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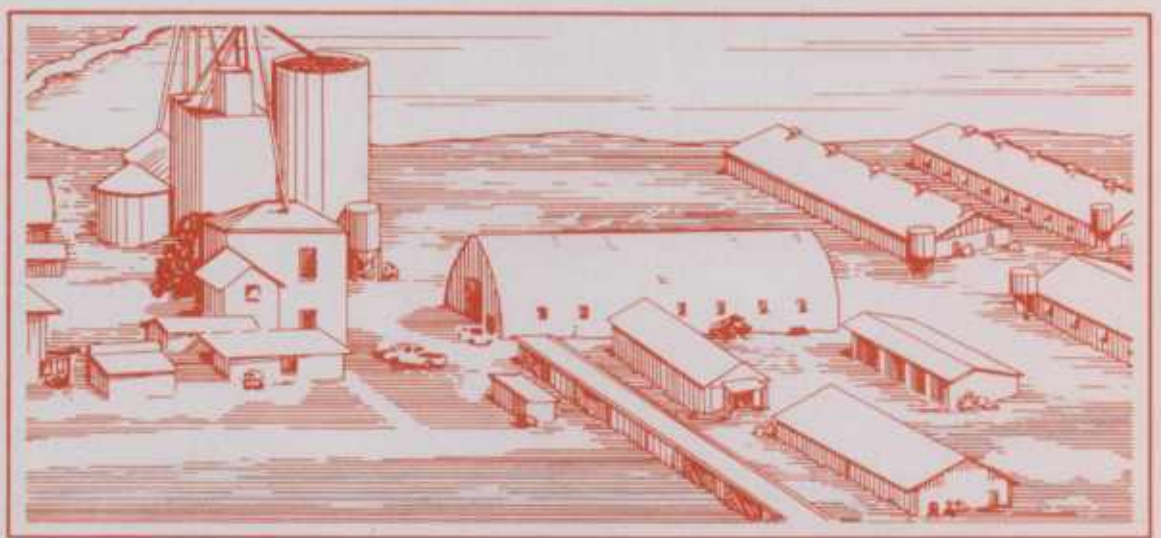
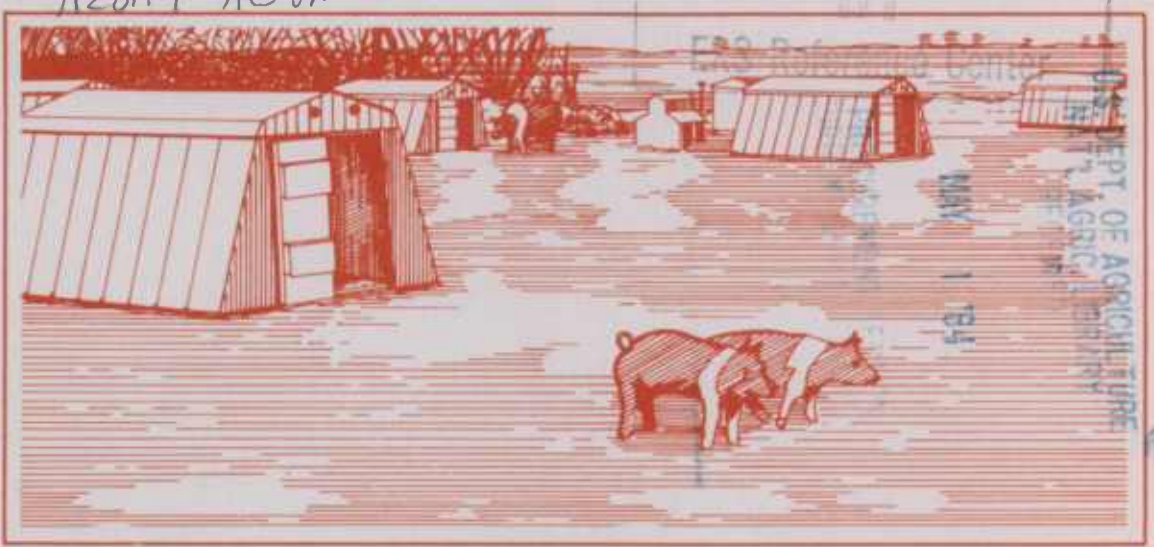
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# Structural Characteristics of the U.S. Hog Production Industry

Roy N. Van Arsdall

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Economics,  
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Cooperatives Service

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#### ABSTRACT

Structural and operating characteristics of hog production in 1975 are identified. Data from a sample survey and secondary sources reveal number of hog producers and sizes of enterprises, location of production, forms of ownership, general farm characteristics, details of production practices, specifics of facilities in use, and methods of marketing. Information is given by region for the three major types of hog producing enterprises: feeder pig production, farrow-to-finish, and feeder pig finishing.

Keywords: Hog, Feeder pig production, Feeder pig finishing, Hog feeding, Hog facilities, Structure of hog production.

#### PREFACE

This report is a part of a comprehensive research project by the Commodity Economics Division (CED) of the Economics, Statistics, and Cooperatives Service to identify the structural characteristics, operating practices, and costs of production for the major meat animal industries in the United States.

The planning and conduct of the overall program have been a cooperative effort of members of the Meat Animals Research group of CED. Chief contributors to the investigation of the hog industry were C. C. Boykin, R. J. Crom, H. C. Gilliam, R. A. Gustafson, J. E. Nix, and R. C. Otto.

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## DEFINITIONS

Feeder pig production: production of pigs for sale as feeder animals usually weighing 40 to 60 pounds per head.

Feeder pig finishing: purchase of feeder pigs and feeding them to slaughter weight.

Farrow-to-finish: production of pigs and feeding them to slaughter weight on the same farm.

Farrowing: giving birth to pigs.

Litter: group of pigs farrowed by a gilt or sow in one farrowing.

First litter gilt: female producing first litter of pigs.

Sow: female after production of the first litter of pigs.

Cull sow: female removed from the breeding herd generally for sale as a slaughter animal.

Market or slaughter hog: hog finished for the slaughter market usually weighing 220 to 240 pounds.

Free choice feeding: grains and protein feeds offered separately and without constraint as to amounts consumed.

Complete feed: all ingredients mixed together.

Custom feed processing: grinding and mixing of ration ingredients for a fee at a commercial feed mill or by a mobile operator.

Portable housing: shelter units that can be moved from one location to another with tractor power.

Farrowing house: shelter facility for the farrowing of pigs.

Central farrowing house: nonportable farrowing house with pens or crates for sows.

Nursery: housing for small pigs generally from weaning to weights of 60 to 70 pounds per head.

Finishing house: shelter building for the growing and finishing of hogs to slaughter weight.

Slotted floor: buildings with floors partially or completely covered with slats of concrete or other material spaced to allow manure to drop into pits below the floor.

Confinement production: all production is under roof with no access to exposed lots or pastures in total confinement; hogs have access to exposed lots in partial confinement.

Capacity of housing: the average number of hogs or pigs that can be produced in a specified type of housing in one year.

Waste management: the utilization or disposal of manure, used bedding, and waste water resulting from hog production.

## HIGHLIGHTS

Hog production accounts for about a third of U.S. red meat production and generates a sixth of the cash receipts from the sale of all livestock and livestock products. It is an important enterprise on a large number of farms, especially in the North Central Region.

A survey was taken of a random sample of hog producers in 1976. Data from this survey, along with information from secondary sources, are used to identify and quantify the major structural characteristics of U.S. hog production. The more important findings follow. All results pertain to 1975 unless specified.

1. Regional location of production has changed little since 1950. The North Central Region accounted for 78.6 percent of liveweight produced in 1975; the Southeast Region, 14.8 percent; the Southwest Region, 2.4 percent; and all other regions, 4.2 percent.
2. Farms selling hogs dropped from 2.1 million in 1950 to 453,000 in 1974. During 1964-74, sales from farms marketing less than 200 head annually dropped from 46 to 24 percent of total. Farms selling 1,000 head or more increased their share from 7 to 25 percent of total. The larger enterprises are relatively less numerous in the North Central than other regions.
3. One-fourth of all farms selling hogs and pigs sold feeder pigs in 1974. Size distribution was essentially the same for feeder pig enterprises as for all farms selling hogs and pigs.
4. Hog sales accounted for 37 percent of adjusted gross farm sales on farms producing feeder pigs in 1975, 52 percent on farms with farrow-to-finish operations, and 40 percent on farms purchasing and feeding pigs to slaughter weight. Even small hog enterprises were important contributors to gross farm income as size of hog enterprise was directly related to size of farm business.
5. Two-thirds or more of all farms that produced hogs or pigs in 1975 had other livestock or poultry enterprises in addition to hogs. Beef cows or cattle feeding enterprises were present on over 90 percent of the farms with other livestock.
6. The average feeder pig producer farmed 230 acres of land, operators with farrow-to-finish enterprises managed 425 acres, while feeder pig finishers had 332 acres. Average farm size leveled or decreased as hog production exceeded 1,000 head annually.
7. Eighty percent or more of the farms producing hogs were partly or fully owned by the operator. Few hogs were produced on rented land. Even when they were, the landlord seldom had a financial interest in the hog enterprise.
8. About 90 percent of all farms were sole proprietorships, 5 to 10 percent were full partnerships, and 1 to 2 percent had limited partnerships. All

other forms of business organization accounted for about 1 percent. Partnerships and corporations handled more than half of the largest hog enterprises.

9. Farrowing was concentrated seasonally in small enterprises and spread over the year in large ones. The mix of small and large enterprises tended to level production over the year.
10. Sows (as opposed to first litter gilts) accounted for a larger proportion of litters in feeder pig production (78 percent) than in farrow-to-finish (65 percent); less in the North Central than other regions; and less in large enterprises than small ones. Capital gains tax provisions, feed costs, and availability of production facilities affected gilt-sow ratios.
11. Farrowings averaged 8.8 pigs per litter in feeder pig production and 8.5 pigs in farrow-to-finish enterprises. Pigs weaned averaged 7.2 and 6.9 per litter, respectively. Both measures of production trended upward with increases in size of enterprise. The Southeast and Southwest showed an advantage of up to half a pig per litter over the North Central Region. Pigs were weaned at an average age of 6.2 weeks; large enterprises generally weaned pigs at an earlier age than small enterprises.
12. Most producers raised their female breeding stock. Nearly all bought boars. Prices paid per boar were much higher in large operations than small ones.
13. Feeder pig producers marketed pigs 8 to 9 weeks after farrowing at an average weight of 47 pounds per head. Farrow-to-finish took about 6 months; feeder pig finishing took 132 days. Market hogs weighed 225 to 230 pounds. Differences occurred among regions especially in weights of cull sows.
14. Losses from all causes averaged 1.6 percent of total weight produced in farrow-to-finish, 1.8 percent in feeder pig finishing, and 2.5 percent in feeder pig production. Losses were higher in the larger operations and in the Southeast and Southwest Regions, compared with the North Central Region.
15. Feed conversion averaged 5.53 pounds of feed per pound of liveweight produced in feeder pig production, 4.39 pounds in farrow-to-finish, and 4.65 pounds in feeder pig finishing. No consistent relationships were found in feed conversion rates among either regions or sizes of enterprises.
16. Less feed was required to produce a given amount of slaughter hogs in farrow-to-finish operations than when pig production and pig finishing were done on different farms. Part is due to the additional stresses of marketing on feeder pigs; evidence suggests that the inherent performance capabilities of pigs may be less when the operations are split.
17. Most producers made direct use of grain either in free choice feeding or in processing their own rations. Homegrown grains accounted for 80 percent of direct grain use in the North Central Region, half to three-



fourths in the Southeast and about 10 percent in the Southwest. On the basis of total feedstuffs, purchases accounted for at least half of the value of feeds fed.

18. Commercially prepared protein supplements, commonly containing 35 to 40 percent protein, were bought by 75 to 80 percent of all producers finishing hogs for slaughter and 65 percent of all feeder pig producers. One-sixth of the farrow-to-finish producers used soybean meal; one-eighth of those with other enterprises did so. Separate purchases of vitamins and antibiotics for use in feed rations were substantial.
19. Purchases of complete feeds were made by most producers for pig starter rations, but were common for grower, finisher, and sow rations only in the Southeast and Southwest.
20. Some type of on-farm feed processing equipment was used by 75 percent of all producers with farrow-to-finish enterprises, 63 percent of the feeder pig finishers and 34 percent of the feeder pig producers. Tractor-powered feed mills outnumbered electric mills 5 to 1, but electric mills were common in large enterprises and in the Southeast and Southwest. Most farmers in the North Central Region used their mills with other livestock enterprises.
21. Hog wastes were handled as solid manure by over four-fifths of the producers in the North Central Region. Some 10 to 15 percent used liquid or combination solid-liquid systems. Nearly all manure handled in the North Central Region was put on cropland. Three-fourths or more of all producers in the Southeast and Southwest handled no manure. Special facilities for manure storage and pollution control were seldom used in any region.
22. One-fifth of all nonportable facilities, including a third of the major shelter buildings, were over 30 years old. Oldest facilities were in the North Central Region and on farms with small hog enterprises. Fifty to 70 percent of the facilities in the Southeast and Southwest were no more than 10 years old.
23. Central farrowing houses with slotted floors were used in about a third of all farrow-to-finish enterprises and handled about 40 percent of the output of pigs. Five percent or less of total farrowings were without shelter, portable housing accounted for only about 10 percent, while central houses with solid floors handled the remainder. Farrowing houses in feeder pig production were much less developed.
24. Nurseries were used in 40 percent of the feeder pig enterprises and 30 percent of the farrow-to-finish operations. Most were solid floor buildings.
25. Solid floor housing units, typically open front barns or sheds with paved lots attached, were used by 62 percent of all producers finishing hogs and accounted for 58 percent of total production. Slotted-floor finishing buildings, including systems in transition, handled a fourth of total production while a sixth of all hogs were fed without shelter.

26. The capacity of all shelter facilities was greatly underutilized. Farrowings averaged only 2.4 litters per unit of space. Nurseries and finishing facilities were operated at less than half capacity. Largest enterprises approached capacity utilization of all facilities, but small ones fell far below.
27. Most pig producers used some pastures, but seldom for anything but the breeding herd. Feeder pig finishing was done almost exclusively without pasture.
28. Tractors were the chief source of power for all enterprises, especially in the North Central Region. Nearly a third of the tractors used were at least 20 years old, a high proportion operated on gasoline, and the average size was about 50 horsepower. Use averaged 2.8 hours per litter in feeder pig production and 3.2 hours per 1,000 pounds of liveweight produced in finishing enterprises. Less tractor power was used per unit of production in large compared with small enterprises. The Southeast and Southwest regions used less than the North Central Region.
29. Most producers used trucks and automobiles in hog production. Truck use averaged 48 ton miles per litter of feeder pigs; a little less per 1,000 pounds of liveweight produced occurred in finishing enterprises. Automobile use added 25 to 30 miles per unit of production.
30. Unpaid operator and family labor accounted for 93 percent of the hours of labor used in feeder pig production, 82 percent in farrow-to-finish enterprises, and 89 percent in feeder pig finishing. Hired labor was relatively more important in the Southeast and Southwest than in the North Central Region and it constituted a greater part of the total labor in large compared with small enterprises.
31. Labor inputs averaged 22.4 hours per litter of feeder pigs produced, 1.8 hours per hundredweight of production in farrow-to-finish enterprises, and 1.4 hours per hundredweight of gain in feeder pig finishing. Overall, about four times as much labor was used per unit of production in the smallest as in the largest enterprises. Unit inputs of labor were higher in the Southeast and Southwest than in the North Central Region.
32. Half to two-thirds of all producers slaughtered hogs for home use.
33. Seventy-two percent of all slaughter hogs were sold direct to packers. Terminal markets handled 16 percent; auction markets handled 12 percent. About 9 percent were sold on a grade and weight basis with the rest sold on a liveweight basis.

# STRUCTURAL CHARACTERISTICS OF THE U.S. HOG PRODUCTION INDUSTRY

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## INTRODUCTION

Hog production includes a wide range of sizes and systems of production units, old and new facilities, different types of hogs produced, kinds and mixtures of feeds, single and multiple enterprise farms, and geographic location. Such factors largely influence cost of production and supply response. Much change has occurred in recent years and accelerated rates of change are probable in the future. The outcome of decisions related to hog production by individual producers; input and supply industries; marketing, processing, and distribution firms; and public policymakers is affected by these structural characteristics.

### Objectives

This report identifies and quantifies important structural characteristics of U.S. hog production. Differing structural characteristics are examined for their implication to efficiency and change in hog production. Periodic update can be made of the more important characteristics to aid identification of trends and future change. Further, the data provide the basis for specifying and determines the relative importance of representative hog enterprises by region, type of hogs produced, size of enterprise, and system of production. 1/

### Sources of Data

Information provided in this report comes largely from a 1976 survey of U.S. hog production by the Statistical Reporting Service (SRS) which is now part of the Economics, Statistics, and Cooperatives Service. The survey collected information on both structural characteristics of hog producing units and costs of production. 2/

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1/ Hog enterprise budgets, FEDS file numbers 750 through 812, weighted according to their relative importance in U.S. hog production are on the Firm Enterprise Data System budget generator, Economics, Statistics, and Cooperatives Service, (FEDS) Stillwater, Oklahoma.

2/ The cost of producing hogs derived in part from this survey is reported in Costs of Producing Hogs in the United States, 1976, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate. Prepared by the Econ., Stat., and Coops. Serv., U.S. Dept. of Agr., U.S. Senate Committee Print 25-503, April 1978.

The survey covered all or parts of 24 States that accounted for 95 percent of U.S. hog production (fig. 1). Producers were selected on a random basis from lists maintained by SRS. Results were weighted for each segment according to the relationship between number of producers in the sample and total population so that aggregations are representative of regions.

The sample was divided among three types of hog producers: feeder pig producers, farrow-to-finish operations, and feeder pig finishers. Producers were excluded from the survey if they had not sold at least 100 hogs in 1975 or if their production was mixed such that less than 90 percent of their hog sales, exclusive of cull breeding stock, came from a single one of the three identified enterprises. This second constraint, aimed at maintaining an identifiable enterprise for purposes of analysis, resulted in the elimination of about 10 percent of the potential respondents from the sample. Final results presented in this report are based on complete sets of data from 851 farms on which hogs were produced in 1975.

The measurements of structural characteristics taken from the survey apply only to 1975. Data are not available to determine how operations in 1975 differed from those of previous years. The sample was not stratified by size of enterprise, so some size-type cells lack adequate observations for reliable measurements. This limitation weighs most heavily on the least intensive hog producing region and on large enterprises.

The survey was designed primarily to describe systems of production and to measure costs of production. Marketing practices were not considered. To make this report as complete as possible, data from the Census of Agriculture, SRS publications, and other secondary sources were used.

## HOG PRODUCTION 1950-76

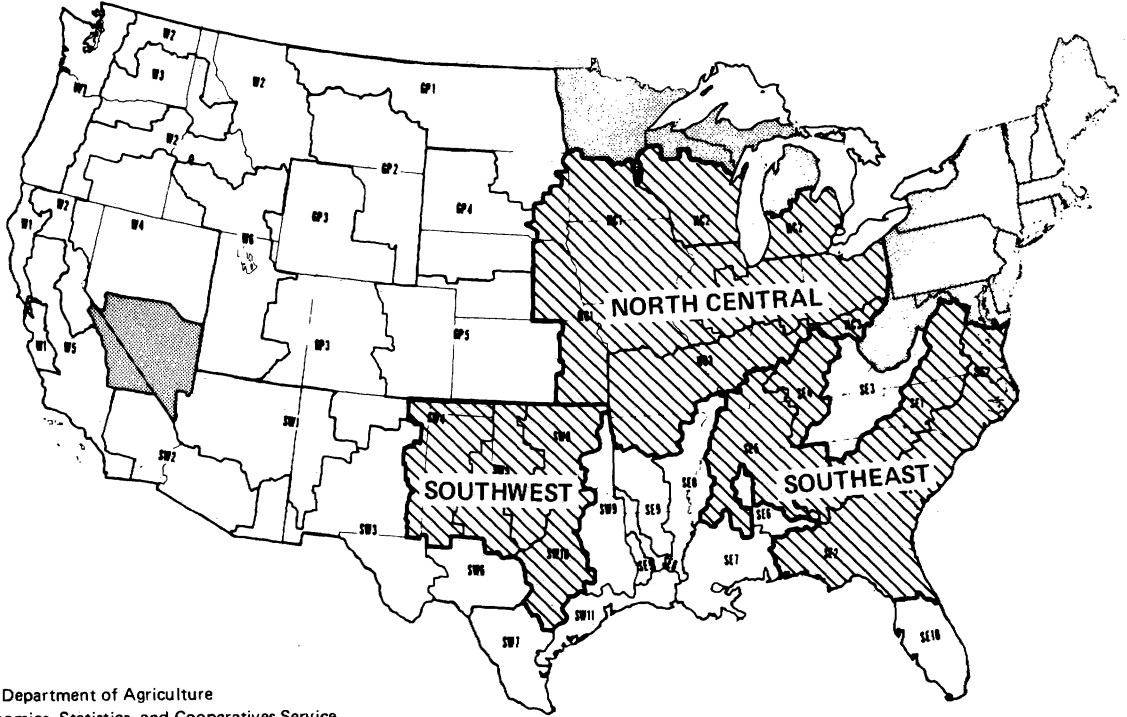
The following data highlight some of the major characteristics of the hog industry during the past 26 years and provide a setting for examining the detailed structural characteristics of the industry as it appeared in 1975. 3/

### Volume of Production

In the early fifties, hogs accounted for over half of the total U.S. red meat production, fluctuating generally around 13 billion pounds carcass weight. Beef production was below the output of hogs. Production of both beef and hogs fluctuated cyclically during 1950-76, but pork output remained in the 11- to 15-billion pound range while beef production cycled continually upward, reaching an alltime high of nearly 26 billion pounds carcass weight in 1976. Recently, hog production has accounted for about a third of total red meat production (appendix table 1). In 1976, hogs accounted for 8 percent of the cash receipts from all farm marketings and 16 percent of the receipts from marketings of livestock and livestock products (fig. 2).

3/ Data in this section are from Census, SRS reports, and other secondary sources as specified.

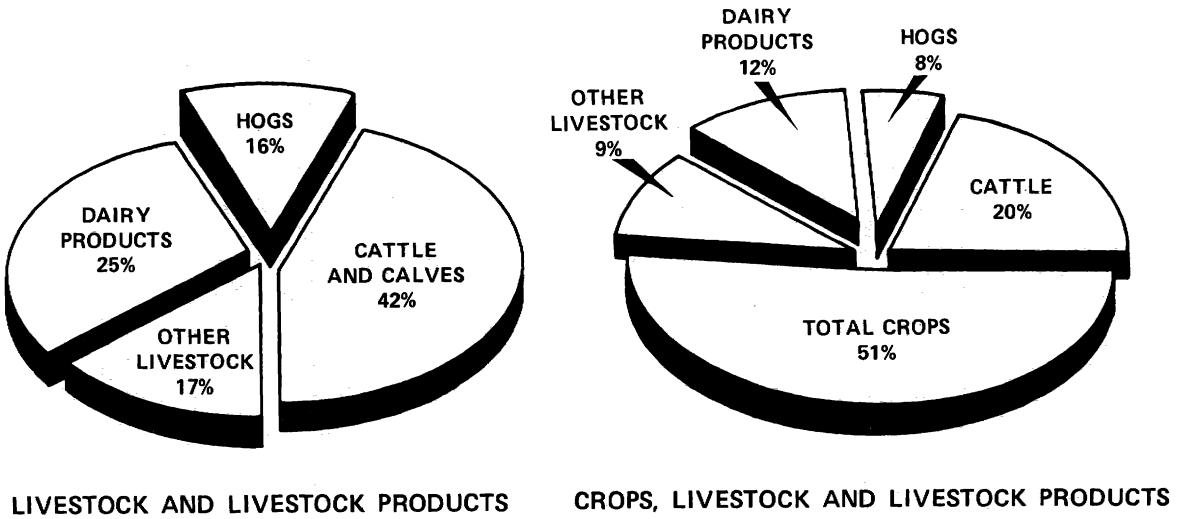
# PRODUCTION REGIONS FOR MEAT ANIMAL COST ANALYSIS



U.S. Department of Agriculture  
Economics, Statistics, and Cooperatives Service

Figure 1

# CASH RECEIPTS FROM FARM MARKETINGS, BY COMMODITY, 1976



U.S. Department of Agriculture  
Economics, Statistics, and Cooperatives Service

Figure 2

Except for short periods per capita consumption of pork generally held in the 60- to 80-pound range during 1950-76. During 1975, hog production and the resulting per capita consumption were both quite low. Production of beef cattle was moving toward an alltime high. The farm price for hogs was generally much more favorable than for beef cattle and substantial adjustments were beginning to occur in the volume of production in both enterprises.

### Location of Production

Hog and feed grain production remain together much as they were in 1950 (fig. 3 and table 1). Some small interregional shifts have occurred, but no dominant change is apparent.

The Corn Belt-Lake States turned out 66 percent of the total liveweight of hogs in 1975, one percentage point less than in 1950. There is some indication of an east-to-west movement of production within the region, but it is not strong (appendix table 2). Iowa and Illinois remain the first and second most important hog producing States, accounting for 37 percent of U.S. production between them (over 3 percentage points more than in 1950). The Northern Plains increased its share of output from 10.4 to 12.8 percent of the total.

The Southeast gained little in importance in hog production, standing at 14 percent of total in 1950, 14.8 percent in 1975. Increases in production in some States, notably North Carolina and Georgia, were largely offset by declines in several others. The Southwest dropped from 3.5 to 2.4 percent of total U.S. production while all other States not included in the regions listed above fell from 5 percent of total in 1950 to 4.2 percent in 1975.

### Number of Producers

Hogs were a common U.S. farm enterprise 25 years ago. Census data taken in 1950 show that 63 percent of the 2.9 million farms in the top 15 hog producing States had hogs on hand at inventory time. <sup>4/</sup> Nearly half of all farms in these States sold some hogs. Sales averaged 38 head per farm. Iowa topped the list with 85 percent of all farms in the State having sales of hogs. For the whole United States, 2.1 million farms (39 percent of all farms) had some hog sales during the year (table 2).

With each census period after the 1950 count, both the total number of farms and the number engaged in hog production declined. The proportion of all farms with hog sales trended downward, but rose and fell with the profitability of hogs. This indicates the flexibility that farmers had for moving into and out of hog production. By 1974, the top 15 hog producing States included only 1.4 million farms, less than half the number in 1950. Farms with hog sales had dropped to slightly less than a fourth of the total compared with half in 1950. Over a million farms quit selling hogs in these States during this period either because farms were combined into larger units or the hog enterprise was dropped. Nationally, farms selling hogs dropped from 2.1 million in 1950 to 450,000 in 1974. Hog sales came from about 325,000 farms in the top 15 States.

<sup>4/</sup> The top 15 hog producing States, remaining the same in 1950-74, consistently produce more than 80 percent of the total U.S. output of hogs.

Table 1--Distribution of hog production, by major regions, 1950-75 <sup>1/</sup>

Region	1950	1955	1960	1965	1970	1975
<u>Percent of liveweight</u>						
Corn Belt-Lake States:						
Eastern	30.2	31.1	32.5	31.7	28.6	29.3
Western	36.9	37.8	36.9	37.8	37.2	36.6
Northern Plains	10.4	11.1	10.2	12.2	13.7	12.8
Southeast	14.0	13.0	14.1	12.8	14.4	14.8
Southwest	3.5	2.6	2.3	2.0	2.6	2.4
Other	5.0	4.4	4.0	3.6	3.5	4.2
48-State total	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1/</sup> Percentages are based on liveweight produced. See appendix table 2 for data by States.

Source: Agricultural Statistics, and Livestock and Meat Statistics. Various issues, U.S. Dept. of Agr.

