, loc. cit.

⁵B. D. Raskopf, "Grower Receipts and Costs in Contract Broiler Production in Tennessee, 1964," Tennessee Farm and Home Science, Tennessee Agricultural Experiment Station Progress Report 55 (July, August, September 1965), pp. 13-16.

Tennessee; (2) to determine the provisions of the contracts being used, e.g., inputs furnished by each party and the methods of payments used; and (3) to evaluate growers' attitudes toward, and degree of satisfaction with, existing conditions in Tennessee's broiler industry, e.g., payment provision, contract alternatives, the quantity of inputs supplied by each party, and the risks assumed by each contracting party.

II. PROCEDURE

To meet the requirements of the three objectives, a 100% sample of agribusiness firms located in Tennessee that contract for broilers in the state was obtained, and a questionnaire was filled out with a representative from each company by means of a personal interview. Also, representative contracts were obtained from each company. There were four companies located in the state that contract and process chicks from Tennessee growers. Also, a complete list of growers was obtained from each of the four companies included in this study (a total of 560 growers), and a random sample of 88 growers was chosen from that list.⁶ A questionnaire was taken to those growers previously chosen and was filled out by means of a personal interview. The length of these interviews ranged from 15 to 90 minutes depending upon the willingness of a grower to elaborate on the questions.

The sample data were analyzed by geographic region in order to determine differences in broiler farms and broiler enterprises in

⁶The sample size used in this study was determined using: Taro Yamane, Statistics--An Introductory Analysis (New York: Harper and Row, 1967), p. 581.

different areas of Tennessee. Four areas were delineated for this purpose (Figure 1). Region 1 is a mountainous area totally separated from the other three regions consisting of Fentress, Morgan, and Scott counties. Region 2 is located in Middle Tennessee and consists of Franklin, Coffee, Lincoln, and Bedford counties. Grundy county has one of the highest concentrations of broiler growers of any county in Tennessee and was designated as Region 3. Region 4 consisted of Marion, Bradley, McMinn, Polk, Hamilton, Sequatchie, and Monroe counties. This region is the best suited for agricultural production among those regions outlined above and contains the largest cities. The sample of growers used in this study consisted of 28 growers from Region 1, 13 growers from Region 2, 19 growers from Region 3, and 28 growers from Region 4.

CHAPTER II

DESCRIPTION OF BROILER GROWERS AND THEIR FARMS

I. DESCRIPTION OF GROWERS.

The 84 broiler growers in the sample who reported their age averaged almost 47 years old (Table A-3). Their ages ranged from 23 to 70 years. On the average they had received a ninth grade education, ranging from no formal education to 7 years beyond high school (a Master's degree).

The 88 growers in the survey had been producing broilers an average of 9.37 years, ranging from about 4 months to 32 years. Their experience producing broilers on contract averaged 9.31 years. Growers averaged almost 6 years' experience with the company they presently contract with.

Growers in Region 1 were the oldest of the four regions, averaging almost 50 years old. Their ages ranged from 30 to 70 years. These growers had received an average of less than 8 years of formal education, the lowest educational level of the four regions. About 65% of these growers had not completed high school. The growers in Region 1 had more broiler production and contracting experience than those in any of the other three regions. These growers have been with the same company an average of 4.51 years.¹

¹A few growers had tried to grow broilers without a contract but soon returned to contract production.

The growers reporting in Region 2 averaged 45 years of age. Their ages ranged from 23 to 68 years. These growers had the highest average level of education in the four regions with an average level of over 10 years, ranging from 2 years to 7 years beyond high school. About 50% of them had completed high school. The growers in Region 2 had less broiler production experience, 5.55 years, than those in any of the other regions analyzed, and their average experience with their present contractor was less than 5 years.

Broiler growers in Region 3 were the youngest, and their average age was 44.44 years. Their ages ranged from 24 to 68 years. These growers had the second highest average level of education among growers in the four production regions studied. About 44% of them had graduated high school. The growers in Region 3 averaged being with their present contractor the longest, 7 years. None of them had tried to produce broilers without a contract. The average number of years' experience producing broilers was just under 9 years.

The average age of broiler growers in Region 4 was almost 46 years. Their ages ranged from 27 to 66 years. Growers in this region had the third highest average level of education among the four production areas. Almost 43% of these growers had completed high school. The average number of years of formal education was 9.54 years, ranging from no formal education to 6 years beyond high school. Growers in this region ranked second among those in the four areas analyzed in both average broiler production experience and average experience with their present contractor.

II. BROILER GROWER FARMS

The average size of all farms in Tennessee in 1977 was 131 acres.² The average size farm of the broiler growers in the sample was somewhat smaller than the average farm in Tennessee--about 110 acres in 1977 (Table A-4). Overall in 1977, about 97% of the growers surveyed averaged owning about 101 acres. Almost 32% of them rented-in an average of about 56 acres, and about 8% of the growers rented-out an average of 98.71 acres.

The largest farms operated by the growers in the four sample areas were in Region 1, and they averaged over 175 acres in size. But this area also had the largest percentage of land that was idle or wooded and not being farmed. This is mainly because of the mountainous nature of the region and the fact that much of the land in that area has been strip mined and not reclaimed. A higher percentage of farmers in this region rented-in at least part of the land they operated than in any of the other regions.

Broiler farms in Region 2 were the second largest in terms of average acres among the four regions. The farms in this region averaged about 92 acres that were available for operation in 1977. This region is located in Middle Tennessee and is more suitable for farming than Region 1. None of the growers surveyed in this region rented any of their land out, and over 46% of them rented-in additional acres for farm operation.

²Tennessee Farm Facts, U.S. Department of Agriculture, Tennessee Department of Agriculture, Tennessee Crop Reporting Service, Volume 1, No. 1 (Nashville, Tennessee, January 5, 1977), p. 2.

The broiler farmers in this region had the smallest percentage of their land idle and wooded of any region studied.

The growers in Region 3 operated the smallest farms of the four areas studied based on average acreage. Over 21% of these growers rented-in at least part of the land they operated, and only about 10% rented-out any land they owned. This area is also mountainous, but a lower percentage of the land in broiler farms is idle and wooded than in Region 1.

Broiler farms in Region 4 averaged about 82 acres in size and ranked third on this basis among the four regions. Just under 18% of these growers rented-in at least part of the land they operated, and only about 10% rented-out any land they owned.

III. FARM ENTERPRISES

The major crops that broiler growers produced in 1977 were corn, hay, and tobacco (Table A-5). Corn was produced by about 37% of the broiler growers on an average of just over 21 acres. Hay was produced by about 47% of the broiler growers on an average of just over 26 acres, and tobacco was produced by almost 14% of the growers on an average of just under 1 acre.

Beef cattle and hogs were the major livestock enterprise reported on broiler farms (Table A-6). Over half of the broiler growers reported beef cattle herds averaging about 43 head each. Over 36% of the growers averaged having about 10 head of brood hogs each, and just over 20% of the growers had an average of almost 34 head of other type hogs.

Crops

Region 1 had a larger percentage of growers producing corn than any other region (Table A-5). Almost 54% of the growers sampled in Region 1 produced an average of about 21 acres of corn each. Region 3 had the second largest percentage of broiler growers producing corn, and Region 2 ranked third on this measure. In Region 3 about 42% of the growers produced an average of almost 24 acres. These growers (about 31%) produced an average of just over 33 acres each. Region 4 growers were the smallest corn producers. Only about 21% of the growers from this region produced corn on an average of 12 acres each.

The growers in Region 1 were also the largest hay producers. Over 57% of the growers in this region produced an average of almost 35 acres of hay. The second largest percentage of growers producing hay was in Region 2 where over 46% of the growers produced an average of just over 20 acres. Region 3 had the third largest percentage of growers producing hay with about 42% of them producing an average of 21 acres. Region 4 had the smallest percentage of growers producing hay with just over 39% of them producing an average of almost 22 acres.

Tobacco was a more important crop on broiler farms in Regions 1 and 2 than in either of the other two regions. The percentage of growers producing tobacco was slightly higher in Region 1 than in Region 2, but the average acreage produced on farms growing tobacco was highest in Region 2.

Some other crops that were important to the individual region were vegetables to Region 1 and soybeans to Region 3.

Livestock

At least half of the growers in Regions 1, 2, and 4 reported beef cattle herds on their farms, and these herds averaged over 40 head in each region. Less than 1/3 of the broiler farms in Region 3 had a beef enterprise, and the average herd was smaller in this region.

Region 2 had the highest percentage of broiler growers in the four regions studied reporting breeding hogs in their livestock inventory with over 60% of the growers reporting an average of 14 head. Over 38% of the growers in this region also reported an average of over 61 head of hogs other than brood stock. Less than half the broiler growers in Region 3 and 1/3 of the growers in Region 1 reported swine breeding herds, and these herds averaged less than 10 head in both of these regions.

The proportion of broiler growers reporting dairy cattle on their farms in 1977 was about 10% in all four regions; however, the average size of dairy herds varied considerably between regions. The largest herds, averaging over 50 cows, were reported in Region 4, while no herds large enough for commercial milk production were reported in Region 2. Dairy herds in Regions 1 and 3 averaged about 30 cows.

IV. SUMMARY

The average broiler grower surveyed in this study was between 46 and 47 years old, had less than a high school education, and had been producing broilers for almost 9 years. Broiler growers in Region 1 were older, had more broiler production and contracting experience, and had less formal education than growers in any of the other three regions

analyzed in this study. Growers with the most formal education were from Region 2. These growers also had less broiler production experience than growers in any of the other regions studied. Even though broiler growers in Region 3 were younger than those from any other region analyzed, they had a longer tenure with their present contractor than growers from any other region.

The average size farm operated by broiler growers in Region 1 was over 175 acres--the largest of the four study areas--and broiler growers in Region 3 operated smaller farms than growers in any of the other three regions. The highest percentage of land in crops and pasture on broiler farms in the four study areas was found in Region 2.

Pasture, corn, hay, and tobacco were the most frequently reported crops produced on broiler farms. A higher percentage of broiler growers in Region 1 reported the production of corn, hay, and tobacco on their farms than in any other region.

Beef cattle and hogs were the most frequently reported livestock enterprises on broiler farms. Beef cattle were reported by at least 50% of the broiler farm operators in Regions 1, 2, and 4. The highest percentage of broiler growers reporting hogs on their farms was in Region 2, and these growers also had the largest average swine herds of those in any other study area. Dairy cattle were reported on about 10% of the broiler farms in each of the four study areas. The largest dairy herds on the average were reported by growers in Region 4.

CHAPTER III

THE BROILER ENTERPRISE

The growing phase of the broiler operation is a 6-to-8-week process, depending upon the size broiler the company wants to market. During this period, growers are responsible for the chicks, and they receive technical and managerial assistance from a company representative or serviceman. Growers provide all of the labor and equipment needed to insure the health and growth of the chicks.

The serviceman is the link between the company and the growers. His job is to see that the growers maintain proper conditions in their broiler houses for chicks, detect chick health problems, and provide proper medication to prevent and treat them, and suggest better management practices to the grower. He makes regular visits to each operation to insure the company does not lose its investment in the chicks.

During most of the first 2 weeks of a grow-out, at least 1/2 of a broiler house is partitioned off in order to reduce heating costs and to keep chicks close to brooders, feed, and water. If chickens get cold, they huddle together to keep warm and smother each other. Keeping feed and water close to chicks increases their feed consumption and growth rate.

I. LABOR REQUIREMENTS IN BROILER OPERATIONS

During the first 2 weeks of a grow-out, chicks are fed by hand in trays because permanent feeders are usually too large for chicks to

use. Chicks are also usually hand watered with glass jugs during this time. However, there are some operations that have automatic watering systems for baby chicks. This is the most labor intensive phase of a grow-out. The average total labor requirement reported by Tennessee broiler growers for the first 2 weeks of a grow-out was almost 7 man-hours of labor per 1,000 chicks (Table A-7). By the second 2-week period, the chicks were using permanent waterers and feeders which reduces the labor requirements. The average total labor requirement reported by broiler growers was 3.46 hours per 1,000 chicks for each of the last three 2-week periods of a grow-out.

After the broilers have been marketed, growers usually have from 2 to 7 weeks to get their broiler houses ready for the next flock of chicks. During this period, growers either clean-up their houses by putting a layer of fresh litter over the old litter, or clean-out their houses by removing the old litter and replacing it with fresh litter. The clean-up time reported by growers who cleaned-up their houses between broods averaged 2.45 hours per 1,000 chicks. The average clean-out time reported by growers was over 5 hours per 1,000 chicks. Some growers do not clean-out their houses between every brood because of the extra time and expense involved and old litter in houses during the winter helps reduce heating cost by producing heat when it decays.

An average of about 20 hours of labor per 1,000 chicks was reported by growers in Region 1 during the grow-out and was the second greatest amount of labor reported from the four regions. The average clean-up time reported by growers in this region was close to 2 hours per 1,000 chicks, and clean-out required just over 5 hours. Overall, the

operations in Region 1 were the second most labor intensive on the average of the four regions. When growers in this region only cleaned-up their houses between broods, they used an average of approximately 22 hours of labor during one production cycle. This labor requirement was increased to about 25.5 hours when houses were cleaned-out between broods.

The growers in Region 2 used an average of roughly 15 hours of labor per 1,000 chicks during the grow-out phase of the production cycle. The growers who cleaned-up their houses between broods used almost 3 hours of labor per 1,000 chicks for that task, and those who cleaned-out their houses used an average of about 6 hours. The average amount of labor used for the production cycle when the houses in Region 2 were cleaned-up was around 18 hours per 1,000 chicks, and when the houses were cleaned-out, it was 21.52 hours per 1,000 chicks.

The growers in Region 3 were least efficient in their use of labor. These growers used an average of 21 hours per 1,000 chicks for the grow-out phase of the operation. Clean-up required almost 5 hours, and during clean-out, an average of 6.56 hours of labor per 1,000 chicks were used. The total number of hours of labor used per 1,000 chicks for the entire production cycle in Region 3 was an average of 25.90 hours when the houses were cleaned-up between broods and 27.56 hours when the houses were cleaned-out.

The growers in Region 4 were the most efficient with their use of labor. They only used an average of just over 12 hours of labor per 1,000 chicks during the grow-out phase of the operation. Those growers who cleaned-up their houses between broods in this region reported using only 1.45 hours per 1,000 chicks. When these growers cleaned-out their

houses, they used an average of approximately 4 hours per 1,000 chicks. The total amount of labor used per 1,000 chicks for the entire production cycle in Region 4 averaged almost 14 hours when the houses were cleaned-up between broods and over 16 hours when they were cleaned-out.

II. DESCRIPTION OF FACILITIES

Broiler facilities vary considerably from one farm to the next, and some of these differences influence labor and management requirements. Broiler houses differ by size and chick capacity and by type of construction and insulation. The age and number of houses varies between farms, and houses differ by type of feeders, heaters, and litter used. Selected characteristics of broiler facilities on Tennessee farms will be discussed in this section.

Size of Broiler Enterprises

The size of the broiler enterprises varied from farm to farm by the number of houses on a farm, the size of those houses, and the chick capacity of each farm. Although the number of houses that growers in the sample operated ranged from one to six, the modal number of houses was one (Table A-8). Only in Region 4 was this result different. The modal number of houses operated by growers in that region was two.

Number and size of houses on a farm. The size of houses and the chick capacity per farm also varied greatly between farms. The average house size in the sample was about 9,247 square feet. House sizes ranged from 3,867 square feet to 16,000 square feet. The modal house size was

10,000 square feet in all four sample regions.

The average size of broiler houses in Region 1 was the smallest of the four study areas, about 7,503 square feet. House sizes on the farms sampled in this region ranged from 3,867 to 12,500 square feet.

The houses in Region 2 were on the average the largest of the four regions, 10,123 square feet, and ranged in size from 7,000 to 12,000 square feet. The average size of houses in Region 3 was 9,026 square feet, and houses in this region ranged in size from 6,240 to 10,400 square feet.

Region 4 had the second largest average house size. The houses sampled in this region averaged about 10,074 square feet, and they ranged in size from 5,250 to 16,000 square feet.

Chick capacity per farm. The average chick capacity per grow-out on the 88 broiler farms sampled was about 17,698 chicks per farm. The chick capacity per farm ranged from 6,000 to 108,000 chicks, and the modal capacity was 12,000 chicks.

The average chick capacity for Region 1 was about 14,511 chicks per farm per grow-out. The smallest operation sampled from all regions was from this region, and it had a capacity of 6,000 chicks per grow-out. The largest farm in this region had a capacity of 60,000 chicks. The modal chick capacity in this region, as well as Regions 2 and 4, was 12,000 chicks per farm.

The smallest broiler operations of the four regions were in Region 2 and averaged about 13,954 chicks per farm. The smallest farm sampled in this region had a capacity of 9,800 chicks, and the largest

farm had a capacity of 21,000 chicks.

The chick capacity of farms in Region 3 ranged from 8,000 to 50,000 chicks per grow-out, and it averaged about 14,305 chicks per farm. The modal farms in this region could produce 12,500 chicks per grow-out.

