

# Staff Papers Series

CHANGES IN LIVESTOCK MARKETING AND PACKING INDUSTRIES:  
UNITED STATES, UPPER NORTH CENTRAL REGION, AND MINNESOTA

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## 1. INTRODUCTION

The livestock marketing and slaughtering sector has changed considerably in the last few decades. These changes are both (1) in response to changes in the livestock production industry and (2) the cause of changes in livestock production. As livestock production becomes more specialized and concentrated, competitive advantages of one region over another become more pronounced. An important factor in the competitiveness of a region is its access to markets and the net farm level price received for livestock produced.

The location of livestock slaughter facilities has changed in the last half of the twentieth century as a new generation of plants were built closer to livestock production regions. These plants were single species and single story, and were larger in scale than the plants they replaced located in population centers near terminal livestock markets. Locating nearer production allowed for direct trade between producers and packers. As a result, the volume of trade through terminal markets is less than 15 percent of the level of 30 years ago.

The livestock slaughtering industry is characterized as having economies of size, and as a result, has consolidated into fewer, larger plants. The number of small and medium sized plants has decreased 28 percent across all species in the past decade. Ownership of the slaughtering facilities has consolidated as well, as is shown by the percentage of livestock slaughter controlled by a few large firms. The four firm concentration ratio (CR4) for steer and heifer slaughter was 70 in 1988, compared to 25 in 1975. The sheep and lamb CR4 increased from 50 percent in 1980 to 80 percent in 1988. Hog

slaughter concentration, although relatively stable through most of the 1980s, has increased substantially from 1988 to 1990, and now is in the low 40s.

Because of the symbiotic relationship between livestock production and livestock slaughter as it pertains to the competitiveness of a region, it is important to monitor the progress of both. This report summarizes the marketing and slaughtering segments of the livestock industry and is a companion to a report by Olson, Bjornstad, and Grande which focused on livestock production. It will examine national, regional, and state trends in slaughter numbers, plant size and number of plants, packer feeding, and market outlets for cattle, calves, hogs, and sheep. It will also compare regional and state production to slaughter in order to address the issue of slaughter capacity. The Upper North Central Region in this study includes Minnesota, North Dakota, South Dakota, Iowa, and Wisconsin.<sup>1</sup>

## 2. TOTAL SLAUGHTER

### 2.1 U.S.

The number of cattle and hogs slaughtered annually has been relatively stable since 1960 (Figure 1, Table 1). Cattle slaughter (fed and nonfed) increased steadily from 25.2 million head in 1960 to 42.7 million head in 1976, following the buildup of the nation's cattle herd. Cattle slaughter has leveled off since 1976 and has begun a decreasing trend as cattle inventories decline. Cattle slaughter in 1989 was 33.9 million head, down 20 percent from the peak in 1976. Hog slaughter increased from 79.0 million in 1960 to 88.7 million in 1989. This relatively moderate increase (12.2 percent in

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<sup>1</sup>The data are publicly available and reported by the USDA. The source materials are listed in the References section. All tables and figures are found in the Appendix.



29 years) does not reveal the large fluctuations in the 1970s, 94.5 million in 1971, down to 68.7 million in 1975, before rising to 96.1 million in 1980.

The sheep and lamb slaughter peak in the past 30 years was in 1961 at 17.2 million head and has decreased by more than 70 percent to only 5.0 million in 1979 (Figure 2 and Table 1). This is a continuation of a downward trend in sheep production that began following World War II. Sheep and lamb slaughter has leveled off through the 1980s and finished the decade with 5.5 million slaughtered in 1989. Calf slaughter has followed a similar trend. Volume declined during the 1960s and early 1970s (from 8.2 million in 1960 to 2.2 million in 1973), but has stabilized since then. This downward trend was broken briefly in the late-1970s, increasing to 5.5 million in 1977 before going to 2.8 million in 1979. By 1989, calf slaughter had dropped to 2.2 million head. Calf slaughter is likely to continue to decline for two reasons. First, consumers are becoming concerned about the production practices under which veal calves are raised and may reduce their consumption of veal. Second, calf slaughter weights have increased dramatically in 1990, reducing the number of calves slaughtered to produce the same amount of product.

## 2.2 Region

The regional trends are much like those for the nation as a whole, but some differences deserve comment. Cattle slaughter rose steadily from 5.3 million in 1960 to 8.7 million in 1968, and then stayed steady until 1976 (8.9 million) before declining (Figure 3). This period corresponds with the height of farmer feeding and before the migration of cattle to large commercial feedlots in the High Plains. Iowa was the country's number one cattle

feeding state in 1968, and Minnesota reported its highest number of cattle on feed in 1970. Although losing relative importance in cattle feeding, slaughter in the region remained relatively high as the beef herd liquidated due to nonfed slaughter. The number of cattle slaughtered in the region declined to 4.9 million in 1989. In addition, Figure 4 (also Table 1) shows that the region has lost cattle slaughter relative to the rest of the country. From a share of 24.8 percent in 1968, the region's share of cattle slaughter has declined steadily to 14.4 percent in 1989. As cattle feeding moved from the region, packers also moved, closing plants in the midwest and building new ones near the commercial feedlots in Kansas, Texas, and Nebraska.