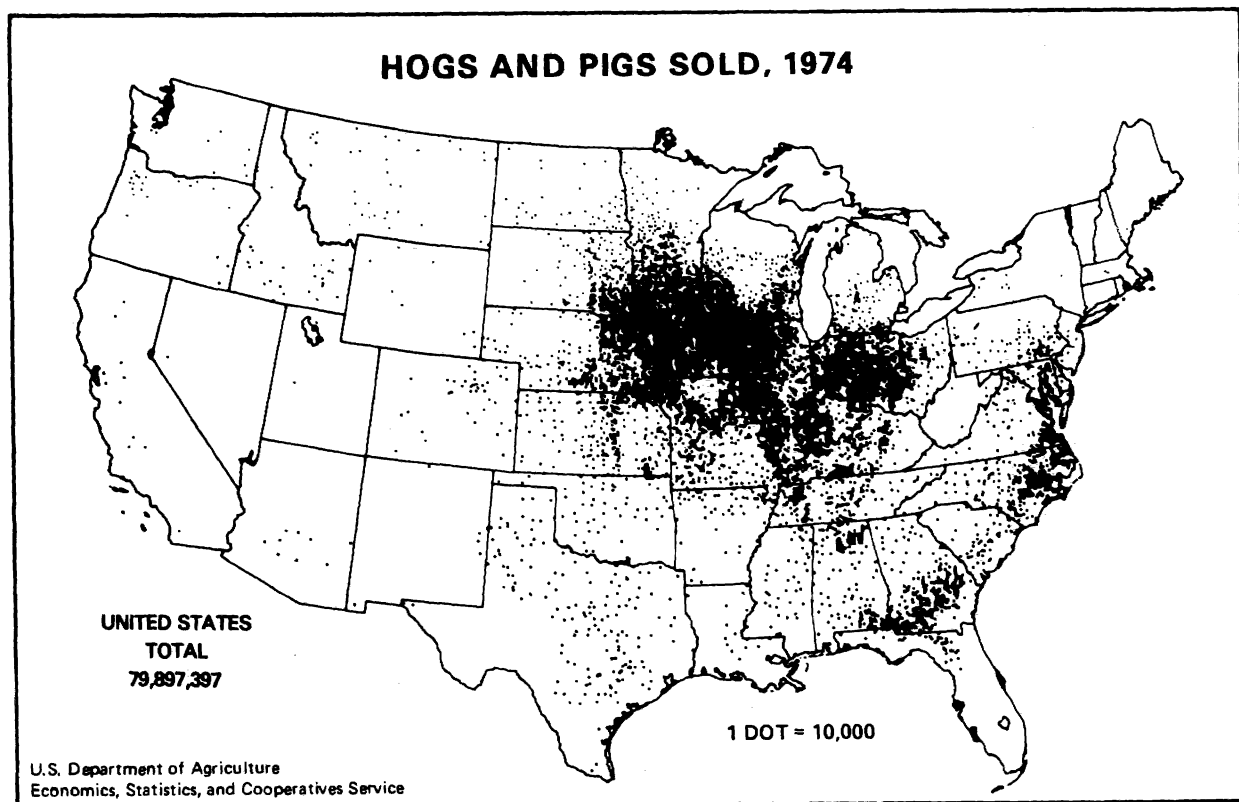


Figure 3

Table 2--Number and proportion of farms with sales of hogs and pigs, and feeder pigs, and numbers of hogs and pigs sold, selected areas, 1950-74

Year and area	Farms			Hogs and pigs sold <sup>1/</sup>				Farms selling feeder pigs <sup>2/</sup>	
	Total	Selling hogs and pigs		All hogs and pigs	Feeder pigs		No.	Percent of farms with hog sales	
		No.	Pct.		No.	Pct.			
		--1,000--	Pct.	--1,000--	Pct.	1,000	Pct.		
1950:									
Top 15 States <sup>3/</sup>	2,915	1,446	49.6	55,499	--	--	--	--	
Other States	2,467	652	26.4	10,013	--	--	--	--	
Total	5,382	2,098	39.0	65,512	--	--	--	--	
1954:									
Top 15 States	2,626	1,045	39.8	50,288	--	--	--	--	
Other States	2,156	379	17.6	7,131	--	--	--	--	
Total	4,782	1,424	29.8	57,419	--	--	--	--	
1959:									
Top 15 States	2,126	951	44.8	71,276	--	--	--	--	
Other States	1,584	322	20.3	6,624	--	--	--	--	
Total	3,710	1,273	34.3	80,900	--	--	--	--	
1964:									
Top 15 States	1,838	638	34.7	75,017	--	--	--	--	
Other States	1,315	105	8.0	5,624	--	--	--	--	
Total	3,153	743	23.6	80,641	--	--	--	--	
1969:									
Top 15 States	1,674	511	30.5	79,518	12,891	16.2	124	24.2	
Other States	1,056	134	12.7	9,795	2,194	22.4	36	26.8	
Total	2,730	645	23.6	89,313	15,085	16.9	159	24.7	
1974:									
Top 15 States	1,380	325	23.6	64,047	9,695	15.1	79	24.3	
Other States	1,070	128	12.0	14,790	3,374	22.8	39	30.7	
Total	2,314	450	19.4	79,897	13,167	16.5	116	25.8	

<sup>1/</sup> Data on sales of feeder pigs are not available prior to 1969.

<sup>2/</sup> Farm selling feeder pigs are expressed as a percentage of all farms selling hogs and pigs of any kind.

<sup>3/</sup> The top 15 hog producing States are Iowa, Illinois, Indiana, Missouri, Minnesota, Nebraska, Ohio, North Carolina, South Dakota, Kansas, Wisconsin, Georgia, Kentucky, Tennessee, and Texas for all years.

Source: Agricultural Census, for the specified years.



## Size of Enterprise

In 1964, 23 percent of all hog sales came from farms selling fewer than 100 head annually; 46 percent of sales came from farms selling fewer than 200 head. Only a little more than 7 percent of total hog sales were from farms selling 1,000 or more a year.

By 1974, the proportion of sales had shifted at an accelerating rate toward the larger enterprises (tables 3 and 4). Hogs coming from operations selling fewer than 200 head had dropped by nearly half, accounting for only 24 percent of the total. Declines also occurred in the relative importance of intermediate size classes. The proportion of hog sales originating on farms selling 1,000 head or more a year had advanced greatly, especially in some States (appendix tables 3 and 4). Approximately 10,000 farms accounted for a fourth of all sales in 1974. While census data give no information on the distribution of sales above 1,000 head per farm, other research indicates that a substantial portion of these sales are coming from enterprises turning out 5,000 or more hogs in a year. <sup>5/</sup> Number and size of operations producing feeder pigs are distributed about like farms producing all types of hogs and pigs (table 5 and appendix table 5).

Large hog enterprises occupied a more dominant role in the Southeast and Southwest than in the North Central Region. Many producers in the southern area are relatively new entrants to commercial hog production and started with hog enterprises of substantial size. Diversified farming, established production patterns, and existing facilities still exert strong influence on size of enterprise in the North Central Region.

The rapid increase in size of hog enterprise parallels the general trend in farm size, enterprise specialization, adoption of new production technology, and producer attitudes. As sufficient land or additional productive capacity in terms of other enterprises is acquired to make a full-time farm business, there is less economic pressure for farmers to maintain a small hog enterprise. Many obviously feel that the marginal income a small hog enterprise generates is not of sufficient importance to justify the effort and expense. The proportion of production coming from the larger units is likely to continue a rapid increase. The extent of growth in size of hog enterprises will depend on the relative profitability of hog production and other farm enterprises, the ability to control hog diseases, the availability of managerial talent, and other factors.

## Enterprise Importance

In recent years, most hogs have been produced in enterprises considerably below the productive capacity of one man even without a highly mechanized system. Two-thirds of total sales came from farms selling fewer than 500 head in 1969. Nevertheless, most hog sales still came from farms on which hogs accounted for a major portion of the total gross farm income.

<sup>5/</sup> Large Volume Hog Production in the U.S., A 1975 Survey, V. James Rhodes and Glenn Grimes, Dept. Agr. Econ., Univ. Missouri, Columbia, SR 114.

Table 3--Number and percentage of hogs and pigs sold, by size classes and selected regions, 1964, 1969, and 1974 <sup>1/</sup>

Year and region	Hogs and pigs sold	Annual sales of hogs (head)					1,000 and over	Total
		1-99	100-199	200-499	500-999			
	<u>1,000</u>	-----Percent of sales-----						
1964:								
Corn Belt	49,491	14.5	21.8	38.5	17.1	8.1	100.0	
Lake States	10,142	31.9	27.7	28.2	8.2	4.0	100.0	
Northern Plains	9,788	29.3	30.0	29.5	7.3	3.9	100.0	
Southeast	9,493	47.8	18.9	17.1	7.0	9.2	100.0	
Southwest	1,477	46.5	14.3	15.7	7.7	15.8	100.0	
Total	80,391	23.0	23.1	33.2	13.4	7.3	100.0	
1969:								
Corn Belt	50,329	10.0	15.7	38.0	23.2	13.1	100.0	
Lake States	9,616	18.9	22.2	35.1	15.9	7.9	100.0	
Northern Plains	10,927	17.3	22.8	36.4	14.3	9.2	100.0	
Southeast	12,763	31.4	18.4	23.1	11.3	15.8	100.0	
Southwest	2,267	28.1	15.9	22.8	13.4	19.8	100.0	
Total	85,902	15.6	17.7	34.9	19.2	12.6	100.0	
1974:								
Corn Belt	43,037	7.6	11.9	31.5	25.5	23.5	100.0	
Lake States	8,758	13.5	16.0	30.5	21.4	18.6	100.0	
Northern Plains	11,430	11.1	15.9	33.7	19.6	19.7	100.0	
Southeast	11,306	21.3	13.2	18.6	12.6	34.3	100.0	
Southwest	1,891	17.8	9.4	16.4	12.7	43.7	100.0	
Total	76,422	11.4	13.0	29.0	21.7	24.9	100.0	

<sup>1/</sup> Any sales recorded by the Census, but not included in the Census distribution by size classes, have been placed in the 1-99 sales class in this table.

Source: Census of Agriculture, 1964, 1969, and 1974.

Table 4--Number and percentage of farms selling hogs and pigs, by size class and selected regions, 1964, 1969, 1974 <sup>1/</sup>

Year and region	Farms selling hogs and pigs	Annual sales of hogs (head)					1,000 and over	Total
		1-99	100-199	200-499	500-499			
	1,000	-----Percent of farms-----						
1964:								
Corn Belt	320.3	50.7	24.2	20.2	4.1	0.8	100.0	
Lake States	106.3	68.9	19.6	9.9	1.3	.3	100.0	
Northern Plains	100.0	66.3	21.8	10.5	1.2	.2	100.0	
Southeast	196.2	89.3	7.0	3.0	.5	.2	100.0	
Southwest	28.9	89.5	6.2	3.2	.7	.4	100.0	
Total	751.7	66.9	18.1	12.3	2.2	.5	100.0	
1969:								
Corn Belt	255.0	44.6	22.0	24.7	7.0	1.7	100.0	
Lake States	75.2	59.1	20.4	16.7	3.1	.7	100.0	
Northern Plains	79.1	56.1	22.8	17.3	3.0	.8	100.0	
Southeast	166.6	81.4	10.5	6.2	1.3	.6	100.0	
Southwest	28.3	81.9	9.4	6.3	1.6	.8	100.0	
Total	604.2	59.8	18.1	16.8	4.2	1.1	100.0	
1974:								
Corn Belt	181.2	42.7	20.3	24.5	9.1	3.4	100.0	
Lake States	55.4	58.7	18.2	16.2	5.1	1.8	100.0	
Northern Plains	60.6	49.0	21.8	21.6	5.7	1.9	100.0	
Southeast	103.9	78.9	10.6	7.0	2.1	1.4	100.0	
Southwest	15.1	79.9	8.8	6.8	2.4	2.1	100.0	
Total	416.2	56.1	17.4	18.0	6.1	2.4	100.0	

<sup>1/</sup> Any farms selling hogs and recorded by the Census, but not included in the Census distribution by sizeclasses, have been placed in the 1-99 sales class in this table.

Source: Census of Agriculture, 1964, 1969, and 1974.

Table 5--Number and percentage of feeder pigs sold and farms selling feeder pigs, by size class and selected regions, 1974 <sup>1/</sup>

Region	Item	Annual sales of hogs (head)					
		1-99	100-199	200-499	500-999	1,000 and over	Total
	<u>1,000 pigs</u>	<u>Percent</u>					
Feeder pigs sold:							
Corn Belt	5,587	10.6	13.6	28.0	22.8	25.0	100.0
Lake States	2,015	14.4	16.5	31.2	20.3	17.6	100.0
Northern Plains	1,873	10.0	13.2	29.5	20.9	26.4	100.0
Southeast	2,555	27.5	16.3	20.2	18.0	18.0	100.0
Southwest	343	27.6	11.9	20.4	12.6	27.5	100.0
Total	12,373	15.1	14.5	27.0	20.8	22.6	100.0
Farms selling feeder pigs:	<u>1,000 farms</u>						
Corn Belt	38.4	46.2	20.9	21.5	8.1	3.3	100.0
Lake States	16.8	56.8	19.3	16.9	5.2	1.8	100.0
Northern Plains	12.8	44.2	22.5	23.3	7.3	2.7	100.0
Southeast	33.2	77.8	12.2	7.1	1.8	1.1	100.0
Southwest	4.7	80.0	9.7	6.9	2.0	1.4	100.0
Total	105.9	59.0	17.6	15.8	5.3	2.3	100.0

<sup>1/</sup> Any sales or farms selling feeder pigs recorded by the Census, but not included in the Census distribution by size classes, have been placed in the 1-99 sales class in this table.

Source: Census of Agriculture, 1974.

A special agricultural census pertaining to farm operations in 1971 showed that 81 percent of all hog and pig sales in the North Central Region came from farms on which hogs were the principal enterprise generating 50 percent or more of the total value of sales for the farm, with sales of hogs from these farms amounting to \$10,000 or more (table 6 and appendix table 6). Another 9 percent of sales originated in secondary hog enterprises where hog sales amounted to \$10,000 or more, but less than half of the total value of sales from the farm. Only 10 percent of sales came from farms with less than \$10,000 in total value of farm products sold. <sup>6/</sup>

<sup>6/</sup> The Census sample omitted all farms with 1969 farm product sales of less than \$2,500.

Table 6--Economic importance of hog production to farm businesses, by selected regions, 1971 <sup>1/</sup>

Region and importance of enterprise	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent of number sold</u>					
Corn Belt:					
Principal	81.4	65.3	80.1	83.9	83.2
Secondary	9.0	6.9	7.3	9.0	10.8
Small	9.6	27.8	12.6	7.1	6.0
Lake States:					
Principal	71.0	55.7	75.2	73.0	77.0
Secondary	16.2	11.2	14.2	18.5	15.2
Small	12.8	33.1	10.6	8.5	7.8
Northern Plains:					
Principal	83.6	76.6	84.3	85.2	84.1
Secondary	7.3	6.5	5.3	7.2	8.3
Small	9.1	16.9	10.4	7.6	7.6
Southeast:					
Principal	56.3	41.6	50.5	58.7	63.9
Secondary	16.6	7.7	8.3	18.7	20.1
Small	27.1	50.7	41.2	22.6	16.0
Southwest:					
Principal	64.2	54.5	59.8	67.4	64.5
Secondary	8.3	7.3	5.2	8.2	9.7
Small	27.5	38.2	35.0	24.4	25.8

<sup>1/</sup> The three categories of enterprise importance, the sum of which always equals 100% in this table, are defined as: Principal--Sales in 1969 amounted to \$10,000 or more from hogs and 50 percent or more of the total value of sales for the farm. Secondary--Sales in 1969 amounted to \$10,000 or more from hogs, but less than 50 percent of the total value of sales from the farm. Small--Sales of hogs in 1969 from farms with less than \$10,000 total value of product.

Source: 1969 Census of Agriculture, U.S. Dept. of Commerce, Bureau of Census, Vol. V, Special Reports - Part 9, Cattle, hogs, sheep and goats, data are for 1971. The North Central Region includes the Corn Belt, Lake States, and Northern Plains. See appendix table 6 for data by States.

Hog sales on farms where hog production was the principal or secondary enterprise accounted for about 95 percent of all hog sales in Iowa and Illinois and, within the North Central Region, fell below 80 percent only in Michigan where they still accounted for 74 percent of hog sales. The economic importance of hogs to farm businesses was less in the Southeast, but farms where hog production was the principal or secondary enterprise accounted for 73 percent of the sales of hogs in both the Southeast and Southwest.

### Types of Hog Enterprises

All hogs eventually move to slaughter, but there is a division of production systems determined largely by the resources available. Resulting sales are either feeder pigs or market hogs. The latter come either from pigs purchased and fed to slaughter weight or farrow-to-finish operations.

Feeder pigs were sold by one-fourth of all farmers with hog and pig sales in both 1969 and 1974 (table 2). Feeder pigs accounted for an eighth of the number of hogs sold in the Corn Belt in 1971; a fifth of the total in the Southeast (table 7 and appendix table 7). Feeder pigs were generally a higher proportion of total hog sales in States where feed grain production was relatively low.

Slaughter hogs dominated sales in all regions in 1971 accounting for 85 percent of the total number sold in the Corn Belt, 82 percent in the Northern Plains, and 78 to 79 percent in all other regions (table 7). The major difference in market hog production among States and regions was in the source of the pigs. In the major hog producing States, farrow-to-finish enterprises (all production on one farm) produced four out of every five market hogs; the remainder were purchased as feeder pigs from other farms. Purchased feeder pigs were a more important source of market hogs produced in the Southeast and Southwest Regions, but the ratio seldom dropped below two to one in favor of farrow-to-finish production in any State.

## GENERAL FARM CHARACTERISTICS

The farm business setting within which hogs are produced has a bearing on the way hogs are handled and producer response to varying conditions. Important farm characteristics include the enterprise mixes, sources of farm income, size of hog enterprises, the amount of farmland associated with hog production, the form of business organization, and the tenure status of hog producers. 7/

### Enterprise Mix

In 1975, most hogs were still produced on multiple enterprise farms. On the survey farms, hog sales accounted for 37 percent of adjusted gross farms sales on farms producing feeder pigs, 52 percent on farms with farrow-to-finish

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7/ The following description of these characteristics is representative of hog producing farms in 1975 and comes from the special survey taken in 1976.

Table 7--Relative importance of the different classes of hogs and pigs sold, by selected regions, 1971

Region	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent sold</u>					
Corn Belt	100	12	3	68	17
Lake States	100	18	3	54	25
Northern Plains	100	15	3	60	22
Southeast	100	20	2	57	21
Southwest	100	17	4	54	25

Source: 1969 Census of Agriculture Vol. 5, Special Reports, Part 9, Cattle, Hogs, Sheep and Goats. Data are for 1971. See appendix table 4 for the data by States.

operations, and 40 percent when feeder pigs were purchased and fed to slaughter weight (table 8). <sup>8/</sup> Typically, hogs produced the smallest portion of total farm sales in the Southeast and the largest portion in the Southwest.

The sizes of the hog enterprises were related to the sizes of whole farm businesses. Therefore, even the smallest hog enterprises made important contributions to total farm sales. As size of hog enterprise increased, however, the relative importance of the enterprise grew. Hog sales generally accounted for two-thirds or more of total farm sales, except for feeder pig finishing, when annual sales exceeded 1,000 head per farm (table 9).

Sales of other livestock and poultry were significant in all regions, and exceeded the value of hog sales in some situations (table 8). Typically, 60 percent or more of all farms had livestock or poultry enterprises in addition to hogs (appendix table 8). Beef cows or cattle feeding enterprises were present in over 90 percent of the cases where other livestock in addition to hogs were produced. Feed grains, wheat, and soybeans were also major contributors to farm sales in the North Central Region; peanuts, cotton, and tobacco were important in the South.

<sup>8/</sup> Farm sales were adjusted to exclude the cost of purchased feeder animals.

Table 8--Sources of sales of farm products on farms with sales of 100 or more hogs, by type of hog enterprise and region, 1975 <sup>1/</sup>

Source of sales	Feeder pig enterprises				Farrow-to-finish operations				Feeder pig finishing			
	North Central	Southeast	Southwest	All	North Central	Southeast	Southwest	All	North Central	Southeast	Southwest	All
	<u>Percent of sales</u>											
Hogs	44.6	23.9	40.2	37.4	51.8	52.1	71.7	52.3	40.8	27.7	67.9	40.1
Other livestock and poultry	14.5	2.0	47.0	10.4	15.2	11.3	14.7	14.9	22.1	48.1	5.7	24.8
Feed grains and wheat	27.3	3.1	7.6	18.7	18.2	6.5	8.8	16.4	21.4	7.2	5.3	19.2
Soybeans	12.4	2.2	0	8.8	12.2	6.2	0	11.3	12.0	6.2	0	11.0
Peanuts, cotton, and tobacco	0	68.3	1.7	23.7	0	20.3	4.5	2.6	0	10.4	18.2	1.7
Other	1.2	.5	3.5	1.0	2.6	3.6	.3	2.5	3.7	.4	2.9	3.2
Total sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1/</sup> Sales are adjusted to exclude the cost of purchased feeder animals. The severe imbalance between purchase cost of feeder cattle and returns for slaughter cattle in 1975 resulted in a lower than normal proportion of sales from cattle feeding.

Source: 1976 survey.

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Table 9--Percent of gross farm sales from hogs, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)						All sizes
	100-199	200-499	500-999	1,000-2,499	2,500 and over		
	<u>Percent of sales</u>						
<b>Feeder pig production:</b>							
North Central	36	47	46	*	*		45
Southeast	4	40	85	92	*		24
Southwest	*	*	*	*	*		40
All regions	16	46	48	*	*		37
<b>Farrow-to-finish:</b>							
North Central	35	48	61	63	*		52
Southeast	19	43	49	86	84		52
Southwest	42	54	50	*	99		72
All regions	34	48	59	66	*		52
<b>Feeder pig finishing:</b>							
North Central	27	35	53	59	*		41
Southeast	5	49	52	55	*		28
Southwest	39	*	*	65	*		68
All regions	20	36	53	60	*		40

\*Insufficient observations for computation of reliable size-type average.

Source: 1976 survey.

Hogs accounted for a relatively higher proportion of adjusted gross farm sales in 1975 than they likely would over a period of several years. Hog prices were relatively favorable while prices for beef cattle were exceptionally low. Further, sales of feed grains and wheat, especially the former, greatly understate the importance of these enterprises on farms on which hogs are produced. The existence of any sales of feed grains usually indicates that grain has been produced in excess of livestock feed requirements. Feed grain production may therefore be the major enterprise on many farms even though hogs account for most of the sales.

The multiple enterprise character of farms producing hogs provides some risk protection through diversification. Use of general purpose farm machinery, especially tractors and trucks, helps to reduce unit overhead costs. Special livestock equipment such as water systems, feed mills, and waste handling equipment may be used economically in a small hog enterprise when it is operated in conjunction with other livestock or poultry enterprises. Overall, some of the size economies pertaining to volume purchases of inputs are possible, even for small hog enterprises, when the volume of business conducted by the farm as a whole is relatively large. Diversification and smallness of enterprises, however, may have a negative impact on efficiency in hog production compared with the level of achievement in large, highly specialized operations.

### Size of Hog Enterprise

The survey excluded farms with mixed hog enterprises and those selling fewer than 100 head of hogs annually. Thus, the survey results cannot be compared directly with census information. Based on size distribution data from the 1974 Census, however, survey results appear to be representative of the population (appendix tables 9 and 11). Limited numbers of observations distort some regional distributions and sample results are probably biased downward slightly in the largest sales group; this is especially true in the North Central Region because the survey requirement for a minimum of 90 percent enterprise purity resulted in deletion of some of the largest enterprises from the survey.

Annual sales of all hogs and pigs averaged 414 head per farm for all regions combined (appendix table 11). Sales averaged slightly below 400 head per farm for all three types of hog enterprises in the North Central Region. Average sales were generally much higher in the Southeast and Southwest regardless of type of enterprise.

### Land in Farms

In 1975, hog production retained the traditional characteristic of being associated with crop production and substantial acreages of farmland regardless of geographic location, system of production, type of hogs, or size of enterprise (appendix table 12). Feeder pig producers farmed an average of 230 acres, operators with farrow-to-finish enterprises had 425 acres, and farmers with feeder pig finishing operations managed 332 acres. Generally, acreage in farms increased with size of hog enterprise, but only to a point. Average farm

size tended to level, and even decline, as annual hog sales exceeded 1,000 head, though the change was not great nor did the decline in size occur in all regions.

The technology of total confinement permits hogs of any type to be produced successfully without associated farmland except that required for a building site and waste management facilities. Such systems may become more prevalent in the future if specialized farrowing centers and hog feedlots satisfactorily control breeding, disease control, and waste management problems. In recent years, some totally confined single-enterprise operations have been built. Some remain in business, but most producers eventually added farmland and crop production.

Fully owned and full rented farms were consistently the smallest, commonly having only half to two-thirds the acreage of part-owned units (appendix table 13). The largest farms combined ownership and rental of land, though hog production is most commonly carried out on land owned by the farm operator with rented land restricted to crop production.

Addition or expansion of a hog enterprise has been one of the more commonly used routes to enlarging a farm business, but expanded crop production has usually been preferred. Land is typically added whenever it becomes available, either through purchase or rental. The hog enterprise may be retained, but it is sometimes reduced in size or even dropped, especially by older operators. Even relatively large, successful, single enterprise operations seldom stay that way. Earnings are frequently put into farmland as an investment, for production of feed grains, or to secure control over a land base on which to utilize hog wastes.

### Tenure Status

Relatively few hogs are produced on rented land. Eighty percent or more of the farms producing hogs in 1975 were partly or fully owned by the operator (appendix table 14). Owned land accounted for half or more of the total acreage (appendix table 15). Ownership, both in terms of number of farms and acreage of land, was generally highest for farms with feeder pig enterprises and least on farms that finished feeder pigs for the slaughter market. Farms with feeder pig enterprises commonly involve the less productive and lower valued land. Finishing operations are usually associated with heavy production of feed grains and relatively costly land. Producers in the North Central Region acquired most of their owned land after 1960, but those in other regions had owned their land much longer (appendix table 16).

Cash renting was the most important method of renting land on farms producing feeder pigs (appendix table 15). Share renting increases with the importance of feed grain production. On partly owned farms, however, the hog production unit is usually kept on the owned portion of the land and the landlord seldom has a financial interest in the hog enterprise (appendix table 17). Even on fully rented farms, the operator commonly maintained full interest in feeder pig enterprises, either through cash rental of the farm or some type of crop-share lease that excluded hogs. Livestock share leases were more common on rented farms producing slaughter hogs only in the North Central

Region. Where share rental was practiced, the landlord commonly received the same share of income from both crops and hogs (appendix table 18). Overall, however, only 5 to 10 percent of all farms had any landlord participation in hog production.

### Farm Business Organization

Approximately 90 percent of all farms producing hogs in 1975 were under the direction of a sole proprietor (table 10). Full partnerships, most commonly composed of family members, generally accounted for 5 to 10 percent of the operations while limited partnerships accounted for between 1 and 2 percent of total. All other forms of business organization combined accounted for about 1 percent.

Alternatives to the sole proprietorship became important on larger farms. Individuals operated only two-thirds of the farms with farrow-to-finish enterprises in the 1,000 to 2,499 size class. The percentage fell to less than half for farms selling 2,500 or more hogs a year. Various corporate forms of business organization were significant with these larger enterprises, especially in the Southwest where other enterprises often far exceeded hogs in importance. Even so, partnerships maintained second position to sole proprietorships. Farm organization on 25 to 30 percent of the businesses with the largest hog enterprises was under a partnership.

### HOG PRODUCTION PRACTICES IN 1975

Hog production practices affect every aspect of the industry. An assessment of the impact of production practices requires both description and measurement of production practices in use.

Although specialization, with larger enterprises, and standardization of production practices has been increasing, hog production is still dominated by large numbers of producers with relatively small enterprises. Hog production is greatly influenced by the type of farm business of which it is a part, the age of the operator, personal preferences, and many other factors. Much of the resulting variation may well disappear if hog production moves off general crop-livestock farms into large, specialized businesses, but that time has not yet come.

Most of the practices followed in hog production change only gradually over a period of years. Thus, most activities recorded in the 1976 survey should be reasonably representative of hog production during the seventies.

### Hog Inventories

The average number of hogs on hand in beginning and end-of-year inventories is generally indicative of the amount of capital invested in hogs. The average feeder pig enterprise on farms with sales of 100 or more hogs in 1975 carried an inventory of 35 breeding females, 2 boars, and 50 weaned pigs weighing less than 60 pounds per head (table 11). The average inventory of 92 hogs was

Table 10--Proportion of farms having specified forms of business organization, by region and type of hog enterprise, 1975

Form of organization	North Central			Southeast			Southwest		
	Type of hogs <sup>1/</sup>			Type of hogs <sup>1/</sup>			Type of hogs <sup>1/</sup>		
	1	2	3	1	2	3	1	2	3
<u>Percent of farms</u>									
Individual operation	93.8	90.0	93.0	86.7	74.3	85.5	94.6	77.4	81.9
Partnership:									
Full partnership	5.4	7.9	4.4	6.4	18.8	11.2	5.4	18.3	15.5
Limited partnership	.8	1.6	1.5	3.8	1.8	0	0	0	0
Corporation:									
Family corporation	0	.4	.3	1.2	3.5	3.3	0	.9	2.6
Nonfamily corporation	0	0	.4	0	0	0	0	0.9	0
Sub Chapter "S" family	0	.1	.4	0	0	0	0	0	0
Sub Chapter "S" nonfamily	0	0	0	0	.8	0	0	2.5	0
All other	0	0	0	1.9	.8	0	0	0	0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1/</sup> Type 1 = feeder pig production; Type 2 = farrow-to-finish; Type 3 = feeder pig finishing.

Source: 1976 survey.

Table 11--Average inventories and annual sales of hogs, by type of enterprise, all regions combined, 1975 <sup>1/</sup>

Kind of hogs	Feeder pigs <sup>2/</sup> production	Farrow-to- finish <sup>2/</sup>	Feeder pig finishing <sup>2/</sup>
	<u>Number of head</u>		
<b>Breeding stock:</b>			
Sows and gilts	35.4	40.7	2.1
Boars	1.6	2.2	.1
Culls	1.4	2.0	.1
<b>Market hogs:</b>			
Under 60 lbs	50.1	60.9	32.0
60-119 lbs	1.8	61.2	53.1
120-179 lbs	.3	51.5	61.7
180-219 lbs	.6	45.1	45.0
220 lbs and over	.3	7.4	16.1
All hogs	91.5	271.0	210.2
Average annual sales	391.0	418.0	417.0

<sup>1/</sup> These average inventories are coupled with 1975 average annual sales of 391 head from feeder pig production enterprises, 418 head from farrow-to-finish operations, and 417 head from feeder pig finishing enterprises. Given the average annual sales, these inventories are slightly higher than normal, especially for female breeding stock, because of producer intentions to increase output in 1976.

