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NATIONAL TRENDS REFLECTED IN CHANGING OHIO SWINE INDUSTRY

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SUMMARY

A long term decline in comparative importance of Ohio farm income from livestock compared to crops is part of larger regional and national changes in both the location and organization of livestock production. These developments appear to suggest continuing declines in the comparative importance of animal agriculture (compared to crops) in Ohio. Yet the Northeast census region contains 20 percent of the meat consuming (but non-producing) U.S. population, a market that states like North Carolina hasten to supply. Does this market potential justify collective efforts in Ohio to reverse long term industry trends?

Introduction

The 20th Century record of cash receipts to Ohio agriculture from sales of farm products shows that the comparative importance of crops and livestock as income producers has shifted toward more income from crops and less from livestock (Figure 1). Why has this happened?

Perhaps a place to start is with the observation that the importance of livestock on Ohio farms began in self-sufficient house holds with family needs for food, clothing, and draftpower. As alternatives arose to meet these requirements, livestock became commercial investments for some families rather than necessities for all. Their worth then lay in their value in commerce, and even this worth was placed in comparison to the value of other commercial goods a farm might provide if it invested in them instead of livestock. So the history of Ohio farming has been one of evolution away from its origins in self-sufficient frontier homes, toward 20th and 21st century commercial or industrial business units sharply motivated by market demand.

The cost of this evolution is not merely financial. As technology accelerates both the promise and the pace of change, ever less about the future can be forecast by experience from the past. Change begins to demand not just embracing the future, but rejecting the past as well and this is very hard to do. The future offers inducements that are material and countable, but the past contains values both nonmaterial and uncountable. Trade-offs between past and future become impossible to calculate. But change occurs nevertheless, brought about less, perhaps, by any certainties about the future than by an indifference to the past.

Changing Farmland Use Patterns

Figure 2 illustrates changes in Ohio farmland use. There were more than 24 million acres in Ohio farmland in 1920, but less than 16 million in 1990. More than 8 million acres disappeared into nonfarm uses (forest land, rights of way, lakes, parks and recreation areas, airports, military installations, research facilities, and commercial, industrial and residential uses). But ***cropland*** acres have remained about the same. Most of the disappearance (in farm use) has been in pastureland. Most of the cropland

Figure 1: Percent of Cash Receipts from Farm Marketings of All Crops, All Livestock (and Products) and and Hogs and Pigs, Ohio, Selected Years, 1910-1990.