The region has a strong position in hog slaughter as it is the leading hog producing region in the U.S. The yearly slaughter shows a slightly increasing trend, with a typical annual volume at 30 million head (Figure 5). Two peaks in hog slaughter have occurred since 1960. The first occurred in 1971 (36.5 million hogs) and the second in 1980 (36.7 million hogs). In between, slaughter dipped to a low of 24.7 million in 1975. This variation coincides exactly with the variation in the national hog slaughter shown in Figure 1. Over the past 30 years, the number of head slaughtered in the region increased from 25.5 million in 1960 to 34.9 million in 1989, a 36.9 percent increase. This is a larger increase than the increase in U.S. hog slaughter during the same period, indicating that the region is increasing its share of the total hog slaughter. Figure 4 confirms this observation. Commercial hog slaughter in the region as a percent of U.S. hog slaughter has increased steadily from 1960 to 1989. The region's share increased from 32.3 percent of all hogs in 1960 to 39.4 percent in 1989.

Commercial slaughter of sheep and lambs in the region decreased from 3.3 million in 1960 to 0.76 million head in 1975, a 77 percent decrease. It more than doubled to 1.8 million in 1984, before dropping again to 0.96 million in 1989. Relative to the nation, the rapid decrease in sheep and lamb slaughter between 1960 and 1975 meant a reduction in the region's share of commercial sheep and lamb slaughter from 20.8 percent in 1960 to 9.7 percent in 1975. The slaughtering "boom" in the mid-1980s that gave the region over one-fourth of the U.S. commercial slaughter in 1984 and 1985 was due to the opening of plants in Iowa (Table 2). The share has since dropped to 17.5 percent in 1989. Because the confidentiality of individual plants must be maintained, it's difficult to find data on the number of firms slaughtering sheep and lambs on a regional or state basis. Although total slaughter numbers are correct, plant numbers may not be reported, thereby clouding the plant size picture.

Regional calf slaughter follows a similar declining trend as was seen for the nation as a whole. In the region, calf slaughter fell from 1.8 million head in 1960 to 0.3 million in 1989 (Figure 3). The region's share of the national calf slaughter has declined from 21.7 percent in 1960 to 14.7 percent in 1989, nearly a one-third decrease (Figure 4). The 1989 number is up slightly from 1986 when the region's share was as low as 11.6 percent. Wisconsin, with its strong dairy industry, has been the only major contributor to the region's calf slaughter in the 1980s.

### 2.3 Minnesota

Cattle slaughter in Minnesota has been relatively stable during the 1960 to 1989 period. Minnesota plants slaughtered 1.4 million cattle in 1960 and

reached a period high at 1.99 million in 1968 before dropping to 0.93 million in 1980. The 1980s have been very stable and the 1989 volume of 1.0 million head is typical for cattle slaughter during that decade (Figure 7 and Table 1). Minnesota cattle slaughter was in a downward trend relative to the region between 1960 (26.7 percent) and 1980 (16.1 percent). The stable slaughter volumes in Minnesota during the 1980s coupled with a declining volume for the region as a whole have resulted in an increasing share of the region's cattle slaughter taking place at Minnesota plants. This share rose from the 1980 low at 16.1 percent to 20.6 percent in 1989 (Figure 8).

Annual Minnesota hog slaughter has been fairly stable during the entire 1960 to 1989 period (Figure 7). Starting in 1960 with 5.4 million head and ending in 1989 with 5.2 million, slaughter ranged from a high in 1968 of 6.2 million to a low in 1975 of 4.4 million head. However, in light of the strengthening of the region in terms of hog slaughtering, Minnesota is seeing its share of the region's hog slaughter decreasing from 22.3 percent in 1961 to 13.6 percent in 1988 and 14.9 percent in 1989 (Figure 8). This share will likely decrease in 1990 as the Albert Lea, Minnesota, slaughter facility was closed for eight and a half months of the year and a new plant opened in Waterloo, Iowa, in May, increasing that state's share of the regional slaughter, while Minnesota's share declined.

The sheep and lamb sector is the one in which Minnesota has the highest share of the region's slaughter (Figure 8). This number has been in the 30 to 40 percent range during most of the 1960-1989 period. Minnesota had exceptionally high shares around 1980 (54.9 percent in 1980) and unusually low shares in the early-1970s (20.5 percent in 1972) and in the mid-1980s (25.8 percent in 1984). Minnesota had 35 percent of the region's sheep and

lamb slaughter in 1989. In absolute numbers, the 1980s ended with an annual slaughter of 335,700 sheep and lambs in Minnesota (Figure 6). A typical slaughter in the mid-1970s was approximately 230,000 head, while in the early-1960s it could exceed one million sheep and lambs.

Calf slaughter is not a big industry in Minnesota. In 1960, about 261,000 calves were slaughtered in the state (Figure 6). Calf slaughter has typically been less than 10,000 head per year in the 1980s, and in 1989 only 2,100 calves were slaughtered in Minnesota. Minnesota's share of the region's calf slaughter has been less than 2 percent since 1970, and was 0.7 percent in 1989.