<sup>2/</sup> Small numbers of some types of hogs that do not fit the enterprise appear in the average inventories because enterprises were included if 1975 sales were 90 percent or more of one type of hogs, exclusive of culled breeding stock.

Source: 1976 survey.

associated with average annual sales of 391 head. Breeding stock inventories were about the same in farrow-to-finish operations, but pigs in the several stages of growing and finishing increased the inventory total to 271 hogs supporting average annual sales of 418 head. Inventories in feeder pig finishing enterprises were similar except for the virtual absence of breeding stock. <sup>9/</sup>

<sup>9/</sup> Average inventories in 1975 were biased slightly upward in feeder pig production and farrow-to-finish operations as favorable prices had resulted in a 4- to 7-percent increase during the year in females kept for breeding. Conversely, inventories in feeder pig finishing operations declined about 7 percent due to the high cost of replacement feeder pigs.

The ratio of annual sales to inventory increased with size of enterprise due to more intensive year-round production in the larger operations. This lessens the capital charges per unit of output.

### Breeding Programs and Performance

What goes to market as slaughter animals is determined by type of hogs and timing of breeding programs. Success of feeder pig and farrow-to-finish enterprises is also largely determined by the proficiency of the operator in producing weanling pigs. Like other aspects of hog production, much variation still occurs in pig production.

Breeds--Breeds of hogs were not recorded in the survey. Cross breeding of hogs for the slaughter market has long been almost a universal practice. Seldom is a purebred line of hogs produced except for sale as breeding stock. <sup>10/</sup> Typically, a producer of pigs, whether for sale or finishing, buys purebred boars and selects replacement gilts from his own production. Boars may be rotated among breeds, but some producers simply purchase the best boars available for the price range considered acceptable, with limited regard to breed.

Inventory records show an average of 18 to 22 sows and gilts per boar for feeder pig producers and operators with farrow-to-finish enterprises (table 12). Producers with the smallest enterprises kept one boar per 16 to 18 females of breeding age. The ratio moved upward to 20 to 25 females per boar in the larger enterprises because of the opportunity to use boars on a more nearly continuous basis. Experienced producers, however, consider over extension of the services of boars to be one of the most costly false economies in hog production.

Within a given enterprise size group, producers in the North Central Region typically handled about four more females per boar than those in the Southeast and Southwest. The reason for this difference is unknown, but it may be that the longer periods of hot weather in the South require more boars to assure successful breeding.

Seasonality of Production--Hog production used to be a two season business for most farmers and a one-season activity for some. Typically, farmers for whom hogs were an important enterprise farrowed pigs in the spring after the weather moderated, but before starting field crop work, and again in the fall before corn harvest. Some farrowed only once a year during the mid summer period after final cultivation of row crops. This resulted in a pronounced seasonal variation in hog supplies and prices.

The historical seasonal pattern of farrowing remains in the smaller enterprises. Small volume feeder pig producers in the North Central Region farrowed nearly one-fifth of their litters in March. Almost another fifth farrowed their litters in July, with another concentration in the fall

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<sup>10/</sup> Enterprises producing hogs for sale as breeding animals were excluded from the survey.

Table 12--Average number of females per boar, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	: All sizes
	<u>Number of females</u>					
Feeder pig production:						
North Central	21.4	28.2	22.7	*	*	24.2
Southeast	11.2	14.9	20.0	24.9	*	16.7
Southwest	*	*	*	*	*	14.8
All regions	17.9	24.3	22.4	*	*	22.1
Farrow-to-finish:						
North Central	17.1	18.0	17.5	21.8	*	18.3
Southeast	12.3	14.5	14.2	15.0	17.0	14.8
Southwest	11.2	14.9	14.4	*	14.4	13.8
All regions	16.5	17.7	17.0	20.4	*	17.7

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Based on beginning inventory of boars and females, which include sows and gilts of breeding age.

Source: 1976 survey.

(appendix table 19). Producers with farrow-to-finish enterprises followed the same seasonal schedule of farrowing (appendix table 20). Concentrations in some months occurred in both the Southeast and Southwest, but they differed from peak farrowing periods in the North Central Region because weather and demand for labor from competing enterprises are not the same.

Central farrowing houses and enclosed growing and finishing buildings greatly reduce the importance of weather as a determinant of production periods. Monthly farrowings move toward equalization as these facilities are brought into use in the larger enterprises. Some concentration of farrowing remains even in the larger operations because of demands on labor from other enterprises, but the combination of confinement housing and intensive production tends to even the flow of pig production over the year. <sup>11/</sup>

<sup>11/</sup> Production during any one year is affected by the cyclical adjustments that producers are making. Total production was relatively low during 1975 and did not make significant recovery until later.



Production from Gilts and Sows---Females can produce two litters of pigs in less than a year and remain in production for several years if they are properly cared for and remain physically sound. In practice, productive life is much less than the potential.

The number of litters that a female will be allowed to produce depends on many factors, the more important ones being performance, cost, type of enterprise, and level of taxable income of the producer. Commonly, mature sows will produce larger litters of stronger pigs than gilts having their first litter. Also, probable performance is known with greater certainty after the first litter. Major disadvantages of keeping females for two or more litters are the difficulty of preventing excessive gains in weight, maintenance costs, and the low price of heavy cull sows. Also, a lesser portion of total sales is eligible for capital gains treatment in the computation of Federal income taxes. 12/

Feeder pig producers tend to keep females as long as they are sound and productive. Most replacement females are selected from within the enterprise and grown to breeding age. Feeder pig producers are seldom well equipped for growing and finishing of hogs so they tend to minimize the raising of replacements. Also, they are often located in areas where feeds are higher priced.

Nationally, only 22 percent of the litters of feeder pigs produced in 1975 came from first litter gilts; 78 percent came from sows having already produced at least one litter (table 13). Less than a sixth of the litters produced in the Southeast and Southwest came from first litter gilts. One-fourth were from gilts in the North Central Region where feed is relatively less expensive and replacement stock near breeding age is more readily available for purchase.

Gilts are used more extensively in farrow-to-finish enterprises. Thirty five percent of the litters produced in these enterprises nation wide came from first litter gilts in 1975. In the smallest enterprises, production came about equally from gilts and sows. This is partly because many producers raised only one litter a year, then marketed everything except the gilt pigs to be kept for breeding the following year. The proportion of litters from gilts was least in the midsize enterprises. Although not reflected by the data, producers with the largest operations, and usually the highest taxable incomes, tend to emphasize production from gilts, wean pigs early, then quickly move the gilts to slaughter market. Weights of such culls were low enough to avoid severe price discounts and a higher proportion of total sales qualified for capital gains treatment on tax returns. Also, replacement of females for breeding was easier in farrow-to-finish operations than in feeder pig production because gilts can remain a part of the regular finishing program until near breeding time.

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12/ Sales of hogs acquired after 1969 and held for breeding purposes for 12 months or more have been eligible for a 50-percent reduction in the amount subject to the Federal income tax. Department of the Treasury, Internal Revenue Service, Farmer's Tax Guide, 1977 Edition, Publication 225.

Table 13--Proportion of litters farrowed by gilts, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	Percent of litters					
Feeder pig production:						
North Central	34	23	21	*	*	24
Southeast	20	14	18	10	*	14
Southwest	*	*	*	*	*	16
All regions	31	22	21	*	*	22
Farrow-to-finish:						
North Central	53	36	32	32	*	37
Southeast	18	14	16	17	33	21
Southwest	30	28	17	*	17	24
All regions	50	34	30	30	*	35

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Gilts are females having their first litter. All other production is from sows having already farrowed at least one litter.

Source: 1976 survey.

Production Per Litter--Farrowings averaged 8.8 pigs born per litter in feeder pig enterprises and 8.5 pigs in farrow-to-finish operations (table 14). The higher proportion of gilts used in the latter probably accounts for the difference between the two types of enterprises. Pigs born per litter trended upward with size of enterprise, leveling at the largest sizes. Better management may have affected the outcome as size of enterprise increased, but the increasing use of sows relative to gilts, except in the largest enterprises, was probably the major factor causing differences.

More pigs were born per litter in the Southeast than in the North Central Region, both as an average and for nearly all size classes. Again, the differences in gilt-sow ratios appear to preclude any suspicion of purely regional differences.

Pigs weaned per litter followed the same pattern as pigs farrowed averaging 7.2 per litter in feeder pig production and 6.9 in farrow-to-finish operations. Farmers in the Southeast and Southwest reported an advantage of up to half a pig per litter over producers in the North Central Region.

Table 14--Number of pigs born and weaned per litter, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	:All sizes
	<u>Number of pigs per litter</u>					
<u>Feeder pig production:</u>						
Born:						
No. Central	8.6	8.7	8.4	*	*	8.6
Southeast	8.9	9.5	9.7	10.3	*	9.7
Southwest	*	*	*	*	*	9.2
All regions	8.7	8.9	8.6	*	*	8.8
Weaned:						
No. Central	6.9	7.2	7.3	*	*	7.2
Southeast	6.3	7.4	7.4	8.7	*	7.3
Southwest	*	*	*	*	*	7.6
All regions	6.8	7.3	7.3	*	*	7.2
<u>Farrow-to-finish:</u>						
Born:						
No. Central	7.6	8.1	8.6	9.3	*	8.4
Southeast	8.0	8.4	9.2	9.2	9.1	8.9
Southwest	7.4	7.4	8.9	*	9.7	8.9
All regions	7.6	8.1	8.6	9.3	*	8.5
Weaned:						
No. Central	6.5	6.7	6.8	7.7	*	6.9
Southeast	6.7	6.9	7.6	7.8	7.8	7.5
Southwest	6.2	5.9	6.7	*	7.7	7.2
All regions	6.5	6.7	6.8	7.7	*	6.9

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Loss of pigs between farrowing and weaning averaged about 18 percent for both types of enterprises. Losses generally ranged from 15 to 20 percent for the several enterprise size classes with no clear relationship between losses and size of enterprise except that the largest, best equipped operations do no better, and perhaps not as well, in saving pigs than do operators with small enterprises. Producers with large operations often sacrifice individual attention to sows and pigs for increased volume per man, investing in equipment to compensate as much as possible for lack of personal care.

Weaning Age--Pigs were weaned at an average of 6.2 weeks of age in both feeder pig production and farrow-to-finish enterprises (table 15). Typically, pigs remained with the sows for 6 to 8 weeks in the smallest enterprises. With the usual practice of only two farrowings a year, there is no pressure to vacate farrowing quarters. Also, there are usually no other suitable facilities in which to care for small pigs.

Producers with large enterprises have reduced weaning age, sometimes taking pigs off the sows and placing them in nursery quarters at 3 weeks of age. Early weaning, however, is as yet only a trend. The largest operations included in the 1975 survey still had pigs with the sows for an average of about 5 weeks. Increasing investment required for slotted floor central farrowing houses, coupled with effective nursery facilities, better knowledge of nutrition, and disease control, should foster continued reduction in weaning age. Early weaning increases the burden on management, but it increases the capacity of facilities, reduces facility costs per pig, and permits rebreeding or culling of sows more quickly.

### Purchases of Hogs

Feeder pig production enterprises and farrow-to-finish operations are largely perpetuated through the raising of replacement females (except in special circumstances) and the purchase of boars. Farmers who specialize in finishing pigs for the slaughter market purchase all of their feeder stock.

Breeding Stock--Substantial purchases of female breeding stock may be made by producers to replace the herd after a disease problem or to achieve a quick increase in production. But most producers select female replacements from their own production. Fear of the introduction of disease from outside sources and lack of assurance of improving productivity at acceptable prices are major constraints on purchasing of females.

Feeder pig producers tend to purchase more female replacements than do farmers with farrow-to-finish enterprises, as their facilities are not well geared to growing of replacements. Most producers made no purchases in 1975, but those who did concentrated on gilts near breeding age rather than bred gilts or mature sows (appendix table 21).

Barring exceptional circumstances, operators with farrow-to-finish enterprises replaced females almost exclusively from their own herds. Only 6 percent bought unbred gilts; 3 percent or less bought bred gilts or sows.

Table 15--Average weaning age of pigs, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Number of weeks</u>					
Feeder pig production:						
North Central	6.4	5.7	5.7	*	*	6.0
Southeast	7.1	7.0	7.3	5.9	*	7.0
Southwest	*	*	*	*	*	7.2
All regions	6.5	6.0	5.9	*	*	6.2
Farrow-to-finish:						
North Central	6.7	6.0	5.7	5.9	*	6.1
Southeast	7.7	7.3	7.0	6.6	4.7	7.2
Southwest	7.2	7.3	5.9	*	5.2	6.4
All regions	6.7	6.1	5.8	6.0	*	6.2

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

In contrast, producers of feeder pigs and slaughter hogs from farrow-to-finish enterprises typically bought boars from producers of breeding stock. Nearly two-thirds of all producers with these enterprises bought boars in 1975. Their purchases averaged two boars per farm nationally. The typical small volume producer bought one boar; those with enterprises turning out over 2,500 head annually purchased 10 to 15 boars during the year. The usual productive life of boars in commercial operations is one year.

If price is any measure of quality, producers with the larger enterprises were clearly striving for improvement through purchase of better boars. Also, the reward for use of higher quality boars is either greater or more easily recognized--perhaps both--in farrow-to-finish enterprises than in feeder pig production. Nationally, prices paid for boars averaged \$227 per head for those used in feeder pig production and \$263 for those used in farrow-to-finish enterprises (appendix table 22). Prices trended upward with size of enterprise from \$161 to \$381 in feeder pig production; the progression was from \$215 to \$342 in farrow-to-finish operations.

Feeder Pig Purchases--On a national basis, feeder pig finishing operations provide a uniform supply of slaughter hogs throughout the year. Aggregate quarterly purchases of feeder pigs in 1975 differed by only 4 percentage

points, ranging from 23 percent in the fourth quarter of the year to 27 percent in the third quarter (appendix table 23). Purchases in the smaller enterprises tended to be concentrated in the first and fourth quarters when crop work was the least. Producers with the larger enterprises operated more nearly on a year-round basis.

The quarterly purchase pattern for feeder pigs approximates the production pattern in feeder pig enterprises. Additional balancing supplies of pigs come from farrow-to-finish enterprises, especially the larger ones, which sometimes produce more pigs than can be accommodated in existing growing and finishing facilities. Poorly performing pigs and those from late farrowings of a group of sows may also be sold as feeders. Further, relative prices affect supplies. A few producers maintain a flexible position by either selling or finishing pigs, depending on their evaluation of the economic outlook. Interstate shipment is common, so supplies tend to balance both seasonally and regionally.

Pigs entering the feeder market vary considerably in weight, ranging from as little as 25 or 30 pounds per head, usually small pigs from the last farrowings of a group of sows or pigs from enterprises that are going out of business, to weights well over 100 pounds. Most feeder pigs, however, come to market weighing 40 to 60 pounds per head. Purchases in 1975 averaged 51 pounds per head for the Nation with relatively little variation among regions or sizes of enterprises (appendix table 24). On the average, pigs of this weight should be ready for the slaughter market in about 4 months. Since purchases were nearly balanced among quarters, marketings of slaughter hogs from feeder pig finishing enterprises should have flowed rather evenly over the year.

#### Length of Production Period

Feeder pig producers moved pigs to market 8 to 9 weeks after farrowing, typically weaning at 6 weeks of age, and using 2 to 3 additional weeks for growing and conditioning (appendix table 25). An 8-week program was representative of operations in the North Central Region; 10 to 11 weeks was average in the Southeast and Southwest, resulting in pigs weighing 10 to 12 pounds more per head. Production periods did not differ among sizes of enterprises within regions.

Farmers with farrow-to-finish enterprises took about 6 months to go from farrowing to sale of slaughter hogs, using a week to 10 days less in the Southeast and Southwest than in the North Central Region. Differences in production periods among regions, however, was consistent with differences in market weights of slaughter hogs.

Feeder pig finishers used 132 days to move from purchase of pigs to sale of slaughter hogs, about 12 days more in the North Central Region than in the other regions. Ending weights were in direct relation to length of feeding programs. There was no evidence to suggest performance differences among regions or enterprises of different sizes.

## Losses of Hogs

Losses of hogs from deaths, thefts, and all other causes averaged 1.6 percent of total production in farrow-to-finish operations, 1.8 percent in feeder pig finishing, and 2.5 percent in feeder pig production (appendix table 26). <sup>13/</sup> Nearly all losses were nonreimbursed death losses. Monies recovered through insurance and idemnity payments covered little more than 1 percent of the total. Information was not obtained on causes of losses.

On a weight basis, losses of breeding stock accounted for 77 percent of the total in feeder pig production and 30 percent in farrow-to-finish operations. More pigs than brood sows die, but the heavier weights of brood sows more than offset numbers in feeder pig production and do so in part in farrow-to-finish production. Actually, losses of pigs in feeder pig production accounted for an unexpectedly high proportion of total losses as pigs lost prior to weaning are not included in the estimate.

Losses were reported to be a higher proportion of production in the largest operations. Confinement facilities, commonly used in large operations, can help maintain animal heath as such facilities moderate extremes of environment. But, close confinement can also increase stress on animals and requires superior management for successful operation. Further, mass handling of hogs is more prevalent in larger operations and hogs often do not get the individual attention commonly provided in smaller enterprises.

Losses were higher in the Southeast and Southwest than in the North Central Region. This may reflect less experienced producers than in the North Central Region. Also, veterinarians may not have the same level of experience with problems in hog production as in the dense production areas of the North Central Region. Whether climate or other factors associated with geographic differences are significant is not known.

Notwithstanding the relatively low loss percentages reported in the 1975 survey, all types of hog producers face potentially high losses, especially those with large confinement units where close proximity of animals can result in rapid spread of disease. While average losses were low, some farmers reported high death losses and even the need to depopulate entire groups of hogs because of disease. Further, weight loss due to death losses, as recorded in this section, do not fully account for pigs lost between farrowing and weaning. Losses of unweaned pigs can be quite large and represent an important problem. Brood sow losses, which were a substantial part of the total, often involve the loss of a litter of pigs yet unborn or too small to survive, and the cost of this loss is not reflected by weight alone. Also, reduction in performance by hogs that survive attacks of disease may often represent a greater loss than those that die. The problem of diseases and death losses warrants far more concern than suggested by death loss percentages alone.

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<sup>13/</sup> These are considered to be minimum loss estimates as respondent memory bias tends to deflate losses which often are not recorded in farm accounts.

## Feedstuffs and Feeding

Feed rations required to produce a given type of hog have basic similarities as to nutritional content, but they differ as to kinds and sources of ingredients, methods of processing, and methods of supplementation. Choice at the farm level is influenced largely by crops produced, feedstuffs available, and type and size of enterprise. Amounts of feed purchased versus grown on the same farm affect cash outlays and the level of price risk. Options for formulating rations and including health care products affect costs, the level of management needed, and the potential for making costly errors.

This section includes data on the feed conversion rates of hogs produced in 1975; the kinds, sources, and forms of feedstuffs, plus related additives used; and producer use of feed processing equipment. The results reflect an industry composite useful for aggregate analyses or for further study of specific problems.

Rates of Feed Conversion--Quantities of feed fed per unit of pork produced were quite variable among farms. No consistent relationships were discovered among either regions or sizes of enterprises. 14/ For all regions combined, feeder pig production was estimated to have used 5.53 pounds of feed per pound of live animals produced; farrow-to-finish enterprises took 4.39 pounds of feed. Feeder pig finishing was reported to have taken 4.65 pounds (table 16). 15/

Each of these average feed conversion ratios is within expected limits. 16/ Average performance of feeder pig production relative to farrow-to-finish production was also consistent with expected results, with the former taking about 1.1 pounds more feed per pound of liveweight produced than the latter due to maintenance requirements of breeding stock and sale of pigs at weights of 50 to 60 pounds per head rather than at slaughter weight. Feeder pig finishing, however, did not conform to expected results in terms of rate of feed conversion. Estimates showed feeder pig finishing to be using 0.3 pound of feed more per pound of liveweight produced than in farrow-to-finish operations. Other things being equal, the feed conversion rate should be better in finishing than in farrow-to-finish because of the absence of maintenance for

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14/ A fully accurate measure of feed use under farm conditions requires carefully kept detailed records. Results of personal interview, the data collection procedure used in this survey, may suffer from respondent memory bias, incomplete accounting, and sometimes the lack of sufficient farm records on which to base estimates. While absolute quantities determined in this manner may be suspect, differences in feed conversion rates among regions and types and sizes of enterprises are credible as all farmers provided estimates under the same set of conditions.

15/ Producers using bulky or nontypical feedstuffs such as garbage, forages, or food processing wastes were excluded from the averages. No values were credited to pasture in any case.

16/ See Summaries of Illinois Farm Business Records, Coop. Ext. Ser. Circulars 1058, 1083, 1097, 1113, 1124 and 1140, Col. of Agr., Univ Ill., 1971 through 1976, for information on rates of feed conversion in hog production on commercial farms in Illinois.



Table 16--Amount of feed per pound pork produced, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	:All sizes
	<u>Pounds of feed</u>					
Feeder pig production:						
North Central	5.77	5.03	5.42	*	*	5.41
Southeast	6.64	6.40	4.93	5.44	*	5.86
Southwest	*	*	*	*	*	7.12
All regions	5.93	5.41	5.36	*	*	5.53
Farrow-to-finish:						
North Central	4.85	4.57	4.15	4.35	*	4.43
Southeast	4.76	5.13	4.17	4.43	3.15	4.15
Southwest	4.96	5.09	4.35	*	3.86	4.17
All regions	4.85	4.61	4.15	4.34	*	4.39
Feeder pig finishing:						
North Central	4.90	4.41	5.64	4.04	*	4.76
Southeast	6.22	3.12	4.23	4.20	*	4.14
Southwest	3.86	*	*	3.95	*	3.75
All regions	4.99	4.28	5.41	4.04	*	4.65

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

the breeding herd. This result, however, reflects some inefficiencies in split phase production that do not occur under controlled conditions. The last section of this report provides more information on this topic.

Direct Use of Grains--Most hog producers make direct use of grain either as part of a free-choice feeding program or as a component of complete rations processed either on farm or by a custom miller (table 17). Some producers purchase complete feeds, hence do not deal with grain as a separate ingredient, but this occurred commonly only in Southwest feeder pig finishing operations. The largest enterprises tended to rely more heavily on complete rations from off-farm sources, especially in the Southeast and Southwest.

Table 17--Proportion of producers making direct use of specified grains, by type of enterprise and region, 1975 <sup>1/</sup>

Enterprise and kind of grain	North Central	Southeast	Southwest	All regions
	<u>Percent of producers</u>			
Feeder pig production:				
Corn	77.2	84.5	75.0	78.8
Grain sorghum	25.6	3.6	81.3	21.3
Oats	58.3	2.1	65.6	45.9
Wheat	0	5.7	9.4	1.4
Other	1.2	2.8	56.3	2.2
All	95.6	88.1	90.6	93.9
Farrow-to-finish:				
Corn	92.5	92.2	42.3	91.7
Grain sorghum	3.9	9.3	67.0	5.3
Oats	49.9	4.3	2.2	45.0
Wheat	1.6	6.8	11.9	2.2
Other	2.3	4.9	3.5	2.6
All	96.0	95.1	78.0	95.6
Feeder pig finishing				
Corn	93.1	75.8	29.9	90.4
Grain sorghum	3.7	9.3	35.1	4.8
Oats	46.7	6.9	23.4	42.7
Wheat	1.3	8.2	23.4	2.3
Other	.3	10.5	0	1.2
All	93.1	78.2	39.0	90.8

<sup>1/</sup> Excludes grains used in purchased mixed feeds and hence not identifiable.

Source: 1976 survey.

Over 90 percent of the producers of slaughter hogs in the North Central Region made direct use of corn. Grain sorghum use was dominant in all types of enterprises in the Southwest, but diversity of choice was evident in that region. Feeding of oats was largely restricted to the North Central Region where that grain is used chiefly to add bulk to rations for breeding stock.

On the basis of quantity, corn accounted for 90 percent or more of direct use of grain in finishing programs in the North Central and Southeast regions; grain sorghum had a similar though less important position in the Southwest (table 18). Mixtures of grains were characteristic in feeder pig production enterprises. There was no relation between proportions of grains used and size of enterprise.

Sources of Grains and Feedstuffs--Traditionally, hogs and grain have been companion production enterprises. Producers have been protected to some extent against unfavorable price shifts by having the flexibility to market the grain they produce either directly or through hogs.

For the hog industry as a whole, this protective shield remains, but it is not as strong as in years past (table 19). Home grown grains accounted for about 80 percent of the direct grain use in the North Central Region and half to three-fourths in the Southeast. Home produced grains fell to as little as 10 percent of use in the Southwest.

Based on weight of all feedstuffs, including grains, protein feeds, and complete feeds, feeder pig producers raised less than half of their needs; finishers raised roughly 60 percent (appendix table 27). Produced feedstuffs accounted for a lesser share of total volume in the Southeast compared with the North Central Region, and declined to as little as 6 percent in the Southwest. On a value basis, produced feedstuffs occupy an even smaller position because unit costs of protein supplements and complete feeds are higher than for grain. Though data on prices paid were not available from the survey, it is clear that on a national basis purchases accounted for at least half of the value of feedstuffs used in hog production in 1975.

Operators of large hog enterprises commonly bought a higher proportion of their feed requirements than did producers with small enterprises. If the trend continues toward larger and more specialized hog enterprises depending heavily upon purchased feeds, the industry will lose much of the flexibility that it has provided to crop-livestock farms in the past.

Method of Supplementing Grains--Grains alone do not provide a balanced ration for hogs. Additional protein, minerals, vitamins and other ingredients are necessary. <sup>17/</sup> In addition, antibiotics are commonly introduced into hogs through feed.

Balanced rations are obtained through purchase of complete feeds, or the use of either commercially prepared supplements or fortified oilseed meals with grain. Use of commercially prepared supplements, commonly containing 35 to 40 percent protein, was reported by 75 to 80 percent of all producers finishing

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<sup>17/</sup> G. R. Carlisle and H. G. Russell, Your Hog Business Ration Suggestions, Coop. Ext. Serv., Cir. 1023, Col. of Agr. Univ. Ill.

Table 18--Relative importance of grains used in hog feed, by type of enterprise and region, 1975 <sup>1/</sup>

Enterprise and kind of grain	North Central	Southeast	Southwest	All regions
	<u>Percent of weight</u>			
Feeder pig production:				
Corn	73.2	94.9	38.2	78.7
Grain sorghum	17.0	1.6	38.8	13.2
Oats	9.6	1.0	7.6	7.3
Wheat	0	1.9	12.3	.6
Other	.2	.6	3.1	.2
Total	100.0	100.0	100.0	100.0
Farrow-to-finish:				
Corn	93.3	94.8	38.5	92.7
Grain sorghum	2.1	1.9	59.6	3.0
Oats	4.0	.4	0	3.7
Wheat	.3	1.5	1.2	.3
Other	.3	1.4	.7	.3
Total	100.0	100.0	100.0	100.0
Feeder pig finishing:				
Corn	92.3	90.4	8.4	91.5
Grain sorghum	.8	3.2	88.0	1.7
Oats	6.1	0	0	5.4
Wheat	.8	3.2	3.6	1.1
Other	0	3.2	0	.3
Total	100.0	100.0	100.0	100.0

<sup>1/</sup> Based on weights of grains reported as produced or purchased for hog feed. Grains included as part of purchased mixed feeds are not included.

Source: 1976 survey.

Table 19--Proportion of all grain fed to hogs that was produced on the farm where it was fed, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of grain</u>					
Feeder pig production:						
North Central	54.3	89.2	73.1	*	*	73.4
Southeast	78.0	70.5	73.6	25.5	*	67.5
Southwest	*	*	*	*	*	45.5
All regions	60.0	82.4	72.8	*	*	71.6
Farrow-to-finish:						
North Central	85.0	85.4	79.9	74.2	*	81.0
Southeast	79.3	91.1	88.9	49.9	48.8	75.9
Southwest	45.2	27.6	16.3	*	0	9.6
All regions	84.3	85.3	80.1	69.8	*	79.1
Feeder pig finishing:						
North Central	81.3	90.0	80.6	69.6	*	79.2
Southeast	89.5	72.2	56.6	0	*	55.0
Southwest	69.2	*	*	42.9	*	26.9
All regions	81.9	89.5	76.6	60.1	*	76.7

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Excludes grains used in purchased mixed feeds and hence not identifiable.

Source: 1976 survey.

hogs for slaughter and by 65 percent of all feeder pig producers (table 20). The proportion dropped as size of enterprise increased due to greater use of soybean meal.

Soybean meal is the major alternative to commercial supplements for preparing complete feeds for hogs. While soybean meal alone is inadequate for building a fully balanced hog ration, it can be used successfully along with other essential ingredients, either added as separate elements or as a commercially prepared mix designed specifically to fortify soybean meal. <sup>18/</sup>

<sup>18/</sup> D. E. Becker, A. H. Jensen, and B. G. Harmon, Balancing Swine Rations, The Illinois System of Swine Nutrition. Coop. Ext. Serv., Cir. 866, Col. of Agr., Univ. Ill.

