

LAWRENCE A. JONES

RONALD L. MIGHELL

Agricultural Research  
Service, USDA

## *Vertical Integration As a Source of Capital in Farming*

**L**ENDERS, trade creditors, landlords, partners, and farm operators are the traditional sources of capital used in farming. But we have come to recognize another significant source — business concerns vertically integrated with farm operations. Through vertical arrangements, suppliers, processors, and dealers have put much new capital to work in farming. This, in turn, has stimulated an increase in capital from traditional sources. This chapter is concerned with an examination of this relatively new means of expanding farm capital, how it came about and its implications.

### DEFINITIONS

In this chapter farm capital is defined broadly to include all the financial resources and all the goods and services used in farming except the labor of the operator and his family (Spitze and Raup's definitions in Chapters 2 and 9). Land, buildings, machinery, livestock, supplies, services, and the funds used to buy or hire any of the goods and services used in farm production are considered to be farm capital.

Vertical integration also is a term that is subject to various interpretations, partly because it does not fit in well with an outmoded relatively simplified concept of economic organization. As used in this chapter, vertical integration means the joining together of two or more stages in the vertical chain of production under some form of unified or shared management.

### FORMS OF VERTICAL INTEGRATION

In the Southeast, vertical integration in agriculture has developed in a variety of forms. In some instances, individuals or corporations coordinate production and processing by owning both farms and processing plants, shade tobacco in Georgia and Florida, sugar cane in Florida, cotton in Mississippi, and apples in Virginia. Cooperative activity as a way of integrating production and marketing is important in Florida citrus. Contracts are another means of tying farm production to sources

of supply or to marketing channels. Contracts have existed for some time in potatoes, aromatic tobacco, tung nuts, and certain vegetables. The most dramatic development of vertical integration has occurred in the broiler industry. The current contractual arrangements in egg and hog production in a few areas have been watched with much interest, since the implications are important.

The various forms of vertical integration differ widely with respect to meeting risk, supplying capital, and controlling management in farm production. In this chapter the discussion is limited to contractual arrangements and how they affect the capital position of agriculture. Even among contracts, large differences are found among areas, commodities, and producers. The conclusions herein are focused mainly on contract production of poultry and hogs in the Southeast.

### CONTRACTS AND CAPITAL EXPANSION

Feed and fertilizer firms, hatcheries, canneries, and other suppliers and processors are among those who furnish capital to, and are integrated with, agriculture under contractual arrangements. These businesses, which may be private organizations or cooperative associations of farmers, are usually called contractors or integrators. They provide a variety of operating capital including such items as feed, fertilizer, chicks, pigs, medicine, and equipment. They also furnish a variety of services ranging from general managerial guidance to such specific tasks as pruning, spraying, harvesting, and hauling. Often the contractor retains ownership of the capital he furnishes and becomes a joint enterpriser with, rather than a creditor of, the farmer. This is commonly termed "financing production." The "producer" usually means the operator of the farm, and he may be either an owner or a tenant. However, at times the integrator is more likely to be the real producer — in both the economic and legal sense — if he owns much of the operating capital and exerts a considerable measure of entrepreneurial control.

The land, buildings, equipment, and labor used in contract production are usually provided by the farmer. He may also supply some of the operating capital. The relative amounts of the different resources supplied by the farmer vary with the commodity and the type of contract. If he needs credit for the items he furnishes, he may borrow from commercial banks, insurance companies, Federal Land Banks, production credit associations, or other usual sources. Sometimes a contractor helps a farmer arrange for his credit needs.

Integrators in the Southeast provide substantial financing in some instances.<sup>1</sup> A broiler contract, for example, might provide for \$18,000 worth of feed, chicks, medicine, fuel, litter, and other supplies each

---

<sup>1</sup>The estimates of costs used in this section are approximations based on information from published and unpublished sources.

year in a typical operation of four lots of 10,000 birds each. For a 2,000-bird laying flock, the contractor's advances in pullets, feed, and supplies would come to more than \$12,500 a year. The integrator's stake in breeding stock for a 24-sow-and-boar contract would amount to about \$1,700. Frequently, he also provides corn and supplement worth \$6,000 or more annually.

For the farmer, investments needed to meet the contract requirements may include new or remodeled buildings, machinery and equipment, and some of the operating expenses. Cash costs for constructing buildings may be considerably less than the investment value because farmers frequently use their own labor and farm-produced lumber.

