ERS - 591

Farming and Agribusiness Activities of Large Multiunit Firms

U.S. Department of Agriculture

Economic Research Service

FARMING AND AGRIBUSINESS ACTIVITIES OF LARGE MULTIUNIT FIRMS. By Donn A. Reimund. Economic Research Service, U.S. Department of Agriculture. ERS-591.

ABSTRACT

Farming and related agribusiness activities of 410 large multiestablishment firms are examined. The firms, with annual sales of $1 million or more, were identified from data obtained from the Dun and Bradstreet Complex Business File and classified on the basis of their primary business activities--nonagricultural, farming, and three types of agribusiness (agricultural input, processing, and distribution).

The most common farming enterprise was beef cattle production, followed by production of vegetables, fruits, and poultry other than broilers.

Many of the farming firms had two or more separate farming units while others, primarily those with poultry, vegetable, or fruit production, were vertically integrated. Farming activities of the agribusiness firms were largely a vertical extension of their basic businesses. Farming ventures of the nonagricultural group, except for conglomerate firms, were less integrated into other activities.

Keywords: Corporation farming, vertical integration, structure, agribusiness.

Washington, D.C. 20250 March 1975

PREFACE

Over the past decade, the dominance of independent farms over parts of the farm production sector has been increasingly challenged. The particular challenge which has perhaps evoked the most concern is direct agricultural production by firms with primary business interests outside farming. This study is an effort to develop information on the identity of multiestablishment firms engaged in farm production and the relationship between their farm and nonfarm business activities.

Data used in this report are for 1969, from the Dun and Bradstreet Complex Business File of 1970 and the 1969 Census of Agriculture. This is the latest available issue of the census, which is published every 5 years. These sources supply benchmark information on the importance of such multiestablishment firms in farm production. Findings of this report will provide valuable comparisons with future studies on the direction of change in the farm sector.

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SUMMARY

Large multiestablishment firms with farming operations included in this study had sales totaling $59.1 billion in 1969. Their farm production was valued at $3.3 billion. This amounted to about 5 percent of their total sales and 7 percent of the total value of U.S. farm production as reported in the 1969 Census of Agriculture. Nonfarm agribusiness sales of the firms were estimated at $29.3 billion. Of this, $24.7 billion was from food and other products and $4 billion from farm-originated inputs.

The 410 study firms, identified from data in the Dun and Bradstreet Complex Business File, each had gross annual sales from all sources of $1 million or more. Each had two or more business units--either two or more separately operated farming units or a combination of farm and nonfarm businesses. They were classified according to their major business activities--nonagricultural, farming, and three types of agribusiness (agricultural inputs, processing, and distribution).

Farming was the major business activity of over a third of these firms. About 13 percent, 14 percent, and 15 percent, respectively, were primarily agricultural input, agricultural processing, and agricultural distribution firms. The remaining firms, over a fifth of the total, had a primary activity not directly related to the food and fiber sector.

In terms of total sales, the farm firms were the smallest, with average annual sales of nearly $24 million. The nonagricultural firms, with average annual sales of about $355 million, were the largest. The farm firms, however, had the largest farm sales per firm at $11 million, while the farm input firms, with average farm sales of over $2 million, had the smallest.

For the nonagricultural firms, farm sales made up 1.1 percent of total sales. Farm production accounted for 3.4 to 5.7 percent of the total sales of the agricultural input, processing, and distribution firms. Sales of farm products accounted for 46.5 percent of the total sales of the farm firms. For the farm firms, the large portion of sales attributed to nonfarm sources indicates the extent to which many large farming firms have extended their activities beyond farming.

Beef cattle, produced by more than one-quarter of all firms, was the most common farming enterprise, followed by vegetables, fruits, and poultry other than broilers.

The farming operations of the input, processing, and distribution firms were quite specialized, indicating that these firms engaged in farming as a vertical extension of their basic activities. Farming enterprises of the farm firms and the nonagricultural firms were more diversified. The nonagricultural firms, with the exception of the conglomerates, had the least vertical integration into nonfarm food system activities of all the major types of firms studied. The nonagricultural conglomerates were heavily integrated into all stages of the food system.

For the firms studied, a substantial amount of the vertical integration involving livestock and poultry commodities was input oriented, while the integration involving crop and dairy farming was almost entirely oriented toward processing and distribution. This suggests that the basic motivating factors for vertical integration in most livestock enterprises have been related to the input-production linkage, with feed manufacturing the key input. Vertical integration in crop and dairy enterprises appears to be motivated by the need for coordination between the production and processing and/or distribution stages.

Technical and institutional factors influence participation in farming by large firms. Technical factors include both the state of technology employed in production, processing, and distribution and the physical characteristics of the commodities themselves. The farming enterprises of large multiunit firms were generally concentrated in commodities possessing characteristics that make them conducive to large-scale operations under a highly coordinated structure. These commodity characteristics include intensive resource use, perishability, flow versus batch production cycles, and degree of uniformity.

Among the institutional factors affecting the structure of the food system are basic changes in society, such as increasing affluence, urbanization, and altered lifestyles of the population. Other factors are Government programs and changes in the legal environment, including tax laws.

FARMING AND AGRIBUSINESS ACTIVITIES OF LARGE MULTIUNIT FIRMS

by
Donn A. Reimund
Agricultural Economist
National Economic Analysis Division

INTRODUCTION

The U.S. farm sector has long been dominated by independent firms which purchase their inputs and sell their products in competitive open markets. Individual farm operators have had considerable freedom in controlling their own operations. Certain Government programs and financial limitations have been the major restraints on their decisionmaking.

Over the past decade or so, however, a number of developments have altered the independent farmer's control of parts of the Nation's farm production machine. Among these are an influx of nonfarm capital into certain types of farming, increasing ownership of farm production resources by firms and individuals other than traditional farmers, movement toward unionization of farm labor, and increasing coordination of farm production with other stages of the food and fiber system through contracts and vertical integration.

Ownership and operation of agricultural production facilities by large nonfarm corporations, the so-called "corporate takeover" of farming, has become a major concern for those who would like to see the farm sector remain the domain of independent family controlled and operated businesses. This study is concerned with the farming and related agribusiness activities of large multiestablishment firms.

Although farm leaders and others point to this "corporate takeover" of farming as one of the major issues facing the farm sector, only sketchy information has been available on the nature and extent of such activities, the kinds of outside interests in farming, and the types of farming in which they are involved. The overall objective of the study is to acquire such basic information on large multiestablishment firms involved in agricultural production. Specific objectives are to:

1. Identify the types of multiunit firms with direct operating interests in agricultural production.

2. Identify types of farming in which direct involvement by such firms is concentrated.

3. Determine the range and nature of agribusiness activities of these firms.

Table 1.--Farming activities of 410 large multiestablishment firms, by primary activity and type of farm production, 1970

Type of farm production	Major business category of owning firm							
	Farm	Agricultural input	Agricultural processing	Agricultural distribution	Non-agricultural	Total nonfarm	Total agricultural nonfarm	Total all firms
				Number of firms				
Cotton	11	--	--	1	3	4	1	15
Cash grain	11	4	3	3	10	20	10	31
Other field crops	13	2	3	3	7	15	8	28
Fruit and tree nuts	35	1	10	9	15	35	20	70
Vegetable	39	2	10	15	9	36	28	75
Dairy	17	1	14	2	6	23	17	40
Broiler	12	13	3	9	3	28	25	40
Other poultry	18	29	9	13	5	56	51	74
Beef cattle	37	7	12	18	37	74	37	111
General and other farms	24	8	9	5	24	46	22	70
Total firms	149	52	57	64	88	261	173	410
				Percent				
Percent of all firms	36.3	12.7	13.9	15.6	21.4	63.7	42.4	100.0
Percent of nonfarm firms	--	19.9	21.8	24.5	33.7	100.0	66.7	--
Percent of agr. nonfarm firms	--	29.9	32.8	36.8	--	--	100.0	--
				Number				
Avg. farm enterprise types/firm	1.46	1.25	1.28	1.22	1.35	1.28	1.24	1.35

Source: Dun and Bradstreet Complex Business File, 1970

LARGE MULTIUNIT FIRMS DESCRIBED

Methodology and Sources of Data

Multiestablishment firms with farming operations were identified from data obtained from the Dun and Bradstreet Complex Business File as of April 1970. This is a listing of all multiestablishment business firms on which Dun and Bradstreet maintains credit rating information. A multiestablishment firm was defined as having two or more units which are operated separately. Some of these firms had two or more separate farm units and no nonfarm units, while others had a combination of farm and nonfarm units.