Region 4 averaged having the largest chick capacity, even though the modal farm capacity was no more than any other region. Chick capacity in Region 4 ranged from 9,000 to 108,000 chicks per grow-out per farm.¹

Age of Broiler Houses

The age of broiler houses on farms included in the sample ranged from 1 to 24 years, and the modal age of the houses was 10 years (Table A-9). The average age of all of the houses in the sample from Tennessee was just under 10 years.

The oldest houses in the sample were from Region 1, averaging close to 12 years old. At the time of this study, no new houses had been built in the region in 6 years, and the oldest houses were built over 20 years ago.

The newest houses among the four regions were in Regions 2 and 3, where the average age of houses was 8.69 years and 8.04 years, respectively. The houses in Region 2 ranged from 4 to 18 years old, and they ranged from 3 to 16 years old in Region 3. The modal house ages in these two regions were 6 and 5 years old, respectively.

¹The average is driven higher because only 7% of the farms in this region had a capacity lower than the mode (12,000) for this region, and over 78% of the farms had a capacity greater than the mode.

The houses in Region 4 were on the average the second oldest among the four regions--almost 10 years old. The newest house on farms sampled in this region was about 1 year old, and the oldest house was 24 years old. The modal age of houses in the region was 10 years.

House Construction

Two basic types of broiler houses are used in Tennessee--clear span houses and houses with pole roof supports. Houses with pole roof supports have posts or pillars inside the house supporting the roof. Clear span houses have no posts or pillars inside and have self-supporting roofs. Houses with pole support roofs were the most common type reported by broiler growers surveyed; almost 79% of their houses were of this type (Table A-10).

In Region 1 about 78% of the houses were built with a pole support roof, and the average age of these houses was almost 13 years old (Table A-11). The average age of the clear span houses was just over 9 years. Region 2 had 100% of their houses in the sample with the pole support type roof construction. In Region 3, 96% of the houses had the pole roof supports, and these houses averaged over 9 years old. Only one house in the sample for this region was constructed with a clear span roof, and it was only 1 year old. About 64% of the houses in Region 4 had pole support roofs. These houses averaged almost 11 years old, and the clear span houses averaged just over 5 years old.

Labor Requirements By Type of Construction

Most new broiler houses are built with a clear span roof. Without the poles inside the house to get in the way, tractors with front end

loaders can be used to clean-out the old litter in much less time. Growers can eliminate the hand labor required to remove the litter from around posts. Growers whose houses had clear span roofs reported an average of 1.35 hours less labor per 1,000 chick capacity during the clean-out period than growers whose houses had pole support roofs (Table A-12).

The amount of labor required during the grow-out phase of the operation was also less on farms with clear span houses than on those with pole support houses. However, the reduced labor requirement may be related to the use of newer, more efficient equipment in clear span houses, which are generally newer than pole-type houses, rather than to the type of construction.

House Insulation

The type of insulation in a broiler house is another important factor to a manager. Heating cost is one of the largest out-of-pocket expenses to a broiler grower.² Even though insulation should reduce this cost, some growers in this study had no insulation in their houses (Table A-10).

The most common types of insulation used in broiler houses were styrofoam and blackboard. Over half of the houses were insulated with styrofoam, and blackboard was used in about 22% of the houses.

²Over 12% of the growers in the sample had problems getting fuel in 1977. If heating fuels become more scarce, many growers will not be able to grow chicks because they will be unable to obtain fuel to heat their houses in the winter.

Region 1 had the largest percentage of houses in the four regions which were not insulated (over 21%). Blackboard, the most commonly used insulation in the region, was used in over half of the houses, and styrofoam was used in approximately 21% of the houses.

Styrofoam, the most common type of insulation used in Region 2, was used in about 1/3 of the houses. All of the houses in this region were insulated, but some had only pasteboard insulation. Blackboard and thermoply were each used to insulate 20% of the broiler houses in Region 2.

The type of insulation most frequently used in Region 3 was styrofoam which was used in 64% of the broiler houses. Thermoply was used to insulate 16% of the houses in Region 3, and 4% of the houses had no insulation at all.

In Region 4, over 77% of the houses were insulated with styrofoam. A few houses in this region were insulated with blackboard and thermoply, but almost 2% of them had no insulation at all.

III. HOUSE FURNISHINGS

The type of equipment and litter used in broiler houses affects both the labor requirement of broiler production and production efficiency. Several different types of feeding and heating systems are in general use by broiler growers in Tennessee, and no one type of litter is used by all growers. The distribution of (1) various heating and feeding systems and (2) types of litter in common use on Tennessee broiler farms is presented in this section along with an analysis of differences in labor requirements by type of feeding and heating systems.

Type Feeders

Four types of feeders used by broiler growers in the sample studied were: (1) chain conveyor, (2) auger, (3) hog trough, and (4) pan (Table A-10). Chain- and auger-type feeders are mechanized and most are automatic systems. Trough and pan feeders are filled by hand and require more labor than the other two systems.

The chain conveyor system has feeders connected together throughout the broiler house with a chain inside which distributes feed from a storage bin. About 42% of the houses on the broiler farms sampled were equipped with a chain conveyor feeding system.

The auger-type feeding system utilizes an auger to convey the feed from the storage bin to feeders located throughout the broiler house. This type of feeding system was used in about 19% of the houses on broiler farms sampled.

The hog trough feeder looks like a small hog trough. Growers must bring feed from the storage bin in buckets or a wheelbarrow and put it in these feeders by hand. This type of feeder was used in about 30% of the houses in the broiler-farm survey.

Pan feeders usually hang from the ceiling so chicks cannot waste feed by scratching it out, and, like the hog trough feeders, they are usually filled by hand. Pan feeders were used in about 8% of the houses on broiler farms sampled.

Over half of the broiler houses in Region 1 were equipped with hog trough feeders. The second most common feeding system in Region 1 was the chain conveyor feeder which was used in almost 28% of the broiler houses. Pan feeders were used to feed broilers in the remaining houses

sampled in Region 1; no auger feeders were used by any growers in that region.

The chain conveyor feeding system was used in 60% of the houses sampled in Region 2. The second most popular feeding system in Region 2 was the hog trough which was used in almost 27% of the houses. The pan and auger systems were each used in about 7% of the houses in Region 2.

Hog trough feeders were used in almost half the houses sampled in Region 3. The second most frequently reported feeding system in Region 3 was the chain conveyor which was used in 44% of the sample houses. Pan feeders were reported in fewer than 10% of the broiler houses sampled in Region 3, and no auger feeding systems were reported in that region.

Less than 4% of the broiler houses in Region 4 were equipped with feeding systems which were not automatic; all of those utilized hog trough feeders. Chain conveyor and auger systems were reported in over 95% of the broiler houses sampled in this region, and the proportion of houses equipped with each of these systems was about equal.

Labor Requirement By Type of Feeding System

The type of feeding system has a major effect upon the amount of labor required in broiler production. Mechanized systems require much less labor than nonmechanized systems. Not only is time saved in getting feed to the chicks, but mechanized systems can be regulated by an automatic timer to keep chicks fed without the attention of the grower.

Auger feeding systems require less labor per 1,000 chicks produced than any of the other three feeding systems utilized by Tennessee broiler growers (Table A-13). The operations that used the auger feeding system

required an average of 11.51 hours of labor per 1,000 chicks during an 8-week grow-out. This system required 1.75 hours less labor per 1,000 chicks during this period than the next most efficient system and over 13 hours less labor than the least efficient system--pan feeders. There was only a small difference between the four feeding systems in the amount of time required for clean-up; about 1/2 hour per 1,000 chicks. There was a greater difference in the labor required to clean-out broiler houses, but this difference may be related to the type house rather than the type of feeding system since most of the newer, clear span houses were equipped with automatic feeding systems.

Type of Litter

The growers in the sample used several kinds of litter in their broiler houses, including: peanut hulls, rice hulls, sawdust, wood shavings, bark, straw, and some combination of these, e.g., wood shavings and sawdust. Some growers must buy litter; others get it free depending upon its availability and alternative uses in the area.

The types of litter most frequently used by broiler growers were wood shavings and sawdust in about 40% and 38% of all houses, respectively (Table A-10). A combination of sawdust and wood shavings was used in about 14% of all houses, and one of the other types of litter was used in the remaining houses.

Sawdust and wood shavings were each used as litter by about 1/3 of the growers in Region 1, and a mixture of sawdust and wood shavings was used by an additional 30% of the growers in that region. Sawdust was used as litter in about half of the houses in Region 2 and in 96%

of the houses in Region 3. In Region 4, wood shavings was the most frequently used type of litter (used in over 75% of the houses).

Type of Heaters

Seven different types of heating systems were in use by broiler growers surveyed in this study: (1) butane, (2) propane, (3) natural gas, (4) fuel oil, (5) coal, (6) a combination of butane and coal, and (7) a combination of propane and coal.³ The type of heat that growers use is important because it affects the amount of labor required, and fuels differ in price and availability.⁴

Coal was used by half of the growers sampled and was the most common source of heat used in broiler houses (Table A-14). Either propane or butane was used by almost 41% of the growers, and the remaining growers used one of the other systems previously mentioned.

Coal was the most important source of heat in three of the four regions analyzed. A higher percentage of growers in Region 1 (82.14%) used coal to heat their broiler houses than in any other region. Propane and butane were the most important fuels used to heat broiler houses in Region 4 where about 82% of the growers used them, and in Regions 2 and 3 these fuels ranked second in importance as a heat source. Natural gas was used only by growers in Regions 1 and 2 to heat broiler houses, and fuel oil was used only by growers in Regions 1 and 3 for this purpose.

³Combinations of propane and coal and butane and coal were not used to heat one house; they were used only when growers had more than one house.

⁴See footnote 2 on page 20.

Labor Requirements By Type of Heating System

Heating broiler houses with coal requires more labor than any other type of heat used in Tennessee (Table A-15). Coal heat requires the attention of the grower several times per day. Coal must be brought into the houses by hand if the house has no storage bin. Even if it does, the coal must be put into another bin that feeds coal to the furnace. Ashes must be removed and disposed of, and when clinkers form, they must also be removed. Growers with broiler houses heated with coal reported using an average of about 20 hours of labor per 1,000 chick capacity per grow-out. The average labor requirement for cleaning-up coal-heated houses was less per 1,000 chick capacity than for houses with propane or butane heating systems.⁵ This is probably because individual brooders do not have to be lit in houses heated with coal as do gas brooders.

Operations using propane or butane heat required an average of about 14 hours of labor per 1,000 chick capacity during the grow-out. Clean-up time averaged 2.53 hours per 1,000 chick capacity, and clean-out time averaged 5.49 hours per 1,000 chick capacity on farms reporting either propane or butane heat in their broiler houses.

IV. SUMMARY

Broiler growers in this study reported using an average of 17.40 hours of labor per 1,000 chicks during an 8-week grow-out period. The

⁵Coal and propane or butane are the only heating systems being discussed here because of the limited number of observations for the other types of systems.

first 2-weeks of a grow-out required the most labor, an average of 6.85 hours per 1,000 chicks because chicks must be fed and watered by hand. Average labor requirements for an 8-week grow-out varied considerably between regions. They ranged from a high of 21.00 hours per 1,000 chicks in Region 3 to a low of 12.40 hours per 1,000 chicks in Region 4. Growers who only cleaned-up their broiler houses and added a fresh layer of litter on top of old litter between broods reported using an average of 2.45 hours of labor per 1,000 chicks for this operation. Those growers who reported removing all the old litter from their broiler houses and replacing it with new litter between broods used an average of 5.27 hours of labor per 1,000 chicks for this operation.

The modal number of broiler houses operated by all growers surveyed in this study was one, and the number they operated ranged from one to six. The modal number of houses per farm was the same for all of the regions analyzed in this study except Region 4 where it was two. The maximum number of broiler houses per farm ranged from two in Region 2 to six in Region 4. The modal broiler house size was 10,000 square feet in all four areas analyzed in the study. The average size of broiler houses ranged from 7,502 square feet in Region 1 to 10,123 square feet in Region 2. The modal chick capacity per farm was 12,000 in all study areas except Region 3 where it was 12,500. Chick capacity per farm ranged from a low of 6,000 in Region 1 to a high of 108,000 in Region 4 and averaged 17,697 for all broiler farms surveyed in this study.

The broiler houses operated by growers included in this study ranged in age from 1 to 24 years old, and their average age was 9.93

years old. The average age of broiler houses in the four areas analyzed in this study ranged from 8.04 years old in Region 3 to 11.71 years old in Region 1.

Two basic types of broiler houses were used on Tennessee broiler farms--clear span houses and houses with pole support roofs. Houses with pole support roofs were the dominate type used in all four study regions. The average age of houses with clear span roofs was less than that of houses with pole support roofs indicating a tendency for growers to construct clear span houses when they build new ones. The labor required for producing 1,000 broilers reported by growers with clear span broiler houses was much less than that for growers with pole houses. However, some of this difference in labor requirements for these two types of houses can probably be attributed to the use of newer, more efficient equipment in clear span houses which are generally newer than houses with pole support roofs.

Less than 10% of the broiler houses operated by broiler growers surveyed in this study were not insulated. Over half of the houses were insulated with styrofoam, and 22% were insulated with blackboard. Styrofoam was used to insulate the highest percentage of broiler houses in all of the regions analyzed in this study except Region 1 where blackboard was used to insulate a higher percentage of broiler houses than any other material.

Chain conveyor feeders were used in a higher percentage of broiler houses operated by the broiler growers sampled in this study than any other type of feeder. However, these feeders were used in the highest percentage of broiler houses in only Regions 2 and 4 among the four

study areas analyzed. Hog trough feeders were used in the highest percentage of broiler houses in Regions 1 and 3. The amount of labor required to produce 1,000 broilers reported by growers whose broiler houses were equipped with chain conveyor or auger feeders, both of which are mechanized, was about half that reported by growers who used hog trough or pan feeders in their broiler houses.

Sawdust and wood shavings were both reported used in about an equal percentage of all the broiler houses on the broiler farms sampled in this study. However, these two types of litter were not used uniformly across all four of the regions analyzed in this study. Sawdust, wood shavings, and a mixture of the two were used in about equal percentages as litter for broiler houses in Region 1. Sawdust was used as a litter in the highest percentage of broiler houses in Regions 2 and 3, and none of the growers in those regions reported using wood shavings as broiler house litter. In contrast, wood shavings were used as litter in 75% of the broiler houses in Region 4.

Coal was used to heat broiler houses on a higher percentage of broiler farms surveyed in this study than any other type of fuel. Butane or propane was the other major type of fuel used to heat broiler houses on those farms. Coal was used to heat broiler houses on over 80% of the broiler farms in Region 1, and it was used to heat broiler houses on a higher percentage of broiler farms than any other type of fuel in Regions 2 and 3. However, in Region 4, butane or propane was used to heat broiler houses on over 80% of the broiler farms.

CHAPTER IV

GROWER INCOME

Broiler growers in Tennessee not only received income from broiler production, but also many received income from other farm enterprises and from nonfarm sources. The income sources of broiler growers surveyed in this study will be discussed in this chapter.

I. BROILER INCOME

The level of income broiler growers receive from broiler production depends upon two main factors: (1) the number of broilers marketed and (2) the level of payments broiler growers received per pound of broiler produced.¹ The growers included in the sample started an average of about 74,663 chicks per farm in 1976 (Table A-16). Grower payments for the production of these chicks averaged over \$6,100 which amounts to about \$81 per 1,000 chicks started (Table A-17). The average grower surveyed in this study started about 85,500 broiler chicks in 1975, and he received a grower payment of about \$6,400 in that year which is approximately \$89 per 1,000 chicks started.

The average grower in Region 4 started more chicks in both 1975 and 1976 than the average grower in any of the other three regions; he started about 125,500 chicks in 1975 and over 120,600 chicks in 1976.

¹These are not the only factors involved, but they are the major ones. All the factors influencing grower payments will be discussed in Chapter VI.

Accordingly, broiler payments in this region were also greater than in any other region analyzed. In 1976, the average broiler producer in Region 4 earned over \$5,000 more from broiler production than the average grower in any of the other three study regions.

Region 3 ranked second among the four regions based on the average number of broilers started per farm in 1976. However, in 1975 when only a few growers in that region produced broilers, it ranked third among the four regions based on the average number of broilers started per farm. These growers also had the second highest average grower payments and the highest payments per 1,000 chicks among the four regions in 1976--about \$5,300 in 1976. However, in 1975 growers had the second lowest average grower payments and the lowest payments per 1,000 chicks produced among the four regions.

The growers in Region 2 started the smallest average number of broilers per farm of the four regions in 1976 when they started about 49,400. The growers in Region 1 averaged starting into production more chicks than growers in Region 2 during those 2 years, but the average grower payment was more for the growers in Region 2--over \$900 more in 1976. In 1976, the average grower payment per 1,000 chicks was almost \$20 less in Region 1 than in any other region analyzed in this study.

II. FARM INCOME

Sales of farm products other than broilers averaged around \$7,100 in 1976 and \$5,500 in 1975 for all growers reporting such sales (Table A-17). Among the four regions growers in Region 3 had the largest average sales of farm products other than broilers in both 1976 and 1975.