### 3. AVERAGE PLANT SIZE

The data used in the analysis above are complete in the sense that they incorporate all commercial slaughter in the country, in the region, and in Minnesota. The following section uses data collected and published by Packers & Stockyards' Administration (USDA), and thus only includes data for federally inspected (FI) plants. However, typically in excess of 95 percent of all slaughter passes through FI plants. By simply dividing the number of head slaughtered per year at FI plants by the number of FI plants, one can get an expression for the average plant size in terms of annual kill. This number does not necessarily tell us the slaughtering capacity of the plants, but it still is a useful indicator of the trend in plant size.

#### 3.1 Cattle

The average plant size in the U.S. cattle slaughter industry has been quite stable between 1975 and 1989 (Figure 9). Average annual slaughter per

plant has increased from 23,900 head in 1975 to 27,400 head in 1989. Figure 9 also shows that the average cattle slaughtering facility in the region has between two and three times the volume of the average national plant (60,400 in 1989). This high number for the region is, in part, due to the Iowa cattle industry which has a relatively high plant capacity (average slaughter was 151,000 head in 1989) and a fairly high share of the region's cattle slaughter, 38.2 percent in 1989 (Table 2). The size of Minnesota cattle plants are very close to the national average. Minnesota cattle plants are slightly below the national average, at around 20,000 head, and vary a bit more (Figure 9). Average plant size seems to be increasing with some fluctuations at all levels (nation, region, and state).

### 3.2 Hogs

Minnesota and Iowa are the two states in the region with a fairly stable hog slaughtering industry. Figure 10 indicates that the average yearly kill per plant is on the rise as the industry moves to fewer and larger plants. The average annual kill for the U.S. has increased from 54,600 head in 1975 to 77,500 in 1989, a 42 percent increase. Minnesota average slaughter per plant increased from 78,100 head in 1975 to 131,800 in 1989, or 69 percent higher. Even though the average hog slaughter at Minnesota plants is high compared to the national average, it is small compared to the Iowa numbers. The Iowa hog slaughter industry is in a phase of rapidly increasing average plant size as large slaughtering facilities continue to expand in an effort to capture economies of size in the packing industry. From a 1975 average of 581,600 head, a "representative" Iowa hog slaughtering plant increased its slaughter to 1.216 million hogs in 1989. That is a 109 percent increase in 14 years.

### 3.3 Sheep and Lambs

The region is keeping its share of the sheep and lamb slaughter. However, because a single plant will often have the bulk of FI slaughter in a region and the confidentiality of individual plants must be maintained, it is difficult to find data on the number of firms slaughtering sheep and lambs on a regional or state basis. The average FI sheep and lamb slaughtering facility for all of the U.S. slaughtered around 6,000 head yearly during the 1980s (Table 2). North Dakota is the only state in the region reporting federally inspected plants. Minnesota reported 36 FI plants in 1976, but none in other years, raising questions about the benefit of such a reporting procedure.

### 3.4 Calves

As mentioned above, the calf slaughter industry plays only a minor role in the total picture of the livestock industry. The total national number of calves slaughtered is in a downward trend, and calf slaughter is typically performed at small plants. The average size of a U.S. calf slaughtering operation has declined from about 5,000 head in the mid/late-1970s to less than 4,000 in the late-1980s. Wisconsin is the only state in the region where calf slaughter of some scale takes place. Wisconsin alone slaughtered approximately 15 percent of all U.S. calves slaughtered in 1989, with the average plant slaughtering 35,200 head (Table 2).

## 4. NUMBER OF PLANTS

### 4.1 U.S.

There is a general trend toward fewer and larger FI plants in the U.S. One exception to this trend is the increase in number of plants around 1980

(Figure 11). As also indicated in Figure 11, the number of plants slaughtering sheep/lambs is declining at a slower rate than the number for the other species. In 1989 (1976 numbers in parentheses), there were 1203 (1665) FI plants slaughtering cattle, 1114 (1322) slaughtering hogs, 869 (878) slaughtering sheep and lambs, and 563 (897) plants slaughtering calves under federal inspection (see Table 2 for details).

#### 4.2 Region

The trends for the region are somewhat different from those for the nation (Figure 12). The number of plants slaughtering cattle in the region fluctuated greatly in the late-1970s before it went into a downward trend throughout the 1980s (Figure 12). A high in 1976, at 162 plants, was reduced to 85 plants by 1982. Since 1982, the number of FI plants slaughtering cattle in the region has been rather stable, and in 1989 it was at 75 plants.

Regional data for the number of FO hog slaughtering plants follow the trend for cattle plants closely, both in absolute and relative numbers, but the changes here have been more smooth. From a 1976 high of 131 plants, it fell rapidly to 71 plants in 1982, but since then the trend has been slightly positive and in 1989 there were 79 FI hog slaughtering plants in the region.