The firms were grouped into five categories, according to their major line of business--farming, agricultural inputs, agricultural processing, agricultural distribution, and nonagricultural (table 1). Classification was based on the 1967 standard industrial code. 1/ These major categories were further divided into a total of 21 subgroups to reflect the types of commodities handled and the specific activities of the various types of firms.

Farming: Subdivided into 10 commodity groups.

Agricultural inputs: Four subclasses -- feed manufacturers, poultry hatcheries, farm equipment and supply distributors, and other agricultural inputs.

Agricultural processing: Seven subclasses -- meatpackers, poultry processors, dairy processors, fruit and vegetable processors, flour and wet corn millers, beverage and flavoring manufacturers, and other agricultural and food processors.

Agricultural distribution: Five subclasses -- fresh fruit and vegetable wholesalers, other farm products wholesalers, grocery and related products wholesalers, and retail grocery and eating places.

Nonagricultural: Four subclasses -- land based, manufacturing, trade and services, and conglomerate. Industries comprising the land-based subclass are mining and petroleum, real estate development, construction, and forest products. Manufacturing includes all manufacturing industries except processing of agricultural commodities and manufacturing of items that are specifically farm inputs, such as farm machinery and equipment. The trade and services subgroup consists of transportation services, nonagricultural wholesale, nonagricultural retail, and financial and other services. The conglomerate subcategory is made up of broadly diversified firms in which no one major type of activity predominates.

The input, processing, and distribution groups are collectively referred to as agribusiness in the remainder of this report, and the combination of farming and agribusiness is termed the food and fiber system.

1/ See appendix for SIC codes included in each industrial classification of this study.

Of the nearly 1,500 firms in the Dun and Bradstreet file with farming operations, 410 had total annual sales of $1 million or over from all sources, both nonfarm and farm. This study deals only with those 410 large firms. The $1 million sales cutoff was used to exclude small nonfarm businesses with an incidental involvement in farming. Farming operations connected with such businesses are not considered to be a factor in shifting the control over farm production from small independent firms to large corporate entities, and are therefore not relevant to this study.

Gross sales data in the Complex Business File are aggregated at the firm or subsidiary level for corporations whose corporate structure includes subsidiary corporations, and are not available for individual operating units or product lines. Consequently, farm sales data are available only for those firms in which farming is the sole occupation or in which the farming enterprises are treated as a separate subsidiary. Farm sales data were available for 137 firms, one-third of those in the study. The availability of farm sales data varied considerably by type of firm, ranging from nearly 60 percent for farm firms to less than 15 percent for distribution firms (see table 2).

Farm sales for all firms in the study were estimated by calculating farm sales as a percentage of total sales for those firms for which farm sales data were available. This percentage was used to estimate farm sales of the remaining firms. This procedure was carried out separately for each major category of firms. Total sales and estimated farm sales by firm category are shown in table 3.

Farm sales figures should be treated only as very crude estimates. Since sales were not reported by product line, it is possible that some nonfarm sales were included in the sales figures of some farming subsidiaries. Also, there are statistical problems associated with estimating a total from a nonrandom sample. The estimates do, however, provide a basis for establishing a rough perspective on the farming enterprises of the 410 firms.

Table 2.--Number of large multiestablishment firms and percent with farm sales specified, 1969

Type of firm	Total firms	Firms with farm sales specified	
	Number	Number	Percent
Farm	149	89	59.7
Agricultural input	52	12	23.1
Agricultural processing	57	10	17.5
Agricultural distribution	64	9	14.1
Nonagricultural	88	17	19.3
Total	410	137	33.4

Source: Dun and Bradstreet Complex Business File, 1970

Table 3.--Total sales and estimated value of farm production for 410 large multiestablishment firms, 1969

Type of firm	Firms	Total sales	Estimated value of farm production	Value of farm production as a percent of total sales
	Number	Million dollars		Percent
Farm	149	3,553.3	1,652.8	46.5
Agricultural input	52	3,375.4	114.4	3.4
Agricultural processing	57	10,169.2	524.0	5.2
Agricultural distribution	64	10,800.1	615.3	5.7
Nonagricultural	88	31,232.8	355.7	1.1
Total	410	59,130.8	3,262.2	5.5

Source: Dun and Bradstreet Complex Business File, 1970

Farm production contributed only about 5 percent of the value of total sales of the 410 firms, ranging from nearly half for the farm firms to about 1 percent for the nonagricultural firms. That less than half the value of total sales of the farm firms was from farm production indicates the degree to which large farming firms have extended their activities into nonfarm ventures. This could result from either integration into nonfarm food system activities or diversification into completely unrelated businesses.

In terms of average firm size, as measured by total annual sales, the farm firms were by far the smallest. Their total sales averaged $23.8 million, about one-third that of the input firms ($64.9 million) which had the second lowest total sales per firm (table 4). These categories were followed, in order of ascending sales, by agricultural distribution firms, agricultural processing firms, and nonagricultural firms.

Although farm firms had the smallest average total sales, they had the highest per firm value of farm production, $11.1 million. Farm production values of the processing and distribution firms were close behind at $9.2 and $9.6 million per firm, respectively. The nonagricultural firms had an average value of farm production of $4 million. The input firms had the lowest value of farm production per firm of all categories, $2.2 million.

Table 4.--Average annual value of farm production and total sales of 410 large multiestablishment firms, 1969

Type of firm	Average value of farm production	Average total sales
	Million dollars	
Farm	11.1	23.8
Agricultural input	2.2	64.9
Agricultural processing	9.2	178.4
Agricultural distribution	9.6	168.8
Nonagricultural	4.0	354.9
Total	8.0	144.2

Source: Dun and Bradstreet Complex Business File, 1970

The firms in the study had an estimated total of $29.3 billion in nonfarm agribusiness sales (table 5). 2/ This consisted of $24.7 billion (wholesale value) of food and other products, $4.0 billion of farm-originated inputs (such as feed), and $0.6 billion of off-farm-originated inputs (such as agricultural chemicals and machinery) (fig. 1). The farm value equivalent of food and other products and farm-originated inputs was estimated at $15.4 billion, approximately one-third of the total value of farm production in 1969 (table 6). Nearly $0.7 billion of farm production, accounted for by farm and nonagricultural firms, was not integrated with other agribusiness activities. Thus, the 410 firms studied handled approximately $16 billion worth of farm commodities in 1969.

Although the farm production of the firms in this study was, in general, heavily integrated into other agribusiness activities, the significant point here is that, based on the above estimates, their own production apparently accounted for only about a fifth of the farm commodities they handle. The remaining four-fifths was obtained through other means, such as various types of contractual arrangements or open market purchases. The Dun and Bradstreet data contain no information on the manner in which these commodities were obtained. Consequently, nothing can be said about how much control these firms exercise over the production of purchased farm commodities.

2/ The estimates of nonfarm agribusiness sales, like those of value of farm production, for the 410 firms included in the study should be considered only as very rough estimates. The same limitations that applied to the estimates of value of farm production, namely lack of reporting by product line and certain statistical estimation problems, also apply to the estimates of nonfarm agribusiness sales.