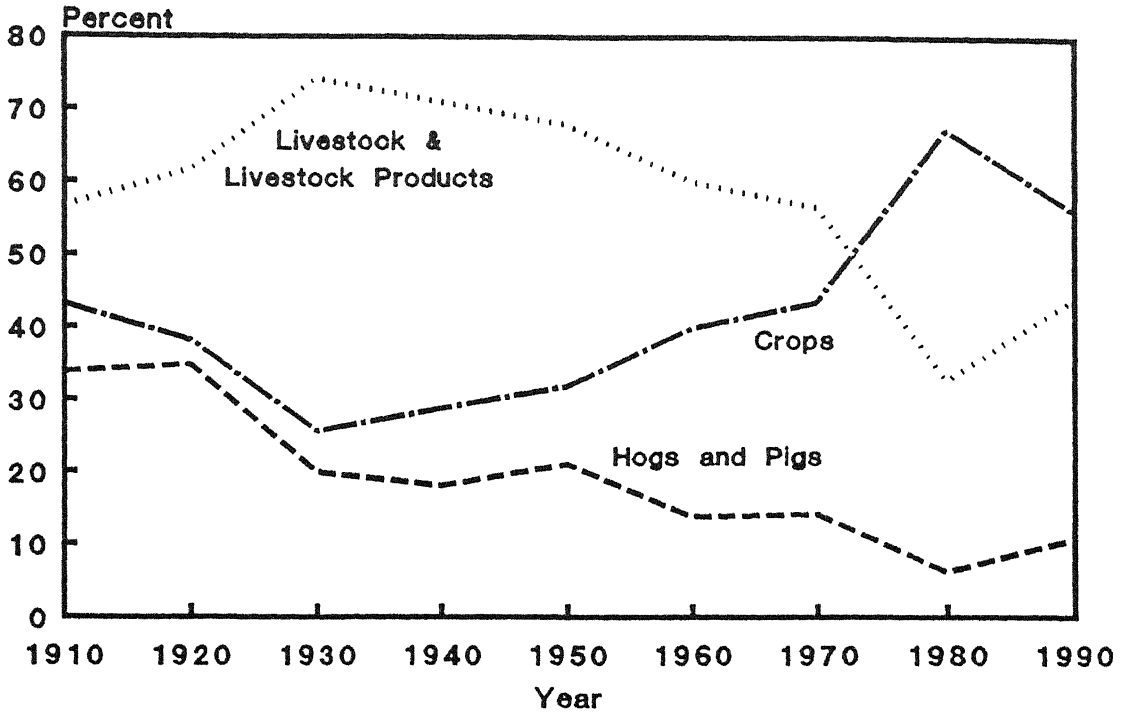
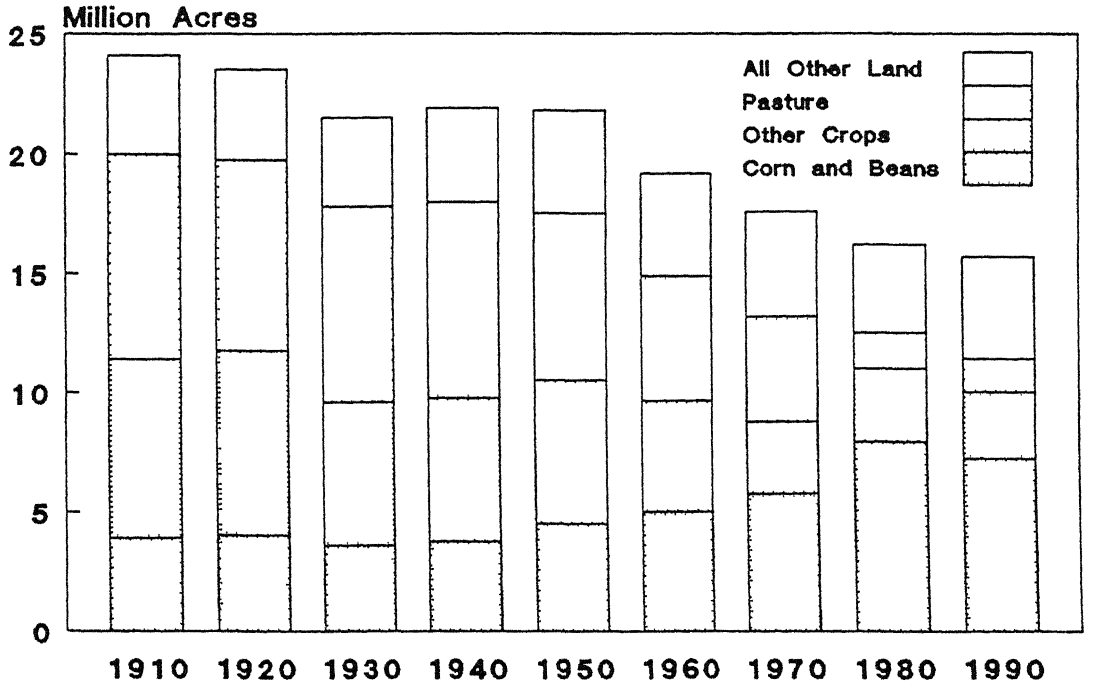


Figure 2: Land in Farms, by Land Use Classes, Ohio, Selected Years, 1910-1990



has gone into corn and soybean production.