Table 20--Proportion of producers reporting use of commercial supplement of varying levels of protein content, by type of enterprise and region, 1975 <sup>1/</sup>

Enterprise and protein content of supplement	North Central	Southeast	Southwest	All regions
	<u>Percent of producers</u>			
Feeder pig production:				
<35%	12.8	15.2	9.4	13.3
35-40%	50.0	47.2	71.9	49.6
>40%	9.2	2.0	0	7.5
Other <sup>2/</sup>	12.5	0	0	9.6
Total	66.6	60.2	81.3	65.3
Farrow-to-finish:				
<35%	10.0	9.7	6.2	9.9
35-40%	51.2	59.2	25.1	51.6
>40%	15.6	18.6	26.0	15.1
Other <sup>2/</sup>	1.4	1.1	.9	1.4
Total	75.4	77.8	56.8	75.3
Feeder pig finishing:				
<35%	7.9	3.3	0	7.4
35-40%	59.9	45.7	26.0	58.0
>40%	19.5	17.9	3.9	19.1
Other <sup>2/</sup>	0	2.3	0	.2
Total	83.1	66.8	29.9	80.7

<sup>1/</sup> Soybean and other oilseed meals are not included.

<sup>2/</sup> Protein content was not specified.

Source: 1976 survey.

One-sixth of all producers with farrow-to-finish enterprises reported the use of soybean meal as a feed supplement in 1975 (table 21). The proportion reached 35 percent in the largest size class. Use of soybean meal was reported by about an eighth of the feeder pig production and feeder pig finishing operations.

Commercially prepared mixing concentrates were used to fortify soybean meal in a fourth of the farrow-to-finish enterprises in which soybean meal was used. Nearly half the feeder pig production operations used a concentrate, but less than 10 percent of the feeder pig finishers did so. The use of mixing

Table 21--Proportions of enterprises using soybean meal (SBM) and mixing concentrates in formulating hog rations, by type of enterprise and region, 1975

Region	Proportion using SBM <sup>1/</sup>			Proportion of SBM users also using mixing concentrate <sup>1/</sup>		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
	Percent					
North Central	12.4	17.3	11.5	46.6	24.0	7.9
Southeast	10.1	15.1	5.6	32.8	40.3	20.5
Southwest	10.8	23.8	3.4	*	*	*
All regions	12.0	17.1	10.8	44.2	25.3	9.1

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Type 1 = feeder pig production; Type 2 = farrow-to-finish; Type 3 = feeder pig finishing.

Source: 1976 survey.

concentrates was most prevalent with the midsize enterprises. This indicates probable lack of needed fortification of soybean meal on farms with small enterprises; use of separate fortifying ingredients rather than a complete mixed concentrate.

Further indication of the level of producer involvement in detailed ration formulation was separate purchases of vitamins and antibiotics (table 22). <sup>19/</sup> A sixth of all producers reported separate purchase of antibiotics for use in feeder pig production; a fourth reported such purchase in farrow-to-finish enterprises. Nearly 40 percent did so for finishing enterprises. Vitamin purchases were reported on only an eighth of the farms with farrowing and virtually none were reported in finishing operations. Some of the highest proportions of separate purchases of both vitamins and antibiotics were reported for the smaller enterprises.

The further producers move from purchase of complete rations or use of commercial supplements toward use of separate ingredients in formulating rations, the greater their flexibility to choose among ingredients and to adapt to changing conditions. They may also be able to reduce both ingredient and processing costs, especially if volume is sufficient for quantity price discounts. At the same time, the management requirement and burden of responsibility shift from commercial concerns to the individual producer,

<sup>19/</sup> While some of these purchases may have been used in the drinking water supply, perhaps even as injectibles, all were reported as part of the feed supply.

Table 22--Proportion of producers reporting use of vitamins and antibiotics as separate inputs into hog rations, by type and size of enterprise, 1975

Ingredient and enterprise	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of producers</u>					
Vitamins:						
Feeder pig production	13.1	23.4	1.7	5.9	*	12.7
Farrow-to-finish	14.8	9.9	15.9	3.6	17.6	12.2
Feeder pig finishing	0	0	12.3	0	*	3.0
Antibiotics:						
Feeder pig production	24.0	9.9	7.5	23.0	*	15.6
Farrow-to-finish	22.6	17.7	35.2	38.5	43.7	23.6
Feeder pig finishing	38.8	27.3	57.1	55.5	*	39.2

\* Insufficient observations for reliable estimate.

Source: 1976 survey.



Use of Purchased Complete Feeds--Hog rations fall into four basic categories: starter, grower, finisher, and sow rations. These basic rations can be formulated on the farm or at a custom mill, or purchased as complete rations.

Over three-fourths of all producers farrowing pigs reported purchase of starter rations in 1975 (table 23). Most of those with small to midsize enterprises who indicated no purchase of starter feed likely did not distinguish a specific starter ration in their program. Usually, only large volume producers engage in on-farm processing of starter rations as these rations can be complex, may contain ingredients not readily available to farmers, and amount to only a small percentage of total feed requirements.

The proportion reporting purchases of grower rations was in the 20- to 40-percent level; 15 to 20 percent purchased finishing rations. About 25 percent bought complete sow feeds. 20/ Quite commonly, the small volume users relied heavily on either purchased complete rations or free choice feeding of separate ingredients, or had their own grains processed into a complete ration by a custom mill. Large-volume users moved strongly toward on-farm processing with limited purchase of complete rations beyond the starter stage in the North Central Region, but less so in the Southeast and Southwest where specialization and reliance on purchased complete feeds seemed further advanced. 21/

Use of Feed Mills--Three-fourths of all producers with farrow-to-finish enterprises used some type of on-farm feed processing equipment in hog production in 1975 (table 24). The proportion dropped to 63 percent in feeder pig finishing operations and 34 percent in feeder pig production. The remainder in each situation purchased complete rations, employed custom processing services or fed ingredients free choice.

Tractor-powered mills, mostly mobile grinder-mixers if manufactured after 1965, were the dominant type of on-farm equipment, outnumbering electric mills about five to one. Electric mills were the most common type, however, in the largest enterprises. Also, electric mills were used by a larger proportion of producers in the Southeast and Southwest than in the North Central Region, because hog enterprises were larger, facilities were newer, fewer needed multiple purpose mills, and field tractors were probably less readily available (appendix table 28).

Feed mills are subject to a high rate of wear and obsolescence. Over 80 percent of all feed mills on farms in 1975 were purchased after 1965 (appendix table 29). Only with the smallest enterprises were there significant numbers

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20/ Some producers obtain rations from more than one source, so those reporting the purchase of complete rations may also use other methods of ration formulation.

21/ Large-volume users usually have more favorable unit costs whichever method they choose. The course that ration formulation takes in the future will be significant both on and off the farm. W. G. Bursch, J. T. Scott, Jr., and Roy N. Van Arsdall, Characteristics and Prospects of the Market for Commercial Hog Feed in Illinois. Agr. Exp. Sta. Bul. 743, Col. of Agr., Univ. Ill., Feb. 1973.

Table 23--Proportion of producers reporting purchase of mixed complete feeds, by kind of feed, type of enterprise, and region, 1975

Kind of feed	North Central	Southeast	Southwest	All regions
	<u>Percent of producers</u>			
Feeder pig production:				
Starter	91.1	68.3	90.6	86.1
Grower	35.0	35.4	65.6	35.4
Sow feed	28.7	38.5	84.4	31.5
All	93.5	82.8	100.0	91.2
Farrow-to-finish:				
Starter	76.0	58.0	54.6	74.0
Grower	38.7	21.6	23.3	36.9
Finisher	18.6	17.0	22.5	18.5
Sow feed	26.8	26.9	19.8	26.7
All	82.3	66.8	60.4	80.6
Feeder pig finishing:				
Grower	20.4	18.1	53.2	20.8
Finisher	12.5	28.5	64.9	14.8
All	29.9	44.4	67.5	31.9

Source: 1976 survey.

of feed mills older than 10 years still in use. Even on these farms, mills manufactured between 1971 and 1975 accounted for about a third of the total.

Most feed mills, especially tractor mills, can service other livestock enterprises as well as hogs. Multiple use of mills was common on farms with the smaller hog enterprises (appendix table 30). Tractor-powered mills were more commonly used with other livestock than were electric mills. Multiple use occurred more on farms with feeder pig finishing enterprises than other types of hog enterprises. Multiple use was more common in the North Central Region than in the Southeast and Southwest.

Spreading the fixed costs of feed processing equipment through multiple enterprise use is a move toward economy, but it creates a need for better management. Nutrition and health care typically combine various chemicals and

Table 24--Extent of use of feed mills in hog production, by type and size of enterprise, all regions combined, 1975 1/

Enterprise and mill type	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
<b>Feeder pig production:</b>						
None	85.6	54.0	46.5	66.3	*	65.6
Tractor	13.6	43.2	51.8	28.6	*	32.3
Electric	0.8	2.8	1.7	5.1	*	2.1
Both	0	0	0	0	*	0
All	100.0	100.0	100.0	100.0	*	100.0
<b>Farrow-to-finish:</b>						
None	29.6	24.6	26.2	11.4	21.0	25.7
Tractor	65.3	61.8	59.8	39.1	1.7	60.9
Electric	5.1	13.5	13.0	47.5	60.7	12.9
Both	0	0.1	1.0	2.0	16.6	0.5
All	100.0	100.0	100.0	100.0	100.0	100.0
<b>Feeder pig finishing:</b>						
None	41.4	33.5	36.3	42.3	*	37.0
Tractor	45.8	50.9	59.3	19.8	*	49.8
Electric	12.8	15.6	4.4	29.4	*	12.8
Both	0	0	0	8.5	*	0.4
All	100.0	100.0	100.0	100.0	*	100.0

\* Insufficient observations for reliable estimate.

1/ Data are percent of producers reporting use of each type of feed mill on the farm.

Source: 1976 survey.

drugs in livestock rations. Care is therefore necessary to assure that ingredients intended for one age or species of livestock are not fed to another.

Salvage Feed--In years past, farmers commonly let hogs follow cattle to salvage feed. Many farmers still have both enterprises, especially in the North Central Region. But increasing specialization in facilities and management systems have drawn the two enterprises apart except for joint use of some machinery and equipment. Only 10 percent of the farmers with farrow-to-finish and feeder pig finishing operations allowed hogs to feed behind cattle; less than 5 percent of the feeder pig producers did so. Producers with annual sales of 1,000 or more hogs practiced complete separation of hogs and cattle.

### Use of Bedding

Decline in production of small grains in the major hog producing regions and the shift to combine harvest of corn, both of which reduced available supplies of bedding materials, plus the increased use of slotted floor housing units for hogs, have greatly reduced the use of and need for bedding in hog production. Nevertheless, most producers still use some bedding, especially in the North Central Region (table 25). Straw is the major type of bedding material. Wood byproducts, low-quality hay, straw, and various other crop residues are used in the Southeast and Southwest (appendix table 31). About two-thirds of the bedding materials used in hog production were home produced; one-third was purchased in all regions.

The high percentage of producers using bedding exaggerates its importance. Few producers practice complete regular bedding programs for all hogs. Quantities used per 100 head of annual sales on farms using some bedding in the North Central Region averaged 2 tons with feeder pig enterprises and about 4 tons in finishing operations (appendix table 32). Only about half as much was

Table 25--Proportion of hog producers using some bedding, by type of enterprise and region, 1975

Enterprise	North Central	Southeast	Southwest	All regions
<u>Percent of producers</u>				
Feeder pig production:	99	79	70	95
Farrow-to-finish:	98	60	67	94
Feeder pig finishing:	95	24	40	88

Source: 1976 survey

used in similar enterprises in the Southeast and even less was used in the Southwest. As size of enterprise increased, amounts of bedding used dropped sharply because more phases of production were managed in facilities where bedding was of no value.

### Waste Management

Handling hog wastes is a disagreeable, time-consuming, and expensive task. It has always been a problem for farmers producing any significant volume of hogs. Wastes contain nutrients for crops, the importance of which varies with the price of commercial fertilizers. Hog wastes are also a potential source of both water and air contamination.

Until recent years, most hog producers simply used the easiest and least costly method for preventing wastes from becoming an impediment to the operation. In pasture production systems, this was accomplished by rotating housing locations and feeding areas. Manure was hauled from centralized production sites to cropland if the operation was large enough to warrant it. Problems of waste management have increased as hog enterprises have become larger and moved from pasture into permanent facilities. But, the 1975 survey data show no dramatic changes in practices or equipment.

Climate and type of farm and production facilities largely determine whether and how hog wastes are handled. This shows clearly in the regional data on methods of handling hog manure (table 26). Few producers in the North Central Region reported managing their hog enterprises without handling manure. Those who did not handle manure either produced hogs on pasture or had small enterprises. Over four-fifths handled manure as a solid. Some 10 to 15 percent used liquid or combination solid-liquid systems. These were operators with the larger enterprises with at least part of the buildings equipped with slotted floors and pit storage for manure.

Waste management programs were greatly different in the Southeast and Southwest. Three-fourths or more of all producers in these regions reported that they handled no manure. Gravity flow to lagoons was practiced in some of the larger operations, but most apparently disposed of manure at or near the site of production. Most producers who did handle manure on farms in the Southeast used a solid system. Liquid systems were more common in the Southwest.

Farmers in the North Central Region typically used both tractor loaders and spreaders for handling solid manure, even with small hog enterprises. They often had other livestock enterprises, usually cattle feeding, to share the equipment costs. For the region as a whole, nearly 60 percent of the farmers with finishing enterprises used tractor loaders; 89 percent used solid manure spreading equipment (appendix table 33). Less tractor powered equipment was used with feeder pig production enterprises, because of the low volume of waste produced. Only about 10 percent of the producers in the Southeast and Southwest used such equipment as most did not handle manure.

Table 26--Proportion of farms handling hog manure in different forms, by type of enterprise and region, 1975

Region and form of manure handling	Feeder pig production	Farrow-to-finish	Feeder pig finishing
	<u>Percent of farms</u>		
North Central:			
No handling	11	3	5
Solid	78	81	87
Liquid	6	4	3
Both	5	12	5
Southeast:			
No handling	76	82	84
Solid	21	15	8
Liquid	2	2	8
Both	1	1	0
Southwest:			
No handling	22	77	77
Solid	62	9	3
Liquid	16	13	21
Both	0	1	0

Source: 1976 survey.

Liquid manure applicators have come into use along with the adoption of slotted floor buildings, though not in proportion to the use of such buildings. Many producers with pit storage still discharge wastes into lagoons or other disposal areas rather than spreading them on land. Liquid spreaders for surface application were in use in 10 to 15 percent of the hog finishing operations in the North Central and Southwest Regions and in only 4 percent of such operations in the Southeast. Liquid spreader use increased to about a fourth of all the farms with the larger enterprises, which is consistent with their use of slotted floor confinement housing (appendix table 34). Though observations were too limited for accurate measurement, there are indications that the larger volume users of liquid applicators are moving toward subsurface injection rather than surface application of liquid wastes.

Virtually all hog manure removed from buildings and lots was reported spread on cropland. Application to pasture lands rarely occurred. All producers applied solid manure to the surface of land with conventional spreaders. Virtually all feeder pig producers with liquid manure systems used surface application with tractor-drawn equipment. Eighty percent of the

farrow-to-finish and feeder pig finishers with liquid systems followed this practice; 5 percent applied wastes with irrigation equipment while 7 percent practiced soil injection. The remainder used a mixture of systems to apply liquid wastes to land.

Soil injection of liquid manure requires more power than surface application and causes difficulties in some soils. But, its use has increased and will probably continue to do so, especially by producers with large quantities of liquid wastes or close neighbors. Injection of wastes into the soil reduces the potential for surface runoff and minimizes loss of nitrogen. Reduction of odor during application, however, is most often cited as the major reason for using soil injection equipment.

Two major changes relating to waste management have occurred since 1970 that were not reflected to any degree in 1975 hog production. One is the sharp increase in the price of commercial nitrogen fertilizer. The other is the increasing pressures, some already formulated into regulations, to eliminate pollution stemming from animal wastes.

Producers in the North Central Region are rather completely equipped to move manure from the production site and thus make use of its fertility value on land, but specialized storage to conserve maximum fertility value is generally lacking. Only 7 percent reported any type of storage other than pits below slotted floors in some of the larger enterprises. Half of the reported storage was lagoons used essentially for disposal of manure rather than preservation. Few farmers in the Southeast and Southwest had equipment to move manure to cropland. While 25 to 30 percent of the farmers in the Southeast reported manure storage, lagoons accounted for 85 percent of the total. They were commonly used as disposal sites.

Investments to prevent pollution from surface runoff from production sites appeared only nominally in the 1975 facility inventories. Fewer than 2 percent of the producers reported facilities common in surface runoff control systems such as diversion terraces, settling basins, and holding ponds. Ten percent was the maximum reported for any type of control facility in any size class for all types of enterprises and regions.

## PRODUCTION FACILITIES

Hogs can adapt to many different conditions. Some are still produced on woodland pastures with little or no shelter. Some are raised in portable housing. Many are handled in drylot situations consisting of some type of shelter building plus a paved feeding floor. The trend, however, is toward specialized buildings for each phase of production with emphasis on more confinement of the animals and greater control of all aspects of production.

Several factors have combined to foster an increase in specialized housing, including more profitable alternatives for the use of land, mechanization of materials handling, desire for continuous year round production, better control of diseases and parasites, and need for better control of hog wastes. Historical data are not available to show the rate of change in the mix of

production facilities, but a substantial number of hogs are now produced in confinement housing.

The following section provides an accounting and description of the types of facilities in use in 1975 and the intensity with which farmers used them. These factors have a bearing on the kinds and amounts of other inputs needed in hog production, the cost of producing hogs, some of the problems associated with hog production, such as pollution control, and the capacity of facilities for short-term supply response. 22/

### Age Structure of Nonportable Facilities

The age structure of hog production facilities in use in 1975 reveals something about the general level of technology being used, where adjustments are being made, and in which category of facilities. The age structure also provides clues as to replacement needs. Much of the cost reducing and output increasing technology now embodied in production systems is of recent introduction. Many important advances had their beginning in commercial application no more than 20 years ago. Included are crate-equipped, slotted floor central farrowing houses; totally enclosed, slotted floor, nursery and finishing buildings; more precisely engineered heating and ventilation systems; liquid manure storage and handling facilities; farm storage and handling systems for shelled corn; and provisions for pollution control. Most facilities constructed prior to 1956, unless substantially modified, lack many of the components of presently available technology.

Considering the numerous technological advances in recent years, many hog production facilities in use in 1975 must be classified as old. Approximately one-fifth were in excess of 30 years of age (table 27). 23/ Another 12 percent were between 20 and 30 years old. Conversely, the strong viability of the industry is reflected by construction of fully a quarter of all facilities after 1970 and about 40 percent between 1965 and 1975. Age structure of facilities did not differ among the three types of hog enterprises.

The age structure of facilities differed greatly among hog producing regions (appendix table 35). Oldest facilities in use were in the North Central Region. Relatively new facilities dominated production systems in the Southeast and Southwest where 90 percent had been constructed in the last 20 years; 50 to 70 percent were no more than 10 years old. Construction between 1971 and 1975 accounted for about a third of the total. Even in the North Central Region, however, construction of facilities was rather heavy after 1970.

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22/ Specific recommendations on housing and equipment for use in hog production are contained in Swine Handbook, Housing and Equipment, Midwest Plan Service, Iowa State Univ., Ames, Mar. 1974.

23/ The age of facilities was measured by date of construction or major remodeling. All facilities were given equal weight in computing averages. Results are therefore best used as general indicators of the age structure of facilities with greater accuracy within a facility type, such as farrowing houses, than for all facilities combined.



Table 27--Age structure of nonportable hog production facilities, by type of facility and enterprise, all regions combined, 1975 <sup>1/</sup>

Enterprise and year of construction	Type of facility									
	Farrowing houses	Nurseries	Grow- finish houses	Other buildings	Grain storage	Other feed storage	Paved	Stock water supply	Manure facilities	Total
	<u>Percent of facilities</u>									
Feeder pig production:										
Before 1946	29.5	32.2	X	29.0	26.3	30.2	22.6	22.2	1.1	22.3
1946-55	11.2	15.3	X	10.8	17.1	6.4	16.6	7.0	12.1	12.5
1956-65	21.6	17.6	X	18.1	26.1	29.1	40.4	28.7	48.6	29.6
1966-70	18.2	3.6	X	11.2	7.1	10.5	7.6	10.1	15.3	11.3
1971-75	19.5	31.2	X	30.9	23.4	23.8	12.8	32.0	22.9	24.3
All	100.0	100.0	X	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Farrow-to- finish:										
Before 1946	29.4	24.2	28.5	28.3	21.1	17.4	12.2	14.3	1.2	17.9
1946-55	13.6	16.0	16.0	13.0	15.1	9.8	14.8	7.6	5.7	12.0
1956-65	24.4	18.8	20.3	29.8	23.3	22.0	35.2	28.0	30.4	26.3
1966-70	15.4	18.6	15.2	5.8	16.2	15.1	18.5	18.3	23.4	17.6
1971-75	17.2	22.4	20.0	23.1	24.3	35.7	19.3	31.8	39.3	26.2
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Feeder pig finishing:										
Before 1946	X	X	37.1	5.9	26.0	18.7	19.5	18.4	1.8	20.4
1946-55	X	X	7.5	40.3	9.3	25.2	10.7	10.5	9.0	10.1
1956-65	X	X	24.7	21.8	24.7	6.8	44.8	19.5	22.7	25.9
1966-70	X	X	10.7	20.2	19.0	21.0	3.4	11.3	26.2	15.3
1971-75	X	X	20.0	11.8	21.0	28.3	21.6	40.3	40.3	28.3
All	X	X	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

X = Types of housing not used in the specified enterprise.

<sup>1/</sup> All facilities weighted equally regardless of size or cost. Some types of facilities, such as nurseries and manure facilities, were not present on many farms.

Source: 1976 survey.

Nearly a third of the major hog shelter buildings exceeded 30 years of age (table 27). Although these older buildings may be structurally sound, and remodeling may be feasible in many cases, some inefficiencies are likely in environmental control, materials handling, waste management, and chore labor compared with achievements possible in facilities of recent design and construction. Relatively large recent construction of these types of facilities reflects a combination of new entrants, expansion, and a shift toward more effective facilities in ongoing enterprises. Age of grain storage generally reflects the switch to shelled corn harvesting beginning in the midfifties, though much of the storage in use in 1975 predates that period. Greatest construction of paved lots occurred between 1956 and 1965 as enterprises enlarged and moved off pasture, but before slotted floor confinement housing became generally accepted. Most facilities for manure storage and pollution control, though relatively few in number, represent recent investments.

Investment patterns differed greatly by size of enterprise. Farmers with small hog enterprises were for the most part not replacing or upgrading their facilities. Typifying the situation were producers with farrow-to-finish enterprises marketing 100 to 199 hogs annually, compared with those selling over 2,500 head (appendix table 36). Forty to 50 percent of the major hog buildings on farms with the small enterprises were over 30 years old. Little new construction had occurred in the last 5 years except for grain storage, water systems, and facilities for waste handling. In contrast, nearly 60 percent of all facilities in use in the largest enterprises had been built after 1970; 75 to 80 percent were no more than 10 years old. This shifting investment pattern continued through farrow-to-finish enterprises of intermediate size (appendix table 37). Data are not presented for feeder pig production or feeder pig finishing, but the facility age structure relationships were essentially the same as in farrow-to-finish enterprises.

### Farrowing Facilities

Farrowing pigs and raising them to weaning age is a critical and demanding operation. Close supervision and much labor is used in the typical operation. Type of farrowing facility has a bearing on the success of pig production, and determines to a large extent the seasonality of production and amount of labor that will be necessary.

Types of Farrowing Houses--Use of central farrowing houses to reduce chore labor and permit year-round production became popular some 40 years ago. Inability to control diseases and parasites with such intensive housing generally forced farmers to shift to portable facilities rotated among clean pastures. Eventually, the means for satisfactory sanitation and disease control permitted a return to central farrowing houses. Then, in the sixties slotted floors and pit storage for manure were added to central farrowing houses. Additional new systems for managing wastes, reducing labor and costs, controlling diseases, and improving hog performance are continually being tested by researchers and innovative producers.

Few producers farrowed pigs without shelter in 1975. Virtually all feeder pig producers used some type of housing for farrowing (table 28). Only 5 percent of production in farrow-to-finish enterprises resulted from unsheltered field farrowing (table 29).

Portable individual or colony-type farrowing houses, which were formerly the mainstay of pasture production systems, accounted for only about 10 percent of total farrowings. Their use will continue to decline as hog enterprises increase in size and are shifted off pasture. Central farrowing houses with solid floors occurred on half to two-thirds of all farms and were used in the production of nearly 60 percent of all feeder pigs and over 40 percent of the pigs raised in farrow-to-finish enterprises.

A high proportion of central farrowing houses constructed since 1965 are of the slotted floor type with pit storage beneath the building for storage of wastes. Supplemental heat and mechanical ventilation are provided. Some employ pens for the sows, but most are equipped with farrowing crates which confine the sows until the pigs are weaned and give maximum protection to the pigs. A major advantage over the central houses with solid floors is that the slotted floors are self-cleaning and sows are fed in place, resulting in substantial savings of labor.

Slotted floor central farrowing houses were used by an eighth of all producers in 1975 and accounted for a fifth of all pigs farrowed. The use of this type of facility in farrow-to-finish enterprises was more prevalent in the Southeast and Southwest than in the North Central Region, largely because facilities were newer and enterprises were larger in these regions, reflecting the better opportunity for producers to adopt newer technology.

Ten to 20 percent of the farrowing facilities on farms in 1975 were reported as mixed types. This generally reflects expanding operations in which slotted floor houses are being added and old houses are being converted. On this basis, a third of the farrow-to-finish enterprises, turning out over 40 percent of all pigs, had completed or were in process of shifting to slotted floor farrowing houses. Feeder pig producers lagged behind farmers with farrow-to-finish enterprises in building and converting to slotted floor units. Most lack the volume of wastes necessary to justify purchase of relatively costly liquid manure handling equipment.

Intensity of Use--The traditional pattern of hog production involved farrowing twice a year in inexpensive portable sow houses. Demands for labor from other enterprises did not permit more intensive use of farrowing facilities and the low investment exerted little economic pressure to intensify production.

Central farrowing houses virtually eliminate weather as a factor in time of farrowing. Intensive year round farrowing of pigs can be done successfully and high facility costs provide strong motivation to do so. With the usual weaning age of 6 weeks, farrowing facilities have the capacity to handle about eight litters of pigs annually for each farrowing space. Irregularities in breeding and time for cleanup reduce average capacity to about six litters a year. Yet,

Table 28--Distribution of farrowing facilities in the production of feeder pigs, by region, 1975

Region	Type of farrowing facility					Total
	No facilities	Portable housing	Central housing Solid floor	Slotted floor	Mixed housing	
	<u>Percent of farms</u>					
North Central	.6	11.3	65.6	12.2	10.3	100.0
Southeast	1.9	11.5	76.0	7.9	2.7	100.0
Southwest	0	48.7	29.7	21.6	0	100.0
All regions	.8	11.7	67.1	11.5	8.9	100.0
	<u>Percent of hogs</u>					
North Central	.2	10.5	56.0	19.6	13.7	100.0
Southeast	.8	5.2	70.9	18.9	4.2	100.0
Southwest	0	19.2	57.3	23.5	0	100.0
All regions	.3	9.4	59.2	19.5	11.6	100.0

Source: 1976 survey.

with early weaning, commonly at 3 to 4 weeks of age, farrowing can be intensified to a monthly basis. Some producers use a combination of early weaning plus a nursery to move more than 12 litters a year through each farrowing space.

On the basis of potential production capacity, farrowing facilities were greatly underutilized in 1975. All pig producing operations combined turned out only 2.4 litters per unit of space that year (table 30). Farmers with slotted floor central houses produced 4.3 litters from each space, but those with solid floor central houses managed only 2.2 litters compared to the 2.5-litter output from portable housing. Use of nurseries in combination with farrowing houses increased output from 0.7 to 1 litter per unit of farrowing space compared with operations that did not employ a nursery stage.

Producers with large enterprises used farrowing facilities most intensively. Litters farrowed per unit of space were up to four times greater in enterprises selling over 2,500 hogs a year compared with those marketing 100 to 199 head annually (table 30). The increase in intensity of use was greatest for those with slotted floor units.

Hog production in 1975 was the lowest in many years. Some unused capacity in facilities is therefore expected. In total, however, producers had enough farrowing capacity in terms of housing to more than double the 1975 output of

Table 29--Distribution of farrowing facilities in farrow-to-finish enterprises, by region, 1975

Region	Type of farrowing facility					Total
	No facilities	Portable housing	Central housing : Solid floor	Slotted floor	Mixed housing	
	<u>Percent of farms</u>					
North Central	5.3	12.0	49.2	11.6	21.9	100.0
Southeast	15.3	2.3	57.5	18.3	6.6	100.0
Southwest	3.8	3.4	51.1	31.9	9.8	100.0
All regions	6.2	11.0	50.0	12.5	20.3	100.0
	<u>Percent of hogs</u>					
North Central	5.2	14.0	40.1	16.8	23.9	100.0
Southeast	7.1	1.7	48.1	29.5	13.6	100.0
Southwest	1.9	1.5	45.7	42.6	8.3	100.0
All regions	5.3	12.1	41.3	19.1	22.2	100.0

Source: 1976 survey.

pigs. Some of this unused capacity would come into use with more favorable price expectations. Probably the major portion, however, would not be used differently regardless of the economic situation. Some of the unused capacity is part of two-litter operations on multiple enterprise farms where labor is available for farrowing only seasonally. Some buildings are not suited to effective use of labor even though they may provide a satisfactory environment for sows and pigs. Some of the farrowing capacity is owned and managed by older farmers who have reduced production or are in the process of phasing out of hog production. Producers with the smallest enterprises were cutting inventories of breeding stock substantially in 1975 in spite of favorable prices. Once idled, facilities on such farms may never be brought back into use.