Table 5.--Estimated nonfarm agribusiness sales of 410 large multiestablishment firms, 1969

Type of firm	Source of sales: Food and other consumer products	Farm-originated inputs	Off-farm inputs	Total nonfarm agribusiness sales
	Million dollars			
Farm	2,683.8	12.4	5.2	2,701.4
Agricultural input	258.3	2,708.3	127.1	3,093.7
Agricultural processing	9,187.6	325.9	--	9,513.5
Agricultural distribution	9,131.3	830.9	--	9,962.2
Nonagricultural	3,443.1	105.9	467.9	4,016.9
Total	24,704.1	3,983.4	600.2	29,287.7

Source: Dun and Bradstreet Complex Business File, 1970

Importance of Large-Scale and Corporate Farms

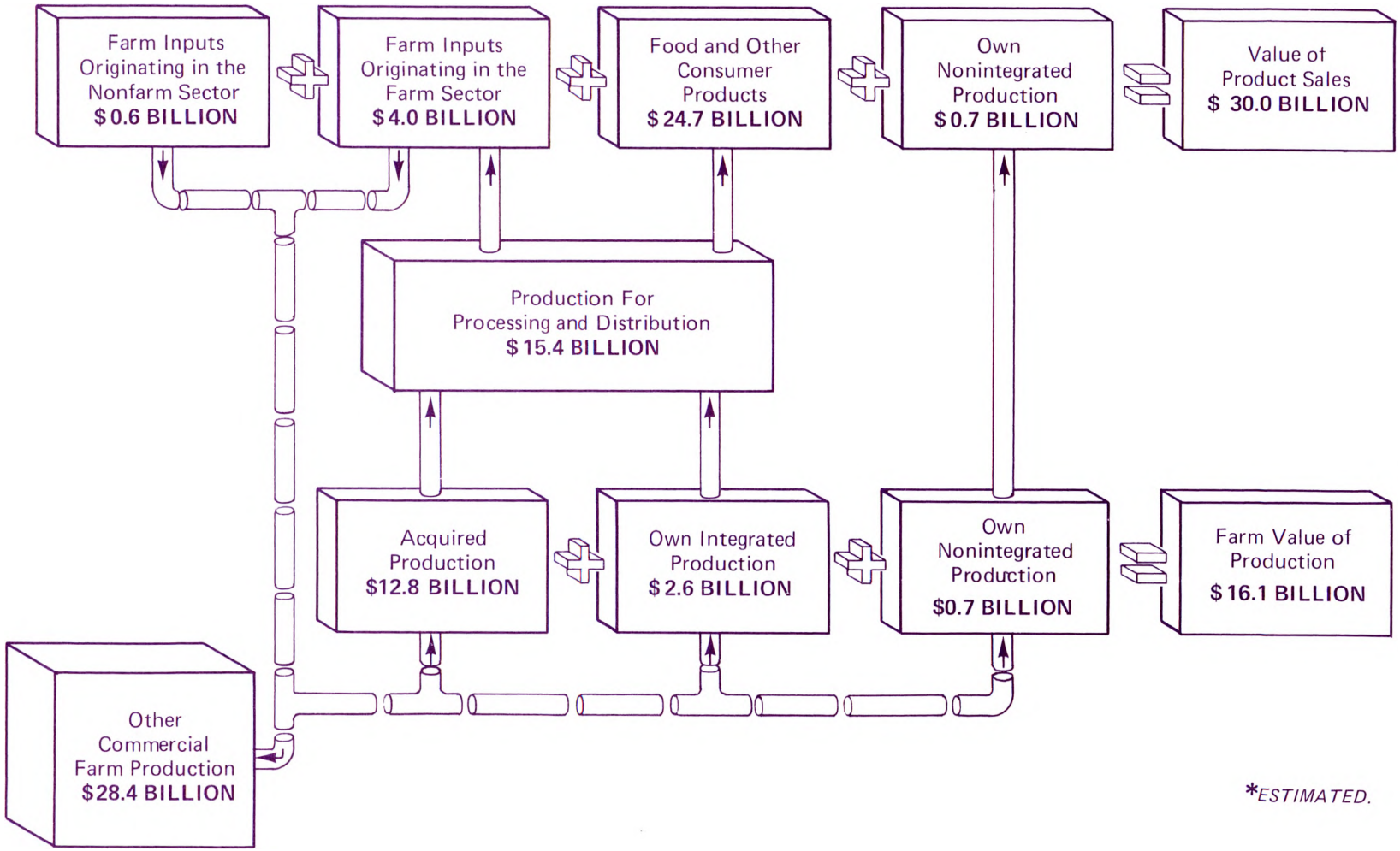
The 1969 Census of Agriculture reported nearly 52,000 farms with sales of $100,000 or over (class 1a). Although these were only 3 percent of all commercial farms, they accounted for over a third of commercial farm sales (table 7). Large-scale farms were especially important producers of vegetables, fruits, nursery products, other field crops (primarily sugar crops, pineapples, and potatoes), poultry, and cattle, accounting for about half to over two-thirds of the total commercial production of these commodities.

Over half of the large farms were organized as individual proprietorships, about a quarter as partnerships, and about 15 percent as corporations in 1969 (table 8). Corporate farms tended to be much larger than individual and partnership farms. While nearly two-thirds of the class 1a farms with sales of under $200,000 were individual proprietorships and about a fourth were partnerships, less than 10 percent were corporations. For those farms with sales of $1 million or over, corporations accounted for over 60 percent while individual proprietorships and partnerships each accounted for less than a fifth.

The firms identified from the Dun and Bradstreet file are predominately corporations. Consequently, the farms operated by these firms may be considered as a subset of the class 1a farms operated by corporations. The estimated $3.26 billion farm sales of the 410 firms in the study is about 7 percent of the

VALUES* OF FOOD AND FIBER SYSTEM ACTIVITIES

(410 LARGE MULTIESTABLISHMENT FIRMS, 1969)



*ESTIMATED.

Figure 1

Table 6.--Estimated farm value of farm-originated agricultural inputs and agricultural products marketed by 410 large multiestablishment firms, 1969

Type of firm	Farm value equivalent of inputs marketed	Farm value equivalent of food and other consumer products marketed	Total farm value equivalent	Value of nonintegrated farm production
		Million dollars		
Farm	9.0	1,362.3	1,371.3	512.3
Agricultural input	1,959.5	131.1	2,090.6	--
Agricultural processing	235.8	4,663.6	4,899.4	--
Agricultural distribution	601.2	4,635.1	5,236.3	--
Nonagricultural	76.6	1,747.7	1,824.3	140.9
Total	2,882.1	12,539.8	15,421.9	653.2

Source: Dun and Bradstreet Complex Business File, 1970

total U.S. farm sales reported in the 1969 Census of Agriculture and accounts for roughly a fifth of the sales from class 1a farms.

ONE-THIRD OF STUDY FIRMS ENGAGE PRIMARILY IN FARMING

Over one-third of the study firms reported farming as their major activity. Slightly over one-fifth gave an activity not related to the food and fiber system as their major line of business. The remainder of the firms were about equally divided among farm input firms, agricultural processing firms, and agricultural distribution firms (table 1).

The heaviest concentration of farm production was in beef cattle, with 27 percent of the firms reporting cattle production. Other commodities with high levels of concentration were vegetables, fruits, and poultry other than broilers. A significant number of the poultry operations were breeding flocks.

Farm firms had the most diversified farming operations, with an average of 1.46 types of farm enterprises per firm. 3/ Firms with nonagricultural

3/ A farm enterprise is defined as a commodity or group of commodities as specified at the four-digit level in the Standard Industrial Classification Manual. The phrase "type of farm enterprises per firm" is used synonymously with the phrase "farm diversification ratio" in this report.