In the U.S., there are now only about one-third as many farms as there were early in the century. Most people understand that this means existing farms have been consolidated into larger units, even though some land has been switched to nonfarm uses. What is less well known is that this consolidation into larger units has been accompanied by a strong trend toward specialization by individual farms on one or a few enterprises rather than on many, as was common many years ago. This means for example that the number of farms producing hogs has dropped even more rapidly than has the total number of farms. In 1900, 75 percent of U.S. farms had hogs, but by 1991, only 12 percent still raised them. All other farms that once raised hogs had abandoned them in favor of other specialties that looked more promising.

In Ohio the most common alternative land use has become cash grain farming, and perhaps the most common alternative income-producer to replace livestock production has become nonfarm jobs to support the family unit that still comprises the farm household.

Changing Ohio Swine Populations

Figures 3 and 4 compare county swine population densities in Ohio in 1961 and 1991. They are based on annual livestock inventory data collected by the Ohio Agricultural Statistics Service (OASS).

Contour lines have been used to identify changes in population densities because they are less arbitrary than county lines as indicators of geographic differences. For example, contour lines detect sharp changes within Fairfield County, which local knowledge might associate with urban encroachment in the northwest and rapidly changing terrain in the southeast. Similar insights appear in western counties where, for example, the contours suggest that population densities for hogs in Auglaize and Shelby counties are higher in the west than in the east. Figures 3 and 4 also show shifting contours in Butler county and the river counties east of Cincinnati which local experience might associate with rising commuter populations and changing land use patterns. Much of the rise in hog inventories in Holmes and Wayne counties is among the Amish, and so appears in Figure 4 in eastern Holmes and southern Wayne counties with spillover into Tuscarawas and Coshocton counties.

Changing patterns of livestock production are not confined to Ohio, of course. Both the location and organization of swine production are changing regionally and nationally.

Regional Divisions of the United States

State and regional data distributed by the USDA usually employ regional divisions like those shown in Figure 5. These regional groups can be consolidated into four major regions: Northeast, South, North Central, and West. These consolidations appear in the tables that follow, except that Maryland and Delaware have been included in the Northeast.

In Tables 1-3, regional comparisons of 1960, 1975, and 1990 are made for hog ***inventory***, hog ***marketings***, and hog ***slaughter***. Inventory represents the beginning annual population. Marketings and slaughter represent total output for the year. The choice of years is arbitrary, representing a recent year and preceding years at evenly spaced intervals. Regional totals in each table are the sum of leading states plus "all other" states, which lumps into one category a number of states whose regional contribu-