The cash investment in a 10,000-bird capacity broiler house might be \$5,000 or more at 1959 cost levels. For a 2,000-bird laying flock, the producer's cash investment in buildings and equipment could be as high as \$4,000. Out-of-pocket expenses for constructing and equipping the pig parlor and farrowing houses needed for a 24-sow contract would amount to \$2,500 or more. The total amount by which the capital investment in these farms has been increased depends on how much additional value is estimated for the farmer's own labor and materials used in the construction.

For contract farms in the aggregate, the authors know of no estimates that indicate the additional capital investment or the increase in the use of operating capital. Some calculations have been made so as to get an idea of the magnitude of these estimates for the southeastern broiler industry. For the greater Southeast, the ten states that lie east of the Mississippi and south of the Ohio and Potomac Rivers were included in the calculations. The broiler houses used in contract production and other forms of vertical production in 1959 were estimated to have a cash investment cost of about \$90 million and a total investment cost of about \$135 million, assuming \$45 million to be the value of the operators' noncash investment. One way of picturing the sheer magnitude of the physical investment is to say that if these houses were laid end to end, they would extend from Knoxville, Tennessee, to Reno, Nevada, with enough left over to go on to Los Angeles. More than four-fifths of the investment in broiler houses has been made since 1950.

The value of feed, chicks, and miscellaneous supplies provided by integrators in 1959 was estimated roughly at \$350 million, about 40 percent of the value of all feed and livestock expenditures in the region. In 1940 the amount of broiler financing by integrators probably was less than \$10 million.

## REASONS FOR CAPITAL EXPANSION

Capital resources in the enterprises mentioned would have expanded somewhat even without contracts. Since 1945 the economy as a whole has been prosperous, and although farm incomes have been less favorable than nonfarm incomes, the level has been sufficiently good to

provide funds for loans and investment. The possibility of increased efficiency through improvements in machinery and equipment has caused capital growth in almost all segments of agriculture (Chapters 6 and 7). In view of the technological innovations in production of broilers and other integrated commodities, it is reasonable to assume that much capital would have been attracted even if contracts had not developed.

If contract farming had not developed, however, the use of capital would have grown at a slower rate, particularly in the Southeast and for low-income farmers. Basic forces that have encouraged the flow of capital to farming through integrated channels have included technological innovations, expansion of production in the feed and fertilizer industries, growth of retail chains, supermarkets, and other means of mass distribution, and the recognized possibilities of profit by integrators.

Of importance is the fact that a contract is often an "open sesame" which unblocks the flow of resources to agriculture. Ordinarily, capital expansion is restricted in several types of situations. These situations are especially prevalent in the South because: (1) some farm operators lack knowledge of profitable investment opportunities or the ability to carry them through (Chapters 14, 21, and 23); (2) some are reluctant to borrow because of uncertain prices or markets — the chance of impairing or losing the equities in their own farms is one they do not wish to take (Chapters 14 and 21); (3) some may be reluctant to borrow because of a misunderstanding about the value of using credit or because they believe it to be morally wrong (Chapter 20); and (4) others may wish to use credit but are turned down by the lender on grounds of risk — usually low management ability or too much uncertainty regarding production or markets (Chapter 13).

A production contract often overcomes these drawbacks to capital investment. The integrator provides a ready-made production program with built-in guidance in new technology and management. He also provides price or income guarantees and access to markets. Financing in the form of supplies provided by the contractor does not create a debt. Consequently, it is not objectionable to farmers who would be reluctant to borrow. Since uncertainties of income are reduced, producers are willing to invest more of their own money and labor. They are also better able to obtain loans from regular lenders to finance buildings, equipment, and miscellaneous operating expenses.

How much the grower's income uncertainty is reduced depends, of course, on the type of production contract. Any kind of stop-loss guarantee eliminates the possibility of negative net cash returns; a straight salary or wage contract eliminates almost all of the uncertainty for the period of the contract; a flat fee per head or per pound limits the uncertainty to the physical hazards.

## UNCERTAINTY AND CAPITAL EXPANSION

The relationship between uncertainty and the investment of capital resources is so important in some instances that the subject deserves special attention. This can be illustrated by referring to the history of commercial broiler production. Here, one of the chief reasons for the development of contractual arrangements was the high degree of uncertainty with respect to financial outcome that faced independent producers. Feed dealers and other integrators were better able to cope with the uncertainties and to continue to supply the necessary resources.

Disease and heavy mortality of birds originally constituted the main source of uncertainty. Even in the late forties, death losses of broilers in Delaware were as high as 40 percent or more for some producers.<sup>2</sup> Since that time, the disease problem has been greatly reduced, and widely fluctuating prices have constituted the major source of uncertainty. In 1959 average weekly prices of broilers in Delaware varied from a low of 14.5 cents per pound to a high of 20.3 cents. An individual broiler producer might be unlucky enough to experience heavy mortality or be obliged to market his birds during a period of low prices. A feed dealer with many flocks under contract is more concerned with average mortality and the average of prices for all lots during the entire year. These averages can be predicted with more certainty than can the production of a particular producer or the price during a particular week.