Table 7.--Number and sales of large farms by commodity and as a percentage of all commercial farms, 1969

Commodity	Large farms	Percent of all commercial farm numbers	Large farm sales	Percent of all commercial farm sales
	Number	Percent	Billion dollars	Percent
Crops	NA	NA	4.8	29.1
Grain	26,370	2.6	1.1	13.0
Tobacco	1,320	.8	.1	8.8
Cotton	5,234	3.9	.3	32.8
Field seeds, forage, and silage	9.370	2.4	.2	21.1
Other field crops	6,070	6.4	.8	51.1
Vegetables	5,038	7.3	.9	67.9
Fruits	5,276	6.1	.8	48.4
Nursery and greenhouse	2,352	13.0	.6	70.1
Livestock and poultry	NA	NA	10.5	37.6
Poultry and poultry products	10,538	5.4	2.1	54.3
Dairy products	6,537	1.8	.9	16.4
Dairy cattle and calves	6,439	1.9	.1	15.5
Other cattle and calves	29,183	3.1	6.6	50.7
Hogs, sheep, and goats	15,273	2.5	.7	15.4
Other livestock and products	3,105	4.4	.1	30.7
All agricultural products	51,995	3.0	15.3	34.4

NA = Not available

Source: 1969 Census of Agriculture

Table 8.--Number and percentage distribution of large farms by type of organization and value of sales, 1969

Value of sales (1,000 dollars)	Large farms	Type of organization			
		Individual	Partnership	Corporation	Other
	Number	Percent of total			
100-199	35,308	65.4	25.2	9.1	0.3
200-299	7,926	53.4	27.0	19.0	.5
300-399	3,145	47.2	25.0	27.2	.6
400-499	1,537	44.2	24.3	30.9	.7
500-699	1,531	37.6	23.8	37.9	.7
700-999	962	31.9	21.9	45.2	.9
1,000 and over	1,586	19.3	18.1	61.2	1.5
Total	51,995	59.0	25.1	15.5	.4

Source: 1969 Census of Agriculture

primary business activities had the second most diversified farming operations, averaging 1.35 types of farm enterprises per firm.

Diversification of farming activities was somewhat lower for the agricultural input, processing, and distribution firms. The input firms, as a group, had 1.25 types of farm enterprises per firm, the processors 1.28, and the distributors 1.22. This suggests that the agribusiness firms moving into direct agricultural production limit their farming ventures to those commodities dealt with through their primary business activities. The entry into farming, then, by these types of firms may be largely a matter of vertically extending their primary activity to include the agricultural production stage. The farming activity in this case becomes an integral part of the firm's basic business.

ALL FIRM GROUPS PARTICIPATE IN FOOD SYSTEM ACTIVITIES

Farm Firms

Over half of the 149 firms that reported farming as their primary activity were in one of three types of farming. Twenty-seven, or 18 percent, were classified as fruit producers, the same number as vegetable producers, and 26, (17 percent) as beef producers (table 9).

Farming was the only food system activity of 27 of the 149 farm firms. They were in the Complex Business File because they had two or more farming

Table 9.--Farm firms: Farming activities of large multiestablishment firms, by primary activity and type of farm production, 1969

Type of farm production	Primary farm type of owning firm										
	Cotton	Cash grain	Other field crops	Fruit and tree nuts	Vegetable	Dairy	Broiler	Other poultry	Beef	General and other farms	Total
						Number of firms					
Cotton	6	--	1	2	1	--	--	--	1	--	11
Cash grain	3	2	--	1	1	--	--	1	1	2	11
Other field crops	3	--	7	1	--	--	--	--	2	--	13
Fruit and tree nuts	1	--	--	27	4	--	--	--	2	1	35
Vegetable	2	--	--	6	27	--	--	--	2	1	39
Dairy	--	--	--	--	--	17	--	--	--	--	17
Broiler	--	--	--	--	--	--	9	3	--	--	12
Other poultry	--	--	1	--	--	--	--	15	--	3	18
Beef cattle	1	1	--	1	3	1	--	2	26	2	37
General and other farms	3	--	1	1	--	2	--	1	3	13	24
Total firms	6	2	7	27	27	17	9	15	26	13	149
						Percent					
Percent of firms	4	1	5	18	18	11	6	10	17	9	100
						Number					
Avg. farm enterprise types/firm	3.17	1.50	1.43	1.44	1.33	1.18	1.00	1.47	1.42	1.69	1.46

Source: Dun and Bradstreet Complex Business File, 1970

units, or because their secondary activities were outside the food and fiber system. Eighteen of these firms produced only a single commodity, while nine produced more than one commodity. Beef cattle production was the most common farming activity of these firms, involving 13 of the 27 firms either as a single commodity or in combination with other farming enterprises (table 10).

Over 80 percent of the farm firms were integrated into nonfarm food system functions (table 10). Distribution of agricultural commodities was the most common nonfarm activity of these firms, followed by input supplying and processing. Nearly two-thirds of the vertically integrated farm firms were engaged in only one function other than farming.

The pattern of vertical integration by farm firms appears to be a function of the commodities produced. This is made most apparent by examining the vertically integrated, single commodity firms. Those with crop enterprises were heavily integrated into distribution and, to a lesser extent, processing. Firms with dairy production were involved with both processing and distribution. Firms with poultry or beef cattle production were heavily involved in supplying inputs, largely feed, to their farm operations. More than half of the single commodity broiler firms in the study were engaged in all four food system functions.

Cotton and cash grain farm firms had the most diverse farming operations of the specialized commodity producers with 3.17 and 1.50 types of farm enterprises per firm, respectively. Broiler and dairy firms, on the other hand, were the most specialized of the farm firms. Dairy firms had 1.18 types of farming activities per firm and broiler producing firms were 100 percent specialized (table 9).

Farm Input Firms

Feed manufacturers, poultry hatcheries, and farm equipment and supply distributors together accounted for 96 percent of the agricultural input firms with farming activities in the study (table 11). Feed manufacturers alone made up nearly half of this category. As might be expected, the farming activities of these firms were concentrated in livestock enterprises, with poultry other than broilers the most prevalent type of farm production. A large proportion of these poultry enterprises were breeding flocks, which in turn were an input to broiler or egg production. Only farm equipment and supply distributors reported significant crop production. Even within this subgroup of firms, however, farm production was concentrated in poultry other than broilers and in beef cattle, with nearly half of the firms reporting production in one of these commodities.

Eleven of the 52 farm input firms in the study reported multiple farming enterprises (table 12). Six of these, however, consisted of broilers and other poultry, which is more indicative of vertical integration of breeding and broiler growout operations than of commodity diversification at the farm level.

Seventeen of the input firms, or about one-third, were integrated forward into processing and/or distribution. This forward integration was largely

Table 10.--Distribution of farm commodities produced and food system functions performed by large multiestablishment firms primarily engaged in farming, 1969

Commodity produced	Production only	Production + input	Production + processing	Production + distribution	Production + input + processing	Production + input + distribution	Production + processing + distribution	Production + input + processing + distribution	Total
				Number of firms					
Single commodity:									
Cotton	1	--	--	--	--	--	--	--	1
Cash grain	1	--	--	--	--	--	--	--	1
Other field crops	1	--	2	1	--	--	--	1	5
Fruit and tree nuts	1	--	2	9	--	--	4	1	17
Vegetables	3	--	--	16	1	1	--	--	21
Dairy	--	--	1	--	--	--	13	--	14
Broilers	--	2	--	--	2	--	--	5	9
Other poultry	--	5	--	2	--	2	1	1	11
Beef cattle	8	7	--	2	1	2	1	--	21
General and other farms	3	1	--	2	--	1	--	--	7
Total single commodity	18	15	5	32	4	6	19	8	107
Total multiple commodity	9	5	1	18	2	3	1	3	42
Grand total	27	20	6	50	6	9	20	11	149

Source: Dun and Bradstreet Complex Business File, 1970

Table 11.--Agricultural input firms: Farming activities of multiestablishment firms, by primary activity and type of farm production, 1969

Type of farm production	Primary industrial activity of owning firm				
	Feed manufacturing	Poultry hatcheries	Farm equipment and supply distributors	Other agricultural inputs	Total
	Number of firms				
Cotton	--	--	--	--	--
Cash grain	--	--	4	--	4
Other field crops	--	--	1	1	2
Fruit and tree nuts	--	--	1	--	1
Vegetable	--	--	2	--	2
Dairy	--	--	1	--	1
Broiler	8	5	--	--	13
Other poultry	17	6	6	--	29
Beef cattle	4	--	3	--	7
General and other farms	3	--	4	1	8
Total firms	24	9	17	2	52
	Percent				
Percent of firms	46	17	33	4	100
	Number				
Avg. farm enterprise types/firm	1.33	1.22	1.18	1.00	1.25