Figure 3: Inventory: Hogs and Pigs on Farms, January 1, 1961

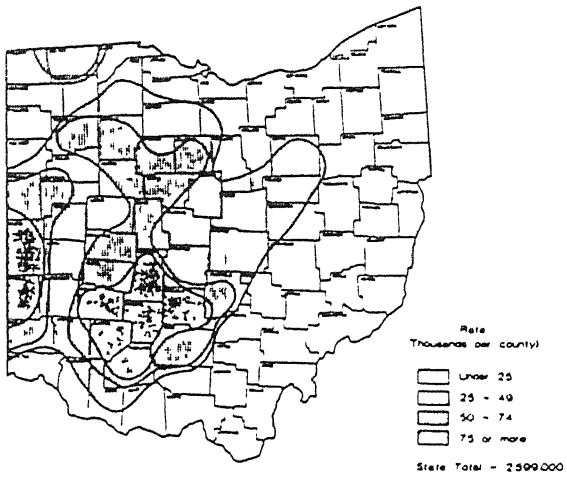


Figure 4: Inventory: Hogs and Pigs on Farms, December 1, 1990

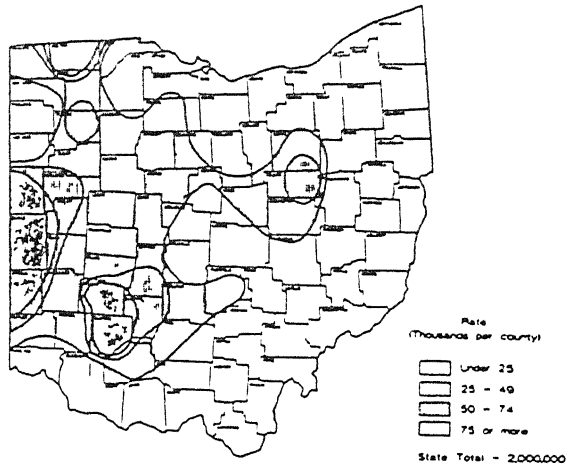


Figure 5: USDC Census Regions

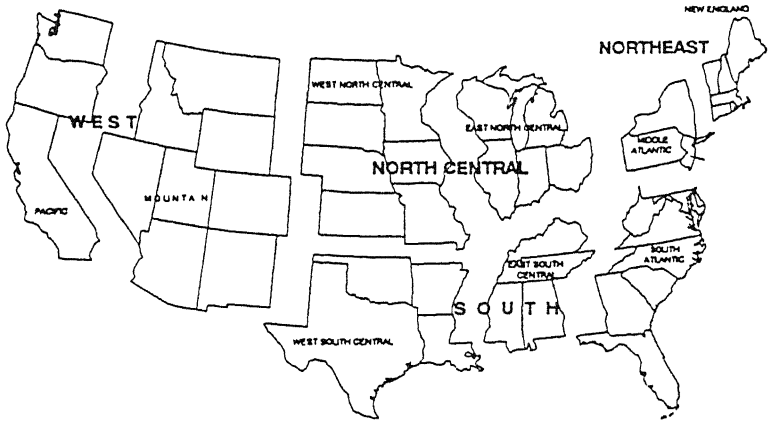
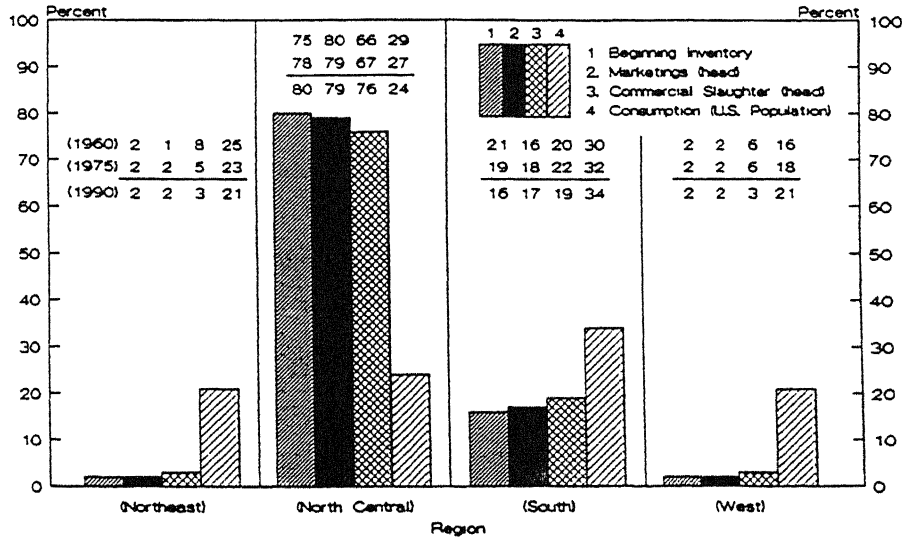


Figure 6: Hogs and Pork: Regional Percentage Distribution of Inventory, Marketings, Slaughter, and Pork Consumption, 1960, 1975 and 1990



tions are modest.

Regional Distribution of U.S. Hog Inventories

The national center of swine production is the North Central Region (see Figure 5). In fact, the twelve North Central states account for nearly 80 percent of total hog inventory and this percentage has not changed much over the years (Table 1) but there is a qualifier here: when the apparently stable North Central states are examined closely, it is clear that there has been growth in the west North Central states balanced by a decline in east North Central states. Growth and decline is indicated in the right-hand column of Table 1, where 1990 inventory is shown as a percentage of 1960 inventory. Notice the dramatic growth of inventory in states like North Carolina or Arkansas, and cornbelt fringe states like Michigan, Kansas, Nebraska, and the Dakotas.