The industry as a whole can respond to a degree by increasing production of pigs without matching construction of new facilities. It seems certain, however, that much of the unused capacity of farrowing facilities does not represent a potential resource for expansion of production.

#### Nursery Facilities

Pigs are placed under considerable stress at weaning. They undergo change in both ration and environment. A nursery building may be provided to ease the

Table 30--Litters of pigs produced per unit of farrowing space, by type of facility and size of enterprise, all regions combined, 1975 <sup>1/</sup>

Type of farrowing facility	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Litters per space</u>					
Portable	1.9	1.9	2.5	*	*	2.5
Central solid floor	1.4	2.3	2.7	2.2	3.1	2.2
Central slotted floor	1.7	2.8	5.0	5.6	6.5	4.3
Mixed facilities	1.2	1.6	2.5	2.8	3.5	2.0
All facilities	1.4	2.1	3.0	3.7	4.3	2.4

\* Inadequate observations for reliable estimate.

<sup>1/</sup> Includes all farrowing of pigs regardless of type of enterprise and is an average of systems with and without nursery facilities. Data are the result of dividing the number of litters produced in 1975 by the units of farrowing space.

Source: 1976 survey.

transition from nursing to the growing-finishing stage. Nurseries, normally used only in conjunction with central farrowing houses, also facilitate earlier weaning, thus permitting more intensive use of the farrowing house which is the highest unit cost building in a hog production system. Pigs ordinarily go into a nursery at 30 to 40 pounds of weight and stay there for about a month, but the practice varies depending upon the weaning program and intended disposition of the pigs.

Types of Nurseries--Nurseries were used in 40 percent of the feeder pig enterprises and 30 percent of the farrow-to-finish operations in 1975 (table 31). The larger, more highly specialized hog enterprises generally had nurseries as an integral part of the housing program. Seventy percent or more of the producers selling at least 1,000 head of hogs or pigs used nurseries.

Most nurseries were solid floor units usually comprised of whatever general purpose farm building happened to be available (table 32). Fully slotted floor units are more effective in helping to manage wastes with small pigs, but the overall benefits from slotted floor farrowing houses are greater. Construction

Table 31--Extent of use of pig nurseries in feeder pig production and farrow-to-finish enterprises, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
Feeder pig production:						
North Central	19	52	66	*	*	42
Southeast	7	26	61	100	*	31
Southwest	*	*	*	*	*	78
All regions	18	47	66	*	*	40
Farrow-to-finish:						
North Central	24	26	39	70	*	31
Southeast	7	9	36	44	100	20
Southwest	48	23	47	*	82	36
All regions	23	26	39	65	*	30

\* Inadequate observations for reliable estimate.

Source: 1976 survey.

of slotted floor nurseries has lagged substantially. They were used on only 6 to 7 percent of the farms and handled 14 percent of the pigs produced in 1975.

Intensity of Use--Pigs need no more than 3 to 4 square feet of floor space per head in slotted floor nurseries and about 5 square feet in solid floor buildings, including allowance for alleys and feed storage. Thus, 25 to 40 square feet will accommodate the pigs from an average litter. Six to 12 groups of pigs can be moved through a nursery building in a year with variations according to the overall management program. At these levels of use, some 3 to 5 square feet per litter are needed with slotted floors; a bit more space is needed with solid floors.

Nursery building space on farms in 1975 was not fully utilized, mostly for the same reasons that farrowing facilities were used far below capacity. Average space available in nurseries was two or three times estimated need (appendix table 38). Only the largest operations approached capacity use. Until farrowing is intensified, existing excess capacity in nursery facilities adds little to production capacity.

Table 32--Proportion of farms and pig production associated with different types of nurseries, by type and size of enterprise and region, 1975

Enterprise and region	Type of nursery				Total
	No nursery	Solid floor nursery	Slotted floor nursery	Mixed type nursery	
	<u>Percent of farms</u>				
Feeder pig production:					
North Central	58	36	6	0	100
Southeast	69	22	9	0	100
Southwest	21	64	14	0	100
All regions	60	34	6	0	100
	<u>Percent of hogs</u>				
North Central	45	0	14	0	100
Southeast	38	46	16	0	100
Southwest	29	51	20	0	100
All regions	44	42	14	0	100
	<u>Percent of farms</u>				
Farrow-to-finish:					
North Central	69	23	6	2	100
Southeast	80	13	7	0	100
Southwest	64	17	11	8	100
All regions	70	21	7	2	100
	<u>Percent of hogs</u>				
North Central	61	24	12	3	100
Southeast	49	30	21	0	100
Southwest	51	22	26	1	100
All regions	59	25	14	2	100

Source: 1976 survey.



## Growing-Finishing Facilities

Pigs enter the growing-finishing phase weighing somewhere around 75 pounds. They are able to withstand more stress and wider ranges in environment than younger animals. At this stage, they are managed in a variety of ways ranging from pasture without shelter to confinement in enclosed slotted floor buildings.

Types of Facilities--Finishing hogs without shelter was still rather common in 1975. Nationally, over a fifth of all farmers producing a sixth of all slaughter hogs operated with no shelter buildings. In the Southeast, half of the producers used no shelter (table 33).

Portable shelters were used by only 2 percent of the producers. Permanent type buildings with either solid or slotted floors dominated housing for the finishing stage. The solid floor housing units, typically open front barns or sheds with paved lots attached, were used by 62 percent of all producers and handled 58 percent of total production. The proportion using this type of facility was highest in the North Central Region.

Slotted floor buildings were used for growing and finishing hogs by 8 percent of all producers, accounting for 15 percent of total production. Transition systems, including both solid and slotted floor buildings (mixed facilities), accounted for 9 percent of total production. More than half of the farmers marketing 1,000 hogs or more annually used slotted floor buildings or were in process of converting to them (table 34).

Intensity of Use--Some producers used no shelter during at least part of the year. Most employed solid floor building and lot combinations, many of which were old facilities modified for use by hogs. Therefore, any measure of capacity or degree of utilization based on this study must be used with caution.

Hogs near slaughter weight require about 8 square feet of floor space per head in a slotted floor building and 10 to 12 square feet in a solid floor building. Variations depend on the amount of lot space available in conjunction with building space. Ten to 15 square feet of building space per head, including allowance for alleyways, is usual. Each space can accommodate about three head to slaughter weight each year. On this basis, 4 to 6 square feet per head finished annually is sufficient.

Producers utilized finishing space more fully than farrowing capacity (appendix table 39). Farms with the largest enterprises operated at near capacity, especially those with slotted floor units. Those with the smallest enterprises averaged only one turn per year or about one-third of potential. Overall, finishing facilities were available for producing 50 to 75 percent more hogs than were finished on farms with housing in 1975. Low production that year was partly responsible for the excess capacity.



Table 34--Extent of use of different types of finishing facilities, by size of enterprise, all regions combined, 1975 <sup>1/</sup>

Item	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	:All sizes
	<u>Percent</u>					
<b>Farms:</b>						
None	31	19	16	7	13	22
Portable	X	3	3	1	0	2
Solid floor	63	68	61	36	29	62
Slotted floor	X	6	14	32	45	8
Mixed	6	4	6	24	13	6
Total	100	100	100	100	100	100
<b>Hogs:</b>						
None	30	19	16	6	9	16
Portable	X	3	4	1	0	2
Solid floor	64	67	61	38	36	58
Slotted floor	X	6	14	31	44	15
Mixed	6	5	5	24	11	9
Total	100	100	100	100	100	100

X = less than 0.5 percent.

<sup>1/</sup> Includes all finishing to slaughter weight from both farrow-to-finish and feeder pig finishing enterprises.

Source: 1976 survey.

and parasite free environment. In 1975, only 60 percent of the producers with feeder pig and farrow-to-finish enterprises used pasture of any kind (table 36). Use of pasture was not related to size of enterprise, but many of the larger enterprises using pasture did so only for the breeding herd. Feeder pig finishing enterprises were managed almost exclusively without pasture.

Type of Pastures--On farms where pastures were used in hog production, grass and grass-legume mixes were dominant, accounting for 70 percent of the total acreage used in all classes of hog production (appendix table 41). Foraging of crop residues, chiefly harvested corn fields in the past, has largely been discontinued. Use of row crops, small grains, and woodland areas for hogs is of some significance in the Southeast, but not in other regions. Use of mixes of the several major classes of forage producing lands, such as

Table 35--Proportion of producers using different types of hog lots, by type of enterprise and region, 1975

Enterprise and region	Kind of lot <sup>1/</sup>		
	None	Dirt only	Paved
	<u>Percent of producers</u>		
Feeder pig production:			
North Central	46	1	53
Southeast	76	12	12
Southwest	30	54	16
All regions	51	3	46
Farrow-to-finish:			
North Central	32	3	65
Southeast	61	11	28
Southwest	77	4	19
All regions	35	4	61
Feeder pig finishing:			
North Central	30	3	77
Southeast	64	15	21
Southwest	52	33	15
All regions	24	5	71

<sup>1/</sup> Producers with no lots are either in complete confinement or fully on pasture. Those with paved lots may also use some dirt lots.

Source: 1976 survey.

combined use of a legume and woodland pasture, were important only in the Southeast where farms often include substantial acreages of both pasture and woodland.

Fencing--Building and maintaining permanent fence, and moving temporary fence to rotate pastures, had been a major activity in hog production. Most producers with farrowing operations still used some field fencing chargeable to hogs in 1975, but hardly more than enough for farm boundary lines and to enclose areas for the breeding herd which was still largely managed on fields. Half to two-thirds of the producers with feeder pig finishing enterprises used field fencing (appendix table 42).

Table 36--Proportion of producers using various types of pastures in hog production, by type of enterprise and region, 1975

Enterprise and region	Type of pasture <sup>1/</sup>							Total
	None	Grass-legumes only	Row crops and small grain only	Crop residue only	Woodland only	Mixes <sup>2/</sup>		
	<u>Percent of producers</u>							
Feeder pig production:								
North Central	37.1	51.8	0.4	0	4.1	6.6	100	
Southeast	38.1	46.8	4.6	.7	.7	9.1	100	
Southwest	62.2	32.4	0	0	0	5.4	100	
All regions	37.6	50.7	1.1	.1	3.5	7.0	100	
Farrow-to-finish:								
North Central	43.5	48.8	3.9	1.8	.3	1.7	100	
Southeast	25.3	45.2	6.6	0	7.1	15.8	100	
Southwest	64.3	23.8	2.1	0	1.3	8.5	100	
All regions	42.0	48.2	4.1	1.6	1.0	3.1	100	
Feeder pig finishing:								
North Central	92.3	7.1	.3	0	0	.3	100	
Southeast	71.5	14.3	0	0	9.8	4.4	100	
Southwest	81.9	18.1	0	0	0	0	100	
All regions	90.4	7.9	.3	0	.8	.6	100	

<sup>1/</sup> Percent of producers using each type of pasture specified.

<sup>2/</sup> Mixes are combinations of two or more of the major types of pastures.

Source: 1976 survey.

Amounts and types of fencing used reflect the declining importance of pastures. Except for the smallest enterprises, fencing generally amounted to less than 100 rods per 100 head of annual sales (appendix table 43). About three-fourths of all fencing was permanent woven wire, much of it probably boundary line and permanent lot fencing (appendix table 44). Barbed wire, though not usually considered a hog fence unless electrified, was important in some situations. Temporary woven wire fence, formerly a common method of rotating pastures, has essentially been replaced with electric fences. The high cost of fencing materials and the labor for their construction and maintenance has been a major factor in the decline of production of hogs on pasture.

## TRACTOR, TRUCK, AND AUTOMOBILE USE

Tractors, trucks, and automobiles are used extensively in hog production throughout the United States. Some of these machines are bought specifically for use in hog production activities. Most, however, are multiple purpose and are used with whatever enterprises comprise the farm business.

### Use of Tractors

Tractors are the chief source of power in hog production in all regions with all types and sizes of enterprises. Virtually all farmers in the North Central Region used some tractor power in hog production in 1975 (table 37). Use of tractor power was slightly less on hog farms in the Southeast and Southwest because of less row crop production (hence a reduced availability of tractors), avoidance of manure handling on many farms, and more extensive use of purchased complete rations or custom processing of feeds.

Tractor Size--Tractor size was more a function of the volume of crop production than either size or type of hog enterprise in all regions. Although there was a tendency for larger tractors to be associated with the larger hog enterprises, this usually reflected greater grain production rather than needs of the hog enterprise. This was especially apparent in the high proportion of the larger tractors in use with feeder pig finishing enterprises, which are associated closely with high grain production (appendix table 45).

Generally, larger tractors are used in hog production than required by the operations being performed. High capacity mobile grinder-mixers and large manure spreaders commonly require tractors in the 75 to 90 horsepower range, but much less power is needed for most tractor work. Use of over-sized tractors for some or all of the work in hog production results in greater fuel consumption. Fuel economies from closer matching of tractor size to need, however, would seldom offset the added ownership costs of purchasing an extra tractor only for work with hogs.

Age of Tractors--Approximately a fourth of the tractors used in hog production in 1975 were at least 20 years old (appendix table 46). Median age was about 15 years on farms producing feeder pigs and in farrow-to-finish operations. Eight to 10 years was the more typical age of tractors used in feeder pig finishing operations. Generally, newer tractors were used with

Table 37--Proportion of producers using some tractor power in hog production, by type of enterprise and region, 1975

Enterprise	North Central	Southeast	Southwest	All regions
	<u>Percent of producers</u>			
Feeder pig production	91.7	74.4	92.9	88.8
Farrow-to-finish	99.0	90.5	93.0	98.2
Feeder pig finishing	99.4	69.6	46.9	95.6

Source: 1976 survey.

large enterprises than small ones; newer ones in the Southeast were more common than in the North Central Region.

A high proportion of tractors remain usable for livestock work long after they have been written off or downgraded as field tractors. Cost of transferring them from crop to hog production is little more than their salvage value. Farms are continually increasing in acreage and employing higher horsepower tractors; therefore, the downgrading or multiple use of tractors will result in larger tractors for livestock use in the future. These practices will come under increasing pressure as fuel and repair costs for large tractors begin to offset the advantages of using them for chore work.

Kind of Tractor Fuel--Most tractors manufactured in recent years operate on diesel fuel, but gasoline fueled tractors are still important in hog production, especially in the North Central Region (appendix table 47). Two-thirds of the total tractor horsepower hours used in all feeder pig production were generated by gasoline, reflecting both the older age and smaller size of tractors in use. More power was generated by diesel fuel than by gasoline in finishing enterprises, reflecting the use of newer and larger tractors. But, gasoline was still a major fuel.

Diesel fuel accounted for more than three-fourths of total tractor horsepower hours used in all hog enterprises in the Southeast, largely because of the use of newer tractors. LP gas was not an important tractor fuel nationally, but it provided nearly a third of total tractor horsepower in the Southwest. Diesel tractors will comprise an increasing proportion of total tractor power in the future, but the many years that tractors are kept in use indicate that considerable gasoline will be necessary for some time to come, and LP gas will be of continuing importance in the Southwest.

Input of Tractor Power--Size of tractors used in hog production in 1975 ranged from less than 25 to over 110 horsepower (hp). Typical size was near 50

hp, so for purposes of analysis all tractor time was converted to 50 hp equivalent hours. Results of standardization at 50 hp decrease slightly the actual hours of tractor use per litter in feeder pig production and increase hourly use by 0.2 to 0.5 hours per 1,000 pounds produced in other enterprises (table 38). Nationally, feeder pig producers used 2.8 tractor hours per litter produced; farrow-to-finish and feeder pig finishing operations recorded 3.2 hours per 1,000 pounds of liveweight produced. 24/

Producers in the Southeast and Southwest used less tractor power than their counterparts in the North Central Region. Fewer farmers handled manure in these regions. More relied on purchased rations, custom processing of feed, or electrically powered feed mills than did farmers in the North Central Region. Inputs of tractor power per unit of hogs produced decreased substantially as size of enterprise increased in all regions.

### Use of Trucks and Automobiles

Trucks were used almost as extensively in hog production in 1975 as tractors (table 39). Little difference existed in degree of use among regions or size-type classes of hog production. Pickup trucks of less than 1-ton size accounted for most of the trucks used in all types of hog production (appendix table 48). Large trucks were somewhat more common with finishing operations because of associated grain production activities. Generally, the larger trucks were relatively old units; pickup trucks were relatively new (appendix table 49).

Producers drove trucks an average of 72 miles (48 ton miles) for each litter of feeder pigs produced and 40 to 42 miles (39 to 46 ton miles) for each 1,000 pounds of liveweight produced in finishing operations (table 40). Amount of truck use fell below these averages on most farms, but some operators reported exceptionally large truck use, likely due to dispersed facilities, inefficient work routines, and perhaps unnecessary truck travel (appendix table 50). Substantial reduction in truck use per unit of production occurred as size of enterprise increased, due both to shift in activities and to the spreading of fixed routine travel over greater output.

Farm use of automobiles chargeable to hog production averaged 25 to 30 miles per unit of production (table 41). Average use declined with increases in size of enterprise as with truck usage.

### Fuel Consumption

Based on reported tractor use and average fuel consumption per horsepower hour, tractor fuel use was 5.5 to 7 gallons per litter of feeder pigs produced if diesel tractors were used and 8 to 9 gallons with gasoline tractors. In finishing operations the tractor fuel input was 6.5 to 8 gallons of diesel fuel

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24/ Average input of tractor power is not a suitable guide for a single farm because of the great variation in activities performed, system of production, tractor size, and efficiency of operation.



Table 38--Hours of tractor use per unit of hog production standardized to a 50-hp tractor by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Hours per litter</u>					
Feeder pig production:						
North Central	3.8 (4.7)	3.3 (3.3)	2.6 (2.6)	*	*	3.1 (3.4)
Southeast	4.6 (5.7)	2.9 (3.8)	2.1 (2.8)	0.6 (1.3)	*	1.9 (2.6)
Southwest	*	*	*	*	*	2.5 (2.7)
All regions	3.9 (4.8)	3.2 (3.4)	2.6 (2.7)	*	*	2.8 (3.2)
	<u>Hours per 1,000 pounds liveweight produced</u>					
Farrow-to-finish:						
North Central	4.5 (4.5)	3.9 (4.0)	3.5 (3.5)	1.5 (1.5)	*	3.4 (3.4)
Southeast	3.7 (4.5)	4.7 (5.0)	3.0 (3.1)	1.2 (1.3)	0.3 (0.4)	2.2 (2.4)
Southwest	8.8 (10.4)	1.9 (2.0)	1.9 (2.0)	*	1.1 (1.1)	1.7 (1.8)
All regions	4.5 (4.6)	3.9 (4.0)	3.4 (3.4)	1.4 (1.4)	*	3.2 (3.3)
Feeder pig finishing:						
North Central	6.9 (7.0)	4.0 (4.0)	3.3 (3.3)	1.0 (1.1)	*	3.5 (3.5)
Southeast	3.8 (4.8)	1.3 (2.0)	1.5 (2.1)	*	*	1.8 (2.6)
Southwest	*	*	*	*	*	1.0 (2.1)
All regions	6.6 (6.9)	3.8 (3.9)	3.0 (3.1)	1.0 (1.4)	*	3.2 (3.3)

\* Insufficient observations for reliable estimate.

<sup>1/</sup> First figure in each block is based on all farms. Second figure (in parenthesis) excludes producers using no tractor power.

Source: 1976 survey.

Table 39--Proportion of farms using some type of truck in hog production, by type of enterprise and region, 1975

Enterprise	North Central	Southeast	Southwest	All regions
	<u>Percent of farms</u>			
Feeder pig production	93.0	96.1	51.4	93.2
Farrow-to-finish	92.8	96.6	100.0	93.3
Feeder pig finishing	90.1	87.9	81.9	89.7

Source: 1976 survey.

per 1,000 pounds of liveweight produced and 9.5 to 10.5 gallons with gasoline tractors. Assuming that trucks operating under average farm conditions achieve 6 ton miles per gallon of fuel, a litter of feeder pigs took about 8 gallons of fuel and 1,000 pounds of slaughter hogs took about 7 gallons. Most would be gasoline. Automobile use would add another 2 gallons of gasoline per unit of production in the average operation.

#### LABOR

##### Source

Most of the work done in connection with hog production is performed by unpaid operator and family labor, especially in feeder pig production. Nationally, only 7 percent of the total hours of labor used in feeder pig production were hired in 1975 (table 42). About 18 percent were hired for farrow-to-finish operations; 11 percent were hired for feeder pig finishing. The high use of operator and family labor results from the relative smallness of most enterprises, the demanding routine of hog production, and the general crop-livestock family farms on which most hog production still occurs.

The use of operator and family labor was greatest in the North Central Region where family farming and grain-livestock enterprises are dominant. Hired labor was more important in the Southeast and Southwest, approaching a third of the total labor input, except in feeder pig production. Substantial field labor is necessary for some crop enterprises in these regions. Employees are often kept on a year round basis so they will be available for peak labor needs in crop production. More hired labor was therefore used in hog production in these regions partly because it was available. Larger hog enterprises also required the use of more hired labor.

Operator and family labor remained the major source of labor for hog production until annual sales surpassed 1,000 head (table 43). Unpaid labor did not drop below half the total labor input until size of enterprise exceeded 2,500 head of annual sales, except in feeder pig finishing.

Table 40--Miles of truck use per unit of hog production, by type and size of enterprise, and region, 1975

Enterprise and region	Annual sales of hogs (head)											
	100-199		200-499		500-999		1,000-2,499		2,500 and over		All sizes	
	Actual	Ton	Actual	Ton	Actual	Ton	Actual	Ton	Actual	Ton	Actual	Ton
	<u>Miles per litter</u>											
Feeder pig production:												
North Central	135	72	52	42	57	34	*	*	*	*	68	42
Southeast	205	155	98	84	95	74	31	18	*	*	90	69
Southwest	*	*	*	*	*	*	*	*	*	*	32	19
All regions	145	85	60	49	61	38	*	*	*	*	72	48
	<u>Miles per 1,000 pounds liveweight produced</u>											
Farrow-to-finish:												
North Central	56	38	39	32	36	32	22	31	*	*	37	32
Southeast	155	122	100	115	49	64	36	43	41	101	62	85
Southwest	166	172	135	99	65	46	*	*	25	20	58	46
All regions	63	45	44	38	38	35	24	32	*	*	40	39
Feeder pig finishing:												
North Central	56	34	39	39	39	56	26	38	*	*	37	41
Southeast	119	137	105	60	37	30	21	43	*	*	53	45
Southwest	904	1936	*	*	*	*	28	15	*	*	97	120
All regions	77	78	46	41	40	53	26	34	*	*	42	46

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Table 41--Miles of automobile use per unit of hog production, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Miles per litter</u>					
Feeder pig production:						
North Central	77	34	10	*	*	30
Southeast	53	22	17	15	*	21
Southwest	*	*	*	*	*	6
All regions	72	32	11	*	*	28
	<u>Miles per 1,000 pounds liveweight produced</u>					
Farrow-to-finish:						
North Central	51	30	25	9	*	27
Southeast	37	25	13	12	11	16
Southwest	43	25	14	*	1	11
All regions	50	29	24	9	*	25
Feeder pig finishing:						
North Central	37	40	36	12	*	32
Southeast	22	5	13	12	*	12
Southwest	59	*	*	7	*	14
All regions	37	38	32	11	*	30

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Table 42--Source of labor used in hog production, by type of enterprise and region, 1975

Region and source of labor	Feeder pig production	Farrow-to-finish	Feeder pig finishing
	<u>Percent of hours</u>		
North Central:			
Hired	4.2	20.8	7.0
Operator	76.5	57.5	77.2
Family	19.3	21.7	15.8
Southeast:			
Hired	15.2	32.4	30.9
Operator	68.5	51.0	54.9
Family	16.3	16.6	14.2
Southwest:			
Hired	0	33.4	24.6
Operator	65.0	46.7	42.3
Family	35.0	19.9	33.1
All regions:			
Hired	6.9	17.5	10.8
Operator	74.4	59.9	72.6
Family	18.7	22.6	16.6

Source: 1976 survey.

### Labor Input

Producers recorded an average labor input of 22.4 hours per litter of feeder pigs produced; 1.8 hours to produce 100 pounds liveweight of hogs in farrow-to-finish enterprises; and 1.4 hours per hundredweight of gain in feeder pig finishing operations (table 44). The effect of size of enterprise on labor use, including the increased mechanization used with the larger enterprises, was apparent. Overall, about four times as much labor was used per unit of production in the smallest enterprises as in the largest.

Given a size of enterprise, farmers in the Southeast and Southwest consistently reported use of more labor per unit of production than their counterparts in the North Central Region. Availability of more year-round labor in these regions may be the major cause of the greater reported labor input. Actually, labor requirements should be less in the Southeast and Southwest Regions because weather is less severe, few producers handle manure,

Table 43--Unpaid operator and family labor as a proportion of the total labor used in hog production, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	:All sizes
	<u>Percent of hours</u>					
Feeder pig production:						
North Central	97.2	97.0	93.7	*	*	95.8
Southeast	98.2	92.6	84.7	61.6	*	84.8
Southwest	*	*	*	*	*	100.0
All regions	97.5	95.8	92.6	*	*	93.1
Farrow-to-finish:						
North Central	89.4	91.9	77.1	67.0	*	85.0
Southeast	86.6	69.9	73.8	59.2	33.3	67.6
Southwest	94.4	89.8	71.1	*	23.1	66.6
All regions	89.3	89.7	76.5	65.4	*	82.5
Feeder pig finishing:						
North Central	99.0	94.9	92.3	73.7	*	93.0
Southeast	83.4	78.0	62.9	41.0	*	69.1
Southwest	92.3	*	*	36.7	*	75.4
All regions	96.8	93.7	87.7	61.2	*	89.2

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Other labor was hired.

Source: 1976 survey.

and a higher proportion purchase complete rations or use off-farm processing of feed. <sup>25/</sup>

<sup>25/</sup> The number of observations was relatively small in the Southwest, so the labor inputs reported in the Southeast are considered to be the best measure of labor use for both regions. In any case, labor used must not be confused with labor required.

Table 44--Labor input per unit of hog production, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	:100-199	:200-499	:500-999	:1,000-2,499	:2,500 and over	: All sizes
	<u>Hours per litter</u>					
Feeder pig production:						
North Central	: 35.34	19.32	18.21	. *	*	21.26
Southeast	: 55.80	32.95	22.28	13.02	*	26.46
Southwest	: *	*	*	*	*	25.71
All regions	: 38.62	21.89	18.73	*	*	22.41
	<u>Hours per 100 pounds liveweight produced</u>					
Farrow-to-finish:						
North Central	: 2.96	1.87	1.47	1.03	*	1.75
Southeast	: 3.65	2.89	1.90	1.26	0.72	1.76
Southwest	: 5.73	3.84	3.18	*	0.98	2.25
All regions	: 3.04	1.96	1.54	1.09	*	1.77
Feeder pig finishing:						
North Central	: 2.93	1.35	1.30	0.67	*	1.35
Southeast	: 5.66	1.77	1.31	0.81	*	1.61
Southwest	: 9.11	*	*	0.81	*	1.85
All regions	: 3.23	1.42	1.35	0.71	*	1.40

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

#### MARKETING OF HOGS AND PIGS

Emphasis was placed on production in the design of the field survey for this study, so that the only marketing information available stems directly from production decisions made by hog producers during 1975. Data from secondary sources are used to describe market outlets.

## Sale Weight

Highest price for slaughter hogs is commonly paid for grade 1 and 2 hogs weighing 220 to 240 pounds. Maximum price per pound for feeder pigs is usually set for pigs weighing 40 pounds. Lightweight cull sows for slaughter commonly command higher prices than heavy sows.

Within limits, producers can vary market weight of slaughter hogs without incurring price discounts. If the feed-hog price ratio is favorable, producers may profitably feed hogs to heavier weights, even to weights that bring price discounts. Unfavorable prices force marketing of slaughter hogs at lighter weights and increase the pressure on feeder pig producers to market pigs near the base weight of 40 pounds. Market weight of cull sows is determined largely by individual production programs, the phase of the hog cycle and prices which affect rate of culling, and the level of farm income which determines the importance of the capital gains provisions of the Federal income tax regulations applying to the sale of cull breeding stock.

The feed-hog price situation leading into and during 1975 was near normal and did not cause producers to deviate from average marketing patterns. The average weight of slaughter hogs sold centered around 225 to 230 pounds per head for all regions (table 45). Sale weights tended to be about 10 pounds per head less in the Southeast than in the other regions, possibly reflecting in part the regional differences in cost of grains.

Nationally, feeder pigs were marketed at an average weight of 47 pounds per head (table 45). Weights were at least 10 pounds greater in the southern regions than in the North Central Region. Data do not reveal the reasons for these weight differences, but buyers may take into consideration the longer hauls and differences in climate that pigs will encounter in moving northward. Hence, they may encourage production of heavier feeder pigs.

Cull sow weights differed both by type of enterprise and region. Most feeder pig producers in all regions kept sows for two or more litters; hence, they marketed cull sows weighing about 425 pounds. Culls from farrow-to-finish operations weighed 364 pounds per head, reflecting the more intensive culling of females after the first farrowing. Early culling at relatively low cull weights was much more common in the North Central Region than in the Southeast or Southwest.