Source: Dun and Bradstreet Complex Business File, 1970

Table 12.--Distribution of farm commodities produced and food system functions performed by large multiestablishment firms primarily engaged in agricultural input industries, 1969

Commodity produced	Input	Input plus distribution	Input plus processing	Input plus distribution plus processing	Total
			Number		
Single commodity:					
Cotton	--	--	--	--	--
Cash grain	3	1	--	--	4
Other field crops	--	--	--	--	--
Fruits and tree nuts	--	--	--	--	--
Vegetables	1	--	--	--	1
Dairy	1	--	--	--	1
Broiler	2	--	1	4	7
Other poultry	13	2	3	1	19
Beef cattle	4	1	--	--	5
General and other farms	3	--	1	--	4
Total single commodity	27	4	5	5	41
Total multiple commodity	8	--	1	2	11
Grand total	35	4	6	7	52

Source: Dun and Bradstreet Complex Business File, 1970

confined to those firms with some type of poultry production. Fourteen of the input firms with processing or distribution operations were engaged in the production of broilers, poultry other than broilers, or both.

Of the three types of input firms that comprised all but two of the firms in the group, two--feed manufacturers and poultry hatcheries--were commodity specific. These firms engaged in farming enterprises that were directly related in a vertical sense to their primary activities. This finding supports the contention that agribusiness firms enter farming as a means of vertically extending their primary activity to include production.

Why farm equipment and supply distributors enter farming is less clear. There are no apparent organizational efficiencies to be gained by vertically linking a wholesale or retail equipment or supply dealership with farming. Some cost-saving advantages could possibly be gained in purchasing machinery and supplies relative to farms that are not affiliated with an equipment or supply dealership, but any advantages appear to be minor compared with the potential efficiencies achieved through coordinating feed processing with cattle feeding or hatchery operations with poultry production in an integrated organization. The data contained in the Dun and Bradstreet file do not provide sufficient information to allow an evaluation of the relationships between the farming and input supplying functions of this subgroup of firms. However, it is likely that their farming activities reflect diversification more often than vertical integration.

Farm input firms other than feed manufacturers, poultry hatcheries, and equipment and supply dealers were conspicuous by their virtually complete absence from the list of firms with farming operations. There are two possible causes for this. First, there may be no compelling economic or technical incentives to induce such firms to enter farming. Second, many farm inputs are produced and distributed as just one of a number of related businesses. Agricultural chemicals such as fertilizers and pesticides are produced largely by full line chemical companies and petroleum companies, which are classified in this report as nonagricultural firms. Thus, some input-related farming activities may have been attributed to nonagricultural firms in this report.

Processing Firms

Dairy processors and fruit and vegetable processors each accounted for a fourth of the agricultural processing firms with farming activities (table 13). These processors and meatpackers comprised two-thirds of the processing firms. The pattern of farming enterprises and the low level of farm diversification of the agricultural processing group as a whole indicate that most farming operations were undertaken as an integrated stage of the firms' basic businesses. Of the 73 farm enterprises these firms were involved in, 48 were directly related to their processing activity. The poultry enterprises of the flour and wet corn milling firms and the poultry and beef cattle operations of the other agricultural and food products firms were input-related through feed manufacturing, which is a secondary activity of the firms involved. Only the fruit and vegetable processors showed a tendency toward diversification of farming activities, with a diversification ratio of 1.50.

Table 13.--Agricultural processing firms: Farming activities of large multiestablishment firms by primary activity and type of farm production, 1969

Type of farm production	Primary industrial activity of owning firm							
	Meat packing	Poultry processing	Dairy processing	Fruit and vegetable processing	Flour and wet corn milling	Beverage and flavoring manufacturing	Other agricultural and food products	Total
	Number of firms							
Cotton	--	--	--	--	--	--	--	--
Cash grain	--	--	--	2	--	--	1	3
Other field crops	--	--	--	2	--	--	1	3
Fruit and tree nuts	--	--	1	4	--	5	--	10
Vegetable	--	--	--	10	--	--	--	10
Dairy	--	--	14	--	--	--	--	14
Broiler	--	2	--	--	1	--	--	3
Other poultry	--	4	1	1	2	--	1	9
Beef cattle	9	--	--	2	--	--	1	12
General and other farms	1	--	--	--	1	--	7	9
Total firms	9	5	14	14	3	5	7	57
	Percent							
Percent of firms	16	9	25	25	5	9	12	100
	Number							
Avg. farm enterprise types/firm	1.11	1.20	1.14	1.50	1.33	1.00	1.57	1.28

Source: Dun and Bradstreet Complex Business File, 1970

Backward integration into farm input supply activities by processors was confined primarily to those firms with livestock production enterprises (table 14). Of the 13 processing firms involved in supplying farm inputs, 8 had poultry production enterprises and 3 produced livestock other than poultry.

Nearly half of the total processing firms were integrated forward into distributing agricultural products. Most of these firms had fruit, vegetable, dairy, or poultry production. The poultry-producing firms, moreover, all had input supplying activities in addition to production, processing, and distribution. Thus, complete integration across all food system functions was common among firms that are primarily poultry processors, as well as those that are primarily broiler farmers.

Distribution Firms

Of the agricultural distribution firms with farming activities 36 percent were fruit and vegetable wholesalers, about one-fifth were poultry wholesalers and over one-quarter were wholesalers of other products (table 15).

Vegetable and beef cattle production were the most common farming activities for distribution firms--over one-fourth of the firms produced each of these commodities. All vegetable producers except one were fresh fruit and vegetable wholesalers, while beef cattle were produced by firms in every subgroup of the agricultural distribution firms. Over one-fifth of the distribution firms were directly involved in a nonbroiler poultry production enterprise. Both broiler and nonbroiler poultry were produced by firms in every subcategory except fresh fruit and vegetable wholesale.

Farm production and distribution of agricultural products were the only food system functions performed by nearly two-thirds of the distribution firms in the study (table 16). Those distribution firms that did engage in input or processing activities were mostly firms with livestock farming enterprises, while most of those involved in all four food system functions produced broilers at the farm level.

The distributors with fruit or vegetable production had a pattern of functional activities very similar to that of the fruit and vegetable-producing farm firms. Both sets of firms were grower-shippers--the only meaningful distinction between the two was the relative importance of the growing and shipping (distribution) functions within the firm. Distribution firms with broiler-producting operations had the same pattern of complete integration across all functional activities that was evident among the farm, input, and processing firms.