Regional Distribution of U.S. Hog Marketings

Perhaps the best place to begin an examination of hog marketings is with the bottom-right corner of inventory Table 1 and the bottom-right corner of marketing Table 2. National hog inventories in 1990 were only 91 percent of the 1960 levels - down 9 percent - but hog marketings during that same period were up nearly 12 percent, reflecting increased industry productivity. (Comparing inventory and marketings on a state-by-state basis is unreliable because there are substantial interstate shipments of livestock, such as the movement of feeder pigs from states where they were farrowed to states where they were finished and marketed.)

Changes over time in state or regional marketings offer useful insights. Iowa remains the leader in hog marketings, accounting for nearly one-fourth of the national supply. No state has grown faster than North Carolina which now markets more hogs than Ohio (Table 2). Increased hog marketings in states like Kansas and Nebraska are related to the advent of irrigation and the increased production of feed grains. The rise in hog marketings in Michigan, the only growth state in the ENC region, has been associated with a rise in slaughter capacity (see Table 3).

Regional Distribution of U.S. Hog Slaughter

Commercial slaughter includes all slaughter activity except farm slaughter, which is for home consumption and has declined to very small amounts. In some states commercial slaughter information for the whole year is not reported. This is because the industry is so small or there are so few firms in the state that disclosure might identify useful information about competitors (state totals minus *my* firm equals information about *that* firm). So estimates have sometimes been made by the authors in completing Table 3. Table footnotes explain.

Shifts in packer location tend to coincide with shifts in livestock population. The long term interest of the packing industry is to be located as close to the livestock as transportation and storage technologies will allow. Once bound to cities and consumers, packers have always been sensitive to developments in railroads, refrigeration, trucks, highways, and comparative freight rates that would allow them closer access to livestock, their raw material. So packer migrations for most of this century have been from east to west, from urban to rural, and more recently into the south. As individual plants have grown larger, a few relocations can have a large impact on changing state totals in

Table 1: **HOG AND PIG INVENTORY;** Thousands of Hogs and Pigs on Farms, with Percentage Distributions and Changes, by Regions and Selected States, United States, January 1, 1960, and December 1, 1974 and 1989

Region and State	1960		1974		1989		1989 as Percent of 1960
	Thousand Head	Percent of U.S.	Thousand Head	Percent of U.S.	Thousand Head	Percent of U.S.	
NORTHEAST	1,075	1.8	918	1.7	1,198	2.2	111.4
Pennsylvania	558	0.9	633	1.2	975	1.8	174.7
All Other	517	0.9	285	0.5	223	0.4	43.1
NORTH CENTRAL	43,957	74.5	42,687	77.6	42,840	79.7	97.5
Ohio	2,707	4.6	1,950	3.5	2,080	3.9	76.8
Indiana	4,949	8.4	4,300	7.8	4,350	8.1	87.9
Illinois	7,469	12.7	6,500	11.9	5,700	10.6	76.3
Michigan	797	1.3	715	1.3	1,260	2.3	158.1
Wisconsin	1,963	3.3	1,400	2.5	1,150	2.1	58.6
Total ENC	17,885	30.3	14,865	27.0	14,540	27.0	81.3
Minnesota	3,594	6.1	3,700	6.7	4,450	8.3	123.8
Iowa	12,951	22.0	13,400	24.4	13,500	25.2	104.2
Missouri	4,232	7.2	3,900	7.1	2,700	5.0	63.8
N. Dakota	288	0.5	322	0.6	280	0.5	97.2
S. Dakota	1,328	2.2	1,700	3.1	1,720	3.2	129.5
Nebraska	2,502	4.2	3,050	5.5	4,200	7.8	167.9
Kansas	1,177	2.0	1,750	3.2	1,450	2.7	123.2
Total WNC	26,072	44.2	27,822	50.6	28,300	52.7	108.5
SOUTH	12,568	21.3	10,266	18.7	8,753	16.3	69.6
N. Carolina	1,520	2.6	1,890	3.4	2,570	4.8	169.1
Georgia	1,780	3.0	1,590	2.9	1,200	2.2	67.4
Kentucky	1,474	2.5	1,100	2.0	975	1.8	66.1
Tennessee	1,453	2.5	780	1.4	700	1.3	48.2
Arkansas	478	0.8	170	0.5	710	1.3	148.5
All Other	5,863	9.9	4,636	8.4	2,598	4.8	44.3
WEST	1,426	2.4	1,129	2.0	990	1.8	69.4
48 STATES	59,026	100.0	55,000	100.0	53,781	100.0	91.1