To illustrate the difference between the way a feed dealer and an independent producer view the uncertainty of mortality in growing broilers, judgment probability curves have been developed for each. These curves are based on data from a study of 180 flocks produced in the last half of 1952 in Delaware.<sup>3</sup> The mortality among these flocks ranged from almost zero to more than 30 percent. This experience indicates that a mortality expectation curve for an individual producer based on that period would be relatively wide and low, skewed to the right, and with a modal frequency of about 6 percent mortality (Figure 8.1). The curve indicates a probability that the mortality would be 10 percent or more in 1 in 4 flocks and that the mortality would be 20 percent or more in 1 in 20 flocks. The chances of experiencing these higher losses, even though small, would influence producers to seek arrangements that would make returns more certain.

In contrast to the producer's situation, a probability curve as viewed by a feed dealer would be high and narrow (Figure 8.1). The uncertainties that confront the individual producer would disappear in the average. The feed dealer is confronted with the uncertainty of the level of the annual average. The average mortality for 180 flocks during the last half of 1952 was 8 percent. In the subsequent three years, the

<sup>2</sup>W. T. McAllister and R. O. Bausman, Influence of Management Practices on Cost of Producing Broilers in Delaware, Winter 1948-49, Del. Agr. Exp. Sta. Bul. 282, Jan., 1950.

<sup>3</sup>Unpublished data from study reported in Frank D. Hansing, Financing the Production of Broilers in Lower Delaware, Del. Agr. Exp. Sta. Bul. 322, Oct., 1957.

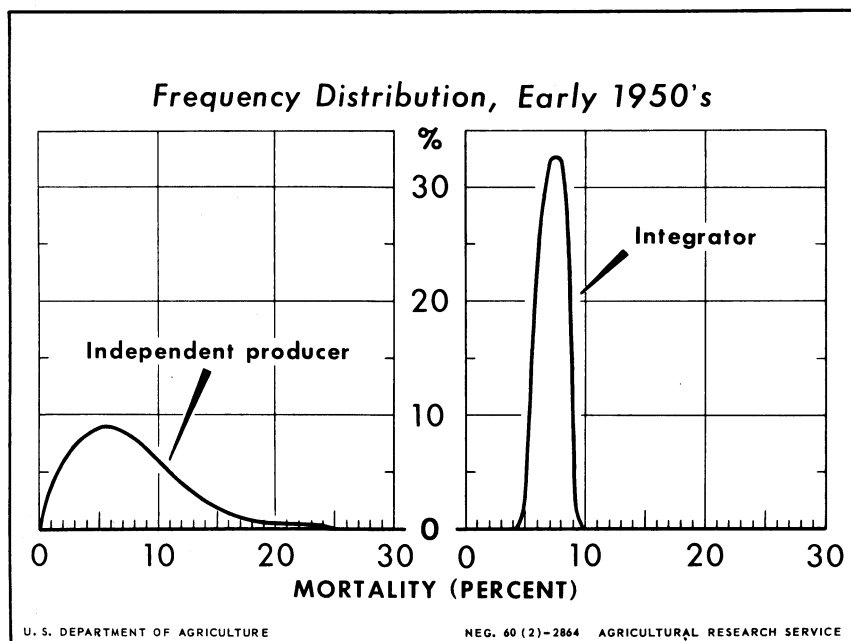


Fig. 8.1. Expected mortality of broilers.

mortality averaged 7.1, 8.0, and 6.2 percent, respectively. This suggests that a dealer with a large number of flocks under contract could have expected with much certainty, at that time, that the average annual mortality would not vary from year to year by more than 2 percentage points. In effect, what was a major uncertainty to each individual producer was converted by the integrator into something more like a smaller calculated risk. A calculated risk is just another cost of doing business.

The differences between individual producers and integrators in ability to cope with fluctuating broiler prices are similar to the differences in meeting the uncertainty of mortality. The farmer who produces four lots of broilers a year must look at the probabilities of marketing his birds at various prices. Using Delmarva weekly price data for 1957, for example, a probability curve was constructed that is slightly rounded and relatively low and wide (Figure 8.2). Average weekly prices ranged from a low of 14.5 to a high of 23.0 cents per pound. The probability of an individual producer marketing his broilers that year at 17 cents or less was the same as the probability of receiving 21.5 cents or more. On the other hand, a feed dealer who keeps up with price trends and operates on a large enough scale to market his broilers continuously throughout the year might have been able to predict his average sales price within 2 or 3 cents (Figure 8.2).