The number of FI sheep and lamb slaughterers in the region has been stable (Table 2). Since 1975, with the exception of 66 plants in 1976, this number has been between 19 and 28. The 1989 number was 19 plants. Federally Inspected sheep and lamb slaughter is basically located in North Dakota; there have been no such plants reporting in Minnesota since 1976. As mentioned above, confidentiality of individual plants clouds the picture.



In 1975 there were 45 plants slaughtering calves under federal inspection in the region and in 1977 there were none (Table 2). Except for these extremes, a typical number of calf slaughtering plants has been between 10 and 20, especially in the 1980s (Figure 12). In 1989 there were 9 plants, down six from 1988. None of these plants were in Minnesota.

#### 4.3 Minnesota

The number of cattle and hog slaughtering facilities has followed a similar pattern (Figure 13). The number of FI cattle plants declined from 68 plants in 1975 to 41 plants in 1989, a larger percentage decrease than for either the region or the nation (Figure 14). The number of FI hog plants in Minnesota declined steadily from 1975 through 1989. This number has decreased from 56 in 1975 to 39 in 1989, less dramatic than the decline for the region. Iowa has retained relatively more of its plants than has Minnesota (Figure 15). Nationally, the number of FI hog slaughtering plants has decreased even less than it has in Iowa, so one can suggest that the hog producing states in our region have seen the processing industry become more concentrated than is the case for the rest of the country.

### 5. FEDERALLY INSPECTED PLANTS: SIZES AND VOLUMES

#### 5.1 Cattle

The total number of FI plants slaughtering cattle in the U.S. is decreasing, but the decrease is not evenly distributed among the different size categories of plants (Table 3 and Figure 16). It is evident that the large plants, those killing more than 500,000 cattle a year, are increasing in number. There were eleven 500,000+ head plants in the U.S. in 1981, and by

1989 this number had increased to 20 plants, up over 80 percent. All other size categories decreased during the same period. The smallest category, plants slaughtering no more than 10,000 head per year, had the smallest relative decrease. This category consisted of 1279 plants in 1981 and 1032 plants in 1989, a 19.3 percent reduction. The changes in number of plants in the other size categories are as follows:

<u>Size</u>	<u>1981</u>	<u>1989</u>	<u>% Change</u>
10,000-99,999 head	196	105	-46.4
100,000-499,999 head	69	46	-33.3

The eleven plants in the U.S. slaughtering more than 500,000 cattle in 1981, represented more than one-fourth of all U.S. federally inspected cattle slaughter (Figure 17 and Table 3). By 1989 these eleven plants had grown to 20, and their share of slaughter had increased to 54.2 percent. The other size categories have all been losing market share. Plants in the 100,000 to 499,999 head range dropped from a 47.4 percent share in 1981 to 31.2 percent in 1989. The 10,000 - 99,999 head firms saw their market share drop from 22.6 to 11.9 percent during the same period. The most numerous group, the less than 10,000 head per year plants, had only 4.1 percent of the slaughter in 1981, and the 1032 firms in this group in 1989 slaughtered a mere 2.4 percent of the total cattle volume in the country.

In addition to the trend to larger slaughtering plants, ownership of the plants has consolidated into fewer firms, increasing the concentration of the industry. The four firm concentration ratio (CR4), the percent of the total industry controlled by the four largest firms, has increased dramatically in recent years in the beef industry (Ward, 1990). The steer and heifer CR4 increased from 25 percent in 1975 to nearly 70 percent by the late-1980s.

Boxed beef followed a similar trend, increasing from approximately 51.3 percent in 1979 to 79.3 percent in 1988. However, total cattle slaughter, including non-fed slaughter is less concentrated with a CR4 of 57, up from 28 in 1980.

## 5.2 Hogs

The U.S. hog slaughtering industry has also experienced an increasing concentration during the 1980s. Between 1981 and 1989 the number of large slaughtering plants (1.5 million head or more annual slaughter) increased 140 percent from 10 to 24. The 1989 number is down two from 1988, but still represents a dramatic increase (Figure 18 and Table 3). During the same period, these plants increased their share of the total FI hog slaughter from 21.1 percent to 62.0 percent (Figure 19). In 1988 these firms had a share of the total slaughter as high as 65.8 percent.

At the other end of the scale are firms slaughtering less than 10,000 hogs annually. Even though these 947 firms outnumbered those in the largest category by almost 40:1, they had a 1989 share of the total slaughter that was less than 1 percent (Table 3). The category of FI hog slaughtering plants that have gone through the most substantial decrease are the 0.5 to 1.5 million head group. While some of these plants closed their doors, others expanded and are now counted in the over 1.5 million head category. The category lost 56.9 percent of its plants between 1981 and 1989. In 1981 this group had more than five times as many plants as the over 1.5 million head category (51 to 10), but in 1989 large plants were more numerous, 24 compared to 22. The market share of the plants slaughtering between 0.5 and 1.5 million hogs decreased from 58.3 percent in 1981 to 25.1 percent in 1989.

Plants with annual slaughter of 10,000 to 499,999 head decreased from 159 in 1981 to 121 in 1989, and this category's market share fell from 19.4 to 11.9 percent in the same period (Figure 19).