Source: For January 1, 1960 and December 1, 1974, Livestock and Meat Statistics, Annual Summaries, SRS, ERS, USDA. For December 1, 1989, Meat Animals: Production, Disposition, and Income, NASS, USDA, April, 1992.

Table 2: SLAUGHTER HOG MARKETINGS: Thousand Head Marketed, with Percentage Distributions and Changes, by Regions and Selected States, United States, 1960, 1975 and 1990[1]

Region and State	1960 Thousand Head	1960 Percent of U.S.	1975 Thousand Head	1975 Percent of U.S.	1990 Thousand Head	1990 Percent of U.S.	1990 as Percent of 1960
NORTHEAST	1,074	1.3	1,075	1.5	1,716	1.9	159.8
Pennsylvania	593	0.7	715	1.0	1,424	1.6	240.1
All Other	481	0.6	360	0.5	292	0.3	60.7
NORTH CENTRAL	64,265	80.4	58,114	78.5	70,422	78.8	109.6
Ohio	4,064	5.1	2,766	3.7	3,455	3.9	85.0
Indiana	7,348	9.2	5,649	7.6	7,106	7.9	96.7
Illinois	10,651	13.2	9,492	12.8	8,930	10.0	83.8
Michigan	1,096	1.4	949	1.3	2,014	2.3	183.8
Wisconsin	3,335	4.2	2,357	3.2	1,900	2.1	57.0
Total ENC	26,494	33.1	21,213	28.6	23,405	26.2	88.3
Minnesota	5,660	7.1	5,053	6.8	7,689	8.6	135.8
Iowa	18,457	23.1	16,821	22.7	21,994	24.6	119.2
Missouri	5,709	7.1	5,222	7.1	4,485	5.0	78.6
N. Dakota	487	0.6	469	0.6	429	0.5	88.1
S. Dakota	2,236	2.8	2,481	3.4	3,027	3.4	135.4
Nebraska	3,577	4.5	4,411	6.0	6,917	7.7	193.4
Kansas	1,645	2.1	2,444	3.3	2,476	2.8	150.5
Total WNC	37,771	47.3	36,901	49.9	47,017	52.6	124.5
SOUTH	12,947	16.2	13,120	17.7	15,476	17.3	119.5
N. Carolina	1,527	1.9	2,343	3.2	5,044	5.6	330.3
Georgia	1,867	2.3	1,934	2.6	1,805	2.0	96.7
Kentucky	1,794	2.2	1,485	2.0	1,532	1.7	85.4
Tennessee	1,610	2.0	1,186	1.6	1,254	1.4	77.9
Arkansas	496	0.6	457	0.6	1,391	1.6	280.4
All Other	5,653	7.2	5,716	7.7	4,450	5.0	78.7
WEST	1,652	2.1	1,688	2.3	1,759	2.0	106.5
48 STATES	79,938	100.0	73,997	100.0	89,373	100.0	111.8

[1] Excludes intrastate interfarm sales.

Source: For 1960 and 1974, Livestock and Meat Statistics, Annual Summaries, SRS, ERS, USDA. For 1990, Meat Animals: Production, Disposition, and Income, NASS, USDA, April, 1992.