Broiler growers in Region 1 had the second highest average sales of farm products other than broilers in 1976, but in 1975 they ranked the lowest. Growers in Region 4 ranked third on this measure in 1976, but in 1975 they ranked second. Growers in Region 2 had the lowest average farm sales in 1976 and the second lowest among the four regions in 1975.

III. NONFARM INCOME

Over 50% of the broiler growers sampled worked off of the farm in 1976 an average of over 11 months (Table A-18). The average nonfarm earnings of broiler growers who worked off-farm was \$11,205 in that year (Table A-17).

Roughly half the growers in each region worked off-farm an average of 11 months or more in 1976. Average nonfarm earnings were greatest for growers working off-farm in Region 4--\$13,086. Their average nonfarm earnings were over \$3,000 more than those of growers in Region 1 who had the lowest average nonfarm earnings among growers in the four study regions.

Broiler growers in Regions 2 and 3 ranked second and third, respectively, when compared to growers from other regions based on their nonfarm income. Nonfarm income averaged \$11,240 for growers in Region 2 and \$10,995 for growers in Region 3. One reason why growers in Region 1 had lower nonfarm incomes might be their lower level of education. The growers in the other three areas had an average of about a tenth grade education, compared to the average grower in Region 1 who had less than an eighth grade education. And the average nonfarm income of broiler growers in Regions 2, 3, and 4 was over \$2,400 per year greater than that of growers in Region 1.

IV. SUMMARY

The total income of broiler producers includes receipts from the sale of farm products other than broilers and income from nonfarm sources in addition to their grower payments for broilers. The income a grower earns from broiler production is a function of the number of broilers produced and the level of payment he receives for each pound of broilers he produces.

The Tennessee broiler growers surveyed in this study earned an average of \$6,153.36 from broiler production in 1976. The amount that those growers received for producing broilers in 1976 varied considerably between the regions analyzed. Broiler income per grower in 1976 ranged from about \$3,000 in Region 1 to over \$10,000 in Region 4. The number of broilers started per farm in 1976 by growers in Region 4 was more than twice that in any of the other three study regions.

Less than half of the broiler growers sampled in this study reported sales of farm products other than broilers in 1976. The average sales of products other than broilers on broiler farms where such sales were reported were about \$7,100 in 1976. Average sales of products other than broilers on broiler farms in 1976 ranged from less than \$4,000 in Region 2 to almost \$14,000 in Region 3.

Half of all the broiler growers surveyed reported working off-farm in 1976, and the proportion of growers reporting such work did not vary by study region. However, the amount that growers earned from off-farm work did vary between regions. That amount ranged from less than \$9,600 in Region 1 to over \$13,000 in Region 4.

CHAPTER V

GROWER SATISFACTION WITH THEIR CONTRACT AND SERVICEMAN

Grower and contractor satisfaction with the broiler industry is an important factor in determining how stable the industry is in Tennessee. Dissatisfaction can cause growers to leave the industry if economically possible. Some of them may not be economically able to leave the industry because growing broilers may be the main way of repaying the debt they incurred when entering the industry. Also, unsatisfied growers will not expand their operations, and this limits the growth potential in the industry. There are two ways for the industry to grow in an area: (1) growers presently producing broilers can build additional houses on their farm or (2) new growers can be brought into the industry. Recruiting new growers into an industry whose members are dissatisfied may be difficult.

The growers sampled in this study were interviewed to determine their attitude toward, and degree of satisfaction with, present conditions in the broiler industry in Tennessee. They were also asked to suggest ways of improving unsatisfactory conditions.

I. GROWER ATTITUDES TOWARD THE AMOUNT THEY ARE PAID

One of the most important factors to growers is the amount they are paid for a grow-out of broilers. Only a narrow majority of growers (54%) felt they were being paid an equitable

amount for producing broilers (Table A-19).

The largest percentage of growers who thought they were not being paid an equitable amount were in Region 1 where over 59% of the growers were dissatisfied with the amount they received for producing broilers. Region 2 had the largest percentage of growers indicating they were paid an equitable amount (76.92%). In Regions 3 and 4, over 50% of the growers indicated they were paid an equitable amount, but growers in those two regions were more evenly divided on this question than those in Regions 1 and 2.

II. GROWER WILLINGNESS TO SHARE

MARKET PRICE RISK

Growers were asked if they would prefer broiler payments tied to the market price level rather than their present method of payment; i.e., their payments would be reduced when broiler prices were low and increased when broiler prices were high. Their responses were split equally. About 47% of the growers favored sharing the market price risk because they thought their total receipts over time would be increased. Another 47% of them did not want to share this risk. They preferred a stable payment they could depend upon for each grow-out. The other growers were uncertain if they would be willing to share this risk.

In all regions except Region 4, most of the growers did not want to share the market price risk with the company. In Region 4 over 60% of the growers indicated a willingness to accept such an arrangement. Just over 50% of the growers in Regions 1 and 3 did not want to take this risk. In Region 2 about 46% of the growers did not want to share the

market price risk, and almost 31% said they did not know enough about the situation to decide.

III. GROWER ATTITUDES TOWARD SERVICEMEN AND THE FREQUENCY OF SERVICEMAN VISITS TO FARMS

In many cases the serviceman is the only contact growers have with their contractor. Some growers feel as though the serviceman is the contractor. He is important to growers because of his expertise in spotting problems with the grow-out such as disease and other health hazards and in suggesting ways to increase grower efficiency which result in increased broiler payments. Therefore, servicemen rated favorably by growers (excellent or good) should be those who help growers improve their production efficiency, and the grower-serviceman relationship should be an important determinant of grower satisfaction in the industry.

Most growers gave their serviceman a favorable rating, excellent or good, but about 23% rated their serviceman only fair or poor (Table A-19). Servicemen visited most broiler houses at least once every week, but over 17% of the growers indicated they received visits from servicemen less frequently.

In Region 1, 86% of the growers rated their serviceman either as good or excellent, and most growers (60.71%) indicated their serviceman visited their operation once each week. Among the remaining growers, almost 18% received visits from their serviceman once every 2 weeks, and over 21% were visited less often. The average grower in this region received fewer visits by his serviceman during a grow-out than the

average grower in any of the other three study areas.

Serviceman ratings in Region 2 were higher than in any other region. Most growers in this region (53.85%) rated their serviceman as excellent, and about 31% said he was good. Only about 15% of the growers in Region 2 gave their serviceman a rating lower than good. All growers surveyed in this region received weekly visits from their serviceman.

The servicemen in Region 3 were rated either excellent or good by almost 80% of the growers interviewed. Almost 90% of the growers in that region indicated their serviceman visited their houses at least once every week.

Growers in Region 4 gave their servicemen lower ratings than did those in other regions. Half of these growers gave their servicemen a rating of good, and about 21% rated them as excellent. However, over 28% of the growers in Region 4 gave their servicemen a rating of either fair or poor which was the highest percentage of growers in the four study regions rating their servicemen in these two categories. Over 90% of the growers in Region 4 said their servicemen visited their houses at least once per week. The other growers in that region said their houses were visited once every 2 weeks.

IV. THE CONTRACT RATING

The contractual arrangement is another important factor in determining the degree of satisfaction of the growers in the state. The contract explains the responsibilities of each party involved in growing broilers. It sets the restraints on payments made to the grower and covers all aspects of the production of broilers.

To find out how broiler growers in the state felt about their contracts, they were asked to rate them either excellent, good, fair, or poor. Over 54% of the growers rated their contracts as either fair or poor (Table A-19), which indicates that they were not completely satisfied with their provisions.

The growers in Region 1 showed the most dissatisfaction with their contracts. Almost half of those growers rated their contracts as only fair, and another 24% gave them a poor rating. One reason for this might be that their grower payments were less than in any other region.¹

The regions in which growers were most satisfied with their contracts were those in which average broiler payments were highest²-- Regions 3 and 4. In Region 3, over 55% of the growers rated their contract as good, and over 53% of the broiler growers in Region 4 rated their contracts as either good or excellent.

V. GROWER SUGGESTIONS FOR IMPROVING CONTRACTS

In order to obtain an indication of problem areas in the Tennessee broiler production industry from the growers' viewpoints, each broiler grower surveyed was asked for suggestions they felt would improve their contracts. Their responses to the open-ended questions (1) what are some things you feel would improve your contract? (2) if present price and contractual arrangements continue, will you continue to produce broilers

¹See Table A-17.

²Ibid.

under contract?³ and (3) if present price and contractual arrangements continue, would you consider building new houses?⁴ are summarized in this section.

What Are Some Things That Would Improve Your Contracts?

About 42% of the growers interviewed suggested that an increase in grower payments would improve their contracts (Table A-20). This suggestion was given by more growers than any other suggestion. The next most frequently suggested improvement, by 26% of the growers, was that the contracting company should pay more of the cost of inputs such as fuel, utilities, medication, and clean-out labor. About 20% of the growers said that a long-term contract which could not be canceled at any time would be an improvement. Contract provisions (1) specifying a minimum payment per 1,000 chicks as insurance against high condemnation and mortality losses and (2) allowing growers more supervisory control over catching crews⁵ and the weighing of feed and broilers were each suggested improvements by 15% of the growers.

In Regions 1 and 4, the main suggestion growers gave for improving contracts was an increase in grower payments. Almost 35% and 54% of the growers in Regions 1 and 4, respectively, gave this response.

³They were also asked to explain why they would or would not want to continue.

⁴Those who answered no to this question were also asked to explain how conditions would need to change before they would consider building new houses.

⁵These growers complained that these crews killed chickens while catching and loading them and left them in the broiler houses and that they tore up equipment in the houses while catching chickens.

In Region 2, two changes were each suggested by 60% of the growers: (1) a long-term contract and (2) the company should pay more of the input costs. The majority of the growers in Region 3 (55.56%) also suggested that the company pay more of the input costs.

The second most popular suggestion given by growers in Region 1 (30.77%) was a guaranteed minimum payment per 1,000 chicks for growing broilers. In Regions 2 and 3, 30.00% and 44.44%, respectively, of the growers wanted an increase in grower payments. The second most frequently cited suggestion by growers in Region 4 (23.08%) was a long-term contract.

VI. EXPLANATIONS FOR CONTINUING TO PRODUCE BROILERS UNDER PRESENT CONTRACTUAL ARRANGEMENTS

When asked if they planned to continue to produce broilers under their present contractual arrangements, over 86% of the growers in the survey said they did (Table A-21). Some of the more frequently cited reasons they gave for staying in production included: (1) need to recover investment in broiler facilities; (2) the broiler enterprise is an extra source of farm income; (3) the broiler enterprise is the best source of farm income; and (4) the grower likes to grow chickens. Some growers said they would stay in production because the broiler enterprise is complementary to other farm enterprises. The litter from broiler production is a valuable fertilizer that can be used in crop production. Others indicated they would continue production because it provided employment for the family or that broiler production was a better source of income than nonfarm employment alternatives. A

small percentage of growers said they would stay in business because it was their only source of income or that it provided a source of retirement income.

The smallest percentage of growers among the four study regions who said they wanted to stay in broiler production under their present contractual arrangements was in Region 1. The most often cited reason those growers gave for staying in business was that the broiler enterprise was a supplement to farm income (Table A-21). The second most frequent response growers in Region 1 gave as a reason for staying in broiler production was to recover their investment in broiler facilities.

Over 30% of the growers in Region 2, where just over 84% of the growers said they wanted to stay in production, explained the reason they would stay in business was that the broiler enterprise provided the best source of farm income. About 23% of those growers answered that the broiler enterprise was a supplement to farm income.

The largest percentage of growers in the survey who said they would continue to produce broilers under their present contractual arrangements was from Region 3 where almost 95% of the growers said they would continue. The reason most frequently cited by those growers for continuing production was to recover their investment in the broiler facilities.

Recovering the investment in broiler facilities was also one of the reasons given most often for continuing to produce broilers by growers in Region 4 where almost 93% of the growers said they would continue to produce broilers under their present contractual arrangement. An extra source of farm income and the best source of farm income were also both

mentioned by over 28% of the growers in Region 4 as reasons for continuing to produce broilers.

VII. EXPLANATIONS FOR DISCONTINUING BROILER PRODUCTION UNDER PRESENT CONTRACTUAL ARRANGEMENTS

Almost 14% of the growers in the survey said they would quit producing broilers unless conditions in the industry changed (Table A-22). Half the growers indicating they would discontinue broiler production cited their low income as the reason for doing so. Other reasons for discontinuing broiler production included: (1) better nonfarm employment alternatives, (2) poor health, and (3) the grower thought he could better utilize the broiler houses by converting them into farrowing houses for swine production.

The most important reason growers gave for wanting to quit producing broilers was low income. This was the most frequently cited reason by growers in Region 1 and the only reason given by growers in Regions 3 and 4.

VIII. GROWER INTEREST IN BUILDING NEW HOUSES

As stated in the introduction, the broiler industry in Tennessee has failed to keep pace with the growth of the industry in the rest of the country. In order for the industry to grow, many of the present growers need to build new houses. But under the present contractual arrangements, almost 14% of the present growers wanted to leave the broiler industry which leaves only about 86% of the growers currently producing broilers to build new houses. Potential growth in the industry

is restricted under present contractual arrangements since only about 23% of the growers surveyed indicated an interest in building new houses under these conditions (Table A-23).

The growers who indicated they would not consider building new houses under their present contractual arrangements were asked what changes would induce them to build new ones. Their most frequent response was that they would need an increase in grower payments (given by 29.55% of the growers). Almost 15% of the growers said they would need a guarantee that chicks would be placed in their houses until they were paid for and a similar number indicated they would consider building new houses if they could do so without incurring any debt. About 11% of the growers indicated a guaranteed minimum broiler payment to insure repayment of any debt incurred would induce them to build new houses. About 18% of the growers in the survey said they had no interest in building new houses under any conditions.

Region 1 showed the poorest potential for growth of the four regions since only about 14% of the growers surveyed would build new broiler houses under their present arrangements. An increase in grower payments, mentioned by almost 54% of the growers, was the change suggested most frequently in Region 1 which would induce them to build new broiler houses. Other changes those growers indicated would be necessary before they would build new houses were: (1) a minimum guaranteed grower payment and (2) a guaranteed number of chicks placed in the new houses until they were paid for. Almost 11% of the growers in Region 1 said they would not consider building new houses under any conditions.

About 23% of the growers in Region 2 expressed a desire to build new houses under their present arrangements. The change in present contractual arrangements that growers in this region most frequently indicated would induce them to build new houses was a guaranteed number of chicks placed in new houses until they were paid for. Other changes which growers in Region 2 indicated would encourage them to build new houses were: (1) an increased grower payment and (2) a guaranteed minimum grower payment. About 15% of the growers in Region 2 said they would not build new houses under any conditions.

Region 3 showed close to the same potential for growth as did Region 2. About 21% of the growers sampled in Region 3 expressed an interest in building new houses under their present arrangements. The most often suggested change in present contractual arrangements that growers in Region 3 indicated was needed before they would build new houses was a guarantee to place chicks in the new houses until they were paid for. The next most often suggested change in present contracts which growers in that region said was needed before they would build new houses was an increase in grower payments. Other growers said they would build if they (1) were guaranteed a minimum grower payment or (2) could build the houses without incurring any debt. About 21% of the growers in Region 3 said they would not consider building new houses under any conditions.

Region 4 showed the most promise for growth among the four regions analyzed. Over 32% of the growers surveyed in that region said they would consider building new houses under present conditions, and 35.71% indicated they would build new houses if they could do so without

incurring debt. In Region 4, 25.00% of the growers said they would not build new houses under any conditions.

IX. SUMMARY

Grower satisfaction with conditions in the broiler industry influences the stability of the industry in an area and its potential for expansion. The attitudes of growers toward present conditions in the broiler industry and their intentions for producing broilers in the future were discussed in this chapter.

Only a narrow majority of all growers surveyed felt they were being paid an equitable amount to produce broilers. Only about 40% of the growers in Region 1 indicated that their broiler payments were equitable, but over 76% of those in Region 2 believed that they were.

The growers sampled in this study were evenly divided as to whether or not sharing broiler market price risk with the contractor would be to their advantage. Most of the growers in three of the study regions were not in favor of sharing this risk with the contractor. Only in Region 4 was the number of growers indicating a preference for sharing broiler market price risk greater than the number opposed to such an arrangement.

Over 75% of the growers surveyed gave their servicemen a favorable rating of either excellent or good indicating that most growers were satisfied with the performance of their servicemen. Growers in Region 4 gave their servicemen higher ratings than did those in any other region. Over half of those growers gave their servicemen excellent ratings, and almost 85% of them rated their servicemen as either excellent or good.

Growers in Region 4 appeared less satisfied with the performance of their servicemen than did growers in any other region analyzed based on the ratings they gave their servicemen. Most of the broiler growers sampled in this study received visits from servicemen at least once every week. The grower ratings which servicemen received in the four study areas did not appear directly related to the frequency of their visits.