Although plants are getting larger, they are owned by several different firms. The CR4 for hog slaughter has not increased as rapidly as it has for cattle. In 1972 the hog slaughtering CR4 was 31.6 percent. By 1988 it had increased to only 33.5 percent, but it was estimated to be over 40 percent by the end of 1990 (Plain, 1990). While the CR4 has been relatively stable, the firms involved in the top four continues to evolve. In 1990 the first, second, and fourth largest firms in hog slaughter were also the three largest in cattle slaughter. That is IBP, Monfort, and Excel, respectively. As late as 1982, none of these three were even in the hog slaughtering business.

### 5.3 Sheep and Lambs

Approximately 25 plants with a yearly kill in excess of 10,000 head have a market share of around 95 percent. This market share has been stable through the 1980s, although these firms have increased in number. The remaining 800 to 1000 plants slaughtering less than 10,000 sheep and lambs per year divide 5 percent of the market. The CR4 for sheep and lambs was relatively stable through the early-1980s at 50 to 60 percent. Following a sharp increase in 1987, it has again stabilized at 75 to 80 percent. Monfort is the largest sheep and lamb packer; neither IBP nor Excel are involved in this industry.

### 5.4 Calves

The calf pattern is similar to that of sheep and lambs. There is a relatively large number of plants slaughtering less than 100 calves a year

(Table 3). This category consisted of 622 plants in 1981 and 414 plants in 1989 and had a market share of less than 0.5 percent during the 1980s. Firms slaughtering more than 10,000 calves a year had 88.7 percent of all slaughter in 1981 and 90.0 percent in 1989. These plants numbered 49 in 1981 and 46 in 1989 but ranged as high as 66 in 1985 (Table 3).

## 6. PACKER FEEDING

Packer feeding of livestock is a form of vertical integration. Although a great deal of data on packer feeding are not available for individual states or regions, some national data are reported. Ownership of livestock allows packers to more carefully control the flow of animals through the facility, thus increasing efficiency and reducing processing costs. As a result, packer feeding tends to increase in times of tight livestock supplies. In recent years forward contracting for delivery and formula pricing have replaced a portion of packer feeding as a method to monitor animal flow through the plant.

### 6.1 Cattle

The total number of cattle fed by packers has declined since the early-1970s (Table 4). Packers fed 1.81 million head in 1969 and 1.85 million head in 1972 is the highest number recorded. Cattle feeding by packers declined to a low of 765,000 cattle in 1984. Figure 20 indicates that the trend may have turned after the mid-1980s as cattle numbers tightened.

Packer feeding in the national cattle sector represented approximately 8 percent of the total U.S. marketings for the period 1960 to 1987. During the 1970s, we saw approximately 7 percent of the cattle being fed by the

packers. This number fell to 4 percent in 1980 and was 4.9 percent in 1987. Packer feeding as a percent of cattle slaughter varies across the states within the region (Table 4). Minnesota is typically low; 1.1 percent in 1987 is the highest we have observed for Minnesota since 1966. North Dakota also has low numbers for packer feeding in the cattle sector. There was a substantial amount of packer fed cattle in Wisconsin in the mid-1970s (28.7 percent in 1976), but it was eliminated in the 1980s. South Dakota is the only state in our region with a seemingly viable packer feeding sector. It has been slightly lower than the national average and amounted to 4.5 percent in 1987.

In spite of the reduction in number of cattle fed, the average size of operation in packer cattle feeding slowly increased between 1964 and 1987. This is because the number of packers feeding cattle has declined more rapidly than the number of cattle fed. There was a total of 182 packers feeding cattle in 1964, a number that was reduced to 41 by 1985. However, the number of packer feeders seems to be increasing again after 1984 and was up to 54 in 1987. The average packer feeding cattle fed 5,800 head in 1964. Although there are yearly variations, this number has been increasing during the period, and it reached 21,600 head in 1987 (Figure 21).

Trends are somewhat different among the ten largest cattle packers. The share fed by the ten largest packers involved in cattle feeding has increased during the 1980s (Table 4 and Figure 20). The number of the ten largest packers feeding cattle declined from nine in the early-1970s to only three or four by the end of the 1980s. Although fewer of the big ten packers are involved in feeding, their total volume of cattle fed has been stable at approximately 400,000 head annually (Figure 20). The size of the average

feeding operation among the ten largest packers has increased from near 40,000 head in the mid-1960s to 143,000 in 1987. This number fluctuates widely since there are only a few packers; for example, the two big ten packers feeding cattle in 1985 fed an average of 237,000 head (Figure 21).

Perhaps more informative than the average size of operation is the share of total packer feeding performed by the ten largest packers. In the mid- to late-1960s this share was approximately 30 percent for cattle. The big ten's share was as low as 15.8 percent in 1972, but has since increased and lies around 45 percent in the 1980s (Table 4). This trend to fewer packers feeding more livestock mimics the trend in packer size. Within the beef slaughtering industry today, three firms are very large and the fourth through tenth largest firms are small by comparison.