Market weights among enterprises of different sizes differed only for cull breeding stock. Cull sows tended to be heaviest from enterprises of medium size where sows are commonly kept for two or more litters because farm income is seldom large enough for capital gains to be a major factor. Cull sows from the smallest enterprises weighed 25 pounds less than the all-sow average because of some one-litter-per-year operations where all sows are sold after weaning their first litter of pigs. The largest farrow-to-finish enterprises yielded cull sows 98 pounds below the average weight of culls from all farms due to heavier culling after one litter of pigs, and possibly the ability of managers to achieve better control of the gains in weight of older sows.



Table 45--Average sale weights per head, by kind of hogs and region, 1975

Region	Kinds of hogs				
	Feeder pigs	Slaughter hogs		Cull breeding stock	
		Farrow-to-finish	Feeder pig finishing	Farrow-to-finish	Feeder pig production
<u>Pounds per head</u>					
North Central	45	228	232	361	426
Southeast	55	217	222	380	422
Southwest	58	226	227	404	426
All regions	47	226	231	364	425

Source: 1976 survey.

### Composition of Sales

The liveweight of hogs for sale in a feeder pig enterprise with sows culled after two litters is 35 to 40 percent cull breeding stock and 60 to 65 percent feeder pigs. In similar farrow-to-finish enterprises, cull breeding stock are 10 to 15 percent of total weight sold; slaughter hogs account for 85 to 90 percent. These are often thought of as typical operations. The composition of sales in 1975, however, differed substantially from these levels. Cull breeding stock accounted for only 17 percent of the weight of sales from feeder pig enterprises and 7 percent in farrow-to-finish operations (table 46). The proportion of sales from culls decreased as size of enterprise increased.

Two factors combined to keep cull breeding stock a low proportion of total liveweight sold. Feeder pig producers commonly kept sows for more than two litters with many producing four or five litters per sow before culling. Also, both feeder pig producers and farmers with farrow-to-finish enterprises were responding to favorable prices during 1975 by increasing their inventories of brood sows partially through reduced culling. The tendency toward more culling of sows after one litter of pigs in farrow-to-finish enterprises, especially the larger ones, hence making cull sows a relatively larger part of total sales, was more than offset by increases in inventories of breeding stock.

Sales of nonclassified hogs averaged about 2 percent of total weight in both feeder pig production and farrow-to-finish enterprises. These sales represent the few animals that were not carried to the completion of the regular production program.

Table 46--Proportion of sales by weight from different kinds of hogs, by type and size of enterprise, 1975

Enterprise and kind of hogs	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of weight</u>					
Feeder pig production:						
Feeder pigs	76.7	76.9	83.6	86.5	*	81.1
Culls	20.0	21.5	13.8	10.7	*	16.6
Other	3.3	1.6	2.6	2.8	*	2.3
Farrow-to-finish:						
Slaughter hogs	90.3	91.4	90.4	91.4	95.6	91.2
Culls	8.8	7.0	6.6	8.2	3.9	7.1
Other	0.9	1.6	3.0	.4	.5	1.7
Feeder pig finishing:						
Slaughter hogs	99.7	99.3	100.0	99.8	*	99.8
Other	.3	.7	0	.2	*	.2

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

### Slaughter of Hogs for Home Use

Direct farm family use of most farm products is declining in importance. Slaughter of hogs for home use, however, is still rather common. Over half of all feeder pig producers reported slaughter for home use in 1975; two-thirds of those producing slaughter hogs did so (table 47). Typical use was two to three hogs per farm totalling 500 to 600 pounds liveweight.

The proportion of producers slaughtering hogs for home use did not differ significantly among sizes of enterprises, but the number of hogs slaughtered per farm increased with enterprise size indicating that pork is still a part of the employee perquisite package. Also, producers in the Southeast and Southwest used more pork per farm than those in the North Central Region, probably because of a combination of a relatively larger labor force for field work and perhaps basic differences in regional consumption habits.

Table 47--Slaughter of hogs for home use, by type of enterprise and region, 1975

Region	Farms slaughtering for home use <sup>1/</sup>			Head used per farm <sup>1/</sup>			Average weight per head <sup>1/</sup>		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
	-----Percent of farms-----			-----Number-----			-----Pounds-----		
North Central	53	67	71	1.6	2.3	2.3	249	240	230
Southeast	59	67	44	3.6	3.6	3.2	307	228	266
Southwest	*	62	53	*	3.0	2.6	*	228	254
All regions	54	67	68	2.0	2.4	2.4	268	239	233

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Types of enterprises are: Type 1 = feeder pig production; Type 2 = farrow-to-finish; Type 3 = feeder pig finishing.

Source: 1976 survey.

## Marketing Methods

Most slaughter hogs were sold direct to packers in 1975, either by direct negotiation or through country buying stations or order buyers. <sup>26/</sup> On a nationwide basis, 72 percent of sales went this route (table 48). Terminal markets handled 16 percent of the slaughter hogs; auction markets handled 12 percent.

Direct marketing was the dominant outlet for slaughter hogs in all major hog producing regions. This method of marketing was most prevalent in the West North Central Region (81 percent) and least important in the Southern Plains (52 percent). Auction and terminal markets shared the remainder of sales in these regions in varying proportion depending upon existence of such outlets. Substantial variation occurred among States within these regions due largely to availability of the different market outlets.

Larger volume producers sell a slightly higher proportion of their hogs directly to packers than do producers with few hogs to market. In 1973, 70 percent of Illinois hog producers selling 100 to 199 slaughter hogs annually considered direct sales to be their major outlet; 81 percent selling over 2,500 head annually used direct sales. The proportion of hogs moving direct to packers was approximately the same as the proportion of producers selling direct.

Slaughter hogs are sold on a liveweight basis or by the more recently introduced carcass grade and weight method. The latter system rose from 2.6 percent of total sales in 1965 to 8.9 percent in 1975. It is most important in the West North Central Region where 16 percent of slaughter hogs were sold on this basis in 1975 (table 49). Sales on a grade and weight basis were below 10 percent of total in all other regions.

Large volume producers sell more of their slaughter hogs on a carcass grade and weight basis than do small volume producers. This method was used for pricing less than 2 percent of the hogs sold by Illinois producers marketing 100 to 199 head in 1973. Half the hogs from farms marketing over 2,500 annually were priced on the grade and weight basis. As with market outlets, however, few producers sell hogs under one pricing system to the exclusion of the other. The carcass grade and weight system can be rather complicated and the pricing procedure may differ among buyers. Typically, producers use a major outlet and one method of pricing for most of their marketings, but occasionally check the market by selling some hogs through alternative outlets and under different systems of pricing.

Information on market outlets for feeder pigs is not well documented. Direct transactions between pig producers and finishers seem most common in the more intensive hog producing States. The larger volume feeder pig producers

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<sup>26/</sup> Data on marketing were not included in the 1975 survey. Information in this section is drawn from Packers and Stockyards Resume, Vol. XIV, No. 7, Packers and Stockyards Adm., U.S. Dept. Agr., Dec. 24, 1976, and unpublished 1973 data from Illinois farm recordkeepers.

Table 48--Hogs purchased by packers through different market outlets, by region where slaughtered, 1975 <sup>1/</sup>

Region	Market outlet				Total <sup>2/</sup>
	Direct, country dealers	Terminal markets	Auction markets		
	<u>Percent of head purchased</u>				
North Atlantic	75.7	10.4	13.9	100.0	
East North Central	68.2	20.3	11.4	100.0	
West North Central	80.6	15.2	4.2	100.0	
South Atlantic	67.5	3.1	29.5	100.0	
South Central	61.6	15.4	23.1	100.0	
Southern Plains	51.8	22.7	25.5	100.0	
Mountain	51.6	9.6	38.8	100.0	
Pacific	41.2	47.8	11.0	100.0	
United States	71.6	16.3	12.1	100.0	

<sup>1/</sup> Packers and Stockyards Resume, Vol. XIV, No. 7, Packers and Stockyards Adm., U.S. Dept. Agr., Dec. 24, 1976, Table 9.

<sup>2/</sup> Totals do not add to 100 percent in some cases due to rounding.

Source: 1976 survey.

Table 49--Hogs purchased on a carcass grade and weight basis, by region where slaughtered, 1975 <sup>1/</sup>

Region	Hogs purchased on grade and weight basis <sup>2/</sup>
	<u>Percent of head purchased</u>
North Atlantic	1.8
East North Central	4.2
West North Central	16.0
South Atlantic	.1
South Central	5.2
Southern Plains	4.0
Mountain	9.8
Pacific	2.7
United States	8.9

<sup>1/</sup> Packers and Stockyard Resume, Vol. XIV, No. 7, Packers and Stockyards Adm., U.S. Dept. Agr., Dec. 24, 1976, Table 11.

<sup>2/</sup> All other purchases are assumed to be on a liveweight basis or head basis.

Source: 1976 survey.

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Appendix table 1--Total U.S. meat production and consumption, carcass weight, 1950-76

Year	Production 1/					Per capita consumption 1/				
	Beef	Veal	Lamb and mutton	Pork	Total	Beef	Veal	Lamb and mutton	Pork	Total
	-----Million pounds-----					-----Pounds-----				
1950	9,534	1,230	597	13,157	24,518	63.4	8.0	4.0	84.9	160.3
1951	8,837	1,059	521	14,191	24,608	56.1	6.6	3.4	88.8	154.9
1952	9,650	1,169	648	14,259	25,726	62.2	7.2	4.2	89.6	163.2
1953	12,407	1,546	729	12,187	26,869	77.6	9.5	4.7	77.3	169.1
1954	12,963	1,647	734	12,002	27,346	80.1	10.0	4.6	73.0	167.7
1955	13,569	1,578	758	13,477	29,382	82.0	9.4	4.6	81.8	177.8
1956	14,462	1,632	741	13,804	30,639	85.4	9.5	4.5	82.7	182.0
1957	14,202	1,526	707	12,822	29,257	84.6	8.8	4.2	75.1	172.6
1958	13,330	1,186	688	12,673	27,877	80.5	6.7	4.2	73.0	164.3
1959	13,580	1,008	738	14,538	29,864	81.4	5.7	4.8	82.0	173.8
1960	14,753	1,109	768	13,905	30,535	85.1	6.1	4.8	77.7	173.6
1961	15,327	1,044	832	13,648	30,851	87.8	5.6	5.1	74.2	172.7
1962	15,324	1,015	808	13,953	31,102	88.9	5.5	5.2	75.0	174.4
1963	16,456	929	770	14,493	32,646	94.5	4.9	4.9	76.3	180.4
1964	18,456	1,013	715	14,598	34,782	99.9	5.2	4.2	76.2	185.6
1965	18,727	1,020	651	12,781	33,180	99.5	5.2	3.7	67.2	175.5
1966	19,726	910	650	12,798	34,084	104.2	4.6	4.0	65.7	178.3
1967	20,219	792	646	14,131	35,786	106.5	3.8	3.9	72.0	186.1
1968	20,880	734	602	14,515	36,732	109.7	3.6	3.7	73.4	190.4
1969	21,158	673	550	14,245	36,627	110.8	3.3	3.4	71.4	188.9
1970	21,685	588	551	14,699	37,522	113.7	2.9	3.3	72.7	192.4
1971	21,902	546	555	16,006	39,007	113.0	2.7	3.1	79.0	197.8
1972	22,419	459	543	14,422	37,842	116.1	2.2	3.3	71.3	192.9
1973	21,277	357	514	13,223	35,369	109.6	1.8	2.7	63.9	178.0
1974	23,138	486	465	14,331	38,418	116.8	2.3	2.3	69.1	190.5
1975	23,976	873	410	11,779	37,038	120.1	4.2	2.0	56.1	182.4
1976	25,969	853	371	12,688	39,887	128.8	4.0	1.9	59.5	194.7

1/ This historical series has been revised to reflect hog production on a packer style carcass basis. See Livestock and Meat Situation Special Article LMS-217, ESCS-U.S. Dept. of Agr., October 1977.

Source: Agricultural Statistics, U.S. Dept. Agr. 1978.

Appendix table 2--Distribution of U.S. hog production, 1950-75 <sup>1/</sup>

Region and State	1950	1955	1960	1965	1970	1975
	<u>Percent of liveweight</u>					
<b>Corn Belt-Lake States:</b>						
<u>Eastern</u>						
Ohio	5.4	5.0	4.7	4.5	4.0	3.7
Indiana	8.5	8.1	8.9	8.3	7.9	8.0
Illinois	11.1	12.5	13.9	14.4	12.2	13.6
Michigan	1.5	1.4	1.3	1.2	1.2	1.3
Wisconsin	3.7	4.1	3.7	3.3	3.3	2.6
Total	30.2	31.1	32.5	31.7	28.6	29.2
<u>Western</u>						
Minnesota	7.1	7.7	7.1	6.3	6.0	6.4
Iowa	22.5	23.5	22.8	24.2	23.3	23.4
Missouri	7.3	6.6	7.0	7.3	7.9	6.8
Total	36.9	37.8	36.9	37.8	37.2	36.6
<b>Northern Plains:</b>						
North Dakota	.7	.9	.7	.6	.6	.6
South Dakota	2.7	3.4	2.9	3.6	3.6	3.2
Nebraska	4.8	5.1	4.6	5.3	6.2	5.9
Kansas	2.2	1.7	2.0	2.6	3.3	3.1
Total	10.4	11.1	10.2	12.1	13.7	12.8
<b>Southeast:</b>						
Arkansas	1.1	.6	.7	.4	.5	.5
Louisiana	.7	.5	.3	.2	.2	.3
Kentucky	2.0	1.8	2.3	2.3	2.2	2.0
Tennessee	2.0	1.8	2.0	1.9	1.6	1.7
Mississippi	.9	.8	.8	.6	.8	.6
Georgia	1.9	2.0	2.2	1.9	2.5	2.4
Florida	.4	.5	.5	.4	.4	.3
South Carolina	.7	.7	.7	.6	.8	1.0
North Carolina	1.6	1.8	2.1	2.4	3.1	3.4
Virginia	1.2	1.0	1.0	1.0	.8	1.1
Alabama	1.5	1.5	1.5	1.2	1.5	1.5
Total	14.0	13.0	14.1	12.8	14.4	14.8
<b>Southwest:</b>						
Texas	2.1	1.6	1.5	1.3	1.8	1.6
Oklahoma	1.3	.9	.7	.6	.7	.6
New Mexico	.1	.1	.1	.1	.1	.2
Total	3.5	2.6	2.3	2.0	2.6	2.4
<b>Other</b>	5.0	4.4	4.0	3.6	3.5	4.2
<b>48-State total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<sup>1/</sup> Percentages are based on liveweight produced.

Source: Agricultural Statistics and Livestock and Meat Statistics, Various issues.  
U.S. Dept. Agr.



Appendix table 3--Number and percentage of U.S. hogs and pigs sold from all farms, by size class and selected areas, 1964 and 1974 <sup>1/</sup>

Region, State and year	Hogs and pigs sold	Annual sales of hogs (head)					
		1-99	100-199	200-499	500-999	1,000 and over	Total
	Number	Percent of sales					
<b>Corn Belt:</b>							
1964	49,491,250	14.5	21.8	38.5	17.1	8.1	100.0
1974	43,036,894	7.6	11.9	31.5	25.5	23.5	100.0
Ohio:							
1964	4,174,550	22.4	22.4	31.9	15.3	8.0	100.0
1974	3,165,535	13.9	14.9	29.1	20.8	21.3	100.0
Indiana:							
1964	7,504,250	15.1	18.9	34.8	19.4	11.8	100.0
1974	5,927,786	8.7	11.6	26.5	23.1	30.1	100.0
Illinois:							
1964	11,760,500	12.6	18.1	36.4	21.7	11.2	100.0
1974	9,024,521	7.0	10.7	27.4	24.8	30.1	100.0
Iowa:							
1964	19,872,500	10.5	23.8	44.5	15.8	5.4	100.0
1974	19,359,946	4.8	10.7	35.1	28.8	20.6	100.0
Missouri:							
1964	6,181,450	25.0	25.3	31.9	11.3	6.5	100.0
1974	5,559,106	13.4	17.1	32.5	20.1	16.9	100.0
<b>Lake States:</b>							
1964	10,141,750	31.9	27.7	28.2	8.2	4.0	100.0
1974	8,757,783	13.5	16.0	30.5	21.4	18.6	100.0
Michigan:							
1964	1,167,150	56.2	18.4	15.6	6.9	2.9	100.0
1974	1,013,950	15.3	12.1	22.2	20.5	29.9	100.0
Wisconsin:							
1964	3,164,450	32.7	27.9	27.7	7.3	4.4	100.0
1974	2,345,238	17.2	17.7	30.9	18.1	16.1	100.0
Minnesota:							
1964	5,810,150	26.6	29.4	31.0	9.0	4.0	100.0
1974	5,398,595	11.5	15.9	32.0	22.9	17.7	100.0
<b>Northern Plains</b>							
1964	9,788,325	29.3	30.0	29.5	7.3	3.9	100.0
1974	11,429,672	11.1	15.9	33.7	19.6	19.7	100.0
N. Dakota:							
1964	519,575	69.7	16.1	11.2	3.0	0	100.0
1974	657,932	21.5	17.4	25.5	17.1	18.5	100.0
S. Dakota:							
1964	2,611,750	27.3	34.7	29.8	5.7	2.5	100.0
1974	2,950,064	11.5	19.5	38.3	18.0	12.7	100.0
Nebraska:							
1964	4,399,050	25.2	31.3	33.0	7.8	2.7	100.0
1974	4,992,209	9.5	15.2	34.9	21.2	19.2	100.0
Kansas:							
1964	2,257,950	30.2	25.4	26.5	9.3	8.6	100.0
1974	2,829,467	11.0	13.2	28.6	18.9	28.3	100.0
<b>Southeast:</b>							
1964	9,493,356	47.8	18.9	17.1	7.0	9.2	100.0
1974	11,306,347	21.3	13.2	18.6	12.6	34.3	100.0
Virginia:							
1964	640,155	44.9	17.9	18.9	9.5	8.8	100.0
1974	902,641	19.8	12.0	15.7	11.5	41.0	100.0
N. Carolina:							
1964	1,359,750	47.0	15.5	16.7	7.7	13.1	100.0
1974	2,616,555	15.7	9.0	14.2	11.1	50.0	100.0
S. Carolina:							
1964	421,395	56.5	15.2	14.3	5.1	8.9	100.0
1974	533,466	24.6	11.8	16.5	12.7	34.4	100.0
Georgia:							
1964	1,677,350	43.5	21.7	18.8	6.7	9.3	100.0
1974	2,091,998	15.9	14.1	22.6	15.0	32.4	100.0
Florida:							
1964	360,175	47.9	19.9	15.0	5.9	11.3	100.0
1974	310,136	27.9	16.2	19.2	13.0	23.7	100.0
Kentucky:							
1964	1,770,250	40.6	21.1	20.6	8.4	9.3	100.0
1974	1,557,385	25.3	15.8	20.5	14.8	23.6	100.0
Tennessee:							
1964	1,478,950	54.0	20.0	15.8	5.3	4.9	100.0
1974	1,286,124	33.5	18.3	22.1	10.8	15.3	100.0
Alabama:							
1964	880,505	52.2	19.6	15.6	6.6	6.0	100.0
1974	978,340	22.5	14.3	20.9	13.3	29.0	100.0

See footnote at end of table.

Continued

Appendix table 3--Number and percentage of U.S. hogs and pigs sold from all farms, by size class and selected areas, 1964 and 1974 <sup>1/</sup>--Continued

Region, State and Year	Hogs and pigs sold	Annual sales of hogs (head)						Total
		1-99	100-199	200-499	500-999	1,000 and over		
Southeast--Continued		-----Percent of sales-----						
Mississippi: 1964	380,695	54.3	12.1	12.6	5.8	15.2	100.0	
1974	378,061	22.8	9.4	14.3	11.0	42.5	100.0	
Arkansas: 1964	363,705	54.7	16.7	12.5	6.2	9.9	100.0	
1974	543,325	19.9	12.8	17.7	11.0	38.6	100.0	
Louisiana: 1964	160,426	58.8	10.6	12.4	7.3	10.9	100.0	
1974	108,316	25.5	10.1	12.7	13.3	38.4	100.0	
Southwest:								
1964	1,476,477	46.5	14.3	15.7	7.7	15.8	100.0	
1974	1,890,764	17.8	9.4	16.4	12.7	43.7	100.0	
Oklahoma: 1964	420,835	71.5	11.0	9.7	2.8	5.0	100.0	
1974	385,742	28.9	14.5	20.6	14.3	21.7	100.0	
Texas: 1964	997,415	36.7	15.8	18.4	9.4	19.7	100.0	
1974	1,406,927	15.2	8.2	15.8	12.5	48.3	100.0	
New Mexico: 1964	58,227	30.2	13.5	14.2	14.7	27.4	100.0	
1974	98,095	11.0	5.5	9.7	8.3	65.5	100.0	
Total								
1964	80,391,158	23.0	23.1	33.2	13.4	7.3	100.0	
1974	76,421,460	11.4	13.0	29.0	21.7	24.9	100.0	

<sup>1/</sup> Any sales recorded by the Census, but not included in the Census distribution by size classes, have been placed in the 1-99 sales class in this table.

Source: Census of Agriculture, 1964 and 1974.

Appendix table 4--Number and percentage of U.S. farms selling hogs and pigs, by size classes and selected areas, 1964 and 1974 <sup>1/</sup>

Region, State and year	Farms selling hogs and pigs	Annual sales of hogs (head)						Total
		1-99	100-199	200-499	500-999	1,000 and over		
	Number	Percent of farms						
<b>Corn Belt:</b>								
1964	320,352	50.7	24.2	20.2	4.1	0.8	100.0	
1974	181,258	42.7	20.3	24.5	9.1	3.4	100.0	
Ohio:								
1964	36,908	66.2	18.4	12.2	2.6	.6	100.0	
1974	20,062	60.7	17.1	15.3	4.9	2.0	100.0	
Indiana:								
1964	48,295	54.8	21.3	18.1	4.6	1.2	100.0	
1974	25,946	48.4	19.1	19.9	7.9	3.7	100.0	
Illinois:								
1964	67,394	48.8	22.8	21.3	5.8	1.3	100.0	
1974	35,118	43.0	19.7	23.2	9.5	4.6	100.0	
Iowa:								
1964	108,909	36.1	30.9	27.8	4.5	.7	100.0	
1974	66,336	28.2	22.1	33.1	12.7	3.9	100.0	
Missouri:								
1964	58,846	66.7	19.4	11.7	1.8	.4	100.0	
1974	33,796	55.3	20.1	18.0	4.9	1.7	100.0	
<b>Lake States:</b>								
1964	106,291	68.9	19.6	9.9	1.3	.3	100.0	
1974	55,373	58.7	18.2	16.2	5.1	1.8	100.0	
Michigan:								
1964	15,683	80.5	11.6	6.2	1.3	.4	100.0	
1974	7,811	73.1	11.5	9.5	3.8	2.1	100.0	
Wisconsin:								
1964	36,059	72.1	18.0	8.7	1.0	.2	100.0	
1974	17,978	65.0	16.6	13.5	1.3	3.6	100.0	
Minnesota:								
1964	54,549	63.4	23.0	11.8	1.5	.3	100.0	
1974	29,584	51.0	21.0	19.7	6.3	2.0	100.0	
<b>Northern Plains:</b>								
1964	99,957	66.3	21.8	10.5	1.2	.2	100.0	
1974	60,648	49.0	21.8	21.6	5.7	1.9	100.0	
N. Dakota:								
1964	10,378	87.2	8.8	3.4	.5	.1	100.0	
1974	6,032	72.2	13.9	9.9	2.8	1.2	100.0	
S. Dakota:								
1964	24,328	59.9	27.3	11.6	1.0	.2	100.0	
1974	16,154	43.8	25.7	24.1	5.1	1.3	100.0	
Kansas:								
1964	25,088	73.0	16.9	8.4	1.3	.4	100.0	
1974	14,558	54.2	18.8	18.8	5.6	2.6	100.0	
Nebraska:								
1964	40,163	60.6	25.0	12.9	1.3	.2	100.0	
1974	23,904	43.5	23.0	24.6	6.8	2.1	100.0	
<b>Southeast:</b>								
1964	196,202	89.3	7.0	3.0	.5	.2	100.0	
1974	103,882	78.9	10.6	7.0	2.1	1.4	100.0	
Virginia:								
1964	13,727	90.0	6.2	2.9	.7	.2	100.0	
1974	8,450	81.8	9.4	5.8	1.8	1.2	100.0	
N. Carolina:								
1964	28,995	90.7	5.6	2.8	.6	.3	100.0	
1974	17,383	77.7	10.1	7.4	2.4	2.4	100.0	
S. Carolina:								
1964	11,688	93.3	4.3	1.9	.3	.2	100.0	
1974	6,129	84.5	7.8	4.9	1.6	1.2	100.0	
Georgia:								
1964	26,770	84.2	10.4	4.4	.7	.3	100.0	
1974	14,084	67.3	15.5	11.5	3.4	2.3	100.0	
Florida:								
1964	6,331	87.3	8.8	3.1	.5	.3	100.0	
1974	3,563	80.8	10.6	5.9	1.7	1.0	100.0	
Kentucky:								
1964	30,094	85.3	9.3	4.4	.7	.3	100.0	
1974	16,763	79.4	11.0	6.4	2.0	1.2	100.0	
Tennessee:								
1964	33,247	90.2	6.8	2.5	.4	.1	100.0	
1974	17,140	82.2	10.2	5.8	1.2	.6	100.0	
Alabama:								
1964	19,431	90.0	6.7	2.6	.5	.2	100.0	
1974	9,291	77.6	11.2	7.6	2.1	1.5	100.0	

See footnote at end of table.

Continued

Appendix table 4--Number and percentage of U.S. farms selling hogs and pigs, by size class and selected areas, 1964 and 1974 <sup>1/</sup>--Continued

Region, State and year	Farms selling hogs and pigs	Annual sales of hogs (head)						Total
		1-99	100-199	200-499	500-999	1,000 and over		
Southeast--Continued		Number		-----Percent of farms-----				
Mississippi:	1964	12,031	95.2	2.9	1.4	0.3	0.2	100.0
	1974	4,628	87.6	5.7	3.8	1.4	1.5	100.0
Arkansas:	1964	9,106	92.4	5.2	1.8	.4	.2	100.0
	1974	4,860	79.7	10.4	6.8	1.9	1.2	100.0
Louisiana:	1964	4,782	95.3	2.6	1.5	.4	.2	100.0
	1974	1,591	90.0	5.2	2.7	1.4	.7	100.0
Southwest:								
	1964	28,902	89.5	6.2	3.2	.7	.4	100.0
	1974	15,072	79.9	8.8	6.8	2.4	2.1	100.0
Oklahoma:	1964	9,905	91.1	5.8	2.5	.4	.2	100.0
	1974	5,014	83.6	8.5	5.4	1.7	.8	100.0
Texas:	1964	18,132	88.8	6.4	3.5	.8	.5	100.0
	1974	9,441	77.7	9.1	7.8	2.7	2.7	100.0
New Mexico:	1964	865	87.4	6.6	3.5	1.5	1.0	100.0
	1974	617	82.8	6.3	5.2	2.1	3.6	100.0
Total	1964	751,704	66.9	18.1	12.3	2.2	.5	100.0
	1974	416,233	56.1	17.4	18.0	6.1	2.4	100.0

<sup>1/</sup> Any farms selling hogs and recorded by the Census, but not included in the Census distribution by size classes, have been placed in the 1-99 sales class in this table.

Source: Census of Agriculture, 1964 and 1974.