Each grower surveyed was asked to rate his production contract as either excellent, good, fair, or poor. Production contracts were... rated good and fair by almost equal percentages of growers. The percentage of growers rating these contracts as poor was higher than the percentage rating them as excellent, however. Production contracts were rated about the same by growers in three of the regions analyzed in this study, but growers in Region 1 gave their production contracts a much lower rating than did growers in the other three regions.

In addition to giving a general rating to their production contracts, each grower surveyed was asked to suggest ways in which these contracts could be improved. The most frequent suggestion growers gave for improving these contracts was to increase grower payments. Other suggestions made frequently by growers were that the contractor pay more of the costs of producing broilers and that contracts be written to cover a longer time period. Growers in both Regions 1 and 4 suggested an increase in grower payments as a way to improve their contracts more frequently than any other suggestion. In both Regions 2 and 3, growers most frequently suggested that the contractor pay more of the broiler production costs as a way to improve their contracts.

Over 86% of the broiler growers in the survey said they planned to continue broiler production under their present contractual arrangements. Some of the reasons most frequently given by growers for staying in production were: (1) need to recover investment in broiler facilities; (2) the broiler enterprise provides an extra source of farm income; and (3) the broiler enterprise provides the best source of farm income. Broiler growers in Region 1 and 2 tended to view broiler production either as their best source of farm income or as an extra source of farm income, while growers in Regions 3 and 4 cited the need to recover their investment in broiler facilities among the most important reasons for continuing to produce broilers.

Almost 14% of the growers in the survey said they would quit producing broilers unless conditions in the industry changed. The reason most frequently given by growers for discontinuing broiler production was that their broiler income was too low.

Less than 23% of the growers in this study said they had an interest in building new broiler houses. Growers who said they would not build new broiler houses under present conditions indicated they would consider building new broiler houses if (1) they received an increase in grower payments, (2) they were guaranteed chicks until the buildings were paid for, or (3) they could build without incurring any debt. Almost 20% of the broiler growers surveyed indicated they would not build any new broiler houses regardless of how conditions in the industry changed.

CHAPTER VI

INDUSTRY COORDINATION

The broiler industry in Tennessee has become vertically integrated. This section looks at the degree of interlevel coordination between the subsystems or stages of the production and marketing systems. The industry was divided into two stages, the broiler growers and the contracting companies, in order to assess interstage coordination. This analysis assumes that the degree of understanding which broiler growers have of broiler contract provisions of (1) by whom and how decisions are made, (2) who pays for and supplies inputs, and (3) who bears production and price risks affects the coordination of the two levels which in turn influences production and marketing efficiency.¹

The procedure for obtaining the information for this analysis required the use of a "mirror image" questioning procedure. The broiler growers and representatives of the contracting companies were asked identical questions about selected features of their contracts which were structured so that only two answers were possible: (1) The grower paid the full cost of certain inputs, bore the entire production and price risks and was independent of his contractor in making certain decision; or (2) The contracting company either shared or paid the total cost of certain inputs, shared or bore the entire production and price

¹Wayne D. Prucell, "An Approach to Research on Vertical Coordination: The Beef System in Oklahoma," American Journal of Agricultural Economics, Volume 55 (February, 1973), 65-68.

risks, and had an input if not full control of the decision-making process. This section does not compare grower responses by region but compares them to the responses of the representative of the company which they contract with and to responses of other growers for other companies in order to identify conflicts.

A frequency analysis was used to indicate the responses of growers from each company. There should be less conflict, more coordination, and greater efficiency in the system if a high percentage of growers interpret their contracts in the same way as their contractors than if this percentage is low. Therefore, a low percentage of growers giving the same response to these "mirror image" questions as company managers may indicate areas where the contract needs changing or where communication and coordination have broken down within the system.

In addition to the frequency analysis, a chi-square analysis was used to determine significant differences in grower perceptions of certain aspects of the contract between companies. The null hypothesis for the chi-square analysis was set up under the assumption of no significant difference in the responses of growers from different companies whose representatives gave similar responses to specific questions concerning contract provisions. The tests were set up for three different situations depending on the number of company representatives giving the same response to a particular question. These different situations were: (1) the same response from four company representatives, (2) three company representatives giving the same response, and (3) two company representatives giving the same response. A high level of communication and coordination should exist between

growers and contracting companies with respect to those areas in which (1) a high percentage of growers gave the same response to questions as the manager of the company they contract with and (2) the chi-square analysis indicates no significant difference in grower responses between companies with similar policies as evidenced by similar responses from their managers.

In the situation in which all company managers gave the same response, only one chi-square test was needed to indicate differences in grower responses between companies. Two chi-square tests were made when only three company representatives gave the same response to a specific question. The first test in this situation was for differences in grower responses between those three companies. If the null hypothesis could not be rejected,² the growers for those three companies were grouped together before making the second test. The second test was for differences between the responses of the group of growers in the first test and the growers for the company with a different response. This test was expected to show a significant difference ($P < .05$) a priori.

In the situation in which two companies gave one response and two other companies gave a different response, three chi-square tests were performed. The first two tested for differences in grower responses between each set of companies giving the same response to questions about contract provisions. If both of these tests showed no significant difference between the responses of growers for each set of companies

² $\chi^2_{.05}$ is the level used in all chi-square tests to determine significance. A significant difference is assumed when $\chi^2 \geq \chi^2_{.05}$ or when $P \leq .05$.

with the same response, the growers from the companies whose managers gave the same response were grouped together, and the third test was performed. The third test was for differences between the responses of the group of growers for the first set of two companies and the group of growers for the second set of two companies. Since the company representatives of each set of companies in the third test gave different responses, a significant difference in grower responses was expected a priori.

When these test results were not as expected or when most growers gave responses different from those of company representatives, it improved communication and coordination between growers and their companies or indicated changes in contract provisions may be needed.

I. TYPES OF CONTRACTS AND CONTRACT PROVISIONS

There were two types of broiler production contracts used by companies located in Tennessee: (1) competitive and (2) noncompetitive.³ All contracts were written and either had no time period stipulation and could be canceled at any time between grow-outs or were good for no more than one grow-out. Assuming contracts were not canceled by either party, they did not have to be renewed until the provisions were changed. The growers could cancel their contracts with a company for any reason. However, company managers said that the only reason they canceled grower contracts was for poor performance that resulted in high cost to the company.

³Information on contract provisions presented in this section was obtained from company contracts and questionnaires completed by company managers.

Both types of contracts were designed to encourage growers to decrease production costs by reducing feed costs, mortality, and condemnation. Competitive and noncompetitive contracts differed in the method of determining grower payments. Two types of noncompetitive contracts were used by Tennessee broiler contractors. Only a feed conversion ratio was used to determine grower payments in one of these contracts (Table A-24), and in the other, these payments were based both upon the attained weight of broilers and a feed conversion ratio (Table A-25). Both of these payment schedules were subject to reductions due to condemnation and mortality.

Grower payments under competitive contracts are calculated in the following manner: At the end of each pay period, a formula cost per pound of broilers produced by each grower who sold birds during that period is calculated. The total formula cost for each grower is the sum of the cost of medication, feed, and chicks which the contractor furnished the grower during the pay period. Each grower's formula cost per pound is determined by dividing his total formula cost by the total pounds of broilers he produced during the pay period.⁴ An average formula cost per pound is then calculated for all growers by the same method described above using the total pounds of broilers produced and the total formula cost of all growers who sold birds during that period. The average formula cost per pound for all growers is considered the standard for that period. Each grower's formula cost per pound is then

⁴Individual companies may or may not subtract the weight of condemned broilers when calculating total pounds produced.

compared to the standard, and the growers who have a formula cost per pound equal to the standard receive the base payment, for example, 2 cents per pound. The growers whose formula cost is less than the standard receive the base payment plus the difference between their cost and the standard. For example, if a grower's formula cost is 1 cent below the standard cost, he receives 3 cents per pound for the broilers he produced. Growers who have a formula cost higher than the standard receive the base payment minus the difference between their cost and the standard. This type of contract has a minimum and maximum guaranteed payment per pound. Growers under this type of contract are in competition with every other grower selling broilers during the same period. Each tries to reduce his formula costs in order to get a higher payment.

II. SUPPLY OF INPUTS

Broiler production contracts used in Tennessee specify that each party, the contractor and the grower, is responsible for providing and paying for certain inputs. The grower is responsible for providing, paying for, and maintaining the broiler house and all related inputs such as feeders, waterers, brooders, and litter. He provides all labor required for growing the birds to market size and for cleaning and rebedding broiler houses between broods. The grower is responsible for the construction and maintenance of roads to his broiler house and any expenses for towing services necessitated by faulty roads.

The contractor provides the chicks, feed, veterinary services, and medicine necessary for broiler production. The company also provides the labor and equipment for transporting chicks, feed, and medicine to

farms and for catching, loading, and transporting broilers to market. The contractor makes all arrangements and decisions concerning the sale of the broilers.

Contractors also have servicemen who provide technical advice and management assistance to growers at no cost. Servicemen visit the broiler houses regularly throughout the grow-out to help spot and remedy broiler production problems and are on call at all times to assist growers.

Grower Responses About Who Supplies the Inputs

This section analyzes grower responses to questions about who paid for or supplied selected inputs used in broiler production. Although not all growers recognized that the companies paid for the feed used in broiler production, almost 82% of them did, and there was not a significant difference in the responses of growers for the four companies on this point ($P = .2691$) (Table A-26).

Most of the growers from three of the companies understood the contractual arrangements concerning medication. However, 64% of the growers from one company indicated that they paid for medication. There was a significant difference in the way growers for the four companies responded to the question of which party pays for medication ($P < .0001$). Both of these results indicate a lack of understanding between contractors and growers concerning this aspect of the production agreement. However, this problem is more pronounced between some companies and their growers than it is between others.

There was no significant difference in the way growers for the four companies perceived which party paid for veterinary services under

the terms of their contracts ($P = .8986$). This indicates a common understanding between the contractors and the growers concerning this part of the contract. Even though some confusion existed about who paid the cost of medication, over 96% of all growers indicated that the contractor paid for veterinary services.

There was no misunderstanding among any of the growers in the sample concerning who paid for the litter, electricity, and water. They all understood that the grower was responsible for paying this cost.⁵

There was no significant difference between the four companies in grower responses indicating who paid for transporting chicks and feed to the farm and broilers to market (Table A-27). Over 97% of the growers in the sample indicated that the contractor paid each of these expenses.

Some growers for two companies thought that growers, instead of the contractors, paid the labor cost for catching and loading the broilers for marketing (Table A-28). All of the growers from the other two companies understood this part of the contract. However, there was no

⁵No chi-square test was made because all grower responses were the same. The value of chi-square is undefined in this situation since:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{(n_{ij} - e_{ij})^2}{e_{ij}}$$

where: χ^2 = chi-square; n_{ij} = the observed frequency belonging to row i and column j of the table; and e_{ij} = the expected frequency belonging to row i and column j ,

$$e_{ij} = \frac{\left(\sum_{i=1}^r n_{ij} \right) \left(\sum_{j=1}^k n_{ij} \right)}{\sum_{i=1}^r \sum_{j=1}^k n_{ij}}$$

When all growers' responses are the same, the expected values for some of the e_{ij} s will equal zero, and division by zero is undefined.

significant difference in grower responses between the four companies concerning who paid the labor cost for catching and loading the broilers for marketing ($P = .1116$).

There were no conflicts in responses between the growers and their companies concerning who paid the labor cost for cleaning and rebedding the broiler houses. All of the growers sampled indicated that they furnished the labor for both of these activities.⁶

III. RESPONSIBILITY FOR MAKING DECISIONS

Under terms of the contracts for growing broilers in Tennessee, both the company and the grower have responsibility for making certain decisions affecting the broiler operation. The company is responsible for making decisions concerning the transportation of chicks and feed to the farm and broilers to market. It controls the type of feed, medication, and veterinary services used in broiler production. It either has full control, or shares control with the grower, over decisions about the time chicks are placed in broiler houses, the amount of feed and water space per house, the number of chicks placed on the farm, the space per chick in each house, and the range of grower payments per pound of broilers produced.

Representatives of three of the companies agreed that they had an input into decisions concerning the type of feeding system used in broiler houses, the type of litter used in broiler houses, when houses should be completely cleaned-out, the type of broiler house constructed

⁶Ibid.

if growers build new ones, and the type of heating and ventilating system used in each house. The manager of the fourth company indicated that growers were responsible for all these decisions.

Representatives of two companies agreed that decisions about the location of new broiler houses on a farm, building repair and maintenance, and road construction were made by growers. Managers of the other two companies agreed that they had partial, if not full, control over these decisions.

Grower Responses About How Decisions Are Made

Four companies gave the same response. The growers sampled were asked who had control over decisions concerning the transportation phase of the production cycle (Table A-29). Almost 99% of the growers agreed that the contractor had partial, if not full, control over transporting chicks to the farm, and the chi-square test showed no significant difference in grower responses between companies ($P = .5225$).

There also was no significant difference in perceptions of growers between the four companies about who controls decisions concerning transporting feed to the farm ($P = .2010$). Over 88% of the growers in the sample understood this part of the contract, and only two companies had growers who did not understand this contractual arrangement.

All growers in the sample agreed that the contracting company made decisions regarding (1) the transportation of broilers to market and (2) the type of feed, medication, and veterinary services used during the grow-out (Table A-30).⁷ All of the growers sampled concurred that these

⁷Ibid.

decisions were the responsibility of the contractor (Table A-30).

The growers in the sample were asked questions about how different managerial decisions concerning the broiler operation were made (Table A-31). There was no significant difference in their perception of who decided when chicks were placed in the houses ($P = .8466$). Almost 98% of the growers said that this decision was either a shared decision between the company and the grower or that it was left entirely up to the company. Growers for only two companies did not fully understand this part of the contractual arrangement.

The growers in the sample were asked who decides on the amount of feed and water space or the number of feeders and waterers that should be used in each house. There was no significant difference between companies in their responses to this question. Over 91% of the growers indicated that this decision was either controlled by the company or that it was shared between the grower and the company.

There also was no significant difference in grower responses between the four companies about who decides the number of chicks placed on the farm ($P = .2227$). Over 97% of the growers explained that this decision was the responsibility of the company or that it was a shared decision. Only one company had growers who translated this part of the contractual arrangement differently.

Almost 97% of the growers stated that the company decided how much space to allot per chick in a broiler house, and the chi-square test showed no significant difference in the way growers from each company answered this question ($P = .5384$). Only one company had growers who did not understand this part of the contract.

All the growers surveyed replied that contractors determined payment levels for growing broilers.⁸

Three companies gave the same response. There were some misunderstandings among the growers and companies concerning who decided what type of feeding system to use in broiler houses. As stated earlier, representatives from three companies said that this was a decision either for the company to make or to share with the growers; the other company left this decision entirely up to the grower (Table A-32). About 58% of all growers in the sample explained that growers had control over this decision. There was no significant difference between responses of growers from the three companies whose representatives gave the same answer to this question ($P = .1260$), but there was not close agreement between those growers and their contractors. For example, almost 64% of the growers from one of these three companies said this decision was made by growers. The second chi-square test also showed no significant difference between answers from growers of the group of companies which gave the same response and the company which said this decision was left to the grower ($P = .2920$). The results of the second chi-square test and the lack of agreement between growers and company managers suggest a lack of understanding between the companies and their growers concerning this aspect of their contractual arrangement.

The growers in the sample were asked who decided what type of litter should be used in broiler houses. There was no significant

⁸Ibid.

difference in grower responses between the three companies answering this question the same ($P = .1730$), but over half the growers from each of these three companies said the grower controlled this decision. The managers of these three companies had indicated that they were responsible for this decision or that it was shared with the growers. Even though there was not a close agreement between these three companies and their growers, there was a significant difference between the responses of growers for the three companies that agreed and those of the growers for the fourth company ($P = .0165$). Over 96% of the growers for the fourth company gave the same response to this question as did their company.

There was no significant difference in grower explanations of who decided when broiler houses should be cleaned-out between the three companies whose representatives said the company management is responsible for making this decision or that the decision was shared with the grower ($P = .2472$), but over 70% of the growers for two of these companies said that growers made this decision. This indicated that there was not close agreement between the growers and their contractors concerning this part of the contract. There was also no significant difference in grower responses from the three companies whose managers agreed and the responses of growers from the fourth company ($P = .3222$). Since grower responses did not reflect differences in the policies stated by company managers concerning perception of who makes this decision, one might conclude that this part of the contract was not interpreted the same by both the companies and their growers.

Although not all of the growers of the three companies giving the same answer to the question of who decided what type of house to build if new ones were built agreed with the company response, most of them did. And there was not a significant difference in the responses of growers for the three companies on this point ($P = .4348$). There was a significant difference in the way growers from these three companies and growers from the other company responded to this question ($P = .0006$). These results indicate that growers perceived this difference in company policy.

There was a significant difference in the responses of growers for the three companies whose representatives explained that they were involved in determining the type of heating system used in broiler houses ($P = .0221$). This indicates differences in the way growers for these three companies perceived this part of the contractual arrangement.⁹ Almost 93% of the growers for the other company which indicated this decision was made by growers agreed with their contractor.