Nonagricultural Firms

Beef cattle production was by far the most common farm enterprise reported by the firms with nonagricultural primary activities (table 17). Thirty-seven of the 88 firms in this major category produced beef cattle. Fruit production was second in importance, involving 17 percent of the firms. A surprisingly

Table 14.--Distribution of farm commodities produced and food system functions performed by large multiestablishment firms primarily engaged in agricultural processing, 1969

Commodity produced	Processing	Processing + input	Processing + distribution	Processing + input + distribution	Total
			Number		
Single commodity:					
Cotton	--	--	--	--	--
Cash grain	1	--	--	--	1
Other field crops	--	--	1	--	1
Fruit and tree nuts	2	--	6	--	8
Vegetables	3	--	3	--	6
Dairy	3	--	8	1	12
Broilers	--	1	--	--	1
Other poultry	--	--	2	2	4
Beef cattle	8	--	--	2	10
General and other farms	1	1	2	1	5
Total single commodity	18	2	22	6	48
Total multiple commodity	1	2	3	3	9
Grand total	19	4	25	9	57

Source: Dun and Bradstreet Complex Business File, 1970

Table 15.--Agricultural distribution firms--Farming activities of large multiestablishment firms, by primary activity and type of farm production, 1969

Type of farm production	Primary industrial activity of owning firm					
	Fresh fruit and vegetable wholesale	Poultry wholesale	Other farm products wholesale	Grocery and related products wholesale	Grocery and eating place retail	Total
			Number of firms			
Cotton	--	--	1	--	--	1
Cash grain	--	--	3	--	--	3
Other field crops	1	--	2	--	--	3
Fruit and tree nuts	9	--	--	--	--	9
Vegetable	14	--	1	--	--	15
Dairy	--	--	1	1	--	2
Broiler	--	4	1	2	2	9
Other poultry	--	8	2	2	1	13
Beef cattle	2	2	9	3	2	18
General and other farms	--	--	5	--	--	5
Total firms	23	12	17	7	5	64
			Percent			
Percent of firms	36	19	27	11	8	100
			Number			
Avg. farm enterprise types/firm	1.13	1.17	1.47	1.14	1.00	1.22

Source: Dun and Bradstreet Complex Business File, 1970

Table 16.--Farm commodities produced and food system functions performed by large multiestablishment firms primarily engaged in agricultural distribution, 1969

Commodity produced	Distribution	Distribution + input	Distribution + processing	Distribution + processing + input	Total
			Number		
Single commodity:					
Cotton	--	--	--	--	--
Cash grain	--	--	--	--	--
Other field crops	1	--	--	--	1
Fruit and tree nuts	6	--	1	--	7
Vegetables	11	1	--	--	12
Dairy	--	--	2	--	2
Broilers	--	--	--	5	5
Other poultry	6	1	2	1	10
Beef cattle	7	2	3	--	12
General and other farms	2	2	--	--	4
Total single commodity	35	6	8	6	53
Total multiple commodity	6	--	1	4	11
Grand total	39	6	9	10	64

Source: Dun and Bradstreet Complex Business File, 1970

large share of the nonagricultural firms, 11 percent, produced cash grains, making this the third most common agricultural enterprise.

Within the nonagricultural classification, land-based firms had the most specialized farming operations. The diversification ratio averaged 1.18, ranging from 1.00 for forest product firms to 1.38 for real estate firms. Conglomerate firms had the most diverse farming activities among the major nonagricultural subcategories, with a diversification ratio of 1.82. Farming activities of the conglomerates were spread quite evenly across all commodity categories, with no concentration in any one type of farming enterprise. This was in contrast to the other nonagricultural subcategories of firms, all of which had a high concentration of firms in beef cattle production.

The nonagricultural firms, in aggregate, had the lowest percentage of firms involved in nonfarm food system functions of all the major types of firms in the study (table 18). This suggests that vertical integration is not a major factor in explaining the farm involvement of nonagricultural firms. Conglomerate firms, which will be discussed later as a separate case, are an exception. Although the information contained in the Dun and Bradstreet file contains few clues as to why nonagricultural firms enter farming, several hypotheses can be made.

Farming may be entered into as a joint or interim use of land resources held primarily for other purposes, such as mineral extraction or real estate development. This explanation has a special appeal in the case of nonagricultural land-based firms, which comprise slightly less than half of the nonconglomerate firms in the nonagricultural category. It may also apply to firms in other subcategories, which may hold large land tracts for extended time periods for investment or development.

Some firms may enter farming as a method of diversification. The basic motivation in such cases could be profit expectations or financial gains that might be attained through the use of various tax provisions that apply to farming but not to other types of businesses. Examples of such tax provisions are the option of using cash accounting, treatment of cattle as long-term investments, and tax write-offs for investments in certain types of orchards.

A large share of the integration into nonfarm food system activities by the nonagricultural firms was accounted for by conglomerates. About half of the nonagricultural firms engaged in agricultural processing and distribution, and about a third of those supplying farm inputs, were conglomerates. The commodity-functional distribution of food system activities for conglomerates, broken out separately in table 19, shows that firms in the conglomerate subcategory are highly integrated into all stages of the food system, with 9 of the 11 firms involved in three or more functions.

The nature of the food system activities in which the conglomerate firms are involved indicates that their farming operations are essentially vertically integrated with their overall food business. In this respect, they more closely resemble agribusiness firms, especially processors, than they do other nonagricultural firms. In fact, the normal organizational structure of the conglomerates includes a separate vertically integrated food system division or subsidiary, which, were it an independent firm, would be classified as an agricultural input, processing, or distribution firm.

Table 17.--Nonagricultural firms: Farming activities of large multiestablishment firms, by primary activity and type of farm production, 1969

Type of farm production	Primary industrial activity of owning firm							
	Mining and petroleum	Real estate	Construction	Forest products	Chemical and rubber manufacturing	Metal products and machinery manufacturing	Other manufacturing	Transportation services
	Number of firms							
Cotton	1	--	--	--	--	--	--	--
Cash grain	--	1	2	2	1	--	--	--
Other field crops	1	1	--	--	--	1	--	--
Fruit and tree nuts	1	3	1	--	3	1	--	--
Vegetable	--	1	--	--	1	1	--	--
Dairy	--	--	--	--	--	1	1	1
Broiler	--	--	1	--	--	1	--	--
Other poultry	--	--	1	--	--	2	--	--
Beef cattle	6	2	6	3	--	6	--	5
General and other farms	1	3	1	1	5	3	1	1
Total firms	10	8	10	6	7	9	2	6
	Percent							
Percent of firms	11	9	11	7	8	10	2	7
	Number							
Avg. farm enterprise types/firm	1.10	1.38	1.20	1.00	1.43	1.78	1.00	1.00

continued

Table 17.--Nonagricultural firms: Farming activities of large multiestablishment firms, by primary activity and type of farm production, 1969 -- continued

Type of farm production	Primary industrial activity of owning firm								
	Non-agricultural wholesale	Non-agricultural retail	Financial and other services	Conglomerate	Total land based	Total manufacturing	Total trade and services	Conglomerate	Total non-agricultural firms
	Number of firms								
Cotton	--	--	--	2	1	--	--	2	3
Cash grain	1	--	--	3	5	1	1	3	10
Other field crops	2	--	--	2	2	1	2	2	7
Fruit and tree nuts	1	1	2	2	5	4	4	2	15
Vegetable	2	1	--	2	2	2	3	2	9
Dairy	--	2	--	1	--	2	3	1	6
Broiler	--	--	--	1	1	1	--	1	3
Other poultry	--	--	--	2	1	2	--	2	5
Beef cattle	3	3	2	1	17	6	13	1	37
General and other farms	2	3		4	6	9	5	4	24
Total firms	8	7	4	11	34	18	25	11	88
	Percent								
Percent of firms	9	8	5	13	39	20	28	13	100
	Number								
Avg. farm enterprise types/firm	1.38	1.43	1.00	1.82	1.18	1.56	1.24	1.82	1.35

Source: Dun and Bradstreet Complex Business File, 1970

Table 18.--Farm commodities produced and food system functions performed by large multiestablishment firms primarily engaged in nonagricultural businesses, 1969

Commodity produced	Pro-duction	Prod. + input	Prod. + proc.	Prod. + dist.	Prod. + input + proc.	Prod. + input + dist.	Prod. + proc. + dist.	Prod. + input + proc. + dist.	Total
				Number of firms					
Single commodity:									
Cotton	--	--	1	--	--	--	--	--	1
Cash grain	4	--	--	--	1	--	--	--	5
Other field crops	--	--	1	1	--	--	--	1	3
Fruit and tree nuts	8	--	--	2	--	1	--	--	11
Vegetables	1	--	2	--	--	--	1	--	4
Dairy	5	--	--	--	--	--	--	1	6
Broilers	--	--	--	--	--	--	--	--	--
Other poultry	--	--	--	--	--	--	--	2	2
Beef cattle	27	--	--	2	--	--	--	--	29
General and other farms	6	3	--	--	--	--	--	1	10
Total single commodity	51	3	4	5	1	1	1	5	71
Total multiple commodity	4	2	3	--	2	2	3	1	17
Grand total	55	5	7	5	3	3	4	6	88

Source: Dun and Bradstreet Complex Business File, 1970

Table 19.--Distribution of farm commodities produced and food system functions performed by nonagricultural conglomerate firms, 1969

Commodity produced	Prod. + input	Prod. + proc.	Proc. + dist.	Prod. + input + proc.	Prod. + input + proc. + dist.	Total
	Number of firms					
Single commodity:						
Grain	--	--	1	--	--	1
Other field crops	--	--	--	1	--	1
Vegetable	--	--	--	--	1	1
Dairy	--	--	--	1	--	1
Poultry	--	--	--	1	--	1
Total single commodity	--	--	1	3	1	5
Total multiple commodity	1	1	--	1	3	6
Grand total	1	1	1	4	4	11

Source: Dun and Bradstreet Complex Business File, 1970

FIRM TYPE IS RELATED TO FOOD SYSTEM ACTIVITIES

The data indicate that definite relationships exist between these firms' major business activities and their food system involvement. These relationships include both functional and commodity involvement.