## 6.2 Hogs

Packer feeding in the hog sector is not very common compared to feeding in cattle, due, in part, to the different structures of the two sectors. Cattle feeding is dominated by large custom feedlots where packers can easily contract to have cattle fed as they need without a long term commitment. Also, cattle feeding is typically separated from the breeding herd when feeder cattle are sold. Packers can feed cattle without owning a breeding herd or a feeding facility, thus greatly reducing their capital investment. Although the swine industry is changing, most hogs are fed on or near the farm on which they were born. Approximately 80 percent of hogs are produced by farrow to finish operations. These operations are typically part of a diversified farm. While packers can buy feeder pigs and feed hogs without owning the breeding herd or facilities, the custom or contract hog feeding industry is not as

extensive as in cattle feeding. Also, some states remove some of the flexibility of feeding by requiring longer term commitments to farmers that make capital improvements to comply with contract guidelines. For example, Minnesota's Producer Production Act requires damages be paid the producer if a major capital investment is a necessary condition to receive a contract and the contract is terminated prematurely.

The total number of hogs fed by slaughter packers was approximately 40,000 in the years between 1964 and 1969 (Table 4). The 1970s were a more active period for packer feeding, and in 1976 the number climbed to 166,000 head. Following the 1976 high, numbers declined, but fluctuated widely, dropping to 58,000 head in 1980 and to 24,000 head in 1985 and 1986. The volatility of the hog packer feeding can be illustrated by the sharp increase between 1986 and 1987, when the number of hogs fed by packers increased from 24,000 head to 97,000 head (Table 4). No regional or state information is available for packer hog feeding.

The big increase in number of hogs fed by packers in the first half of the 1970s corresponds to increased feeding by the ten largest packers. The modest number of hogs fed by packers in the mid-1960s was fed by the smaller packers (less than 10 percent were fed by the ten largest, and only one or two of the ten largest packers were involved in feeding). During the early-1970s two or three of the ten largest packers started their own feeding operation. These firms had as much as 83.4 percent of all hogs fed by packers in 1972, but in a few years the largest hog packers terminated their feeding activities, and after 1979 there has been no hog feeding by the ten largest packers (Table 4).



The total number of packing firms feeding hogs has been declining throughout the whole period. There were 31 packers feeding hogs in 1964, 17 in 1970, seven in 1980, and up to seven again in 1987 after a low of four firms in 1984 and 1985. The average size of operation increased from 1,100 head in 1964 to 10,400 head in 1972. Since then the average number of head fed has varied widely, from 12,800 head in 1976, 5,300 head in 1982, and back up to 13,900 head in 1987 (Figure 22). Even though the very largest hog slaughter packers are not involved in feeding, the packer feeding that takes place seems to be getting increasingly concentrated in a smaller number of packers (with reservations for the increase in number of packer feeders in 1986 and 1987).

### 6.3 Sheep and Lambs

As a national total, the number of sheep and lambs fed by packers declined sharply between 1973 (1.54 million head) and 1982 (103,000 head). However, since 1982 sheep and lamb feeding by packers has increased to 562,000 head in 1987, but that number is still substantially lower than the numbers for the late-1960s and early-1970s, when typically between 1.0 and 1.4 million head were fed by packers on an annual basis (Figure 23).

Nationally, the share of packer fed sheep and lambs has varied substantially since 1960. The percent of FI sheep and lambs fed by packers was 6.3 percent in 1960, rose to 18.3 percent in 1973 and then fell to 1.8 percent in 1982. Since then it has been rising, and lambs fed by packers accounted for 11.8 percent of all FI sheep and lamb slaughter in 1987. Regionally, only South Dakota and Iowa have information about lamb feeding by packers. In both states there was some packer feeding in the late-1960s and

early-1970s (15.2 percent in South Dakota in 1969 and 10.8 percent in Iowa in 1972 are the highest percentages), but in the 1980s there have been almost no packer fed lambs in the region.

The number of packers feeding sheep and lambs has also been decreasing. In 1987 there were only three slaughter packers involved in sheep/lamb feeding among FI plants in the U.S., reflective of the number of large sheep and lamb slaughtering firms remaining in the industry. This number was ten in 1979 and 1972, 20 in 1965, and 29 in 1964. Typically, six of the ten largest sheep and lamb packers were feeding sheep in the mid-1960s, a number that declined to two in the late-1980s (1987). Since the total number of packer feeders is quite low, the few feeders that are among the ten largest packers are able to handle a relatively large share of the sheep and lambs fed by packers. The largest ten fed between 80 percent and 90 percent of all sheep and lambs fed by packers in the late-1960s. This share dropped to less than 50 percent in 1978, but since then it has increased, and is at 89.9 percent in 1987. The size of packer feeding operations also varied (150,000 to 200,000 in the 1960s and 1970s to under 50,000 in 1982 before increasing to over 200,000 again in the late-1980s) (Figure 24).

#### 6.4 Calves

Calf feeding by packers is much less concentrated than cattle feeding. As a matter of fact, there have been no feeding activities among the ten largest calf slaughter packers since 1975 (Table 5). The total number of packer feeders has declined from 45 in 1964 to 10 in 1987. The total volume of calves fed by packers declined from approximately 80,000 head in the late-1960s to only 16,200 head in 1974. During the late-1970s and early-1980s

the number fluctuated nearly 50,000 head and increased to 106,000 head in 1987. The average calf packer feeding operation has increased in size from less than 2,000 head around 1965 to 5,600 head in 1986 and 10,600 head in 1987 (Table 4).