There was also a significant difference in grower responses between the three companies which indicated they were involved in deciding what type of ventilating system was used in broiler houses ($P = .0011$). This shows there were differences in the way growers for these three companies perceived this part of their agreement. Almost 64% of the growers for one company gave a response different from their company. There was a better understanding between the fourth company and

⁹The second chi-square test was not made because a significant difference was found in the first test.

its growers. Over 85% of these growers agreed with their contractor that this decision was made by growers.¹⁰

Two companies gave the same response. There was no significant difference in grower responses from the two companies whose managers responded that the grower decides for himself where new houses should be located on the farm ($P = .7635$) (Table A-33). Even though some of the growers from these companies did not perceive this aspect of their contract the same way as the company managers, over 70% of them did. There was also no significant difference in the responses of growers from the two companies whose managers said they had an input into this decision ($P = .8594$), but over 60% of these growers gave a different response than their company. The chi-square test comparing the two groups of growers whose company representatives answered differently gives a further indication of some misunderstanding between the company managers and their growers concerning where new buildings are located on a farm. There was no significant difference in the answers of the two groups of growers whose company managers gave different responses to this question indicating that grower responses did not reflect differences in company policy concerning this decision-making responsibility.

Well over half of the growers whose contractors indicated that growers made all the decisions concerning the repair and maintenance of broiler houses gave the same response as their contractors when asked who made this decision. The chi-square analysis of these grower responses

¹⁰ Ibid.

indicated no significant difference between the two companies ($P = .2903$). When the answers of growers whose contractors said they had an input into this decision were analyzed, the chi-square test also showed no significant difference between the growers of these two companies. But over half of these growers explained that this was entirely their decision. Further, there was no significant difference between the responses of growers for the two companies whose managers said that repair and maintenance decisions were made by growers and the responses of growers for the other two companies indicating that grower responses did not reflect differences in the answers from company managers. The most apparent lack of agreement was between the companies whose managers said they had an input into repair and maintenance decisions and their growers.

There was also a significant amount of misunderstanding between two of the companies and their growers concerning who made road construction and repair decisions. The chi-square test for differences in grower responses between the two companies whose managers replied this decision was made by the growers was not significant ($P = .1093$). And since the majority of growers from these two companies responded the same way as the company managers, one can conclude that there was no conflict between these companies and their growers concerning road construction and repair decisions. The chi-square test comparing the responses of growers for the two companies which indicated their managers had an input into road construction and repair was not significant ($P = .2834$), but the majority of growers for these companies responded differently from the companies. This indicates a lack of communication between these two contractors and

their growers on this aspect of their contractual arrangement. The chi-square test comparing the responses of the two groups of growers whose companies gave different responses to this question shows no significant difference in their responses ($P = .1297$).

IV. PRODUCTION AND PRICE RISK

The companies and the growers in the sample were asked to explain which of the contracting parties bore the production and price risks resulting from condemnation, mortality both during the grow-out and transportation, unused capacity in broiler houses, and market price fluctuations. The purpose of this section is to show how these factors affect each contracting party and to show if there is any breakdown in communication and understanding concerning each of these factors. These breakdowns in communication and understanding are a source of many of the problems in the industry.

Condemnation

All of the companies responded that the risk of condemnation was either shared with the grower or that the company bore all the risks resulting from this factor. One company explained that growers only incurred a loss from condemnation if it was due to farm causes. If so, growers lost the payment they would have received on those birds condemned, but the company lost its total investment in the birds. Another company explained that grower payments were affected only if over 1.5% of the grow-out was condemned, regardless of the reason for condemnation. The other companies reported that they absorbed the entire loss due to this factor.

There was no significant difference in grower responses between the four companies concerning who bore the risk of condemnation ($P = .1288$), but over 65% of the growers responded differently than their company (Table A-34). This indicates a lack of understanding between all the contractors and their growers concerning this aspect of the contractual arrangement.

Mortality During the Growing Phase

All of the companies responded that the risk of mortality during the growing phase of the broiler operation was shared between the growers and the company. Two companies explained that grower payments were reduced due to mortality during the growing phase and that the company lost its total investment in dead birds.

Another company explained that it absorbed all mortality losses during the growing phase if they did not exceed 5% of the chicks started. If mortality exceeded 5%, grower payments were reduced by an amount equal to the cost of each chick that died in excess of this 5% limit. The other company explained that grower payments were reduced .1 cent per pound for every .5% mortality greater than the first 4% of the grow-out. This company bore the entire cost of mortality for the first 4% of the chicks that died during the growing phase.

There was a significant difference in grower responses between the four companies concerning who bore the risk of mortality during the growing phase of the production cycle ($P = .0111$) (Table A-34). Over 49% of all the growers in the sample said that they assumed full responsibility for this risk which indicates a problem in communication

and understanding between the companies and their growers concerning this point. However, the results of the chi-square analysis suggest that this problem was more pronounced for some companies than for others.

Mortality During Transportation

All of the companies said that they bore all the risk of broiler mortality incurred during transportation to the processing plant and that growers' payments were not reduced due to mortality during transportation. Over 75% of the growers concurred with their contractors on this point, and there was not a significant difference in grower responses between the four companies ($P = .4538$) (Table A-34). Although not all growers recognized that the company bore the risk of mortality during transportation, they had a better understanding of mortality risk during transportation than during the grow-out.

Unused Capacity of the Broiler House

There was no misunderstanding between the companies and their growers concerning who bore the risk and cost of having unused capacity in the broiler house. All of the companies and all of the growers in the sample agreed that the grower bore all the risk associated with this factor (Table A-34).

Market Price Risk

The managers of three of the companies surveyed responded that broiler market prices did not affect grower payments. The manager of the other company explained that this risk was shared to the extent that if the market price was above a specified base price, grower

payments were increased .1 cent per pound for each 1 cent the market price exceeded the base price. However, grower payments were not reduced if the market price fell below the base price.

Although some growers did not realize that the contractor bore any market price risk, about 85% of them did, and there was no significant difference in grower responses between the four companies on this point ($P = .9530$) (Table A-34). These results indicate a very uniform understanding among growers of the effects of market price risk and a high level of agreement between contractors and growers with respect to this factor.

V. SUMMARY

The interlevel coordination between two subsystems or stages of the production and marketing system of the broiler industry in Tennessee was examined in this section. The degree of understanding of broiler contract provisions between broiler contractors and their growers was assumed to influence broiler production and marketing efficiency.

A comparison of the responses of growers and company managers to selected mirror image questions was used to indicate differences in the interpretation of broiler contract provisions by contractors and growers, and a chi-square analysis was used to determine differences in grower perception of contract provisions between companies. If such differences exist between contractors and growers or between growers for different companies, changes in contract provisions or improvements in communication between the contracting parties may be needed. Contract provisions in the areas of (1) input supply, (2) decision making, and

(3) risk bearing were included in this analysis.

Two types of broiler production contracts were used by contractors in Tennessee: (1) competitive and (2) noncompetitive. Grower payments under competitive contracts were based on the cost of feed, chicks, and medication per pound of broilers produced. Growers whose cost per pound were low received higher grower payments than growers with higher costs per pound. Grower payments under noncompetitive contracts were based on either (1) feed conversion alone or (2) a combination of the attained weight of broilers and feed conversion.

All of the broiler growers surveyed in this study had the same perception of which contracting party supplied and paid for the (1) litter, (2) electricity, (3) water, and (4) labor for cleaning and rebedding broiler houses used in broiler production, and both agreed that growers paid for each of these inputs.

There was also a close but not perfect agreement between contractors and growers concerning which of them paid for (1) veterinary services, (2) transportation of chicks and feed to farms, (3) transportation of broilers to market, and (4) labor for catching and loading broilers to market. Over 90% of all growers indicated that contractors paid for each of these items, and there was not a significant difference in grower responses between companies concerning any of these production inputs.

Over 18% of the growers surveyed did not recognize that the contractor paid for feed used in broiler production. This misconception on the part of growers was uniform among companies, however, since there

was not a significant difference in grower perception of this feature of production contracts between companies.

There was both a very low and a nonuniform level of understanding on the part of broiler growers concerning which of the contracting parties paid for medication used in producing broilers. Less than 65% of the growers surveyed recognized that contractors paid for this input, and there was a significant difference in grower perceptions of which contracting party paid for this input between companies which indicated that this misunderstanding was more pronounced among the growers for some companies than among others.

There was an extreme range in the level of understanding growers exhibited concerning responsibility of the contracting parties for making selected management decisions during the broiler production process. All of the growers surveyed recognized that contractors were responsible for making decisions concerning (1) marketing broilers, (2) type of feed, (3) type of medication, (4) type of veterinary services, and (5) level of broiler payments.

Most of the growers also recognized that contractors were responsible for making decisions concerning (1) transporting chicks and feed to farms, (2) when to start chicks, (3) feed and water space in broiler houses, (4) the number of chicks each grower received, and (5) the space requirement per chick in broiler houses. Over 88% of the growers surveyed indicated that contractors were responsible for each of these decisions, and there was no significant difference in grower perception between companies concerning any of them. This indicates a uniform level of understanding among growers with respect to responsibility for each of these management decisions.

All of the contractors interviewed indicated the same degree of involvement in the decisions discussed above, but they did not all express the same policy concerning other managerial decisions in the broiler production process. The managers of either one or two of the companies surveyed indicated that broiler growers had responsibility for making decisions concerning (1) the types of feeding, heating, and ventilating systems used, (2) when houses are cleaned-out and the type of litter used in houses, (3) where new broiler houses are located on a farm and the type of houses built, and (4) building and road maintenance.

The responses of growers concerning the responsibility of the contracting parties for making decisions in the above areas did not reflect the differences expressed by the managers of the companies they contracted with except in two cases. Grower responses concerning which party was responsible for deciding the type of litter used in broiler houses and the type of new broiler houses built did reflect differences in the policies expressed by their contractors. However, the percentage of broiler growers agreeing with the policies expressed by their contractors was quite low even for these two variables.

Broiler growers are exposed to a financial risk if they have unused space in their broiler houses or if their houses are empty because they cannot get chicks from a contractor. All of the broiler growers surveyed recognized that they bore this risk involved in contract broiler production. However, many growers did not recognize that broiler contractors were also exposed to production and price risks.

Broiler contractors either shared or bore all the risks associated with (1) broiler price changes, (2) broiler condemnation, and (3) broiler

mortality during both the grow-out period and transportation to market. Almost 15% of the broiler growers surveyed indicated that they alone bore all of the risks associated with broiler market price changes. This misconception was not confined to growers from specific companies but was uniform among growers for all the companies studied.

The broiler growers surveyed had an even less accurate perception of which contracting party bore risks resulting from broiler condemnation and mortality than they did of the consequences of market price risk.

CHAPTER VII

SUMMARY AND CONCLUSIONS

I. SUMMARY

Practically all of the broilers grown in Tennessee are grown on contract, and broiler sales account for only a small portion of the total farm sales in Tennessee. However, broilers are grown in only a few counties in the state and account for a significant portion of the value of farm products sold in those counties.

Broiler production in Tennessee has failed to keep pace with U.S. broiler production. From 1969 to 1976, broiler production in the state declined almost 18%. In these same years, Tennessee's rank among broiler-producing states fell from 11th to 15th.

The main objectives of this research project were (1) to obtain a description of the broiler growers in Tennessee and their broiler enterprises, (2) determine the provisions of the contracts being used, and (3) evaluate grower attitudes toward, and degree of satisfaction with, existing conditions in Tennessee's broiler industry.

A random sample of 88 growers and the managers of four companies contracting for broiler production were personally interviewed during the spring of 1977.

The data were analyzed by geographic region to determine differences in broiler farms, broiler enterprises, and grower attitudes in different areas of Tennessee. Four areas were delineated for this

purpose. Grower perceptions of broiler production contract provisions were analyzed by company to determine the level of agreement between growers and the managers of contracting companies with respect to those provisions. A chi-square analysis was also used to test for differences in grower perceptions of contract provisions between companies.

Description of Broiler Growers and Their Farms

The average broiler grower in Tennessee in 1977 was almost 47 years old and had a ninth-grade education. He had about 9 years' experience in contract broiler production; of which almost 6 years was with the company holding his current contract.

The average size of Tennessee broiler farms was about 110 acres in 1977. The major crops produced on those farms included corn, hay, and tobacco. Beef cattle and hogs were the most common livestock enterprises on broiler farms.

The Broiler Enterprise

The growing phase of the broiler production cycle takes from 6 to 8 weeks. During this period, the grower is responsible for providing all the labor and equipment needed to insure the health and growth of the chicks. The company provides a serviceman who supervises the production process and provides growers with management information.

The most labor-intensive period of the grow-out phase is the first 2 weeks. During this period, the chicks are usually fed and watered using small trays and glass watering jugs. The amount of labor used per 1,000 chicks during this period was 6.85 hours and was almost twice that used during any other period of the grow-out phase. This is because after

the first 2 weeks of the grow-out, the chicks use automatic waterers and large feeders which are either automatic or filled by hand.

There is a period from 2 to 7 weeks between grow-outs that growers have to get their broiler houses ready for the next flock of chicks. On the average, if growers did not replace the litter in their houses, they spent 2.45 hours per 1,000 chicks cleaning up their houses between broods. If litter was replaced in broiler houses between broods, over 5 hours of labor per 1,000 chicks were required to prepare houses for the next flock of chicks.

Description of Facilities

The size of the broiler operations sampled varied considerably. The number of broiler houses per farm ranged from one to six houses, but only in Region 4 did most of the growers have more than one house. The average broiler house in the sample was about 9,247 square feet, and the modal size was 10,000 square feet. The chick capacity per farm ranged from 6,000 to 108,000, and the modal capacity was 12,000 chicks. The growers in Region 4 had the largest operations, and those in Region 2 had the smallest broiler enterprises in terms of average chick capacity per farm.

Two basic types of house construction were found on broiler farms in Tennessee: (1) pole support roof and (2) clear span roof. Houses with a pole support roof were usually older than those with a clear span roof, and the labor requirement for broiler production in those houses averaged 7.62 hours more per 1,000 chicks than in clear span houses.

The most common types of insulation used in broiler houses were styrofoam, blackboard, and thermoply. About 8% of the houses had no insulation at all.

The chain conveyor feeder was used in a larger percentage of broiler houses than any other type of feeder, and both it and the auger feeder were mechanized systems. Hog trough and pan feeders were filled by hand, and more labor was required when those systems were used.

Several different types of litter were used in broiler houses depending upon their availability. However, wood shavings and sawdust were the materials most frequently used as litter.

There were five types of heating systems being used by growers in the sample: (1) butane or propane, (2) natural gas, (3) fuel oil, (4) coal, (5) a combination of butane and coal or of propane and coal. Coal was the most important fuel used to heat broiler houses. Labor requirements per 1,000 chicks in houses heated by coal were higher than in houses heated by any other type of fuel. Butane or propane was the second most important type of fuel used in Tennessee broiler houses.

Grower Income

The growers in the sample started an average of about 74,664 chicks in 1976 and 85,479 chicks in 1975. They earned an average of about \$6,153 in 1976 and \$6,435 in 1975 from broiler production.

Broiler income per farm in Region 4 was larger than in any other region, and growers in Region 1 had the lowest average income from broiler production. In many cases broiler income was supplemented by income from other sources. Those who reported income from nonfarm

sources received an average of about \$11,205 from those sources in 1976, and broiler growers with other farm enterprises received an average of about \$7,104 from sales of farm products other than broilers in 1976.

Grower Satisfaction With Their Contracts and Servicemen

Only a narrow majority (54%) of growers felt they were being paid an equitable amount to grow broilers. However, growers did not express a preference for payments based on market prices which would require them to share the market price risk and perhaps give them a higher average return. They were split equally between those who favored this arrangement and those who did not.

Servicemen are important to growers because of their expertise in solving problems with the grow-out and in finding ways to increase grower efficiency. Over 3/4s of the growers gave their serviceman a favorable rating of excellent or good. About 80% of the growers reported farm visits by their servicemen at least once per week, but some reported only one serviceman visit per grow-out.

The contractual arrangement is an important factor influencing the degree of satisfaction of growers in Tennessee. Over 54% of the growers rated their contracts as only fair or poor which indicates they were not completely satisfied with them.

Suggestions most frequently given by growers for improving their contracts were: (1) an increase in grower payments, (2) the company should pay more of the cost of inputs, (3) provisions for a long-term contract that could not be canceled at any time, (4) provisions specifying a minimum payment per 1,000 chicks, and (5) provisions for grower

supervision over catching crews and the weighing of feed and broilers.

Over 86% of the growers surveyed indicated they would continue to produce broilers under present contractual arrangements. Some of the most often repeated reasons for doing so included: (1) the grower needs to recover his investment in broiler facilities; (2) the broiler enterprise provides an extra source of farm income; (3) the broiler enterprise provides the best source of farm income; and (4) the grower likes to grow chickens.

Some reasons given by growers indicating they would quit producing broilers unless the contractual arrangements were changed included: (1) better nonfarm employment alternatives, (2) poor health, and (3) broiler houses could be better utilized by converting them into farrowing houses for use in swine production.