Within the food system, agricultural processors were, in general, involved in a greater number of functional activities than were farm input suppliers or distributors. The typical processing firm, as indicated in table 20, was engaged in 2.84 functional activities, compared with 2.58 for input firms and 2.54 for distributors. Two-thirds of the processors, moreover, were involved in three or more food system functions, compared with slightly over one-third of the input firms and distributors. Farm firms were the least integrated of the firms with a primary activity within the food system.

As noted earlier, the nonagricultural firms other than conglomerates had the lowest level of food system integration of all the firms in the study. For all nonagricultural firms the average number of food system functions per firm was 1.62. Less than one-fifth of the firms were involved in three or more food system functions. The data for all nonagricultural firms, however, camouflage the high degree of functional integration in the conglomerate subcategory of firms. These 11 firms averaged 3.18 food system functions per firm, and over 80 percent of them performed three or more major functions within the food system. Thus the conglomerates had a significantly higher level of food system integration than even the processing firms.

Table 20.--Average number of food system functions per large multiestablishment firm and percent of firms performing 3 or more functions, 1969

Type of firm	Average functions per firm	Percent of firms with 3 or more functions
	Number	Percent
Farm	2.20	30.9
Agricultural input	2.58	34.6
Agricultural processing	2.84	66.7
Agricultural distribution	2.54	39.1
Nonagricultural	1.62	18.2
Total	2.25	32.7

Source: Dun and Bradstreet Complex Business File, 1970

There was also a definite relationship between commodities produced and type of firm. The farming activities of input firms in general were heavily concentrated in poultry and confinement livestock enterprises. Only farm equipment and supply firms were involved in crop production. The processing and distribution firms with crop and dairy production activities showed only a very limited inclination to become involved in input supply functions. Of the 28 processors with dairying or crops as a single farm enterprise, only one performed an input function. The comparable figure for agricultural distributors was 1 firm out of 22.

Processing and distribution firms producing only poultry or beef cattle, in contrast with those producing only crop commodities, were quite heavily involved in farm input activities. Of the 15 processors with a single farm enterprise of broilers, poultry other than broilers, or beef cattle, 5 had an input supply activity. For distributors producing one of these same commodities as a single farm enterprise, 9 of the 37 were involved in supplying farm inputs.

Input-supplying functions, particularly feed manufacturing, play a key role in vertically integrated livestock production operations, excluding dairy. In contrast, the key factors in integration of crop and dairy production relate to market coordination. This conclusion is supported by the functional activity pattern of vertically integrated farm firms. Twenty-seven of 33 vertically integrated, single commodity farm firms producing poultry or beef cattle performed an input function, while only 4 of 42 vertically integrated, single commodity crop farm firms were involved with supplying inputs.

MANY FACTORS INFLUENCE LARGE FIRM PARTICIPATION IN FARMING

Involvement in farm production by the large multiunit firms in this study is not uniform across all agricultural enterprises. Rather, it is heavily concentrated in intensive fruit and vegetable crop and confinement-livestock production. This does not imply that other types of farming, such as extensive field crop and range-livestock production, are immune from direct involvement by large firms. It does, however, imply that there may be some basic similarities among the commodities in which large firms, primarily corporations, have concentrated their farming ventures, and some fundamental differences between this set of commodities and those commodities in which such involvement by large firms is not a major production factor.

Although a comprehensive analysis of similarities and differences among commodities is beyond the scope of this study, several factors will be discussed that may be important in determining the production and marketing structure for specific agricultural commodities. These factors fall into two major categories, institutional and technical.

Institutional Factors

Among the institutional factors affecting the structure of the food system are basic changes in the nature of society. Urbanization, increased consumer affluence, and lifestyles that call for spending a minimum amount of time in home food preparation have brought about mass merchandising of food products and a proliferation of various fabricated and prepared foods.

Such changes are probably best exemplified by the growth of the food service industry. In 1969, the retail value of food and nonalcoholic beverages consumed away from home was estimated at $35 billion, nearly one-third of the total value of all food consumed. Between 1960 and 1970 the sales of eating places nearly doubled, while grocery store food sales increased by less than half.

These basic changes, in turn, have generated a need for greater coordination among the various food system stages, including farming, than was attainable through a system of independent firms, operating at a single level and dealing vertically with each other through open market transactions. One means of achieving this interstage coordination is direct involvement by a single firm in several stages of the system.

Although factors as broad as changes in the basic characteristics of society affect all agricultural commodities, their impacts are not distributed uniformly across all commodity subsectors. Adjustments in production-marketing systems in response to such broad factors are limited and directed by more commodity-specific factors. Such changes in society do, however, provide the environment that may trigger specific structural developments.

Government programs are a second set of institutional factors that bear on the organization of agricultural production and marketing. Programs that have been used extensively as instruments of U.S. agricultural policy, namely commodity price supports in combination with production controls, have probably insulated the commodities which they affect from the trend toward formal vertical

coordination evident in a number of commodities. In effect, such programs substitute for formal vertical coordination by providing the stability that agribusiness firms have attempted to achieve in other commodities through direct vertical integration or other coordinating techniques. This may partially explain the low incidence found in this study of agricultural input, processing, and distribution firms producing cotton, cash grain, and other field crops.

Tax laws are a third set of institutional factors that affect the structure of the food system. 4/ The farm sector benefits from a number of tax provisions, so-called tax shelters that are not available to other industries. Among these are provisions that allow farms to use cash rather than accrual accounting methods, permit capital investment expenditures for cattle breeding herds and certain types of orchards to be written off as current expenses rather than capitalized, and allow conversion of some ordinary income into capital gains. 5/ Vertically integrated firms with farming operations have the capability, through the use of alert internal pricing, of accruing profits at the point in the firm at which the lowest tax rates apply.

The application of tax shelters such as these by nonfarm investors has led to the phenomenon of tax-loss farming. An investor could, for example, by investing in an orchard development, accrue tax losses each year until the orchard reached bearing age, at which time it would be sold. The proceeds would be taxed as a long-term capital gain, allowing the investor to recoup the losses incurred during the development period. In the meantime, he would have been able to apply the losses incurred in developing the orchard against nonfarm income.

The extent to which tax-loss farming has been a factor in inducing the firms included in this study into farming activities is not known. Total tax-loss investments in agriculture, however, have been estimated to be from $10 to $20 billion. 6/ This is about 3 to 6 percent of the total value of assets in the farm sector.

4/ For a recent analysis of special income tax provisions applicable to agriculture, see Thomas A. Carlin and Fred Woods, Tax Loss Farming, ERS-546, Econ. Res. Serv., U.S. Dept. Agr., Apr. 1974.

5/ Prior to the Tax Reform Act of 1969, capital development expenditures for all orchard developments could be written off as current expenses. The act required capitalization of development expenditures for citrus groves. The provisions of the act relating to capital expenditures for citrus groves were later extended to include almond orchards. Capital expenditures for all other orchard and vineyard developments may still be written off as current expenses.