Appendix table 5--Number and percentage of U.S. farms selling feeder pigs and feeder pigs sold by size class and selected areas, 1974 <sup>1/</sup>

Region and State	Farms selling feeder pigs	Feeder pigs sold	Annual sales (head)					Total
			1-99	100-199	200-499	500-999	1,000 and over	
		Number	Percent					
<b>Corn Belt:</b>								
Farms	38,448	--	46.2	20.9	21.5	8.1	3.3	100.0
Pigs	--	5,586,580	10.6	13.6	28.0	22.8	25.0	100.0
Ohio:	Farms	4,519	--	61.6	18.5	13.4	4.6	100.0
	Pigs	--	462,523	17.5	17.2	26.2	19.4	100.0
Indiana:	Farms	5,452	--	51.1	20.6	18.6	6.6	100.0
	Pigs	--	743,353	12.0	14.4	27.4	21.6	100.0
Illinois:	Farms	6,788	--	47.0	21.2	20.4	7.3	100.0
	Pigs	--	987,466	10.9	13.6	25.9	19.4	100.0
Iowa:	Farms	11,034	--	26.9	21.7	31.5	14.5	100.0
	Pigs	--	2,179,085	5.0	9.7	28.0	28.0	100.0
Missouri:	Farms	10,655	--	56.7	20.9	16.6	4.3	100.0
	Pigs	--	1,214,153	17.1	18.8	30.9	18.2	100.0
<b>Lake States:</b>								
Farms	16,806	--	56.8	19.3	16.9	5.2	1.8	100.0
Pigs	--	2,015,041	14.4	16.5	31.2	20.3	17.6	100.0
Michigan:	Farms	2,247	--	68.8	14.6	11.5	3.5	100.0
	Pigs	--	190,061	18.6	16.2	27.1	19.9	100.0
Wisconsin:	Farms	6,767	--	62.0	18.2	15.0	3.6	100.0
	Pigs	--	694,040	18.0	18.6	33.0	16.4	100.0
Minnesota:	Farms	7,792	--	48.8	21.7	20.2	6.9	100.0
	Pigs	--	1,130,940	11.5	15.3	30.6	22.8	100.0
<b>Northern Plains:</b>								
Farms	12,789	--	44.2	22.5	23.3	7.3	2.7	100.0
Pigs	--	1,873,313	10.0	13.2	29.5	20.9	26.4	100.0
N. Dakota:	Farms	1,423	--	60.5	18.6	13.5	5.1	100.0
	Pigs	--	160,427	15.8	14.1	22.0	22.1	100.0
S. Dakota:	Farms	3,094	--	39.0	24.7	26.8	7.7	100.0
	Pigs	--	429,963	9.9	14.5	33.6	23.5	100.0
Kansas:	Farms	4,132	--	49.2	21.1	21.7	5.8	100.0
	Pigs	--	743,743	7.1	11.1	25.4	21.1	100.0
Nebraska:	Farms	4,140	--	37.5	23.7	25.4	9.4	100.0
	Pigs	--	539,180	12.5	14.9	34.1	17.9	100.0
<b>Southeast:</b>								
Farms	33,171	--	77.8	12.2	7.1	1.8	1.1	100.0
Pigs	--	2,555,189	27.5	16.3	20.2	18.0	18.0	100.0
Virginia:	Farms	2,331	--	79.5	11.1	6.0	2.2	100.0
	Pigs	--	162,268	28.5	16.1	18.9	16.1	100.0
N. Carolina:	Farms	5,143	--	73.0	12.3	9.5	2.7	100.0
	Pigs	--	598,224	17.5	10.5	19.1	11.6	100.0
S. Carolina:	Farms	1,421	--	84.0	8.4	4.1	2.3	100.0
	Pigs	--	82,758	30.6	12.2	13.3	19.3	100.0
Georgia:	Farms	3,295	--	73.4	14.1	8.6	2.3	100.0
	Pigs	--	250,276	25.1	16.3	19.3	11.0	100.0
Florida:	Farms	908	--	82.5	9.7	5.6	1.7	100.0
	Pigs	--	45,253	39.8	16.4	20.1	14.2	100.0
Kentucky:	Farms	5,849	--	79.3	12.5	6.1	1.2	100.0
	Pigs	--	366,800	35.5	21.0	20.7	9.6	100.0
Tennessee:	Farms	7,457	--	80.9	12.0	5.9	.8	100.0
	Pigs	--	431,378	41.5	23.2	23.0	7.1	100.0
Alabama:	Farms	2,720	--	72.9	14.4	9.1	2.2	100.0
	Pigs	--	224,000	24.7	17.2	24.3	13.0	100.0
Mississippi:	Farms	1,238	--	85.9	6.5	5.6	1.4	100.0
	Pigs	--	67,352	35.4	12.7	22.2	15.3	100.0

See footnotes at end of table.

Continued

Appendix table 5--Number and percentage of U.S. farms selling feeder pigs and feeder pigs sold by size class and selected areas, 1974 <sup>1/</sup>--Continued

Region and State	Farms selling feeder pigs	Feeder pigs sold	Annual sales (head)						Total
			1-99	100-199	200-499	500-999	1,000 and over		
		-----Number-----			-----Percent-----				
Southeast--continued									
Arkansas:	Farms	2,451	--	73.1	14.4	8.9	2.7	.9	100.0
	Pigs	--	291,190	18.2	14.8	19.2	12.8	35.0	100.0
Louisiana:	Farms	358	--	90.2	5.9	2.2	1.4	.3	100.0
	Pigs	--	35,690	14.5	5.2	5.0	37.6	37.7	100.0
Southwest:									
	Farms	4,673	--	80.0	9.7	6.9	2.0	1.4	100.0
	Pigs	--	342,787	27.6	11.9	20.4	12.6	27.5	100.0
Oklahoma:	Farms	1,757	--	83.4	9.8	4.9	1.1	.8	100.0
	Pigs	--	89,683	37.9	17.6	20.8	9.0	14.7	100.0
Texas:	Farms	2,715	--	77.7	9.9	8.4	2.6	1.4	100.0
	Pigs	--	221,935	26.0	10.8	22.7	15.0	25.5	100.0
New Mexico:	Farms	201	--	82.0	7.5	4.0	2.5	4.0	100.0
	Pigs	--	31,169	8.6	3.6	3.2	5.5	79.1	100.0
Total	Farms	105,887	--	59.0	17.6	15.8	5.3	2.3	100.0
	Pigs	--	12,372,910	15.1	14.5	27.0	20.8	22.6	100.0

-- = Not applicable.

<sup>1/</sup> Any sales or farms selling feeder pigs recorded by the Census, but not included in the Census distribution by size classes, have been placed in the 1-99 sales class in this table. Census reports did not provide data on feeder pig sales by size class in 1964.

Source: Census of Agriculture, 1974.

Appendix table 6--Economic importance of hog production to farm businesses, by selected areas, 1971

State and importance of enterprise <u>1/</u>	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent of number sold</u>					
Ohio:					
Principal	70.8	46.7	73.3	74.5	72.9
Secondary	10.4	7.3	7.7	10.0	14.6
Small	18.8	46.0	19.0	15.5	12.5
Indiana:					
Principal	74.1	54.6	71.0	76.7	78.1
Secondary	12.7	11.8	9.4	12.5	14.6
Small	13.2	33.6	19.6	10.8	7.3
Illinois:					
Principal	81.5	67.2	78.0	83.6	82.1
Secondary	11.9	8.4	11.6	12.0	13.8
Small	6.6	24.4	10.4	4.4	4.1
Iowa:					
Principal	86.9	78.5	86.8	87.9	87.9
Secondary	7.8	6.5	5.9	7.9	8.9
Small	5.3	15.0	7.3	4.2	3.2
Missouri:					
Principal	76.2	50.0	69.8	82.5	80.7
Secondary	3.6	2.6	2.6	3.2	6.3
Small	20.2	47.4	27.6	14.3	13.0
Minnesota:					
Principal	77.2	64.8	79.2	78.7	81.4
Secondary	12.3	8.3	11.0	13.4	12.7
Small	10.5	26.9	9.8	7.9	5.9
Wisconsin:					
Principal	58.0	44.9	57.8	57.5	71.0
Secondary	29.7	19.2	32.8	36.9	23.6
Small	12.3	35.9	9.4	5.6	5.4
Michigan:					
Principal	65.7	39.7	79.5	73.8	62.2
Secondary	8.4	4.0	5.5	9.0	11.1
Small	25.9	56.3	15.0	17.2	26.7

See footnotes at end of table.

Continued

Appendix table 6--Economic importance of hog production to farm businesses, by selected areas, 1971-- Continued

State and importance of enterprise <u>1/</u>	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent of number sold</u>					
Nebraska:					
Principal	84.6	78.7	87.3	85.9	84.0
Secondary	7.8	8.2	5.3	7.6	8.5
Small	7.6	13.1	7.4	6.5	7.5
Kansas:					
Principal	83.1	74.5	79.8	84.3	87.9
Secondary	6.1	3.2	5.9	6.4	8.0
Small	10.8	22.3	14.3	9.3	4.1
North Dakota:					
Principal	72.2	65.6	70.4	74.3	74.2
Secondary	13.5	11.5	13.8	13.8	14.8
Small	14.3	22.9	15.8	11.9	11.0
South Dakota:					
Principal	84.3	80.2	85.0	86.0	81.0
Secondary	6.8	8.3	3.7	6.7	7.1
Small	8.9	11.5	11.3	7.3	11.9
Georgia:					
Principal	56.9	37.0	40.2	59.7	58.7
Secondary	22.1	9.8	8.2	23.2	26.6
Small	21.0	53.2	51.6	17.1	14.7
Florida:					
Principal	58.2	62.7	69.5	49.9	86.8
Secondary	15.1	7.7	29.3	17.0	13.2
Small	26.7	29.6	1.2	33.1	0
South Carolina:					
Principal	52.1	51.9	52.7	48.9	64.7
Secondary	23.4	13.8	7.7	26.1	28.7
Small	24.5	34.3	39.6	25.0	6.6
North Carolina:					
Principal	60.8	49.2	56.5	63.9	67.4
Secondary	23.0	12.4	16.1	25.5	30.4
Small	16.2	38.4	27.4	10.6	2.2

See footnotes at end of table

Continued



Appendix table 6--Economic importance of hog production to farm businesses, by selected areas, 1971--Continued

State and importance of enterprise <u>1/</u>	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent of number sold</u>					
Virginia:					
Principal	57.7	49.5	36.4	54.8	73.1
Secondary	21.9	13.7	10.8	26.2	19.9
Small	20.4	36.8	52.8	19.0	7.0
Alabama:					
Principal	49.4	40.0	61.2	52.5	46.9
Secondary	17.5	10.1	13.4	18.9	19.0
Small	33.1	49.9	25.4	28.6	34.1
Arkansas:					
Principal	36.1	34.1	39.8	33.1	52.1
Secondary	15.0	1.0	9.1	27.3	47.9
Small	48.9	64.9	51.1	39.6	0
Louisiana:					
Principal	25.8	.5	93.6	40.4	43.9
Secondary	13.0	1.3	6.4	20.4	22.6
Small	61.2	98.2	0	39.2	33.5
Kentucky:					
Principal	66.6	50.1	61.2	69.9	70.3
Secondary	9.8	6.0	2.9	9.7	12.6
Small	23.6	43.9	35.9	20.4	17.1
Tennessee:					
Principal	52.2	32.3	49.5	54.3	68.5
Secondary	6.4	2.8	3.7	5.7	11.9
Small	41.4	64.9	46.8	40.0	19.6
Mississippi:					
Principal	53.4	35.9	44.7	61.5	34.9
Secondary	10.6	13.7	3.5	10.5	9.9
Small	36.0	50.4	51.8	28.0	55.2
Texas:					
Principal	65.8	58.6	59.0	66.8	70.3
Secondary	9.3	5.9	6.0	9.5	11.8
Small	24.9	35.5	35.0	23.7	17.9

See footnotes at end of table

Continued

Appendix table 6--Economic importance of hog production to farm businesses, by selected areas, 1971--Continued

State and importance of enterprise <u>1/</u>	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent of number sold</u>					
Oklahoma:					
Principal	61.2	43.9	60.5	66.2	61.2
Secondary	5.2	4.7	3.1	4.9	6.7
Small	33.6	51.4	36.4	28.9	32.1
New Mexico:					
Principal	53.4	20.4	73.0	86.3	22.9
Secondary	9.7	79.6	7.6	5.0	.4
Small	36.9	0	19.4	8.7	76.2

1/ The three categories of enterprise importance, the sum of which always equals 100 percent in this table, are defined as: Principal--Sales in 1969 amounted to \$10,000 or more from hogs and 50 percent or more of the total value of sales for the farm. Secondary--Sales in 1969 amounted to \$10,000 or more from hogs, but less than 50 percent of the total value of sales from the farm. Small--Sales of hogs in 1969 from farms with less than \$10,000 total value of products.

Source: 1969 Census of Agriculture, U.S. Dept. of Commerce, Bureau of Census, Vol. V, Special Reports, Part 9, Cattle, Hogs, Sheep and Goats. Data are for 1971.

Appendix table 7--Relative importance of different classes of hogs and pigs sold, by selected areas, 1971

Region and State	Class of hogs and pigs sold				
	All hogs and pigs	Feeder pigs	Breeding stock	Market hogs	
				Farrowed on farm	Farrowed on other farm
<u>Percent sold</u>					
Corn Belt	100	12	3	68	17
Ohio	100	12	2	67	19
Indiana	100	12	3	67	18
Illinois	100	10	3	71	16
Iowa	100	11	3	69	17
Missouri	100	17	3	63	17
Lake States	100	18	3	54	25
Minnesota	100	16	3	55	26
Wisconsin	100	22	2	51	25
Michigan	100	17	4	58	21
Northern Plains	100	15	3	60	22
N. Dakota	100	23	3	48	26
S. Dakota	100	11	4	65	20
Nebraska	100	13	3	65	19
Kansas	100	21	2	50	27
North Central	100	13	3	65	19
Southeast	100	20	2	57	21
Arkansas	100	54	3	31	12
Louisiana	100	39	1	48	12
Kentucky	100	16	3	52	29
Tennessee	100	25	2	49	24
Mississippi	100	12	2	69	17
Georgia	100	9	3	74	14
Florida	100	15	1	68	16
S. Carolina	100	21	3	61	15
N. Carolina	100	25	2	53	20
Virginia	100	18	3	55	24
Alabama	100	15	2	59	24
Southwest	100	17	4	54	25
Texas	100	19	3	54	24
Oklahoma	100	15	4	55	26
New Mexico	100	9	2	47	42

Source: 1969 Census of Agriculture, Vol. 5, Special Reports, Part 9, Cattle Hogs, Sheep and Goats. Data are for 1971.

Appendix table 8--Proportion of farms with livestock other than hogs, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
<b>Feeder pig production:</b>						
North Central	79.7	47.5	70.3	*	*	67.3
Southeast	37.3	30.0	39.5	9.4	*	32.1
Southwest	*	*	*	*	*	86.5
All regions	73.0	43.8	67.6	*	*	61.7
<b>Farrow-to-finish:</b>						
North Central	87.4	81.6	65.9	49.7	*	79.2
Southeast	69.9	52.5	68.2	78.0	19.8	61.1
Southwest	83.9	84.5	79.2	*	41.2	81.7
All regions	86.0	79.3	66.4	55.0	*	77.6
<b>Feeder pig finishing:</b>						
North Central	88.2	90.0	76.2	58.4	*	85.5
Southeast	88.4	50.2	72.3	30.8	*	67.8
Southwest	76.9	*	*	60.9	*	63.8
All regions	88.0	86.9	76.1	55.7	*	83.5

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Includes farms with sales or purchases of livestock other than hogs in 1975 and those with other livestock on hand in 1975 but no sales.

Source: 1976 survey.

Appendix table 9--Distribution of farms selling hogs, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
Feeder pig production:						
North Central	42.9	28.8	27.1	1.2	0	100.0
Southeast	40.0	37.3	12.9	7.2	2.6	100.0
Southwest	56.8	27.0	8.1	8.1	0	100.0
All regions	42.5	30.3	24.4	2.3	.5	100.0
Farrow-to-finish:						
North Central	31.8	45.2	17.8	5.0	.2	100.0
Southeast	28.1	40.0	20.5	7.4	4.0	100.0
Southwest	23.8	30.2	22.6	16.2	7.2	100.0
All regions	31.3	44.6	18.1	5.4	.6	100.0
Feeder pig finishing:						
North Central	29.0	44.9	22.1	3.7	.3	100.0
Southeast	28.3	28.7	36.5	6.5	0	100.0
Southwest	22.4	20.7	17.2	39.7	0	100.0
All regions	28.9	42.9	23.2	4.8	.2	100.0
All hogs:						
North Central	32.7	42.9	19.9	4.3	.2	100.0
Southeast	31.1	37.6	21.0	7.2	3.1	100.0
Southwest	26.5	27.1	19.6	22.4	4.4	100.0
All regions	32.5	42.2	19.9	4.8	.6	100.0

Source: 1976 survey.

Appendix table 10--Distribution of hog sales, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of sales</u>					
<b>Feeder pig production:</b>						
North Central	16.0	30.3	50.2	3.5	0	100.0
Southeast	12.3	25.5	20.3	27.1	14.8	100.0
Southwest	23.0	35.1	14.0	27.9	0	100.0
All regions	15.3	29.4	43.6	8.6	3.1	100.0
<b>Farrow-to-finish:</b>						
North Central	12.1	37.5	30.5	18.1	1.8	100.0
Southeast	6.6	21.0	25.4	16.7	30.3	100.0
Southwest	4.1	13.8	20.1	24.0	38.0	100.0
All regions	11.2	34.8	29.6	18.1	6.3	100.0
<b>Feeder pig finishing:</b>						
North Central	10.7	36.5	33.5	13.7	5.6	100.0
Southeast	7.5	18.1	55.4	19.0	0	100.0
Southwest	3.0	11.5	11.3	74.2	0	100.0
All regions	10.0	33.5	34.5	17.2	4.8	100.0
<b>All hogs:</b>						
North Central	12.3	36.4	33.6	15.5	2.2	100.0
Southeast	8.0	21.6	28.2	19.3	22.9	100.0
Southwest	4.5	13.9	17.0	40.4	24.2	100.0
All regions	11.6	33.8	32.4	16.6	5.6	100.0

Source: 1976 survey.

Appendix table 11--Average number of hogs sold per farm, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
				<u>Head</u>		
Feeder pig production:						
North Central	140	394	693	1,082	*	374
Southeast	145	323	743	1,775	2,652	473
Southwest	122	389	519	1,033	*	300
All regions	140	379	697	1,454	*	391
Farrow-to-finish:						
North Central	151	327	680	1,419	3,383	395
Southeast	138	307	725	1,328	4,345	585
Southwest	138	368	717	1,196	4,233	805
All regions	150	326	685	1,399	4,060	418
Feeder pig finishing:						
North Central	146	325	606	1,490	7,500	399
Southeast	126	302	726	1,386	*	478
Southwest	113	464	543	1,555	*	831
All regions	144	325	621	1,492	*	417
All hogs:						
North Central	148	333	667	1,417	4,539	393
Southeast	138	310	728	1,448	3,988	541
Southwest	128	392	664	1,380	4,233	765
All regions	147	331	674	1,419	4,187	414

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 12--Average acreage operated per farm, by type and size of hog enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Acres</u>					
Feeder pig production:						
North Central	198	181	348	*	*	236
Southeast	173	196	197	67	*	184
Southwest	*	*	*	*	*	554
All regions	195	187	343	*	*	230
Farrow-to-finish:						
North Central	325	383	504	616	*	398
Southeast	334	476	584	342	468	448
Southwest	605	841	7,096	*	322	2,084
All regions	329	394	621	571	*	425
Feeder pig finishing:						
North Central	288	327	346	436	*	324
Southeast	504	265	455	335	*	406
Southwest	209	*	*	650	*	375
All regions	305	320	360	468	*	332

\* Insufficient observations for reliable estimate.

Source: 1976 survey.



Appendix table 13--Average acreage operated per farm, by tenure status and type of enterprise, all regions combined, 1975

Tenure status	Feeder pig production	Farrow-to-finish	Feeder pig finishing
	<u>Acres</u>		
Owned	190	340	230
Part-owned	316	513	437
Rented	196	375	260
Other <sup>1/</sup>	518	1,025	423
Average	230	425	332

<sup>1/</sup> Mostly institution and similar type farms.

Source: 1976 survey.

Appendix table 14--Proportion of hog farms, by tenure category, type, size of hog enterprise, and region, 1975

Enterprise, region, and tenure category	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	Percent of farms <sup>1/</sup>					
<u>Feeder pig production</u>						
North Central:						
Owned	56.4	46.1	54.3	*	*	52.4
Part-owned	12.6	34.5	39.0	*	*	27.0
Rented	31.0	19.4	6.7	*	*	20.6
All	100.0	100.0	100.0	*	*	100.0
Southeast:						
Owned	45.6	30.0	74.4	63.5	*	46.3
Part owned	44.6	47.5	25.6	9.4	*	39.7
Rented	4.9	18.9	0	27.1	*	10.8
All	95.1	96.4	100.0	100.0	*	96.8
Southwest:						
Owned	*	*	*	*	*	8.1
Part-owned	*	*	*	*	*	78.4
Rented	*	*	*	*	*	13.5
All	*	*	*	*	*	100.0
<u>Farrow-to-finish</u>						
North Central:						
Owned	50.5	33.9	25.4	23.3	*	36.7
Part-owned	35.6	42.8	50.2	74.3	*	43.2
Rented	13.9	22.8	24.4	2.4	*	19.9
All	100.0	99.5	100.0	100.0	*	99.8
Southeast:						
Owned	45.9	42.9	40.6	44.5	26.7	43.7
Part-owned	50.2	53.1	55.4	55.5	73.3	52.9
Rented	1.0	4.0	4.0	0	0	2.6
All	97.1	100.0	100.0	100.0	100.0	99.2
Southwest:						
Owned	23.2	11.3	39.6	*	70.6	31.5
Part-owned	33.9	88.7	50.9	*	29.4	56.2
Rented	39.3	0	9.4	*	0	11.5
All	96.4	100.0	99.9	*	100.0	99.2

See footnotes at end of table.

Continued

Appendix table 14--Proportion of hog farms, by tenure category, type, size of hog enterprise and region, 1975--Continued

Enterprise, region, and tenure category	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	Percent of farms <sup>1/</sup>					
<u>Feeder pig finishing</u>						
North Central:						
Owned	48.1	31.8	30.3	20.7	*	34.8
Part-owned	41.2	42.9	55.6	71.1	*	47.9
Rented	10.7	24.3	14.1	8.2	*	16.9
All	100.0	99.0	100.0	100.0	*	99.6
Southeast:						
Owned	41.5	34.8	51.6	65.4	*	44.8
Part-owned	58.5	53.7	48.4	34.6	*	51.9
Rented	0	0	0	0	*	0
All	100.0	88.5	100.0	100.0	*	96.7
Southwest:						
Owned	80.8	*	*	0	*	38.8
Part-owned	7.7	*	*	60.9	*	43.1
Rented	11.5	*	*	39.1	*	18.1
All	100.0	*	*	100.0	*	100.0

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Where total is less than 100% difference is due to other forms of land control such as institutional farms or managed units.

Source: 1976 survey.

Appendix table 15--Proportion of land operated, by tenure category, type of hog enterprise, and region, 1975

Region and tenure category	Feeder pig production	Farrow-to- finish	Feeder pig finishing
	<u>Percent of acres</u>		
North Central:			
Owned	60.7	53.2	48.8
Cash rent	22.9	16.8	10.7
Share rent	16.4	29.9	40.3
Managed	0	.1	.2
Southeast:			
Owned	64.5	66.5	70.0
Cash rent	19.0	27.9	26.0
Share rent	13.6	5.6	4.0
Managed	2.9	*	*
Southwest:			
Owned	20.8	86.4	46.5
Cash	75.8	7.2	21.9
Share rent	3.4	6.3	31.6
Managed	0	.1	0
All regions:			
Owned	60.4	56.6	50.8
Cash rent	23.5	17.2	12.5
Share rent	15.7	26.1	36.5
Managed	.4	.1	.2

\* less than 0.05%

Source: 1976 survey.

Appendix table 16--Acquisition pattern of land owned by hog producers by type of hogs produced and region 1/

Region and year obtained	Enterprise			Total
	Feeder pig production	Farrow-to-finish	Feeder pig finishing	
	<u>Percent</u>			
<b>North Central:</b>				
1971-75	34.6	24.2	19.9	24.6
1966-70	6.0	18.5	12.9	16.5
1961-65	14.0	18.3	29.1	19.5
1956-60	23.7	12.0	22.1	14.6
1951-55	1.2	7.0	3.9	5.9
Before 1951	20.5	20.0	12.1	18.9
Total	100.0	100.0	100.0	100.0
<b>Southeast:</b>				
1971-75	8.8	11.9	14.4	12.0
1966-70	13.8	12.6	9.7	12.3
1961-65	14.8	11.6	14.9	12.6
1956-60	19.4	14.3	12.2	14.5
1951-55	14.2	7.3	8.5	8.3
Before 1951	29.0	42.3	40.3	40.3
Total	100.0	100.0	100.0	100.0
<b>Southwest:</b>				
1971-75	*	2.6	*	3.1
1966-70	*	2.0	*	3.4
1961-65	*	3.3	*	4.4
1956-60	*	8.2	*	7.8
1951-55	*	2.2	*	3.7
Before 1951	*	81.7	*	77.6
Total	*	100.0	*	100.0

\* Insufficient observation for reliable estimate.

1/ Data show the percentage of all land owned, whether acquired by purchase, inheritance, gift or other means, according to the time of acquisition by the person who was operating the farm in 1975.

Source: 1976 survey.

Appendix table 17--Extent of landlord participation in hog production, by tenure category, region, and type of enterprise, 1975 <sup>1/</sup>

Region and tenure category	Feeder pig production	Farrow-to- finish	Feeder pig finishing
	<u>Percent of farms</u>		
North Central:			
Part-owned	1.5	7.7	3.4
Rented	8.0	36.4	60.8
Southeast:			
Part-owned	0	2.1	6.3
Rented	11.0	0	0
Southwest:			
Part-owned	0	0	0
Rented	0	7.4	0
All regions:			
Part-owned	1.1	6.9	3.6
Rented	8.2	35.7	59.0

<sup>1/</sup> Percent of part-owned and rented farms on which landlord had financial interest in hog enterprise.

Source: 1976 survey.

Appendix table 18--Landlord's share of income on rented farms where landlord shared in hog production, income, and expenses, by type of enterprise and region, 1975

Region	Feeder pig production			Farrow-to-finish			Feeder pig finishing		
	Crops	Hogs	Other	Crops	Hogs	Other	Crops	Hogs	Other
	<u>Percent of income</u>								
North Central	42.8	48.6	46.4	47.7	49.1	25.0	49.8	50.0	20.8
Southeast	33.0	33.0	0	*	38.9	0	50.0	50.0	0
Southwest	*	*	*	*	*	*	*	*	*
All regions	42.6	48.2	45.4	47.4	49.0	24.8	49.8	50.0	20.5

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 19--Proportion of feeder pig production enterprise litters farrowed, by month, size of enterprise, and region, 1975

Region and size class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	<u>Percent of litters</u>												
North Central:													
100-199	5.1	3.4	17.9	9.0	4.0	5.3	17.5	0.9	14.1	10.9	10.6	1.3	100.0
200-499	2.9	11.3	15.1	7.5	14.3	7.3	11.4	.7	7.0	8.0	6.6	7.9	100.0
500-999	9.8	5.7	6.4	10.3	9.6	11.7	6.2	11.6	7.2	4.4	10.0	7.1	100.0
1,000-2,499	*	*	*	*	*	*	*	*	*	*	*	*	*
2,500 and over:	*	*	*	*	*	*	*	*	*	*	*	*	*
All sizes	6.9	7.1	11.3	9.0	9.9	9.2	10.0	6.1	8.2	6.7	9.3	6.3	100.0
Southeast:													
100-199	8.3	5.9	13.7	9.8	3.3	6.4	15.5	8.8	8.3	7.1	8.2	4.7	100.0
200-499	8.2	7.3	10.2	12.1	6.5	7.4	9.9	8.5	4.3	8.0	9.6	8.0	100.0
500-999	10.1	7.0	8.1	9.2	6.6	7.9	8.5	8.6	7.8	10.0	8.4	7.8	100.0
1,000-2,499	8.5	8.6	8.7	8.5	8.2	8.2	8.3	8.4	8.0	8.4	8.3	7.9	100.0
2,500 and over:	*	*	*	*	*	*	*	*	*	*	*	*	*
All sizes	8.7	7.5	9.5	9.7	6.8	7.7	9.8	8.5	7.1	8.4	8.7	7.6	100.0
Southwest:													
100-199	*	*	*	*	*	*	*	*	*	*	*	*	*
200-499	*	*	*	*	*	*	*	*	*	*	*	*	*
500-999	*	*	*	*	*	*	*	*	*	*	*	*	*
1,000-2,499	*	*	*	*	*	*	*	*	*	*	*	*	*
2,500 and over:	*	*	*	*	*	*	*	*	*	*	*	*	*
All sizes	4.9	10.0	3.6	10.4	5.3	17.6	13.3	3.7	3.1	5.4	13.3	9.4	100.0
All regions:													
100-199	5.6	4.1	16.8	9.1	3.8	5.8	17.2	2.3	12.8	10.1	10.4	2.1	100.0
200-499	3.9	10.6	14.1	8.4	12.9	7.4	11.1	2.1	6.5	7.9	7.1	7.9	100.0
500-999	9.8	5.8	6.5	10.2	9.3	11.2	6.4	11.2	7.2	5.1	9.9	7.2	100.0
1,000-2,499	9.4	7.4	10.2	7.3	7.0	9.2	10.0	7.2	7.0	7.2	11.1	6.9	100.0
2,500 and over:	*	*	*	*	*	*	*	*	*	*	*	*	*
All sizes	7.2	7.2	10.9	9.2	9.3	8.9	10.0	6.6	7.9	7.0	9.2	6.6	100.0

\* Insufficient observations for reliable estimate.

Source: 1976 survey.