Only about 23% of the growers indicated they would be interested in building new broiler houses under their present contractual arrangement. Since about 14% of the growers said they were considering getting out of broiler production and another 18% said they had no interest in building new houses under any conditions, the potential for growth in the industry is limited.

Under present conditions, Region 4 showed the most growth potential of the four regions, and Region 1 showed the poorest potential for growth. The change which growers most frequently suggested would induce them to build new broiler houses was an increase in grower payments.

Industry Coordination

The degree of understanding of the provisions of broiler contracts between growers and contractors was analyzed under the assumption of a

positive relationship between the degree of understanding of these provisions by the two parties involved and production and marketing efficiency in the industry.

Information for this analysis was obtained by a mirror image questioning procedure to obtain responses to specific questions about contractual arrangements from both broiler growers and management personnel of contracting companies. These questions covered three areas: (1) which contracting party paid for or supplied various inputs used in broiler production, (2) which contracting party had responsibility for making certain managerial decisions during the production and marketing processes, and (3) which contracting party bore certain production and price risks.

Types of Contracts

Two basic types of contracts were used by companies located in Tennessee--competitive and noncompetitive. The two types differed in the methods used to determine grower payments. Payments under the noncompetitive contracts were based on either feed conversion or a combination of feed conversion and the attained weight of the broilers. Payments under the competitive contract were determined by calculating a formula cost per pound of broilers produced, and growers with the lowest formula costs received the highest payments per pound.

Although not all growers agreed with their companies about who paid for or supplied each input, most of them did. However, a significant difference was found among responses of growers for the different companies concerning who paid for medication. And only 65% of the growers

surveyed agreed with their contractors about which party paid for this input.

Conflicts also existed between the companies and their growers concerning who has the responsibility for making certain decisions affecting the broiler industry. Growers and contractors did not concur on who made decisions about (1) what type of feeding, heating, and ventilating systems were used in broiler houses, (2) what type of litter was used, (3) when houses were completely cleaned-out, (4) the location of new broiler houses on a farm, (5) building repairs and maintenance, and (6) road construction and repairs.

The growers were asked to explain who bore the production and price risks resulting from condemnation, mortality, unused capacity of broiler houses, and fluctuations in the market price of broilers. The frequency and chi-square analyses indicated a lack of understanding between contractors and growers concerning who bore the risks of condemnation and mortality. There was fairly close agreement between the companies and their growers concerning the other production and price risks.

II. CONCLUSION

Between 1969 and 1976, broiler production in Tennessee declined from 1.65% of 1.17% of total U.S. production, and the potential for growth in the broiler industry in Tennessee appears limited.

About 14% of the growers surveyed in this study indicated that unless conditions in the industry changed, they would not continue to produce broilers, and over 87% of them indicated they would not consider building new broiler houses under present contractual arrangements. No

new broiler houses had been built in the past 3 years on broiler farms sampled in this study in three of the four regions analyzed.

Growers may be reluctant to expand broiler production because they are dissatisfied with their present broiler production contracts. Over 54% of the growers surveyed gave their contract a low rating, and over 45% of them did not think their grower payments were equitable. The main concern of growers who made suggestions to improve their contract was that grower payments should be increased, and this was also the change growers indicated would induce them to expand their broiler operations.

Even though broiler growers appeared dissatisfied with the present level of grower payments, they apparently do not view a profit sharing contractual arrangement as a better alternative to methods of calculating grower payments. The growers surveyed were especially divided as to whether or not they would prefer grower payments based on current broiler market prices.

Substantial increases in grower payments are unlikely under present conditions in the Tennessee broiler industry because companies contracting for broilers in most areas of the state have no competitors. At the time of this study, growers in three of the four study areas could contract with only one company. Growers in those three areas had to either contract with the company operating in their area or cease production. Geographic barriers between the regions delineated in this study, and associated transportation problems, restrict competition between companies located in different regions.

Regardless of whether or not there is any future expansion in broiler production in Tennessee, production is likely to continue at its

current level in the near future. Most of the broiler growers surveyed indicated that they planned to retain their broiler facilities and continue to produce broilers in the future under present contractual arrangements. One of the main reasons growers gave for continuing production was that it provided them an extra source of farm income. Other growers explained that they would stay in the industry to recover their fixed investments in broiler facilities. Broiler production also seems to fit well with off-farm work since half of the growers surveyed had nonfarm employment.

It appears that many Tennessee growers will continue to produce broilers under present contractual conditions even though they are dissatisfied with their present earnings from broiler production. And there is no indication of increased competition between contractors, which might result in better economic returns to growers, in the future either by entry of new contracting firms or by expansion of existing firms into regions other than where they now operate. An alternative to increased competition, which may improve the economic position of growers, may be improved coordination between existing broiler growers and contractors in the broiler production process. If production and marketing efficiency can be improved by better coordination between growers and contractors, the economic returns from broiler production should be increased. Since these returns are shared by the two contracting parties, the economic position of one, or both, of them should be improved.

A clear understanding of the provisions of production contracts and the responsibility of each contracting party by broiler growers should be

a prerequisite to improved coordination between contractors and growers in the production of broilers. Broiler growers in Tennessee do have an accurate perception of many provisions of production contracts and their responsibilities in the broiler production process.

However, between 10% and 20% of the growers sampled in the study do not recognize that contractors, not growers, paid for feed used in broiler production and that contractors either shared or bore all of the risks of broiler market price fluctuations. An even higher percentage disagreed with their contractors about which of the contracting parties paid for medication used in broiler production and bore the risks associated with broiler condemnation and mortality.

It is possible that some growers surveyed in this study were confused or misled by the questioning procedure used to obtain information about broiler contract provisions. However, if such a problem did exist, it did not influence grower responses with respect to all features of production contracts since all growers were in perfect agreement with their contractors concerning many aspects of their production contracts.

A more likely explanation for the observed differences in the perception of growers and contractors with respect to the above contract provisions is that many growers did not understand those provisions. If this is true, coordination between contractors and growers should be improved, and production efficiency should be increased, if these contract provisions are clarified for growers. This educational process might be conducted either by contractors, through their servicemen, or by holding group meetings with growers, or by Cooperative Extension Service personnel.

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APPENDIX

Table A-1. State and County Broiler Production--1974^a

	End of Year Inventory	Number Sold	Value of Poultry Sold ^b	Value of Ag. Prod. Sold	% of Ag. Sales From Poultry
Tennessee	6,949,646	35,269,405	73,476,000	874,192,000	8.41
Bedford	73,554	586,662	1,198,000	11,239,999	10.66
Bradley	1,567,986	6,766,938	6,118,000	11,571,000	52.87
Coffee	17,258	131,113	249,000	6,072,000	4.10
Fentress	941,625	4,159,421	3,088,000	6,065,000	50.92
Franklin	161,796	741,525	2,114,000	17,393,000	12.15
Grundy	542,503	3,898,287	3,377,000	5,710,000	59.14
Hamilton	631,154	2,650,538	4,256,000	7,953,000	53.51
Lincoln	51,770	336,001	808,000	17,362,000	4.65
McMinn	245,586	1,249,309	5,035,000	17,363,000	29.00
Marion	254,310	1,956,872	1,518,000	3,601,000	42.15
Monroe	141,546	954,285	1,298,000	9,755,000	13.31
Morgan	216,895	1,065,820	780,000	2,471,000	31.57
Polk	564,700	2,261,789	1,827,000	4,596,000	39.75
Scott	77,804	705,917	807,000	1,647,000	36.85
Sequatchie	166,100	971,470	1,081,000	2,737,000	39.50

^aFarms with sales of \$2,500 and over.

^bIncludes poultry and poultry products.

Source: Tennessee Census of Agriculture--1974.

Table A-2. State and County Broiler Production--1969^a

	End of Year Inventory	Number Sold	Value of Poultry Sold ^b	Value of Ag. Prod. Sold	% of Ag. Sales From Poultry
Tennessee	8,102,969	41,129,690	53,656,000	547,465,000	9.80
Bedford	238,508	720,480	1,111,000	8,361,000	13.29
Bradley	620,200	3,194,275	2,218,000	5,774,000	38.41
Coffee	36,482	234,907	210,000	6,072,000	3.46
Fentress	1,295,702	6,868,099	3,797,000	6,356,000	59.74
Franklin	116,349	869,580	1,517,000	9,014,000	16.83
Grundy	1,563,509	8,330,732	4,869,000	6,208,000	78.43
Hamilton	185,145	1,269,000	2,923,000	5,604,000	52.16
Lincoln	115	NAC	262,000	9,339,000	2.81
McMinn	253,058	1,399,192	1,910,000	9,089,000	21.01
Marion	351,520	2,102,758	1,316,000	2,321,000	56.70
Monroe	1,178,512	246,600	979,000	7,159,000	13.68
Morgan	501,100	1,768,725	971,000	1,966,000	49.39
Polk	378,800	2,042,972	1,341,000	2,992,000	44.82
Scott	455,500	2,429,490	1,785,000	2,503,000	71.31
Sequatchie	88,902	475,254	334,000	1,167,000	28.62

^aFarms with sales of \$2,500 and over.^bIncludes poultry and poultry products.^cNot available--only one farm reporting.

Source: Tennessee Census of Agriculture--1974.

Table A-3. Average Age, Education, and Production Experience of Tennessee Broiler Growers,
By Region in 1977

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Years Reporting	Number	Years Reporting	Number	Years Reporting	Number	Years Reporting	Number	Years Reporting	Number
Observations		28		13		19		28		88
Age										
Average	49.69									
Minimum	30.00		45.08	12	44.44	18	45.96	28	46.67	84
Maximum	70.00		68.00		68.00		66.00		70.00	
Education										
Average	7.92	26	10.08	12	9.56	18	9.54	28	9.12	84
Minimum	0.00		2.00		4.00		0.00		0.00	
Maximum	14.00		19.00		14.00		18.00		19.00	
Graduated high school		9		6		8		12		35
Some education beyond high school		2		2		1		4		9
Production Experience										
Average	10.65	28	5.55	13	8.95	19	10.16	28	9.37	88
Minimum	0.60		0.30		1.00		0.50		0.30	
Maximum	32.00		18.00		18.00		30.00		32.00	

Table A-3, continued

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Years	Number Reporting	Years	Number Reporting	Years	Number Reporting	Years	Number Reporting	Years	Number Reporting
<u>Experience</u>										
<u>Contracting</u>		28		13		19		28		88
Average	10.47		5.55		8.95		10.13		9.31	
Minimum	0.60		0.20		1.00		0.50		0.20	
Maximum	32.00		18.00		18.00		30.00		32.00	
<u>Experience with Present Contractor</u>		28		13		19		28		88
Average	4.51		4.71		7.00		6.70		5.77	
Minimum	0.60		0.20		1.00		0.50		0.20	
Maximum	9.00		18.00		18.00		11.00		18.00	

Table A-4. Average Number of Acres Operated By Broiler Growers in Tennessee By Region--1977

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Avg. Acres Reporting	Number Reporting	Avg. Acres Reporting	Number Reporting	Avg. Acres Reporting	Number Reporting	Avg. Acres Reporting	Number Reporting	Avg. Acres Reporting	Number Reporting
No. sampled		28		13		19		28		88
Acres owned	144.79	28	92.27	11	69.22	18	82.14	28	101.35	85
Rented-in	76.08	13	30.88	6	56.25	4	34.20	5	56.07	28
Rented-out	65.50	2	0.00	0	75.00	2	136.67	3	98.71	7
Total operated	175.43	28	92.31	13	73.39	18	76.33	27	110.40	86
Pct. land in crops and pasture	56.97	28	64.88	13	60.91	18	55.04	27	57.92	86

Table A-5. Crop Production on Broiler Farms in Tennessee By Region--1977

	Region 1			Region 2			Region 3			Region 4			Combined Regions		
	Avg. Acres	Number Reporting	No. sampled	Avg. Acres	Number Reporting	No. sampled	Avg. Acres	Number Reporting	No. sampled	Avg. Acres	Number Reporting	No. sampled	Avg. Acres	Number Reporting	No. sampled
Corn	20.93	15	28	33.25	4	13	23.63	8	19	12.00	6	28	21.45	33	88
Soybeans	25.00	1		50.00	1		25.00	2		0.00	0		31.25	4	
Silage-hay ^a	100.00	1		0.00	0		0.00	0		80.00	1		90.00	2	
Silage	11.00	2		0.00	0		0.00	0		0.00	0		11.00	2	
Hay	34.75	16		20.33	6		21.00	8		21.64	11		26.44	41	
Pasture	67.80	20		53.63	8		24.54	13		40.67	15		48.46	56	
Tobacco	0.91	7		1.50	3		0.00	0		0.30	2		0.96	12	
Wheat	0.00	0		10.00	1		45.00	1		20.00	1		25.00	3	
Vegetables	69.83	6		0.00	0		5.00	1		0.00	0		60.57	7	
Pine trees	0.00	0		30.00	1		0.00	0		0.00	0		30.00	1	
Soybeans-wheata	0.00	0		0.00	0		0.00	0		45.00	1		45.00	1	
Hay-pasture ^a	0.00	0		0.00	0		0.00	0		17.00	2		17.00	2	
Idle-wooded	75.49	28		32.42	13		28.69	18		35.61	27		46.46	86	

^aAcres were double cropped.

Table A-6. Livestock Inventory on Broiler Farms in Tennessee By Region, January 1977

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Avg. Head	Number Reporting	Avg. Head	Number Reporting	Avg. Head	Number Reporting	Avg. Head	Number Reporting	Avg. Head	Number Reporting
No. sampled		28		13		19		28		88
Beef	49.24	17	40.25	8	27.50	6	45.07	14	43.44	45
Dairy	26.33	3	2.00	1	32.00	2	52.67	3	33.67	9
Brood hogs	9.22	9	14.00	8	9.89	9	6.17	6	10.03	32
Other hogs	15.80	5	61.80	5	32.00	6	15.00	2	33.89	18
Horses	3.00	5	2.00	1	1.00	1	2.17	6	2.39	13
Chickens ^a	0.00	0	0.00	0	0.00	0	50.00	1	50.00	1
Sheep	8.00	1	0.00	0	0.00	0	0.00	0	8.00	1

^aChickens other than broilers.

Table A-7. Total Labor Required Per 1,000 Chicks For Broiler Production in Tennessee By Region^a

	Region 1	Region 2	Region 3	Region 4	Combined Regions
	-----Hours per 1,000 chicks started-----				-----
First 2 weeks	8.09	6.87	7.70	4.94	6.85
Second 2 weeks	4.05	2.72	4.37	2.59	3.46
Third 2 weeks	3.96	2.90	4.34	2.60	3.46
Fourth 2 weeks	4.10	2.90	4.59	2.27	3.63
Subtotal	20.20	15.39	21.00	12.40	17.40
Clean-up ^b	1.99	2.90	4.90	1.45	2.45
Clean-out ^c	5.27	6.13	6.56	4.03	5.27
Total when clean-up	22.19	18.29	25.90	13.85	19.85
Total when clean-out	25.47	21.52	27.56	16.43	22.67

^aAll numbers are for total hours per period and assume a full 8-week grow-out.

^bAverage is only for those who clean-up their houses.. Clean-up is the preparation of a broiler house for the next brood of chicks leaving old litter in the house and adding a fresh layer of new litter on top.

^cClean-out is the preparation of a broiler house for the next brood of chicks including removing and replacing the old litter. Some growers clean-out between every brood; others only clean-out once per year.