Table 3: COMMERCIAL HOG SLAUGHTER: Thousands of Head Slaughtered, with Percentage Distributions and Changes, by Regions and Selected States, United States, 1960, 1975 and 1990

Region and State	1960 Thousand Head	1960 Percent of U.S.	1975 Thousand Head	1975 Percent of U.S.	1990 Thousand Head	1990 Percent of U.S.	1990 as Percent of 1960
NORTHEAST	6,590	8.3	3,599	5.2	2,153[1]	2.5	32.7
Pennsylvania	2,725	3.4	2,452	3.6	1,963[1]	2.3	72.0
All Other	3,865	4.9	1,142	1.6	190	0.2	4.9
NORTH CENTRAL	52,406	66.3	46,274	67.4	64,413	75.7	122.9
Ohio	4,558	5.8	3,397	5.0	2,575	3.0	56.5
Indiana	5,024	6.4	2,975	4.3	3,624	4.3	72.1
Illinois	5,003	6.3	4,438	6.5	8,834	10.4	176.6
Michigan	1,536	1.9	4,060	5.9	3,836	4.5	249.7
Wisconsin	3,441	4.4	3,050	4.4	358	0.4	10.4
Total ENC	19,562	24.8	17,920	26.1	19,227	22.6	98.3
Minnesota	5,428	6.9	4,428	6.4	5,878	6.9	108.3
Iowa	14,455	18.3	15,190	22.2	25,785	30.3	178.4
Missouri	3,879	4.9	2,415	3.5	2,798	3.3	72.1
N. Dakota	18	-	22	-	97	0.1	538.9
S. Dakota	2,154	2.7	2,029	3.0	4,416	5.2	205.0
Nebraska	4,044	5.1	2,907	4.2	5,401	6.3	133.6
Kansas	2,866	3.6	1,363	2.0	811	1.0	28.3
Total WNC	32,844	41.5	28,354	41.3	45,186	53.1	137.6
SOUTH	15,704	19.9	15,064	21.9	16,149[1]	19.0	102.8
Virginia	2,101	2.7	2,798	4.1	4,551	5.4	216.6
N. Carolina	1,141	1.4	1,687	2.4	2,749	3.2	240.9
Georgia	1,859	2.4	1,488	2.2	1,556[1]	1.8	83.7
Kentucky	1,477	1.9	1,456	2.1	2,732[1]	3.2	185.0
Tennessee	2,380	3.0	2,901	4.2	809	1.0	34.0
Texas	1,758	2.2	1,098	1.6	334	0.4	19.0
All Other	4,988	6.3	3,636	5.3	3,418	4.0	68.5
WEST	4,336	5.5	3,750	5.5	2,421	2.8	55.8
48 STATES	79,036	100.0	68,687	100.0	85,136	100.0	107.7

[1] Estimated by the author by distributing U.S. residual among unreported states according to their share reported in first seven months of 1990.

Source: For 1960 and 1975, derived from Livestock and Meat Statistics, Annual Summaries, SRS, ERS, USDA. For 1990, Livestock Slaughter, 1990 Summary, NASS, USDA, March, 1991.

slaughter volume. Michigan, Illinois, and South Dakota provide examples in Table 3. Most of the commercial slaughter activity in the East has disappeared. Pennsylvania accounts for nearly all the slaughter activity in the Northeast region (Table 3). Increases in slaughter in Virginia and North Carolina accompany local growth in hog marketings.

Nearly one-fourth of the U.S. population - and pork consumption - is in the Northeast region. Most of that demand is supplied by shipments from the WNC region. There may be a basis for sustained or increased packer activity, and for integrated hog production, in states nearer to this massive Northeast market (ENC states, for example) if packers and integrated producers acted together to make geographic advantages work for them.