6/ Kenneth R. Krause and Harvey Shapiro, "Tax-Induced Investment in Agriculture: Gaps in Research," Agr. Econ. Res., Vol. 26, No. 1, Jan. 1974.

Technical Factors

Technical factors, which include both the state of technology employed in production, processing, and distribution and the physical characteristics of the commodities themselves, are a major source of the similarities and differences that determine the organizational structure of agricultural production and marketing.

Technological innovations in all stages of the food system have been instrumental in bringing about the conditions that make entry into farming attractive for nonfarm agribusiness firms and entry into the food system in general, and farming in particular, attractive to firms outside the food system. Most innovations are concerned with a single process in one stage of the system, for instance the development of a new crop strain or an improved technique for performing a specific processing function. However, the impact of such innovations is not always limited to the single process. Implementation of an innovation in one stage of the food system may not be possible unless changes in other stages are made. Or an innovation implemented at one stage may act as a catalyst for innovations in other stages. Consequently, a processing firm, for example, may find it necessary or desirable to integrate vertically to take full advantage of an innovation occurring in any one of the four major food system stages.

The development of the poultry industry illustrates how technological innovations can lead to the entry of firms into stages of the food system other than the one in which they were traditionally employed. The National Commission on Food Marketing study of the poultry industries states:

> Rapid technical advances in various phases of poultry production after World World II made it possible for a pound of poultry meat or a dozen eggs to be produced with decreasing amounts of feed and other production items. The incentive was strong to achieve the new efficiencies as soon as possible. To do so required control over production resources and coordination of production practices. 7/

and further:

> As feed manufacturers became more deeply involved in broiler production, they foresaw even further advantages in owning their own hatcheries and arranging to produce hatching eggs from hatching egg supply flocks under their control. Additional advantages of coordination under one management were gained by combining processing with growing and thus marketing poultry meat rather than live broilers.

7/ National Commission on Food Marketing, Technical Study No. 2, Organization And Competition in the Poultry and Egg Industries, U.S. Government Printing Office, Washington, D.C., June 1966.

Commodity characteristics such as perishability, uniformity, intensity of resource use, and production cycle (in the sense of a flow versus batch concept) are the most obvious factors bearing on the organization of a commodity production-marketing system. In this study fruit, vegetable, dairy, poultry, and beef feeding farm enterprises were predominantly integrated into input, processing, or distribution activities of the firms involved, while cotton, cash grain, other field crop, and range cattle enterprises were generally not associated with other agribusiness activities.

The group of commodities in which integrated production-marketing systems were prevalent can be distinguished from the group in which nonintegrated production was the rule on the basis of the characteristics above. Commodities comprising the integrated group are all relatively perishable and employ intensive types of agriculture. Also, they are generally less uniform in quality than the nonintegrated commodities, and several of them are produced on a shorter than annual production cycle. Sugarcane is an exception. In contrast, the nonintegrated commodities are less perishable, involve extensive types of farming, and have an annual production cycle. Thus, based on the findings of this study, there appears to be a definite relationship between certain commodity characteristics and the organizational structure of commodity subsectors.

The factors discussed in this section are not intended to be comprehensive, but merely to illustrate the types of factors that may induce firms such as those in this study to become directly involved in the farming sector. One possible motivation for a firm to enter any venture is the expected profit to be realized. On this basis farming, which has traditionally been a low-return activity, would appear to be a poor investment choice for large firms with primary interests in other areas. We can hypothesize that such firms do not consider the returns anticipated from farming in isolation from other activities of the firm. Rather, they may look at the impact of direct entry into farming on returns of a system of vertically related activities. The efficiencies that may be gained by coordinating farm production with other input, processing, or distribution functions then become of critical importance in arriving at a decision concerning entry into farming.

The nature of farming enterprises of firms in this study strongly suggests that, given present institutional and technical conditions affecting the food system, the potential gains from increased coordination have been a sufficient inducement for vertically integrating intensive types of crop and livestock production with other agribusiness functions. They have not been great enough in extensive farming enterprises, however, to attract agribusiness firms into developing integrated production-marketing operations.

APPENDIX

Standard Industrial Classification Codes 1/ Used to Define Types of Firms

Type of Firm	SIC Codes Included
Farm	
Cotton	0112
Cash Grains	0113
Other Field Crops	0119 excluding potatoes and pineapples
Fruit and Tree Nuts	0122 plus pineapples
Vegetables	0123 plus potatoes
Dairies	0132
Broiler Chickens	0133
Poultry Other than Broilers	0134
Beef Cattle	0135, 0729 part
General and Other Farms	0114, 0136, 0139, 0141, 0192, 0199
Agricultural Input	
Feed Manufacturing	2042, 0713 part
Poultry Hatcheries	0723
Farm Equipment and Supply Distributors	5083, 5099 part, 5252, 5962, 5969
Other Agricultural Inputs	0719, 2871, 2872, 2879, 3522, 4971, 6131

1/ From 1967 Standard Industrial Classification Manual.

Type of Firm	SIC Codes Included
Agricultural Processing	
Meat Packing	2011, 2013
Poultry Processing	2015
Dairy Processing	202 (all 4 digit codes)
Fruit and Vegetable Processing	2033, 2034, 2035, 2037
Grain Mill Products	0713 part, 2041, 2043, 2044, 2045, 2046
Beverage and Flavoring Manufacturing	2082, 2083, 2084, 2085, 2086, 2087
Other Agricultural and Food Products	2031, 2032, 2036, 2051, 2052, 2061, 2062, 2063, 2071, 2072, 2073, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2111, 2121, 2131, 2141, 2211, 2231, 2261
Agricultural Distribution	
Fresh Fruit and Vegetable Wholesaling	0715, 5048
Poultry Wholesaling	5043
Other Farm Products Wholesaling	5041, 5042, 5043, 5044, 5045, 5046, 5047, 5049
Grocery and Related Products Retailing	5411, 5421, 5431, 5441, 5451, 5462, 5463, 5499, 5812, 5813
Agricultural Marketing Services 2/	
Warehousing and Storage	4221, 4222, 4223
Transportation Services	4731

2/ No firms in the study had primary SIC Codes in the agricultural marketing services classifications.

Type of Firm	SIC Codes Included
Nonagricultural	
Mining and Petroleum	10, 11, 12, 13, 14, 29 (all 4 digit codes)
Real Estate	65, 66
Construction	15, 16, 17, (all 4 digit codes)
Forest Products	08, 24, 26 (all 4 digit codes)
Chemical and Rubber Manufacturing	281, 282, 283, 284, 285, 286, 289, 30 (all 4 digit codes)
Metal Products and Machinery Manufacturing	19, 33, 34, 351, 353, 354, 355, 356, 357, 358, 359, 36, 37, 38 (all 4 digit codes)
Other Manufacturing	222, 224, 225, (all 4 digit codes) 2262, 2269, 227, 228, 229, 23, 25, 27, 31, 32, 39 (all 4 digit codes)
Transportation Services	40, 41 (all 4 digit codes) 4224, 4225, 4226, 4231, 44, 45, 46, 472 (all 4 digit codes)
Nonagricultural Wholesale	501, 502, 503, 506, 507 (all 4 digit codes), 5081, 5082, 5084, 5085, 5086, 5087, 5088, 509 (all 4 digit codes)
Nonagricultural Retail Trade	521, 522, 523, 524, (all 4 digit codes) 5251, 531, 532, 533, 534, 535, 539, 55, 56, 57, 591, 592, 593, 594, 595, 597, 598, 599 (all 4 digit codes)
Financial and Other Services	48, 49, 60, 611, 612, 614, 615, 616, 62, 63, 64, 67, 70, 72, 73, 75, 76, 78, 79, 80, 81, 82, 84, 86, 89 (all 4 digit codes)

Type of Firms	SIC Codes Includes
Nonagricultural	
Conglomerate	Includes broadly diversified firms in which no single industrial category is the predominate activity of the firm.