## 7. CARCASS GRADE AND WEIGHT MARKETING

### 7.1 U.S.

The share of slaughter purchased on a carcass grade and weight (CGW) basis has increased over the past 20 years (Table 5). Although the percent of hogs purchased on a grade and weight basis has increased more than three fold and cattle CGW purchases have less than doubled, more than twice as many cattle are sold on a CGW basis than hogs. For calves and sheep/lambs the number varies more, and is usually between the cattle and hog numbers.

Cattle purchased on a CGW basis increased from 17.2 percent in 1968 to 30.4 percent in 1987. The number was 35.3 percent in 1983, suggesting that the increase plateaued in the 1980s. A similar pattern exists in the U.S. hog sector. In 1968 only 3.8 percent of the nation's hogs were purchased on a CGW basis. By 1985 this share had risen to 16.2 percent but dropped again in 1986 and 1987 to 14.7 and 13.5 percent, respectively. The percent of sheep and lambs purchased on a CGW basis was 8.9 percent in 1968 and stayed around 8 to 10 percent for the next ten years. This number began fluctuating widely: 24.6 percent in 1979, 16.4 percent in 1983, 47.4 percent in 1986 and 35.9 percent in 1987. As with sheep and lambs, the calf sector's carcass based purchases constituted a relatively low share (4 to 10 percent) that gradually increased between 1968 and 1978. Starting in 1978, this share began rising more rapidly, to 17.7 percent in 1979, 30.5 percent in 1984, and finally to 36.7 percent in 1987.

## 7.2 The Region and Minnesota

Minnesota producers sell relatively more of their livestock by CGW than the country as a whole (Table 5). Minnesota and Iowa are quite similar in that sense, and in the cattle industry are both significantly higher than the U.S. A higher percentage of fed cattle in the upper-Midwest are sold CGW compared to the High Plains feedlot area where nearly all cattle are sold on live weight. One explanation is that Midwest cattle typically carry more mud on their hides affecting live, but not carcass, weight. Buyers either adjust their bid for the estimated amount of mud or offer a carcass bid. Calf slaughter in the region can be represented by Wisconsin, the dominant calf slaughter state in the region and the only state reporting data for all years. From a low of 4.7 percent in 1970, CGW purchases increased to 48 percent in 1984 before retreating to 30.1 percent in 1987. Wisconsin numbers are generally higher than the U.S. numbers, with the exception of 1986 and 1987.

Carcass grade and weight purchases of hogs have been increasing through the 1970s, but peaked and have been gradually decreasing during the 1980s (Table 6). One explanation for the decline is the buying practices of a leading packer, IBP, which rewards producers for high quality hogs, on a live basis. Thus, farmers do not have to sell CGW to receive a premium for superior hogs. The Iowa and U.S. numbers follow each other quite closely, from 5 to 6 percent in 1968 to 14.2 percent for the U.S. and 18.4 percent for Iowa in 1982. Iowa then started declining to 10.5 percent in 1987, while the U.S. as a whole held it up to 13.5 percent in 1987. (IBP, which has a relatively large market share in Iowa, began operations in 1983.) The share of hog CGW purchases is generally higher in Minnesota than in either Iowa or whole U.S. It was 7 percent in Minnesota in 1968 and increased to

33.8 percent by 1981. During the 1980s the share dropped slightly and was 30.6 percent in 1987.

The share of sheep and lamb slaughter purchased by CGW has fluctuated widely for the states in the region since the late-1960s. U.S. numbers show an increase in CGW purchases, but the states in the region have generally trended to fewer carcass purchases of sheep and lambs.

In Minnesota, cattle have the highest share of animals purchased on a CGW basis. The carcass based share increased from 26.5 percent in 1968 to 57.3 percent in 1987 for cattle. The hog industry has also increased the CGW share, but here the increase has been from 7 percent in 1968 to 33.8 percent in 1981, before it sank to 30.6 percent in 1987. The sheep sector in Minnesota trades a lower share of animals by CGW than the cattle and hog industries. It remained less than 10 percent during the 1980s, with the exception of 1973 and 1986 (Table 5).

## 8. MARKET OUTLETS: NUMBER AND VOLUME

### 8.1 Number of Market Outlets

There are three general market types through which packers purchase animals for slaughter that will be the focus of this section: These are auction markets, terminal stockyards, and nonpublic direct markets. Stockyards and auctions are a central location that brings together buyers and sellers, or their representatives. Direct trade includes producers selling directly to packers and packer buying stations. An additional marketing outlet is the livestock dealer, or order buyer, that typically represents the buyer. This analysis focuses only on animals purchased for slaughter and not feeder livestock or breeding animals.