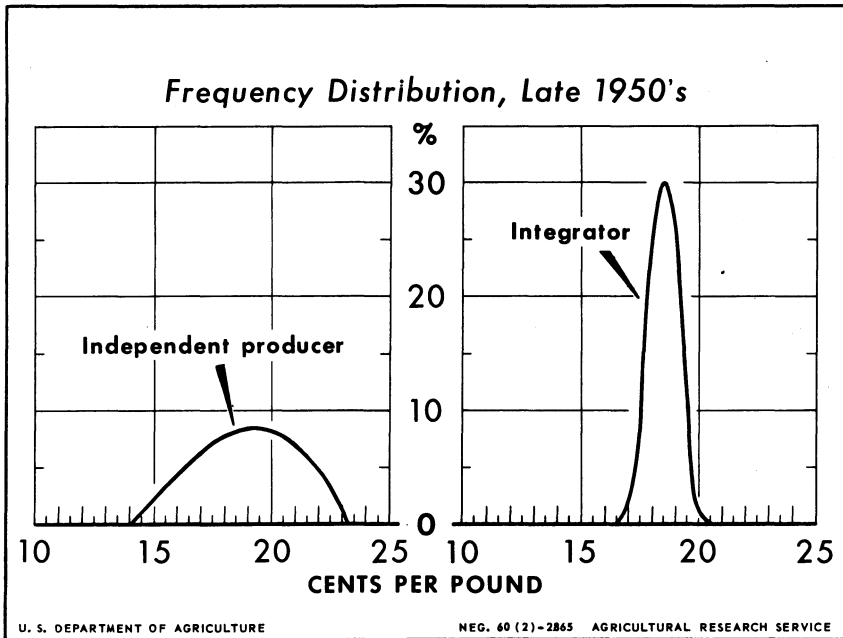


Fig. 8.2. Expected broiler prices.

### IMPERFECTIONS IN THE CAPITAL MARKET

Is contract farming an outgrowth of imperfections in the capital market for agriculture? Admittedly, perfection is unattainable, but one may take as the prototype of one concept the market through which new issues of stocks and bonds are sold. This is an impersonal market including large numbers of new issues and many prospective investors. The capital issues are standardized into homogeneous classes as to type, quality, and denomination. Information about these characteristics and market conditions is widespread. Through changes in supply and demand and the interest rate, this market acts to channel capital from savers and investors to various segments of the economy. Under this concept, emphasis is on the degree of perfection at which the specific market mechanism functions, with little consideration for the need for other institutions.

However, the concern here is with a broader concept which implies that there is some optimum amount of capital or credit that the market should provide to farming (Chapter 3). Is capital as readily available as in other areas and in other industries? Is the supply large enough to employ existing labor resources and promote efficient production? Is the supply of capital sufficiently mobile and are the institutions sufficiently flexible to permit agriculture to adjust to changing conditions?

With this concept of a capital market, the word "adequacy" may be the main point of consideration. Part III is also concerned with the adequacy of the capital market.

The capital market for agriculture obviously has operated neither flexibly nor smoothly, never approaching a state of perfection or adequacy according to either of the two concepts. Information concerning the supply and suppliers of capital and the prospective demand for and users of capital has been imperfect. Lack of uniformity among farms and farmers usually requires that direct investment and loans be handled through individual negotiation. Interest rates tend to be inflexible, lending customs often are rigid, and the conventional institutions that regulate the flow of capital and credit to agriculture are relatively slow in adjusting to changing conditions (Chapters 15-17).

Undoubtedly, the restrictions on the movement of capital funds into agriculture, either through equity investment or through the credit system, have been significant in stimulating the development of contractual arrangements. The capital market for agriculture continues to be far from perfect, but wherever contracts have expanded rapidly the changes have been in the direction of a more perfect market. Suppliers of capital have increased, standardization is more widespread, production is more uniform, and information is more complete with respect to markets and income.

In the sense of adequacy indicated above, the capital market has become more perfect, at least in the short run. Contractual arrangements have met a need, or demand, for capital that is felt by many farmers. They have provided employment for the labor of farmers and have increased their incomes. Both individual and aggregate adjustments probably represent a better use of resources than would otherwise have occurred.

This may be difficult to prove because it is not known what alternatives to contract farming might have evolved. However, it is known that the addition of contract farming to the kit of structural devices makes for more effective treatment of specific problem situations. It is expected that other devices will be developed to reduce uncertainty, provide capital, and accomplish other objectives even more effectively in the future.