Appendix table 20--Proportion of farrow-to-finish enterprise litters farrowed, by month, size of enterprise, and region, 1975

Region and size class	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	Percent of litters												
North Central:													
100-199	3.7	13.8	16.7	6.3	9.2	8.3	12.9	2.8	6.7	12.6	5.7	1.3	100.0
200-499	8.3	5.6	11.6	8.7	6.2	9.6	12.5	8.7	4.4	11.1	9.4	3.9	100.0
500-999	5.2	4.7	14.1	8.4	7.2	6.2	11.3	7.5	3.8	10.9	10.5	10.2	100.0
1,000-2,499	17.6	5.3	6.3	8.6	10.7	4.9	7.2	8.8	10.9	4.4	9.9	5.4	100.0
2,500 and over	*	*	*	*	*	*	*	*	*	*	*	*	*
All sizes	8.2	6.3	12.2	8.1	7.7	7.4	11.2	8.1	5.6	10.0	9.4	5.8	100.0
Southeast:													
100-199	9.6	4.0	9.8	10.3	5.0	13.3	13.1	7.5	4.2	12.3	7.1	3.8	100.0
200-499	12.0	4.8	11.6	10.5	6.4	8.6	8.9	7.2	7.2	9.0	7.4	6.4	100.0
500-999	8.2	7.2	7.4	10.8	7.4	9.9	8.3	6.1	8.1	8.7	8.9	9.0	100.0
1,000-2,499	6.2	9.0	8.8	11.8	5.6	10.0	8.8	6.5	8.6	9.5	10.5	4.7	100.0
2,500 and over	8.1	8.2	8.3	8.4	8.5	8.5	8.2	8.0	8.4	8.4	8.4	8.6	100.0
All sizes	8.8	7.0	9.0	10.1	7.0	9.5	8.9	7.1	7.8	9.1	8.5	7.2	100.0
Southwest:													
100-199	8.8	5.6	9.0	6.1	3.8	9.8	6.8	22.7	6.0	8.4	2.9	10.1	100.0
200-499	6.2	10.8	9.8	8.9	9.1	4.9	9.7	6.2	10.2	5.0	9.8	9.4	100.0
500-999	6.2	10.8	9.8	8.9	9.1	4.9	9.7	6.2	10.2	5.0	9.8	9.4	100.0
1,000-2,499	*	*	*	*	*	*	*	*	*	*	*	*	*
2,500 and over	7.4	7.9	8.8	7.6	8.7	8.6	7.9	8.7	8.3	8.7	9.1	8.4	100.0
All sizes	8.2	9.1	9.8	7.7	7.6	6.9	9.3	9.3	8.9	7.0	8.3	7.9	100.0
All regions:													
100-199	4.2	13.0	16.1	6.6	8.8	8.7	12.9	3.4	6.5	12.6	5.8	1.5	100.0
200-499	8.5	5.5	11.6	8.8	6.3	9.5	12.3	8.5	4.6	10.9	9.3	4.1	100.0
500-999	5.5	5.0	13.5	8.6	7.3	6.5	11.0	7.3	4.3	10.6	10.3	10.1	100.0
1,000-2,499	16.1	6.0	6.8	8.9	9.9	5.5	7.6	8.7	10.7	4.9	9.8	5.3	100.0
2,500 and over	7.9	7.8	8.0	6.4	9.2	6.7	7.8	15.7	8.0	6.6	9.2	6.7	100.0
All sizes	8.3	6.5	11.7	8.4	7.7	7.6	10.9	8.0	5.9	9.8	9.3	6.0	100.0

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 21--Proportion of producers buying breeding stock, by kind of stock and type and size of enterprise, all regions, 1975

Type of enterprise and breeding stock	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of producers</u>					
Feeder pig production:						
Sows	12.5	2.6	19.1	5.1	*	10.8
Bred gilts	16.2	3.5	18.0	0	*	12.6
Other gilts	2.2	17.4	35.3	34.3	*	15.5
Boars	45.4	55.6	92.6	66.3	*	60.1
Farrow-to-finish:						
Sows	0.4	1.0	1.8	4.7	0	1.2
Bred gilts	7.1	1.2	1.6	1.8	1.7	3.1
Other gilts	2.1	4.9	14.0	8.7	26.6	6.0
Boars	65.0	63.5	69.2	89.4	72.0	65.9

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 22--Prices paid for boars per head, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Dollars per head</u>					
Feeder pig production						
North Central	153	218	244	*	*	221
Southeast	187	231	201	299	381	254
Southwest	*	*	*	*	*	171
All regions	161	220	240	*	*	227
Farrow-to-finish:						
North Central	217	233	333	265	*	260
Southeast	196	216	299	373	333	289
Southwest	207	323	193	*	342	281
All regions	215	233	328	279	*	263

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 23--Proportion of feeder pigs purchased quarterly by farmers finishing feeder pigs, by size of enterprise and region, 1975

Region and quarter	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of pigs</u>					
North Central:						
1	29	27	25	24	*	25
2	23	22	29	25	*	25
3	18	29	22	35	*	28
4	30	22	24	16	*	22
Southeast:						
1	29	14	13	24	*	18
2	25	14	35	26	*	28
3	18	14	16	36	*	21
4	28	58	36	14	*	33
Southwest:						
1	5	*	*	24	*	25
2	22	*	*	29	*	28
3	67	*	*	24	*	24
4	6	*	*	23	*	23
All regions:						
1	29	27	23	24	*	24
2	23	21	30	26	*	26
3	18	29	21	33	*	27
4	30	23	26	17	*	23

\* Insufficient observations for reliable estimate.

1/ Quarter 1 is January through March; other quarters follow by 3-month periods.

Source: 1976 survey.

Appendix table 24--Weight of feeder pigs purchased by farmers finishing feeder pigs, by size of enterprise and region, 1975

Region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Pounds per head</u>					
North Central	48	50	54	48	*	51
Southeast	59	47	56	54	*	54
Southwest	46	*	*	49	*	56
All regions	49	49	55	49	*	51

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 25--Length of production period from farrowing or purchase until sale, by type of enterprise and region, 1975

Region	Feeder pig production	Farrow-to-finish	Feeder pig finishing
		<u>Days</u>	
North Central	56	179	134
Southeast	69	170	122
Southwest	79	173	121
All regions	59	178	132

Source: 1976 survey.

Appendix table 26--Losses in hog production, by type, and size of enterprises, and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of weight</u>					
Feeder pig production:						
North Central	2.5	1.9	2.4	*	*	2.4
Southeast	2.3	3.7	2.5	2.9	*	3.0
Southwest	*	*	*	*	*	3.7
All regions	2.5	2.3	2.4	*	*	2.5
Farrow-to-finish:						
North Central	1.6	1.5	1.5	1.5	*	1.5
Southeast	2.3	1.8	1.7	2.1	2.8	2.2
Southwest	2.1	2.1	2.5	*	2.8	2.4
All regions	1.6	1.5	1.6	1.6	*	1.6
Feeder pig finishing:						
North Central	1.7	1.3	1.8	2.3	*	1.7
Southeast	2.3	1.8	2.1	3.4	*	2.3
Southwest	7.0	*	*	2.1	*	2.2
All regions	1.9	1.4	1.8	2.4	*	1.8

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Losses are presented by weight lost as a percentage of liveweight produced plus weight lost. Losses are death losses plus losses from any other cause, including theft, regardless of whether indemnified by insurance or other means.

Source: 1976 survey.

Appendix table 27--Proportion of weight of all hog feedstuffs produced on farms where fed, by type and size of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of weight</u>					
Feeder pig production:						
North Central	38.8	59.5	46.4	*	*	48.2
Southeast	49.1	46.1	39.8	3.6	*	36.1
Southwest	*	*	*	*	*	30.3
All regions	41.4	54.8	45.5	*	*	44.4
Farrow-to-finish:						
North Central	67.5	66.0	60.3	36.4	*	62.3
Southeast	64.3	71.8	62.1	29.3	20.8	49.1
Southwest	28.9	19.1	7.1	*	0	6.0
All regions	66.9	66.0	59.6	51.6	*	59.5
Feeder pig finishing:						
North Central	70.4	70.7	68.3	35.2	*	62.3
Southeast	59.7	44.0	43.0	0	*	37.2
Southwest	59.0	*	*	4.3	*	5.9
All regions	69.5	69.5	64.0	25.2	*	58.0

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Includes all feedstuffs regardless of kind or source.

Source: 1976 survey.

Appendix table 28--Extent of use of feed mills in hog production, by type of enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Type of feed mill			
	None	Tractor mill	Electric mill	Both types
	<u>Percent of farms</u>			
Feeder pig production:				
North Central	63.2	35.8	1.0	0
Southeast	79.6	13.8	6.6	0
Southwest	29.7	62.2	8.1	0
All regions	65.7	32.3	2.1	0
Farrow-to-finish:				
North Central	24.4	63.1	12.0	.5
Southeast	37.7	40.4	21.1	.8
Southwest	29.4	53.6	17.0	0
All regions	25.7	60.9	12.9	.5
Feeder pig finishing:				
North Central	36.0	52.2	11.3	.5
Southeast	41.7	31.8	26.5	0
Southwest	56.9	23.3	19.8	0
All regions	37.0	49.8	12.8	.4

<sup>1/</sup> Data are percent of producers reporting use of each type of feed mill on the farm.

Source: 1976 survey.



Appendix table 29-- Age structure of farm-type feed mills used in hog finishing operations, by size of enterprise, all regions combined, 1975 <sup>1/</sup>

Type of mill and year manufactured	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
<u>Percent of feed mills</u>						
Tractor mill:						
Before 1956	10.0	0.2	0.3	0	0	3.3
1956-65	18.3	18.1	4.8	0	0	14.9
1966-70	42.3	40.3	33.4	12.9	82.7	38.6
1971-75	29.4	41.4	61.5	87.1	17.3	43.2
All	100.0	100.0	100.0	100.0	100.0	100.0
Electric mill:						
Before 1956	28.3	0	1.8	0	0	4.6
1956-65	30.5	15.0	11.3	0	14.6	13.9
1966-70	5.6	54.1	58.6	15.6	9.6	28.9
1971-75	35.6	30.9	28.3	84.4	75.8	42.6
All	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1/</sup> Data from farms with farrow-to-finish and feeder pig finishing enterprises are combined.

Source: 1976 survey.

Appendix table 30--Extent of multi-enterprise use of feed mills used in hog finishing enterprises, by type and size of hog enterprise, all regions combined, 1975

Type of enterprise and mill and percentage of use for hogs	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
<u>Farrow-to-finish</u>						
Tractor mill:						
100	36	43	51	46	100	42
75-99	12	31	39	19	0	26
50-74	43	23	10	35	0	28
Less than 50	9	3	0	0	0	4
All	100	100	100	100	100	100
Electric mill:						
100	52	74	85	96	85	78
75-99	48	16	7	4	0	15
50-74	0	8	4	0	15	5
Less than 50	0	2	4	0	0	2
All	100	100	100	100	100	100
<u>Feeder pig finishing</u>						
Tractor mill:						
100	27	20	49	*	*	29
75-99	21	32	26	*	*	28
50-74	48	29	25	*	*	34
Less than 50	4	19	0	*	*	9
All	100	100	100	*	*	100
Electric mill:						
100	10	57	100	85	*	51
75-99	82	41	0	15	*	46
50-74	8	2	0	0	*	3
Less than 50	0	0	0	0	*	0
All	100	100	100	100	*	100

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 31--Relative importance of kinds of bedding materials used in hog production, by region, 1975 <sup>1/</sup>

Material	North Central	Southeast	Southwest	All regions
	<u>Percent of weight</u>			
Wood products	2.0	23.4	1.4	3.1
Straw	90.6	22.0	63.8	87.2
Hay	1.4	2.5	15.8	1.5
Corn residues	5.8	.7	.3	5.4
Other	.2	51.4	18.7	2.8
Total	100.0	100.0	100.0	100.0

<sup>1/</sup> Importance measured by weight of materials.

Source: 1976 survey.

Appendix table 32--Amount of bedding used per 100 head of sales on farms using some bedding, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Tons per 100 head of sales</u>					
Feeder pig production:						
North Central	2.9	2.4	1.5	*	*	2.0
Southeast	5.2	1.3	1.6	0.3	*	1.4
Southwest	*	*	*	*	*	1.0
All regions	3.2	2.2	1.5	*	*	1.9
Farrow-to-finish:						
North Central	5.7	6.5	2.3	1.9	*	4.2
Southeast	1.7	7.6	1.0	1.3	0.3	2.5
Southwest	1.9	1.1	0.8	*	.4	.6
All regions	5.5	6.5	2.2	1.8	*	3.9
Feeder pig finishing:						
North Central	9.5	3.9	3.0	1.6	*	3.8
Southeast	.9	.9	1.6	.7	*	.7
Southwest	2.2	*	*	.2	*	.3
All regions	9.4	3.9	2.8	1.5	*	3.5

\*Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 33--Proportion of producers using specified kinds of manure handling equipment, by type of enterprise and region, 1975

Equipment	Regions and enterprise <u>1/</u>					
	North Central		Southeast		Southwest	
	Type 1	Types 2 & 3	Type 1	Types 2 & 3	Type 1	Types 2 & 3
	Percent of producers					
Tractor loaded <u>2/</u>	48.9	58.8	2.6	3.7	*	8.6
Spreader, solid <u>3/</u>	73.4	89.0	8.2	13.2	*	5.7
Spreader, surface liquid <u>4/</u>	6.2	10.6	2.0	3.9	*	15.8
Spreader, inject liquid <u>5/</u>	0	0.7	0	0	*	0
Storage <u>6/</u>	9.7	6.9	30.3	26.0	*	9.3

\* Insufficient observations for reliable estimate.

1/ Type 1 = feeder pig production; Type 2 = farrow-to-finish; Type 3 = feeder pig production.

2/ All types of tractor-mounted loaders.

3/ All types of tractor-powered solid manure spreaders.

4/ All types of liquid manure spreaders equipped for surface application only.

5/ All types of liquid manure spreaders equipped for injecting liquids into the soil.

6/ All types of storage for liquid or solid wastes except pit storage beneath slotted floor buildings.

Source: 1976 survey.

Appendix table 34--Proportion of producers using specified kinds of manure handling equipment, by type and size of enterprise, all regions combined, 1975

Enterprise and equipment <sup>1/</sup>	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	Percent of producers					
Feeder pig production:						
Tractor loader	35.5	54.2	37.0	*	*	40.2
Spreader, solid	49.8	73.5	72.6	*	*	61.7
Spreader, surface liquid	.1	0	21.2	*	*	5.4
Spreader, inject liquid	0	0	0	*	*	0
Storage <sup>2/</sup>	11.4	22.5	4.2	*	*	13.7
Farrow-to-finish and feeder pig finishing:						
Tractor loader	47.1	58.7	47.0	65.9	9.5	52.8
Spreader, solid	77.7	88.2	72.0	70.2	20.9	80.3
Spreader, surface liquid	.6	7.1	27.7	28.2	16.2	10.2
Spreader, inject liquid	0	.1	1.0	6.1	8.6	.6
Storage <sup>2/</sup>	1.1	9.0	15.5	29.3	59.7	9.3

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Description of equipment is contained in the footnotes to appendix table 33.

<sup>2/</sup> Mostly lagoons with a few holding ponds. Pit storage was included as a component part of slotted floor buildings.

Source: 1976 survey.

Appendix table 35--Age structure of non-portable facilities used in hog production, by type of enterprise and region, 1975 <sup>1/</sup>

Region and year of construction	Feeder pig production	Farrow-to-finish	Feeder pig finishing
	<u>Percent of facilities</u>		
<b>North Central:</b>			
Before 1946	24.0	18.7	21.1
1946-55	13.3	12.3	10.3
1956-65	30.0	26.0	26.0
1966-70	9.4	17.2	14.2
1971-75	23.3	25.8	28.4
Total	100.0	100.0	100.0
<b>Southeast:</b>			
Before 1946	9.3	6.5	3.6
1946-55	6.7	7.1	5.0
1956-65	26.1	31.0	19.8
1966-70	25.7	22.6	40.8
1971-75	32.2	32.8	30.8
Total	100.0	100.0	100.0
<b>Southwest:</b>			
Before 1946	4.2	4.7	6.1
1946-55	6.1	7.6	3.1
1956-65	23.9	26.9	40.0
1966-70	37.0	23.3	36.6
1971-75	28.8	37.5	14.2
Total	100.0	100.0	100.0

<sup>1/</sup> All facilities included in table 27 combined and weighted equally regardless of cost.

Source: 1976 survey.

Appendix table 36--Age structure of non-portable hog production facilities for small and large farrow-to-finish enterprises, all regions combined, 1975 1/

Size of enterprise and year of construction	Type of facility									
	Farrowing houses	Nurseries	Grow-finish houses	Other buildings	Grain storage	Other feed storage	Paved lots	Stock water	Manure facilities	Total
Annual sales 100-199:	<u>Percent of facilities</u>									
Before 1946	39.1	23.4	43.2	53.0	28.3	18.8	23.6	19.2	1.8	24.6
1946-55	13.7	13.3	23.0	0	14.9	28.2	7.5	7.4	7.4	12.2
1956-65	27.6	46.7	19.1	32.2	24.6	35.1	41.4	36.0	42.5	32.8
1966-70	11.1	11.4	9.7	3.9	11.0	14.1	15.8	15.9	26.7	15.2
1971-75	8.5	5.2	5.0	10.9	21.2	3.8	11.7	21.5	21.6	15.2
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Annual sales 2,500 and over:	<u>Percent of facilities</u>									
Before 1946	0	0	0	0	0	0	0	0	0	0
1946-55	0	0	0	0	0	0	0	0	0	0
1956-65	20.1	27.7	30.0	85.6	12.2	14.2	100.0	20.6	20.7	25.8
1966-70	16.4	10.8	13.2	2.4	27.7	11.7	0	27.3	4.3	15.5
1971-75	63.5	61.5	56.8	12.0	60.1	74.1	0	52.1	75.0	58.7
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ All facilities weighted equally regardless of size or cost. Some types of facilities, such as nurseries and manure facilities, were not present on many farms.

Source: 1976 survey.



Appendix table 37--Age structure of non-portable hog production facilities used in farrow-to-finish enterprises, by size of enterprise, all regions combined, 1975 <sup>1/</sup>

Year of construction	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
Before 1946	24.6	16.3	14.2	11.9	0	17.9
1946-55	12.2	15.1	6.5	8.5	0	12.0
1956-65	32.8	25.1	20.5	24.5	25.8	26.3
1966-70	15.2	17.3	20.3	22.0	15.5	17.6
1971-75	15.2	26.2	38.5	33.1	58.7	26.2
All	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1/</sup> All facilities included in table 27 for farrow-to-finish enterprises combined and weighted equally regardless of cost.

Source: 1976 survey.

Appendix table 38--Nursery space per litter produced annually, by type and size of enterprise, all regions combined, 1975 <sup>1/</sup>

Enterprise and nursery type	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Square feet per litter produced</u>					
Feeder pig production:						
Solid floor	33	19	13	8	*	16
Slotted floor	14	8	8	9	*	8
Farrow-to-finish:						
Solid floor	23	21	12	11	10	15
Slotted floor	22	16	16	9	7	12

\* Inadequate observations for reliable estimate.

<sup>1/</sup> Measure applies only to farms using nurseries. Data are the result of dividing space provided in nurseries by the number of litters produced in 1975.

Source: 1976 survey.

Appendix table 39--Space per head of slaughter hogs finished annually, by type of finishing building and size of enterprise, all regions combined, 1975 <sup>1/</sup>

Type of building	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Square feet per head sold</u>					
Solid floor	9.9	9.3	7.4	5.6	*	8.3
Slotted floor	11.7	7.7	7.1	4.6	3.2	5.6
Mixed <sup>2/</sup>	12.8	11.3	10.0	6.9	5.4	8.5

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Space provided in finishing buildings divided by annual sales of slaughter hogs in 1975. Includes hogs finished in both feeder pig finishing and farrow-to-finish enterprises.

<sup>2/</sup> Farms using both solid and slotted floor housing.

Source: 1976 survey.

Appendix table 40--Amount of paved lot per unit of annual sales, by size of enterprise and region, 1975 <sup>1/</sup>

Region	Feeder pig production	Farrow-to-finish	Feeder of finishing
	<u>Sq ft per litter</u>	<u>Sq ft per head sold</u>	
North Central	21	7	7
Southeast	11	4	8
Southwest	*	3	*
All regions	20	7	7

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Paved lot space divided by litters of feeder pigs produced or number of hogs sold in 1975.

Source: 1976 survey.

Appendix table 41--Proportion of acreage of specified types of pasture used in hog production, by region, 1975

Forage type	North Central	Southeast	Southwest	All regions
	<u>Percent of acres</u>			
Grain crops	3.0	5.5	0	3.3
Legumes	15.7	5.6	1.0	14.1
Grasses	26.8	39.2	89.4	29.5
Grass-legume mixes	43.9	24.4	5.9	40.6
Small grains	5.6	6.4	3.4	5.7
Corn stalks	3.2	6.6	0	3.6
Woodland	1.8	12.3	.3	3.2
All	100.0	100.0	100.0	100.0

Source: 1976 survey.

Appendix table 42-- Percentage of farms not using field fencing in connection with hog production, by type and size of enterprise and region, 1975

Enterprise and region	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of farms</u>					
Feeder pig production:						
North Central	20	35	35	*	*	28
Southeast	9	11	5	27	*	12
Southwest	*	*	*	*	*	6
All regions	18	29	32	*	*	25
Farrow-to-finish:						
North Central	23	18	10	8	*	18
Southeast	5	4	19	11	47	10
Southwest	13	6	11	*	12	17
All regions	21	17	11	10	*	17
Feeder pig finishing:						
North Central	38	57	68	92	*	55
Southeast	24	54	28	52	*	36
Southwest	77	*	*	46	*	42
All regions	38	57	61	78	*	53

\* Insufficient observations for reliable estimate.

Source: 1976 survey.

Appendix table 43--Amount of field fencing per farm using hog fencing, by type and size of enterprise, all regions combined, 1975

Enterprise	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Rods</u>					
Feeder pig production	371 (265)	316 ( 83)	661 ( 95)	915 ( 63)	*	433 (111)
Farrow-to-finish	362 (251)	490 (150)	607 ( 98)	828 ( 55)	1,349 ( 33)	497 (119)
Feeder pig finishing	870 (580)	252 ( 77)	521 ( 76)	1,118 ( 80)	*	566 (135)

\* Insufficient observations for reliable estimate.

1/ Total rods per farm of all types of field fencing enclosing fields used by hogs. Rods per 100 hogs sold annually are shown in parentheses. One rod equals 16.5 feet.

Source: 1976 survey.

Appendix table 44--Distribution of field fencing used in connection with hog production, by type of fence and enterprise and region, 1975 <sup>1/</sup>

Enterprise and region	Fence type											
	Barbed		Woven permanent		Woven temporary		Board		Electric		Other	
	Rods	Pct.	Rods	Pct.	Rods	Pct.	Rods	Pct.	Rods	Pct.	Rods	Pct.
Feeder pig production:												
North Central	122	30	198	49	3	1	3	1	77	19	0	0
Southeast	21	4	401	76	3	1	1	X	100	19	2	X
Southwest	320	35	537	58	0	0	0	0	57	6	6	1
All regions	104	24	242	56	3	1	2	X	81	19	1	X
Farrow-to-finish:												
North Central	26	6	338	79	13	3	2	X	45	10	7	2
Southeast	132	12	779	73	0	0	2	X	157	15	0	0
Southwest	88	12	407	58	5	1	0	0	174	25	33	4
All regions	37	8	382	77	12	2	2	X	58	12	6	1
Feeder pig finishing:												
North Central	184	34	288	54	8	1	12	2	45	8	3	1
Southeast	24	3	649	87	0	0	0	0	76	10	0	0
Southwest	0	0	493	82	0	0	0	0	0	0	105	18
All regions	160	28	336	60	7	1	11	2	47	8	6	1

X = less than 0.5%.

<sup>1/</sup> Includes total fencing around fields used by hogs. Excludes farms using no field fencing. Amounts are given in rods (16.5 feet per rod).

Source: 1976 survey.

Appendix table 45--Horsepower of tractors used in hog production, by type and size of enterprise, 1975 <sup>1/</sup>

Enterprise and horsepower	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
<u>Percent of tractors</u>						
Feeder pig production:						
Less than 25	19.2	19.6	1.2	*	*	14.0
25-49	42.8	51.5	40.0	*	*	45.1
50-79	36.6	26.2	45.9	*	*	35.5
80-109	.7	2.2	11.7	*	*	4.6
110 and over	.7	.5	1.2	*	*	.8
All sizes	100.0	100.0	100.0	*	*	100.0
Farrow-to-finish:						
Less than 25	11.8	6.8	6.6	3.2	7.7	8.4
25-49	40.6	34.0	32.1	38.0	15.8	35.7
50-79	35.1	38.8	35.3	36.4	38.2	36.8
80-109	10.9	16.7	14.5	10.4	15.3	14.0
110 and over	1.6	3.7	11.5	12.0	23.0	5.1
All sizes	100.0	100.0	100.0	100.0	100.0	100.0
Feeder pig finishing:						
Less than 25	12.9	4.4	8.3	0	*	7.4
25-49	33.6	52.1	24.5	19.6	*	40.3
50-79	25.0	23.0	21.6	32.8	*	23.4
80-109	27.9	17.0	25.8	47.6	*	22.6
110 and over	.6	3.5	19.8	0	*	6.3
All sizes	100.0	100.0	100.0	100.0	*	100.0

\* Insufficient observations for reliable estimate.

<sup>1/</sup> Producers often used more than one tractor. All are included in this distribution.

Source: 1976 survey.

Appendix table 46--Age structure of tractors used in hog production, by type and size of enterprise, all regions combined, 1975

Enterprise and year of manufacture	Annual sales of hogs (head)					
	100-199	200-499	500-999	1,000-2,499	2,500 and over	All sizes
	<u>Percent of tractors</u>					
<b>Feeder pig production:</b>						
1971-75	7.4	29.8	18.6	*	*	18.8
1966-70	7.5	8.5	46.6	*	*	19.0
1961-65	4.8	13.1	15.6	*	*	11.1
1956-60	53.6	17.9	11.1	*	*	28.2
Before 1956	26.7	30.7	8.1	*	*	22.9
All regions	100.0	100.0	100.0	*	*	100.0
<b>Farrow-to-finish</b>						
1971-75	13.7	23.9	23.8	33.8	62.3	21.4
1966-70	20.5	17.9	24.3	24.9	17.3	20.3
1961-65	9.7	16.3	18.7	10.1	10.7	14.3
1956-60	22.8	12.7	2.7	19.6	2.0	14.2
Before 1956	33.3	29.2	30.5	11.6	7.7	29.8
All regions	100.0	100.0	100.0	100.0	100.0	100.0
<b>Feeder pig finishing:</b>						
1971-75	5.3	29.6	33.9	29.1	*	23.3
1966-70	42.1	16.8	37.9	26.5	*	28.8
1961-65	26.4	15.6	10.3	28.3	*	19.1
1956-60	0	11.6	0.2	3.9	*	5.5
Before 1956	26.2	26.4	17.7	12.2	*	23.3
All regions	100.0	100.0	100.0	100.0	*	100.0

\* Insufficient observations for reliable estimate.

Source: 1976 survey.



Appendix table 47--Kind of fuel used by tractors used in hog production, by type of enterprise and region, 1975 <sup>1/</sup>

Enterprise and kind of fuel	North Central	Southeast	Southwest	All regions
	<u>Percent of hp hours</u>			
Feeder pig production:				
Diesel	20.7	77.8	36.1	30.4
Gasoline	78.0	22.0	40.2	68.3
LP gas	1.3	0.2	23.8	1.3
Farrow-to- finish:				
Diesel	49.9	75.1	50.6	55.2
Gasoline	49.5	24.9	17.3	46.6
LP gas	0.6	0	32.2	0.9
Feeder pig finishing:				
Diesel	57.0	77.9	44.7	58.0
Gasoline	42.0	22.0	25.6	40.6
LP gas	1.0	0	29.7	1.4

<sup>1/</sup> Based on proportion of hp hours by kind of fuel.

Source: 1976 survey.

Appendix table 48--Size of trucks used in hog production, by type of enterprise, all regions combined, 1975

Size of truck (tons)	Feeder pig production	Farrow-to-finish	Feeder pig finishing
	<u>Percent of trucks</u>		
Less than 1.0	85.7	68.5	73.6
1.0-1.9	5.1	16.2	10.0
2.0-4.9	9.1	14.9	13.3
5.0 and over	.1	0.4	3.1
All	100.0	100.0	100.0

Source: 1976 survey.

Appendix table 49--Age distribution of trucks used in hog production, by type of enterprise, all regions combined, 1975

Year of manufacture	Enterprise and truck size					
	Feeder pig production		Farrow-to-finish		Feeder pig finishing	
	Less than 1 ton	1 ton and over	Less than 1 ton	1 ton and over	Less than 1 ton	1 ton and over
	Percent of trucks					
1973-75	26.9	9.0	40.4	19.8	35.4	13.6
1970-72	46.2	6.0	19.7	12.4	21.2	16.2
1967-69	13.2	9.4	18.6	15.5	26.3	31.8
Before 1967	13.7	75.6	21.3	52.3	17.1	38.4
All	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1976 survey.

Appendix table 50--Distribution of truck travel per unit of hog production, by type of enterprise, all regions combined, 1975

Miles per unit	Feeder pig production			Farrow-to-finish			Feeder pig finishing		
	Farms	Miles per litter		Farms	Miles per 1,000 pounds produced		Farms	Miles per 1,000 pounds produced	
		Actual	Ton		Actual	Ton		Actual	Ton
	Percent	-----Number-----		Percent	-----Number-----		Percent	-----Number-----	
None	6.8	0	0	6.7	0	0	10.3	0	0
1-50	43.2	25	22	62.8	23	24	53.6	25	38
51-100	14.5	75	41	16.5	67	67	24.8	68	57
101-150	14.2	136	76	5.8	116	120	7.8	134	70
151-200	5.9	174	117	1.5	163	116	1.1	177	143
Over 200	15.3	366	232	6.8	301	220	2.4	420	485
Total	100.0	72	48	100.0	40	39	100.0	42	46

Source: 1976 survey.