Table A-8. Size of Broiler Operations in Tennessee By Region

Units		Region 1	Region 2	Region 3	Region 4	Combined Regions
No. of Houses Per Farm						
No. of farms	Farms	28	13	19	28	88
Houses on farms	Houses/farm	43	15	25	53	136
Mean	Houses/farm	1.54	1.15	1.32	1.89	1.55
Mode	Houses/farm	1.00	1.00	1.00	2.00	1.00
Minimum	Houses/farm	1	1	1	1	1
Maximum	Houses/farm	5	2	4	6	6
Size of Houses						
No. of farms	Farms	26	13	19	28	86
Houses on farms	Houses	41	15	25	53	134
Mean	Sq. Ft./house	7502.68	10123.07	9026.31	10074.44	9247.20
Mode	Sq. Ft./house	10000.00	10000.00	10000.00	10000.00	10000.00
Minimum	Sq. Ft./house	3867.00	7000.00	6240.00	5250.00	3867.00
Maximum	Sq. Ft./house	12500.00	12000.00	10400.00	16000.00	16000.00
Chick Capacity Per Farm						
No. of farms	Farms	28	13	19	28	88
Houses on farms	Houses/farm	43	15	25	53	136
Mean	Chicks/farm	14510.71	13953.84	14305.26	24945.00	17697.73
Mode	Chicks/farm	12000.00	12000.00	12500.00	12000.00	12000.00
Minimum	Chicks/farm	6000.00	9800.00	8000.00	9000.00	6000.00
Maximum	Chicks/farm	60000.00	21000.00	50000.00	108000.00	108000.00

Table A-9. Age of Broiler Houses in Tennessee Per Farm By Region

	Units	Region 1	Region 2	Region 3	Region 4	Combined Regions
No. of farms	Farms	27	13	18	28	86
No. of houses on farms	Houses	42	15	24	53	134
Mean	Years	11.73	8.69	8.04	9.71	9.93
Mode	Years	9.00	6.00	5.00	10.00	10.00
Minimum	Years	6.00	4.00	3.00	1.00	1.00
Maximum	Years	20.00	18.00	16.00	24.00	24.00

Table A-10. Type Roofs, Insulation, Feeders, and Litter Used for Broiler Houses in Tennessee
By Region

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	No. Houses	%	No. Houses	%	No. Houses	%	No. Houses	%	No. Houses	%
Type Roof										
No. houses	43	100.00	15	100.00	25	100.00	53	100.00	136	100.00
Clear span	9	20.93	0	0.00	1	4.00	19	35.85	29	21.32
Pole type	34	79.07	15	100.00	24	96.00	34	64.15	107	78.68
Insulation										
No. houses	42	100.00	15	100.00	25	100.00	53	100.00	135	100.00
Not insulated	9	21.43	0	0.00	1	4.00	1	1.89	11	8.15
Styrofoam	9	21.43	5	33.33	16	64.00	41	77.36	71	52.59
Blackboard	22	52.38	3	20.00	2	8.00	3	5.66	30	22.22
Thermoply	1	2.38	3	20.00	4	16.00	2	3.77	10	7.41
Pasteboard	0	0.00	2	13.33	2	8.00	0	0.00	4	2.96
Other	1	2.38	2	13.33	0	0.00	6	11.32	9	6.67
Type Feeders										
No. houses	43	100.00	15	100.00	25	100.00	53	100.00	136	100.00
Chain conveyor	12	27.91	9	60.00	11	44.00	26	49.06	58	42.65
Hog trough	23	53.49	4	26.67	12	48.00	2	3.77	41	30.15
Pan	8	18.60	1	6.67	2	8.00	0	0.00	11	8.09
Auger	0	0.00	1	6.67	0	0.00	25	47.17	26	19.12
Type Litter										
No. houses	43	100.00	15	100.00	25	100.00	53	100.00	136	100.00
Sawdust	14	32.56	8	53.33	24	96.00	6	11.32	52	38.24
Shavings	14	32.56	0	0.00	0	0.00	40	75.47	54	39.71
Sawdust & shavings	13	30.23	0	0.00	0	0.00	6	11.32	19	13.97
Other	2	4.65	7	46.67	1	4.00	1	1.89	11	8.09

Table A-11. Average Age of Houses By Type of Roof By Region

	Number of Houses	Clear Span		Pole Type	
		% of Houses	Avg. Age of Houses (Years)	% of Houses	Avg. Age of Houses (Years)
Region 1	42	21.43	9.44	78.57	12.64
Region 2	15	0.00	--	100.00	9.87
Region 3	24	4.17	1.00	95.83	9.30
Region 4	53	35.85	5.10	64.15	10.97
All regions	134	21.64	6.31	78.36	10.97

Table A-12. Total Labor Requirement Per 1,000 Chicks By Type Roof on House^a

	Units	Clear Span	Pole Support
Number of observations	Farms	16	64
First 2 weeks	Hours	5.50	7.55
Second 2 weeks	Hours	2.53	3.89
Third 2 weeks	Hours	2.51	3.91
Fourth 2 weeks	Hours	2.48	3.96
Subtotal	Hours	13.02	19.31
Clean-up ^b	Hours	1.55	1.39
Clean-out ^c	Hours	4.29	5.64
Total when clean-up	Hours	14.57	20.70
Total when clean-out	Hours	17.31	24.95

^aNumbers are for total hours per period and assume a full 8-week grow-out.

^bAverages are based only on those who reported cleaning-up their houses. Clean-up is the preparation of a broiler house leaving the old litter in the house and adding a fresh layer of new litter on top.

^cClean-out is the preparation of a broiler house for the next brood of chicks including removing and replacing the old litter.

Table A-13. Total Labor Required Per 1,000 Chicks By Type Feeders^a

	Units	Chain Conveyor	Hog Trough	Pan	Auger
No. of observations	Farms	33	31	6	13
First 2 weeks ^b	Hours	5.85	8.19	11.68	4.93
Second 2 weeks	Hours	2.77	4.54	6.01	2.14
Third 2 weeks	Hours	2.70	4.63	5.64	2.28
Fourth 2 weeks	Hours	2.48	4.91	5.64	2.16
Subtotal	Hours	13.80	22.27	28.97	11.51
Clean-up ^c	Hours	1.59	1.44	1.72	1.02
Clean-out ^d	Hours	5.10	5.24	7.92	4.56
Total when clean-up	Hours	15.39	23.71	30.69	12.53
Total when clean-out	Hours	18.90	27.51	36.89	16.07

^aNumbers are for total hours per period and assume a full 8-week grow-out.

^bPeriod may be invalid for comparison. Chicks are fed in trays regardless of the type of feeder used.

^cClean-up is the preparation of a broiler house for the next brood of chicks leaving the old litter in the house and adding a fresh layer of new litter on top. Averages are based only on those who reported cleaning-up their houses.

^dClean-out is the preparation of a broiler house for the next brood of chicks including removing and replacing the old litter. Some growers clean-out between every brood; others only clean-out once per year.

Table A-14. Type Fuel to Heat Broiler Houses in Tennessee By Regions

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Number of Farms	%	Number of Farms	%	Number of Farms	%	Number of Farms	%	Number of Farms	%
Observations	28	100.00	13	100.00	19	100.00	28	100.00	88	100.00
Butane or propane	0	0.00	5	38.46	8	42.11	23	82.14	36	40.91
Natural gas	1	3.57	1	7.69	0	0.00	0	0.00	2	2.27
Fuel oil	2	7.14	0	0.00	1	5.26	0	0.00	3	3.41
Coal	23	82.14	7	53.85	9	47.37	5	17.86	44	50.00
Butane and coal or propane and coal	2	7.14	0	0.00	1	5.26	0	0.00	3	3.41

Table A-15. Total Labor Required Per 1,000 Chicks By Type Fuel Used To Heat Broiler Houses^a

	Propane or Butane		Natural Gas	Fuel Oil	Coal	Butane or Propane and Coal
	No. of farms					
	35		2	3	44	3
-----hours-----						
First 2 weeks	5.87		3.84	9.24	7.81	3.82
Second 2 weeks	2.72		3.36	4.28	4.12	1.92
Third 2 weeks	2.80		3.36	4.28	4.05	1.92
Fourth 2 weeks	2.66		3.36	5.45	4.06	2.11
Subtotal	14.05		13.92	23.25	20.04	9.77
Clean-up ^b	2.53		2.67	2.67	2.28	2.90
Clean-out ^c	5.49		4.43	5.54	4.97	3.73
Total when clean-up	16.58		16.59	25.92	22.32	12.67
Total when clean-out	19.54		18.35	28.79	25.01	13.50

^aNumbers are for total hours per period.^bAverages are based only on those who reported cleaning-up their houses. Clean-up is the preparation of a broiler house for the next brood of chicks leaving the old litter in the house and adding a fresh layer of new litter on top.^cClean-out is the preparation of a broiler house for the next brood of chicks including removing and replacing the old litter.

Table A-16. Average Number of Broilers Started Per Farm By Region

	Region 1	Region 2	Region 3	Region 4	Combined Regions
1976 Number of farms	52194.29 28	49430.77 13	56163.16 19	120682.13 28	74663.63 88
1975 Number of farms	58813.63 22	17400.00 2	45740.00 5	125543.44 23	85478.85 52

Table A-17. Gross Broiler Income, Gross Broiler Income Per 1,000 Chicks, and Farm Sales 1975 and 1976, and Gross Nonfarm Income 1976, By Regions

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	\$	Number Reporting	\$	Number Reporting	\$	Number Reporting	\$	Number Reporting	\$	Number Reporting
Observations		28		13		19		28		88
Gross broiler income--1976	3035.44	25	3964.44	9	5291.66	18	10344.44	27	6153.36	79
Gross broiler income per 1,000 chicks--1976	64.77	25	34.54	9	94.18	18	86.54	27	81.17	79
Gross broiler income--1975	3277.00	18	NA ^a	2	3390.00	5	9713.04	23	6435.43	49
Gross broiler income per 1,000 chicks--1975	66.60	17	NA ^a	1	63.89	4	83.00	23	89.29	45
Farm sales--1976 ^b	6536.86	15	3850.00	4	13916.66	6	5491.66	12	7104.13	37
Farm sales--1975 ^b	4436.36	11	5000.00	4	7250.00	4	6016.66	12	5483.87	31
Gross nonfarm income--1976	9596.86	14	11240.00	5	10995.20	10	13086.15	13	11205.43	42

^aDeleted to avoid possible disclosure of information about a specific broiler grower.

^bSales other than from broilers.

Table A-18. Average Months Growers Worked Off Farm By Region--1976

	Region 1		Region 2		Region 3		Region 4		Combined Regions	
	Mos.	Reporting	Mos.	Reporting	Mos.	Reporting	Mos.	Reporting	Mos.	Reporting
Observations		28		13		19		28		88
Off-farm work	11.14	14	11.00	6	11.73	11	11.14	14	11.27	45



Table A-19. Grower Satisfaction With Contract and Servicemen By Region

<u>Are you paid an equitable amount?</u>							
	Units	Region 1	Region 2	Region 3	Region 4	Combined Regions	
No. of observations							
Yes	Number	27	13	19	28	87	
	Percent	40.74	76.92	57.80	53.57	54.02	
No	Percent	59.26	23.08	42.11	46.43	45.98	
<u>Would you share market price risk?</u>							
No. of observations							
Don't know	Number	27	13	19	28	87	
Yes	Percent	0.00	30.77	5.26	0.00	5.75	
	Percent	48.15	28.08	42.11	60.71	47.13	
No	Percent	51.85	46.15	52.63	39.29	47.13	
<u>Rate serviceman</u>							
No. of observations							
Excellent	Number	25	13	19	28	85	
	Percent	12.00	53.85	26.32	21.43	24.71	
Good	Percent	64.00	30.77	52.63	50.00	51.76	
Fair	Percent	16.00	15.38	21.05	25.00	20.00	
Poor	Percent	8.00	0.00	0.00	3.57	3.53	

Table A-19, continued

	Units	Region 1	Region 2	Region 3	Region 4	Combined Regions
<u>How often does the serviceman visit your houses?</u>						
No. of observations						
Twice per week	Number	28	13	18	28	87
Once every week	Percent	0.00	0.00	5.56	3.57	2.30
Once every 2 weeks	Percent	60.71	100.00	83.32	89.29	80.45
Once every 4 weeks	Percent	17.86	0.00	5.56	7.14	9.20
Once per grow-out	Percent	14.29	0.00	5.56	0.00	5.75
	Percent	7.14	0.00	0.00	0.00	2.30
<u>Rate contract</u>						
No. of observations	Number	25	13	18	28	84
Excellent	Percent	4.00	7.69	0.00	7.14	4.76
Good	Percent	24.00	38.46	55.56	46.43	40.47
Fair	Percent	48.00	38.46	38.88	32.14	39.29
Poor	Percent	24.00	15.39	5.56	14.29	15.48

Table A-20. Grower Suggestions to Improve Their Contracts and Situation in the Industry By Region^a

	Region 1	Region 2	Region 3	Region 4	Combined Regions
Number of observations	26	10	18	26	80
-----percent-----					
Minimum grower payment per 1,000 chicks	30.77	20.00	0.00	7.69	15.00
Company pay more of input costs, e.g., fuel, utilities, medication, clean-out	0.00	60.00	55.56	19.23	26.25
Allow more grower supervision over catchers and weighing feed and chicks	26.92	10.00	5.56	11.54	15.00
Increase grower payment	34.62	30.00	44.44	53.85	42.50
Long-term contract	3.85	60.00	16.67	23.08	20.00
More contractor-grower cooperation in writing contracts and decision making	7.69	0.00	27.78	3.85	10.00
Specify time between broods and a full house of chicks for growers	3.85	0.00	11.11	7.69	6.25
Provide growers training in better production methods	7.69	10.00	0.00	7.69	6.25

Table A-20, continued

	Region 1	Region 2	Region 3	Region 4	Combined Regions
	-----percent-----				
Contractors operate parts and supply service for inputs not now furnished; e.g., fuel, feed, equipment	0.00	20.00	0.00	0.00	2.50
Improve feed distribution system	0.00	0.00	11.11	7.69	5.00
Share market price risk	11.54	0.00	5.56	0.00	5.00
Remove ceiling on grower payments	0.00	0.00	5.56	0.00	1.25
Contractor share more mortality and condemnation loss	7.69	0.00	0.00	0.00	2.50
Provide better chicks	0.00	0.00	0.00	3.85	1.25

^aThe percentages in each column do not equal 100 because some growers gave more than one response.

Table A-21. Explanations for Continuing to Produce Broilers Under Present Contractual Arrangements By Region^a

	Region 1	Region 2	Region 3	Region 4	Combined Regions
Number of observations	28	13	19	28	88
-----percent-----					
Growers who will continue to produce	75.00	84.62	94.74	92.86	86.36
Only income source	0.00	0.00	10.53	3.57	3.41
Best source of farm income	0.00	30.77	21.05	28.57	18.18
Extra source of farm income	21.43	23.08	26.32	28.57	25.00
Better than nonfarm employment alternatives	0.00	0.00	10.53	10.71	5.68
Source of retirement income	3.57	0.00	5.26	14.29	6.82
Recover investments in broiler facilities	17.86	15.38	42.11	28.57	26.14
Provides employment for family	0.00	7.69	5.26	10.71	5.68
Grower likes to grow chickens	10.71	15.38	10.53	21.43	14.77
Litter is valuable in production of farm crops	14.29	0.00	10.53	3.57	7.95
Other	0.00	0.00	5.26	7.14	3.41
No explanation given	7.14	7.69	0.00	0.00	3.41

^aSince some growers gave multiple responses to this question, the column percentages will not add up to equal the percentage who want to continue to produce. The percentages are calculated by using the total number of observations as a base.

Table A-22. Explanations for Discontinuing Broiler Production Under Present Contractual Arrangements By Region^a

	Region 1	Region 2	Region 3	Region 4	Combined Regions
Number of observations	28	13	19	28	88
-----percent-----					
Growers who will discontinue production	25.00	15.38	5.26	7.14	13.64
Broiler income too low	10.71	0.00	5.26	7.14	6.82
Grower is converting broiler house to farrowing house	0.00	7.69	0.00	0.00	1.14
Better nonfarm employment alternatives	3.57	0.00	0.00	0.00	1.14
Poor health	3.57	0.00	0.00	0.00	1.14
Other	10.71	7.69	0.00	0.00	4.55

^aSome growers gave multiple responses to their question; therefore, the column percentages will not add up to equal the percentage who want to quit. The percentages are calculated by using the total number of observations as a base.

Table A-23. Percent of Growers Who Would Consider Building New Houses Under Their Present Condition, Those Who Would Not Consider Building New Houses, and Changes Needed for Them to Consider Building By Region^a

	Region 1	Region 2	Region 3	Region 4	Combined Regions
Number of observations	28	13	19	28	88
-----percent-----					
Those who would consider building under present conditions	14.29	23.08	21.05	32.14	22.73
Those who would not consider building under present conditions	85.71	76.92	78.95	67.86	77.27
Increase grower payments	53.57	15.38	15.79	21.43	29.55
Guarantee minimum grower payment	14.29	15.38	10.53	7.14	11.36
Guarantee chicks placed with grower	3.57	23.08	26.32	14.29	14.77
Grower build without incurring debt	0.00	7.69	10.53	35.71	14.77
Other	3.57	0.00	5.26	7.14	4.55
No explanation given	7.14	7.69	0.00	0.00	3.41
Will not build under any conditions	10.71	15.38	21.05	25.00	18.18

^aSince some of growers gave multiple responses to this question, the column percentages will not add up to equal the percentage of growers who would not consider building under present conditions. The percentages are figures by using the total number of observations as a base.

Table A-24. An Example of a Schedule of Grower Payments Based on Feed Conversion^a

Feed Conversion	Payment Per lb.	Feed Conversion	Payment Per lb.
2.17 - below	2.20	2.32 - 2.35	1.90
2.18 - 2.20	2.15	2.36 - 2.39	1.80
2.21 - 2.23	2.10	2.40 - 2.43	1.70
2.24 - 2.27	2.05	2.44 - 2.49	1.60
2.28 - 2.31	2.00	2.50 - Above	1.50

^aProducer will be paid the above amounts per pound of broiler produced based on amount of feed required to produce a pound of salable broiler.