## THE PLACE OF SPECIALIZED LENDERS IN CONTRACT FARMING

As contracts multiply and integrators supply increasing amounts of capital, one might well ask about the role of banks, production credit associations, and other specialized lenders in this development. How fundamental are the changes that contract farming has made in the market through which agriculture draws capital and credit?

Crops grown under contract continue to be financed largely by regular lenders. But many farmers operating under livestock contracts are receiving capital through a different set of institutions. Investment



in and retained earnings of agri-business — supply, processing, and marketing organizations — constitute one of the important new sources of funds for farming. Significant changes have occurred also within the more traditional banking and credit system. This system is still the basic source of much of the operating capital used under contracts, but the capital reaches the producer by a roundabout route. For example, city banks make loans to large feed manufacturers who, in turn, extend supply credit to feed dealers. Feed dealers also may borrow money from banks. They are then able to provide “financing” to the producer in the form of chicks, feed, and supplies.<sup>4</sup> When a farmer cooperative is a contractor, the funds may be obtained from one of the Banks for Cooperatives. The contract producer of broilers, eggs, and hogs borrows relatively little from the local country banks or production credit associations except for building construction or the purchase of equipment. The new institutional arrangements are still minor as a source of credit or capital for agriculture as a whole, but are well established in many contract farming situations.

The chief reason why local lenders seldom finance farmers directly for the expense of growing broilers is that operating capital is only one of the requirements. Technology, management supervision, a market for the birds, and a guaranteed minimum return must be provided if the operation is to be economically successful for either the producer or the supplier of capital. These are functions usually considered to be outside the field of credit. In fact, most institutional lenders could not go very far in participating legally in these activities even if they wished to do so.

True, many lenders seem to be moving in the direction of providing more services to farmers. Many banks are hiring trained agricultural men who help farmers plan operations and adjustment programs (Chapters 16 and 18). They may also give suggestions on new technology and markets. In a few instances, production credit associations have gone so far as to team up with cooperatives to provide financing to their contract producers. But even here, most of the functions of the integrator are assumed by the farmer cooperative. Credit is the only service provided by the PCA, and it is partly guaranteed by the cooperative.

Perhaps many feed dealers and processors who operate with contracts would like to transfer the financing to the specialized lenders. But local lenders are unlikely to finance production directly to any great extent through contracts. Such activity, even if permitted by law and regulations, would involve a considerable reorganization of the lending business. Interest rates and other charges would be higher to cover costs of additional services and risks.

Some economists believe that as farmers gain more experience under contracts and improve their financial condition, some of the

---

<sup>4</sup>The term “financing” as used here does not mean the extension of credit. Financing is a broad term that implies how the cost of assembling productive resources is met. The cost could be “financed” in various ways — by the producer, by the dealer, by the creditor, etc.

larger-scale operators will become independent producers. In broiler production an appreciable shift could not be expected until the industry reaches a more mature stage of development with more stable product prices. Local lenders might then participate more in financing production, although banks, feed manufacturers, and other centralized sources are likely to continue to provide much of the financing.

### CONTRACTS VERSUS INTEGRATION BY OWNERSHIP

Why do integrators choose contracts as a way to achieve their objectives of selling feed, controlling quality, and scheduling production? These goals might have been attained by ownership or leasing of production facilities. Adoption of the contract method centers around the fact that under this arrangement most of the labor and the fixed capital needed for production—real estate, buildings, and farm equipment—are supplied by the farmer.

In contrast to complete ownership of the facilities, contracts permit greater flexibility in a rapidly developing industry confronted with many uncertainties. A feed dealer can expand his output quickly, even though his assets and borrowing capacity are relatively small. His labor problems are minimized, and he can require the farmer to carry the risk of new investments in specialized buildings and equipment. Some dealers and processors may wish to be ready to move in any of several directions if current production conditions should prove to be temporary. For example, if broiler integrators should be forced to curtail or shift production, they could do so without undue concern over investment tied up in unused housing capacity. Any decline in the value of buildings caused by loss of markets or technological obsolescence would be at the expense of the producer, not the integrator.

Another advantage of contracts is that the producer is frequently able to provide the fixed capital at lower cost than can the integrator. Many farmers in the South are willing to provide their labor in constructing buildings at little cost because its value for alternative uses is low. Similarly, the rate of return that the farmer expects on his real estate, or for timber supplied, may be relatively small. If the integrator were to buy the land and pay the going rates for labor and materials, his costs would be much greater. Thus, production through contracts, rather than through owner integration, has been fostered by the existence of large pools of underemployed labor and other resources that yield low alternative returns and are therefore available for use at relatively low opportunity cost.