A Graphic Overview

Figure 6 provides a graphic summary of Tables 1-3. Each figure is divided into the four major census regions. Each region has four bars representing the regional percentages of U.S. total (1) ***beginning inventory***, (2) ***marketings***, (3) ***slaughter***, and (4) ***population*** (population is used here as a proxy for meat consumption). Percentages flow across the top panels of each figure; the 1990 percentage shows the height of the bar beneath it. For example, we read in Figure 6 that in 1990 the Northeast accounted for 2 percent of U.S. hog and pig inventories, the North Central for 80 percent, and South for 16 percent, and the West for 2 percent. We also see changes in these percentages compared to 1960 and 1975. In the last bar we see human population shifts out of the Northeast and North Central regions and into the South and West. We see that the North Central region dominates the swine industry; all other regions have surplus population (and pork demand) relative to regional capacities to supply that demand. The North Central region ships pork to all other regions - the Northeast is the biggest importing region - and these facts have not changed for 30 years.

For individual ENC states like Ohio where marketings now exceed slaughter capacity this means there is a strong tendency for hogs to be shipped west or north to slaughter only to travel as pork back east across the state on its way to consumption in the Northeast. These double-freight charges have a price-depressing effect that further discourages long term prospects for swine production, and induces producers to continue to switch toward alternatives, like the cash grain/nonfarm job combination.

Summary of Trends

A summary of trends to consider in anticipating the future might include the following:

- For most of the 20th Century, Ohio agricultural production has been shifting gradually toward relatively more income from crops and relatively less from livestock (Figure 1).

- For most of the second half of the 20th century there has been a gradual westward shift in national centers of swine production (Tables 1 and 2).

- In 1990, Ohio hog marketings were at 86 percent of the 1960 levels and hog slaughter was at 56 percent of 1960 levels (Tables 2 and 3).

- The meatpacking industry has consistently demonstrated an interest in being located as close to its source of raw material as technology will allow. During the years since World War II, net industry migrations have been from east to west, from urban locations to rural, and from north to south

(Table 3).

■ In the years since World War II there has been a continuing trend toward larger size and increased specialization in agricultural production. Broilers, eggs, fed cattle and swine all provide examples in animal agriculture. Often these changes have been accompanied by production methods that are integrated or contracted with processors, arrangements that are not always welcomed by midwestern family farm traditions (ESO-1934, ESO 1980).

■ Most U.S. and Ohio farm households now earn more income from nonfarm jobs that from their farm operations. Nonfarm jobs tend to complement crop production but compete with livestock production as sources of farm household income (ESO-1980, RB 1189).

■ Good highways that allow farm householders to commute to nonfarm jobs in town also allow nonfarm families to establish household in the country. Rural nonfarm residents in Ohio now outnumber farm residents by a ratio of about 9 to 1. These residents often regard the rural environment as a consumer good as well as (or rather than) an economic resource. Together with farm households that resist threats to the family farm, these two sets of rural residents can have priorities that are incompatible with large production units like those that dominate the sparsely-populated places where they are accepted (ESO-1980, Bollinger).

Anticipating the Future

Despite these long-term trends observers note that Northeastern states (east of Ohio) contain over 20 percent of the U.S. population and that these consumers depend on red meat shipments from locations west of Ohio (Figures 5 and 6). After all, they ask , why should Ohio livestock move west to slaughter only to be shipped back east across the state as meat on its way to this major market right next door? So efforts are underway to see if Ohio does in fact enjoy some geographic advantages that could be developed.

But new production arrangements in the U.S. are unlike those in the past. National production in the future will be characterized by few participants rather than many, with units so large as to want mutual commitments (for markets and supplies) contracted over periods long enough to be reassuring to producers, packers, and their lenders. Government policy commitments probably would also be sought. A few good locations would be important, perhaps with low population density and committed producers in areas where community income enhancement would be an attractive inducement. In Ohio, the Indiana border, Southeast Ohio, and the Amish communities get mentioned as speculative possibilities.

But nobody has the essential facts; work needs to be done. Turning an Ohio trend around would be more complicated than just being on time for the ride when the opportunity arrives. This opportunity may not even arrive unless something persuasive makes it happen. A collective effort, informed and organized, is going to be required. Packer and producer commitments, comparative freight rates, and contract production arrangements all will need to be examined and discussed.

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