Table A-25. An Example of a Schedule of Grower Payments Based on Weight and Feed Conversion^a

Feed Conversion Per Pound of Meat	2.79	2.80	2.90	3.00	3.10	3.20	3.30	3.40
	or Less	2.89	2.99	3.09	3.19	3.29	3.39	3.49
From - Thru								
1.71 - 1.72	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00
1.73 - 1.74	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95
1.75 - 1.76	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90
1.77 - 1.78	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85
1.79 - 1.80	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80
1.81 - 1.82	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75
1.83 - 1.84	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70
1.85 - 1.86	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65
1.87 - 1.88	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60
1.89 - 1.90	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55
1.91 - 1.92	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50
1.93 - 1.94	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45
1.95 - 2.00	2.00	2.00	2.10	2.20	2.25	2.30	2.35	2.40

NOTE: Two rows of figures above double line indicate average weight (in pounds) in which birds fall; figures below double line indicate price per pound (in cents).

^a Average weight to be determined by dividing pounds of salable broiler meat after deducting condemnation in excess of 1.5 percent of total weight by total number of broilers received at processing plant; feed conversion to be determined by dividing feed used by total weight of live birds less live weight of birds condemned in excess of 1.5 percent of total weight; if mortality is 4.1 percent through 4.9 percent, deduct .1 cents per pound, 5 percent through 5.9 percent, deduct .2 cents per pound, 6 percent through 6.9 percent, deduct .3 cents per pound, 7 percent and over, deduct .4 cents per pound; grower payment to be determined as follows: Base payment will be 2 cents per pound of salable meat, unless before condemnation feed conversion exceeds 2.30. For each .01 over 2.30, deduct .0005 cents from base.

Table A-26. Percent of Growers Indicating Who Pays for Selected Inputs, By Company and Chi-Square Statistics^a

	Number	Party Who Pays		Chi-Square Statistics
		Grower	Company ^b	
		-----percent-----		
Feed				
Company 1	28	7.1	92.9	$\chi^2 = 3.92985$ df = 3 P = .2691
Company 2	36	25.0	75.0	
Company 3	17	17.6	82.4	
Company 4	7	28.6	71.4	
All companies	88	18.2	81.8	
Medication				
Company 1	28	7.1	92.9	$\chi^2 = 24.23686$ df = 3 P < .0001
Company 2	36	63.9	36.1	
Company 3	17	29.4	70.6	
Company 4	7	14.3	85.7	
All companies	88	35.2	64.8	
Veterinary Services				
Company 1	28	3.6	96.4	$\chi^2 = .59053$ df = 3 P = .8986
Company 2	35	2.9	97.1	
Company 3	17	5.9	94.1	
Company 4	7	0.0	100.0	
All companies	88	3.4	96.6	
Litter				
Company 1	28	100.0	0.0	$\chi^2 =$ df = P =
Company 2	36	100.0	0.0	
Company 3	17	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	88	100.0	0.0	

Table A-26, continued

	Number	Party Who Pays		Chi-Square Statistics ^c
		Grower	Company ^b	
		-----percent-----		
Electricity				
Company 1	24	100.0	0.0	$\chi^2 =$ $df =$ $P =$
Company 2	36	100.0	0.0	
Company 3	17	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	84	100.0	0.0	
Water				
Company 1	24	100.0	0.0	$\chi^2 =$ $df =$ $P =$
Company 2	36	100.0	0.0	
Company 3	17	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	84	100.0	0.0	

^aAll companies gave the same response to each variable.

^bThe company either pays the entire cost or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level. When there was no deviation in growers' responses, no chi-square test could be made. For all tables using chi-square, a significant difference is assumed if a chi-square value is larger than $\chi^2_{.05}$ (or if $P \leq .05$).

Table A-27. Percent of Growers Indicating Who Pays for Selected Transportation Costs By Company and Chi-Square Statistics^a

	Number	Party Who Pays		Chi-Square Statistics ^c
		Grower	Company ^b	
		-----percent-----		
Chicks to Farm				
Company 1	28	0.0	100.0	$\chi^2 = 1.50299$ df = 3 P = .6816
Company 2	35	2.9	97.1	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	87	1.1	98.9	
Feed to Farm				
Company 1	28	0.0	100.0	$\chi^2 = 5.58555$ df = 3 P = .1336
Company 2	35	2.9	97.1	
Company 3	17	0.0	100.0	
Company 4	7	14.3	85.7	
All companies	87	2.3	97.7	
Broilers to Market				
Company 1	28	0.0	100.0	$\chi^2 = 1.50299$ df = 3 P = .6816
Company 2	35	2.9	97.1	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	87	1.2	98.8	

^aAll companies gave the same response to each variable.

^bThe company either pays all of the cost or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level.

Table A-28. Percent of Growers Indicating Who Pays For or Supplies Selected Labor Inputs By Company and Chi-Square Statistics^a

	Number	Party Who Pays ^b		Chi-Square Statistics ^c
		Grower	Company	
		-----percent-----		
LABOR				
<u>Catching and Loading</u>				
Company 1	28	17.9	82.1	$\chi^2 = 6.00011$ df = 3 P = 0.1116
Company 2	35	5.7	94.3	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	87	8.0	92.0	
<u>Cleaning Houses</u>				
Company 1	28	100.0	0.0	$\chi^2 =$ df = P =
Company 2	36	100.0	0.0	
Company 3	17	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	88	100.0	0.0	
<u>Rebedding Houses</u>				
Company 1	28	100.0	0.0	$\chi^2 =$ df = P =
Company 2	36	100.0	0.0	
Company 3	17	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	88	100.0	0.0	

^aAll companies gave the same response for each variable.

^bCompany either pays all of the cost or shares it with the grower.

Table A-28, continued

χ^2 = chi-square; df = degrees of freedom; P = level of significance. When there was no deviation in growers' responses, no chi-square test could be made.

Table A-29. Percent Growers Indicating Who Has Control Over Selected Transportation Decisions
By Company and Chi-Square Statistics^a

	Number	Party Controlling Decision Grower	Company ^b	Chi-Square Statistics ^c
-----percent-----				
<u>Chicks to Farm</u>				
Company 1	27	3.7	96.3	$\chi^2 = 2.24806$
Company 2	36	0.0	100.0	$df = 3$
Company 3	17	0.0	100.0	$P = 0.5225$
Company 4	7	0.0	100.0	
All companies	87	1.1	98.9	
<u>Feed to Farm</u>				
Company 1	27	18.5	81.5	$\chi^2 = 4.62932$
Company 2	36	13.9	86.1	$df = 3$
Company 3	17	0.0	100.0	$P = 0.2010$
Company 4	7	0.0	100.0	
All companies	87	11.5	88.5	
<u>Broilers to Market</u>				
Company 1	26	0.0	100.0	$\chi^2 =$
Company 2	36	0.0	100.0	$df =$
Company 3	17	0.0	100.0	$P =$
Company 4	7	0.0	100.0	
All companies	86	0.0	100.0	

^aAll companies gave the same response to each variable.

^bThe company either has full responsibility or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level. When there was no deviation in growers' responses, no chi-square test could be made.

Table A-30. Percent of Growers Indicating Who Has Control Over Decisions About Selected Inputs By Company and Chi-Square Statistics^a

	Number	Party Controlling Decision Grower Company ^b	Chi-Square Statistics ^c
		-----percent-----	
Feed			
Company 1	27	0.0	$\chi^2 =$
Company 2	36	0.0	df =
Company 3	17	0.0	P =
Company 4	7	0.0	
All companies	87	0.0	
Medication			
Company 1	27	0.0	$\chi^2 =$
Company 2	36	0.0	df =
Company 3	17	0.0	P =
Company 4	7	0.0	
All companies	87	0.0	
Veterinary Services			
Company 1	27	0.0	$\chi^2 =$
Company 2	36	0.0	df =
Company 3	17	0.0	P =
Company 4	7	0.0	
All companies	87	0.0	

^aAll companies gave the same response to each variable.

^bCompany either has full responsibility or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level. Since there was no deviation in growers' responses, no chi-square test could be made.

Table A-31. Percent of Growers Indicating Who Has Control Over Selected Managerial Decisions By Company and Chi-Square Statistics^a

	Number	Party Controlling Decision Grower	Company ^b	Chi-Square Statistics ^c
-----percent-----				
<u>When Chicks are Placed</u>				
<u>in Houses</u>				
Company 1	28	3.6	96.4	$\chi^2 = 0.81211$ df = 3 P = 0.8466
Company 2	36	2.8	97.2	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	88	2.3	97.7	
<u>Feed and Water Space</u>				
<u>Per House</u>				
Company 1	28	17.9	82.1	$\chi^2 = 5.07658$ df = 3 P = 0.1663
Company 2	36	5.6	94.4	
Company 3	17	0.0	100.0	
Company 4	7	14.3	85.7	
All companies	88	9.1	90.9	
<u>Number of Chicks Placed</u>				
<u>on Farm</u>				
Company 1	28	7.1	92.9	$\chi^2 = 4.38538$ df = 3 P = 0.2227
Company 2	36	0.0	100.0	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	88	2.3	97.7	

Table A-31, continued

	Number	Party Controlling Decision Grower	Company ^b	Chi-Square Statistics ^c
-----percent-----				
<u>Space Per Chick in House</u>				
Company 1	28	3.6	96.4	$\chi^2 = 2.16748$ df = 3 P = 0.5384
Company 2	36	0.0	100.0	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	88	1.1	98.9	
<u>Range of Payments Per Pound</u>				
Company 1	28	0.0	100.0	$\chi^2 =$ df = P =
Company 2	36	0.0	100.0	
Company 3	17	0.0	100.0	
Company 4	7	0.0	100.0	
All companies	88	0.0	100.0	

^aAll companies gave the same response to each variable.

^bThe company either has full responsibility or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level. When there was no deviation in growers' responses, no chi-square test could be made.

Table A-32. Percent of Growers Indicating Who Has Control Over Selected Decisions About the Equipment and Buildings, By Company and Chi-Square Statistics^a

	Number	Party Controlling Decision		Group B Chi-Square Statistics ^c	Group A-B Chi-Square Statistics ^d
		Grower	Company ^b		
-----percent-----					
<u>Type of Feed System</u>					
(A) Company 1	28	67.9	32.1	$\chi^2 = 4.14296$ df = 2 P = .1260	$\chi^2 = 1.11035$ df = 1 P = .2920
(B) Company 2	36	63.9	36.1		
(B) Company 3	17	35.3	64.7		
(B) Company 4	7	42.9	57.1		
All companies	88	58.0	42.0		
<u>Type of Litter</u>					
(A) Company 1	28	96.4	3.6	$\chi^2 = 3.50895$ df = 2 P = .1730	$\chi^2 = 5.75292$ df = 1 P = .0165
(B) Company 2	36	80.6	19.4		
(B) Company 3	17	58.8	41.2		
(B) Company 4	7	57.1	42.9		
All companies	88	79.5	20.5		
<u>When Houses are Cleaned Out</u>					
(A) Company 1	28	82.1	17.9	$\chi^2 = 2.79474$ df = 2 P = .2472	$\chi^2 = .97993$ df = 1 P = .3222
(B) Company 2	35	71.4	28.6		
(B) Company 3	17	76.5	23.5		
(B) Company 4	7	42.9	57.1		
All companies	87	73.6	26.4		

Table A-32, continued

Type of House (When Built)	Number	Party		Group B Chi-Square Statistics ^c	Group A-B Chi-Square Statistics ^d
		Controlling Grower	Decision Company ^b		
		-----percent-----			
Type of House (When Built)					
(A) Company 1	27	66.7	33.3	$\chi^2 = 1.66588$	$\chi^2 = 11.63668$
(B) Company 2	35	31.4	68.6	df = 2	df = 1
(B) Company 3	17	17.6	82.4	P = .4348	P = .0006
(B) Company 4	7	14.3	85.7		
All companies	86	38.4	61.6		
Type of Heating System					
(A) Company 1	28	92.9	7.1	$\chi^2 = 7.62715$	$\chi^2 =$
(B) Company 2	36	63.9	36.1	df = 2	df =
(B) Company 3	17	23.5	76.5	P = .0221	
(B) Company 4	7	57.1	42.9		
All companies	88	64.8	35.2		
Type Ventilating System					
(A) Company 1	28	85.7	14.3	$\chi^2 = 13.54006$	$\chi^2 =$
(B) Company 2	36	63.9	36.1	df = 2	df =
(B) Company 3	17	11.8	88.2	P = .0011	P =
(B) Company 4	7	28.6	71.4		
All companies	88	58.0	42.0		

^aThree of the four companies gave the same response to each variable. Those with the same prefix letter gave the same response.

^bCompany either has full responsibility or shares it with the grower.

Table A-32, continued

^cA chi-square analysis was run on growers' responses for the three companies that gave the same response--those with letter prefix "B." Managers of Group B companies indicated that they made these decisions or at least had an input in the decision-making process.

^dChi-square statistics for comparison of growers' responses of the three companies with prefix letter "B" as one group and with the grower responses from company with the prefix letter "A" as the second group. This test was not made when the chi-square statistics from Group B showed a significant difference.

Table A-33. Percent of Growers Indicating Who Has Control Over Selected Decisions About Buildings and Roads Construction and Maintenance By Company and Chi-Square Statistics^a

Location of House(s)	Number	Party		Group A Chi-Square Statistics ^c	Group B Chi-Square Statistics ^d	Group A-B Chi-Square Statistics ^e
		Controlling Grower	Decision Company ^b			
		-----percent-----				
<u>Location of House(s)</u>						
(A) Company 2	35	62.9	37.1	$\chi^2 = .03136$ df = 1 P = .8594	$\chi^2 = .09051$ df = 1 P = .7635	$\chi^2 = .58886$ df = 1 P = .4429
(A) Company 3	17	64.7	35.3			
(B) Company 1	24	75.0	25.0			
(B) Company 4	7	71.4	28.6			
All companies	83	67.5	32.5			
<u>Building Repair and Maintenance</u>						
(A) Company 2	36	66.7	33.3	$\chi^2 = .43383$ df = 1 P = .5101	$\chi^2 = 1.11805$ df = 1 P = .2903	$\chi^2 = 1.86794$ df = 1 P = .1717
(A) Company 3	17	52.9	47.1			
(B) Company 1	26	84.6	15.4			
(B) Company 4	7	57.1	42.9			
All companies	86	68.6	31.4			
<u>Road Construction and Maintenance</u>						
(A) Company 2	36	72.2	27.8	$\chi^2 = 1.15087$ df = 1 P = .2834	$\chi^2 = 2.56381$ df = 1 P = .1093	$\chi^2 = 2.29578$ df = 1 P = .1297
(A) Company 3	17	52.9	47.1			
(B) Company 1	24	91.7	8.3			
(B) Company 4	7	57.1	42.9			
All companies	84	72.6	27.4			

^aTwo of the companies gave the same response to each variable. Companies with the same prefix letter answered the question the same.

Table A-33, continued

^b Company either has full responsibility or shares it with the grower.

^c Chi-square statistics for comparison of growers' responses of the two companies with prefix letter "A" whose managers said the companies controlled this decision.

^d Chi-square statistics for comparison of growers' responses of the two companies with prefix letter "B" whose managers said the growers controlled this decision.

^e Chi-square statistics for comparison of growers' responses of two companies with prefix letter "A" as one group and with the grower responses from the two companies with prefix letter "B" as the second group.

Table A-34. Percent of Growers Indicating Who Bears the Production and Price Risks By Company and Chi-Square Statistics^a

	Number	Party Bearing Risks		Chi-Square Statistics ^c
		Grower	Company ^b	
		-----percent-----		
<u>Condemnation</u>				
Company 1	28	50.0	50.0	$\chi^2 = 5.67083$ df = 3 P = .1288
Company 2	36	77.8	22.2	
Company 3	16	68.7	31.3	
Company 4	7	57.1	42.9	
All companies	87	65.5	34.5	
<u>Mortality During Growing Phase</u>				
Company 1	28	25.0	75.0	$\chi^2 = 11.11938$ df = 3 P = .0111
Company 2	35	65.7	34.3	
Company 3	17	58.8	41.2	
Company 4	7	42.9	57.1	
All companies	87	49.4	50.6	
<u>Mortality During Transportation</u>				
Company 1	27	29.6	70.4	$\chi^2 = 2.62114$ df = 3 P = .4538
Company 2	31	29.0	71.0	
Company 3	17	11.8	88.2	
Company 4	7	14.3	85.7	
All companies	82	24.4	75.6	

Table A-34, continued

	Number	Party Bearing Risks Grower	Company ^b	Chi-Square Statistics ^c
		-----percent-----		
<u>Unused Capacity of Broiler House</u>				
Company 1	28	100.0	0.0	$\chi^2 =$ df = P =
Company 2	36	100.0	0.0	
Company 3	16	100.0	0.0	
Company 4	7	100.0	0.0	
All companies	87	100.0	0.0	
<u>Market Price Risk</u>				
Company 1	28	17.9	82.1	$\chi^2 = .33648$ df = 3 P = .9530
Company 2	35	14.3	85.7	
Company 3	17	11.8	88.2	
Company 4	7	14.3	85.7	
All companies	87	14.9	85.1	

^aAll companies gave the same response to each variable.

^bThe company either bears all of the risk or shares it with the grower.

^c χ^2 = chi-square; df = degrees of freedom; P = significance level. When there was no deviation in growers' responses, no chi-square test could be made.

VITA

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