### EFFICIENCY OF CAPITAL USED UNDER CONTRACTUAL ARRANGEMENTS

The widespread interest in contract farming is related to the

generally increased productivity of all the resources involved under this method of operation. It is logical to assume that outside capital does not usually seek investment in agriculture unless the investment will yield a return at least equal to the going rate in industry and commerce (Chapter 5). The efficiency occurs in many ways, but mainly through the reduction in uncertainty and the spreading of new technology and improved management. Larger scale production also often reduces costs per unit.

Great gains in efficiency have been made in production of broilers. By introducing improved breeds, better feed and medicine, and increased efficiency of labor and management, contract arrangements have helped to reduce mortality and to increase feed-conversion rates. Better buildings and equipment—including automatic feeders—have helped to increase output per unit of input of capital and labor.

In 1940, 481 feed units were required to produce 100 pounds of broilers.<sup>5</sup> In 1950 the number of feed units declined to 382 units, and by 1958 to 295 units. Improved efficiencies are shown most dramatically by the change in labor used. In the Appalachian region (Virginia, West Virginia, North Carolina, Kentucky, and Tennessee), the index number of production per man-hour of chickens, broilers, and turkeys was 89 in 1940, rising to 104 in 1950, and jumping to 212 in 1958. In the southeastern states (South Carolina, Georgia, Alabama, and Florida), the index in 1958 was 381, more than 4 times the index of 1940 and about 3-1/3 times that of 1950. Production efficiencies have been increased in egg and hog production in many of the same ways, but contracts for these commodities have not expanded as widely as have those for broilers.

Contracts have helped to increase productivity in crop production through integrators supplying fertilizer, high-quality seed, and specialized services such as are needed at times in spraying and harvesting. Contract arrangements often result in less waste and improved quality, with more of the output reaching market channels. Less storage of products is required, and the producer spends less time and effort in marketing.

### IMPACT OF CONTRACTS ON FARMING

Lack of operating funds to make full use of fixed capital and labor is one of the long-standing problems of farmers. Southeastern agriculture probably has made slower progress than other regions in reducing this imbalance. The apparent shortage of capital in agriculture may be due simply to the reluctance of farmers to draw upon available supplies of capital and credit, or to their lack of knowledge as to profitable uses of such resources. In other instances, capital and credit, although

---

<sup>5</sup>A feed unit is the equivalent of a pound of corn in feeding value. R. D. Jennings, Consumption of Feed by Livestock, 1909-56, USDA Prod. Res. Rpt. 21, Washington, D. C., 1958.

plentiful in the community, have not been available to producers because of the uncertainties of production and prices. Substantial amounts of capital and labor in the hands of producers have remained partially unemployed as well. The advent of contract farming has altered many of these conditions. It has (1) shown how additional capital could be used, (2) provided new capital, (3) changed the attitude of producers concerning the use of more capital, and (4) reduced the risk or uncertainty of investment of capital for both farmers and integrators.

Contracts bring about higher aggregate production through providing more capital, managerial, and technical services. This in turn affects the prices of farm products. The impact varies among commodities and areas, depending on the kinds and amounts of resources and services supplied. The effect may be offset by the extent to which aggregate production may be controlled, and by related changes in demand. Supply may expand more relative to demand when the main force causing contracts is the desire of industry to sell feed, fertilizer, and other significant capital inputs.

In a period of rapid expansion of contract production, the aggregate effects of increased and more efficient capital may therefore be higher total output and lower prices. The competitive pressure will be felt by higher cost areas and farms. Many independent producers may be forced into contracts if they wish to remain in business. Competition among integrators also increases, resulting in a drive toward lower costs and increased scale of production.

Low prices seem to have placed contract broiler producers in a less favorable income position. Feed dealers are less active in seeking contract producers than in earlier years of broiler history. Production facilities on farms have expanded so greatly that the output capacity of those willing to produce may exceed the demand for broilers at prices that will yield reasonable returns to producers. Many producers will be willing to renew contracts under terms that will not yield a satisfactory wage as well as a return on their fixed capital investment. The bargaining position of many southeastern contract producers may be especially poor because of the few alternatives for profitable use of their capital and labor. Even when alternatives are available, relatively few of these producers would have the knowledge and additional resources needed to take advantage of them.

A report on trends in broiler contracts in Louisiana indicates the economic pressure that producers throughout the Southeast have experienced.<sup>6</sup> From 1954 to mid-1959, payment for broilers produced under the "flat fee" type of contract dropped from a high of 3-1/3 cents to about 1 cent per pound. Under "feed-conversion" plans, the base payment in 1954 was about 2 cents a pound, with a "bonus" of 1 cent if the conversion was at less than 3 pounds of feed per pound of broiler. By mid-1959 these rates had been reduced to provide three-fourths of a

---

<sup>6</sup> Paul Roy, "Recent trends in broiler and table egg contracts," Louisiana Rural Econ., Nov., 1959.

cent to 1 cent per pound of broiler plus one-fourth to one-half of a cent bonus if the feed conversion ratio was as good as 2-1/2 to 1.

With regard to contract production of table eggs, Roy reported that the original flat fee of 10 cents per dozen had been reduced by mid-1959 to 6 cents or lower, with 2 cents extra in some instances for the more efficient producers who could meet feed conversion and quality requirements. In the Sand Mountain area of Alabama, the fee paid to contract producers for large or medium eggs dropped from 12 to 6 cents per dozen during the five years preceding 1958, and integrators were offering 4 cents in 1959.<sup>7</sup> Sometimes the contracts included bonus provisions.

The action that integrators may take under increasingly adverse conditions is uncertain. However, contracts have had many modifications and more will undoubtedly come. These changes will have varying effects, but it seems certain that the trends toward larger scale and more efficient output will continue. Another probability is that fewer contracts will be available to producers. Reports in trade journals indicate that feed dealers are becoming more selective and are not renewing contracts with producers who have poor feed-conversion rates. Some dealers are growing more broilers on their own farms. Some are making contracts for only one flock at a time, thus leaving producers with greater uncertainty as to renewal. The 1960's will be a period of adjustment for contract farming and contractual arrangements, especially in production of broilers and table eggs. Before relatively stable conditions are reached, it is expected that there will be much experimentation on the part of both producers and integrators.

The contract producers who should be most concerned are those who exhaust their financial resources for fixed investments in buildings and equipment. The risk is greater if a long-term debt is incurred to expand the investment. If total production rises and prices decline, this additional capital investment may provide improved returns for a relatively short period only. At a minimum, when planning a specialized investment in buildings or equipment to meet contract requirements, the producer should recognize the longer term income uncertainties and the need for a relatively short time schedule in which to depreciate the new capital and repay any added indebtedness.

Another problem, almost unique to the contract method of financing production, concerns the equitable distribution of available returns between integrators and producers. This is a problem that becomes accentuated as the fixed investment of producers becomes larger and their economic position weaker. For dairy and sugar beet production, where contracts have long been used, government market orders and programs have contributed to a stable price situation and equitable sharing between producers and processors. Auctions, which are developing in some areas, will give producers access to markets other than through integrators. In some situations, the best solution may be the

<sup>7</sup> B. R. Miller and Morris White, Contracts vs. Independent Egg Production and Marketing, Ala. Agr. Exp. Sta. Circ. 135, Oct., 1959.

formation of more cooperative marketing associations. In others, the organization of a bargaining association may be the means by which an equitable sharing of costs and returns may be negotiated.

A final comment about contract farming as an innovation may be in order. We must recognize that it is an innovation in the same general sense as a technological or biological innovation. Certain generalizations can be made about the behavior of innovations as a class. These generalizations hold true for both agricultural and nonagricultural industries. Innovations usually involve a growth in investment and productivity and result in basic readjustments within the affected industries. The economy experiences growing pains, and in the short run, some segments may be hurt. But these changes in technology and the resulting shifts of income among individuals and movements of resources from one area to another are the marks of a dynamic and progressive economy. Innovations affect the position and shape of the supply schedules for the affected commodities. For example, the development of hybrid corn brought a shift in the supply schedule for corn. After that, more corn was produced at a given price than formerly. Similarly, the innovation of contract farming in commercial broiler production has caused a shift in the position of the supply schedule for chicken meat. The shape or elasticity of the supply schedule may have changed also. These shifts and changes are in the nature of innovations and the cost of adjustment to them is a part of the cost of progress.

## *Discussion*

### J. WARREN MATHER\*

A comment is warranted on the point made that contractual arrangements have provided much new capital for agriculture. Certainly this is true for the South and for poultry enterprises, but is this the case on a national or aggregate basis? To what extent has the increase in capital in the South been offset by a decline in other areas? This, of course, must be evaluated on a relative basis to take into account the absolute increase in capital in all areas to meet the food needs of an increasing population. It, therefore, seems to me that from the over-all standpoint of agriculture, integration may have affected the sources of capital more than the amount of new capital used. Quite obviously this has resulted in shifts in the use of capital among areas, enterprises, lenders, and farmers.

Two questions regarding issues raised about imperfections in the capital market should be considered. First, do the lenders of capital to integrators consider their funds as going into agriculture — into farming? Or do they consider their capital as going into agri-business with the

---

\*Chief, Farm Supplies Branch, Farmer Cooperative Service.

business entity of the integrator, who retains title to the products and assumes most of the risks, as the most important consideration in loan security? Do the lenders to integrators consider the main function of such capital to be helping farmers produce food more efficiently and profitably? If not, then the charge of imperfections in the capital market appears less valid. Moreover, if it is held that integration has attracted additional capital into agriculture by offering high returns, then overproduction and low prices resulting from excess use of capital introduces still other imperfections, and often a withdrawal of integration funds.

Second, has not capital come into agriculture because of integration — rather than integration coming into agriculture because of lack of capital or imperfections in the capital market? Supporting this reasoning is the fact that an adequate supply of capital has been available for the agricultural industry but it has not been available to many individual farmers because of excessive risks. Once these individual producers were tied-in by contracts with integrated feed or poultry processing firms, however, capital then became available. More security, less uncertainty, the spreading of risks, economies of scale, better management, and other changed conditions caused capital to flow to new entrepreneurial systems.

If integration uses capital more efficiently, then it will employ less total capital for a given amount of production. How much more efficiently does an integrated firm use its capital than a number of individual producers? A study under way by Farmer Cooperative Service indicates that the capital used in broiler contracting by a few regional cooperatives had a turnover of 8 to 11 times in 1959, based on their monthly outstanding balances. How would individual farmers producing four to five batches a year compare? Would they turn their average capital requirements only four to five times annually? Although their investment in land and buildings would remain the same for each batch, the turnover should be a little faster than this (four or five times annually) because they would not be able to obtain the maximum amount of capital for feed to finish each batch until the last three or four weeks of the production period.

As a sidelight, the experience of one regional farm supply and marketing cooperative horizontally integrated with 70 branches (but not engaged in contracting) indicates that this system makes more effective use of operating capital than would be the case if these branches were all independent cooperatives. Although each branch deposits funds daily at its local bank, they also send checks to the regional association's bank to avoid keeping an excess of idle money. This general bank serves as a revolving operating fund for the branches, and as many as 60 branches draw drafts on the general bank account for \$750,000 or more on some days. The regional association also arranges for all loans needed in the system.

The question of who provides the basic capital for vertical integration or contract farming has a number of implications for farmers. Will the integrator or the financier of the integrator in effect control

this segment of farming? Will either try to prevent overproduction or surpluses?

Farmers will need to strengthen their bargaining power to insure a fair return on their capital. As mentioned, in some cases this may be accomplished by use of auctions, bargaining associations, and government market orders and programs. Furthermore, farmers also must do more of their own integrating by developing large, strong cooperatives that will provide complete services. These would include production financing and management assistance, and processing and selling services in moving the product to the retailer or consumer.

If this is an important part of the answer, the implications for farmer cooperatives are tremendous. Farmers have over \$2 billion invested in purchasing and marketing cooperatives, but much larger amounts will be needed to finance both integrated production and marketing. For example, in poultry or hog enterprises, integration means feed milling, wholesaling, retailing, transporting, and financing; providing other production supplies and services; and assembling, processing, storing, transporting, and selling the product. It should be possible to develop arrangements with many local lending agencies to finance producers, and some progress has been made. However, to date, much of these funds for contract production have come through regional cooperatives and other sources. Some regional associations have set up credit associations, and others are considering them.

Vertical integration of the farm supply operations of cooperatives generally has been quite beneficial to farmers. While benefits are usually measured in terms of net savings per ton or dollar of business, they can be translated to returns on the farmers' investments in the cooperative. Such net savings of the principal regional wholesale and manufacturing cooperatives have been equal to 12 to 15 percent on invested capital or net worth in recent years. One large integrated association serving southern farmers with purchasing, marketing, and contracting services has had a return of about 12 percent. Two large poultry marketing and feed supply cooperatives in the Far West have had returns of 18 to 20 percent. Both of these cooperatives have well-developed programs that are both horizontally and vertically integrated.

In view of the growth and impact of integration on farming, farmers should carefully consider integrated cooperatives in investing available funds — both from the standpoint of efficient production and the effective marketing of their products.

There is a definite need for more research on both contractual integration and ownership integration in agriculture. Among the types of specific information needed that pertain to capital and credit are: (1) amount of capital used in contract farming — by sources, by types of enterprises, and by areas; (2) costs of capital used in integrated programs to the integrator and ultimately to the farmer; (3) efficiency with which capital is used in an integrated enterprise compared with a nonintegrated one; (4) reduction of risks to farmers, integrators, and creditors under various methods of integration; and (5) the significance of any imperfections in the capital market for agriculture in the development of integration.