The first auction-market sales in the country took place in 1930. By 1950, the number of auction markets had increased to 240 and peaked in 1962 with 2,222 auction markets. The number has been reduced somewhat since then to 1,564 in 1986. The number of terminal markets has been decreasing steadily since the 1920s and 1930s when there were approximately 80 terminal markets. This number dropped to 68 in 1950, 36 in 1970, and 28 in 1980. By 1986, only 21 terminal markets remained nationwide. The decline in the number of terminal markets and, as is shown below, the volume traded is directly related to the movement of slaughtering facilities from cities and terminal markets to modern slaughter plants near the production areas.

Table 6 provides more detailed information about the number of markets in the region and individual states. Although these data cover only the early-1980s, the trends are fairly obvious. Each of the five states had one terminal market in 1986 (Iowa had two from 1981 to 1985). The number of auction markets declined from 266 in 1981 to 239 in 1986 for the region, and from 49 to 41 in Minnesota. It should be noted that the number of auction markets is not decreasing for of all the states in the region. South Dakota has been quite stable in recent years with 49 auction markets 1981, 50 in 1984, and 49 in 1986. Wisconsin has experienced an increase in the number of auction markets, from 28 in 1981 to 33 in 1986. Nevertheless, for the nation and the region as a whole, the number of livestock auction markets is decreasing. The number of local dealers and order buyers is also declining in general, but fluctuates from year to year. For the whole country, the number of dealers and order buyers has declined from 6,261 in 1981 to 5,799 in 1986. The number for the region was 1,231 in 1981, 1,379 in 1983, and 1,111 in 1986. Minnesota saw a reduction in the number of dealers and order buyers from 317 in 1981 to 221 in 1986.

## 8.2 Volume of Sales by Market

### 8.2.1 Cattle

#### 8.2.1.1 U.S

Direct marketing is becoming the dominant way of selling slaughter cattle in the U.S. (Figure 25). Direct sales accounted for 38.6 percent of cattle sales in 1960 and 80.2 percent in 1987. Auction marketing has been fairly stable during the same period, 15.6 percent in 1960, 16.3 percent in 1970, and 15.6 percent in 1987. However, cattle sales through public terminal markets declined from 45.8 percent in 1960 to only 4.2 percent in 1987.

#### 8.2.1.2 Region

The regional data do not quite confirm or conform to the national trends. Direct marketing did not increase in the 1968 to 1987 period. In the early-1970s approximately 70 percent of slaughter cattle sales were direct from feeder to packer. This number stayed relatively constant through the 1970s until it started to decline slightly in the 1980s. Direct marketing made up 61.1 percent of all regional cattle sales in 1987 (Table 7). At least part of the decline may be due to a declining number of fed cattle packers in the region, thus leaving the farmer no options but the auction or the terminal market. The number of fed cattle in the region also declined during this period. Fed cattle are typically sold directly while nonfed cattle (i.e., cull cows and bulls) are traded at auctions and terminal markets. Thus, the market mix between fed and nonfed slaughter in the region changed away from direct markets.

Auction marketing seems to have gained a foothold, increasing its share of sales from 7.6 percent in 1968 to 23.6 percent in 1987. Cattle sales through terminal markets have decreased in the region between 1968 and 1987, but not nearly as dramatically as at the national level. Terminal markets

facilitated 29.9 percent of all cattle sales in 1968, but fell more than 10 percentage points by 1972, to 19.6 percent. Since then, terminal markets have had a fairly stable share of the region's cattle marketings, and in 1987 this share was 15.2 percent.

#### 8.2.1.3 Minnesota

Minnesota slaughter cattle sales in 1987 were primarily direct sales from farmer to slaughterer (70.9 percent). The remaining volume was evenly distributed between auction sales (14.4 percent) and terminal markets (14.6 percent). Direct sales have been increasing (49.3 percent in 1968) as have auction sales (2.8 percent in 1968). Sales through public terminal markets, on the other hand, had 47.9 percent of the volume sold in 1968, and have fallen by two-thirds to 14.6 percent in 1987.

#### 8.2.2 Hogs

##### 8.2.2.1 U.S.

Between 1960 and 1987, direct marketing increased its share of hog marketings to packers from 61.0 to 88.8 percent (Figure 26). In the same time span, terminal markets decreased their share of the total hog volume from 30.3 to 6.3 percent. Auction markets had a 8.7 percent share in 1960 which grew to 15.5 percent by 1967, but this share has since been decreasing and fell to 4.9 percent in 1987.

##### 8.2.2.2 Region

Hog purchases in the region go mainly through direct channels (Table 7). Direct marketing increased from 81.5 percent in 1968 to 89.8 percent in 1987.



Terminal markets handled 14.0 percent of the region's hog volume in 1968, but in 1987 this share was only 7.1 percent. Auction markets typically traded less than 5 percent of the hog volume between 1968 and 1987.

#### 8.2.2.3 Minnesota

Auction marketing is almost not present in the Minnesota hog industry; less than 1 percent of the annual sales goes through auction markets. The bulk of Minnesota hogs are sold directly to packers. This type of marketing handled 71.6 percent of all sales in 1968, and in 1987 this share was as high as 95.6 percent. The remainder, 28.2 percent in 1968 and 3.7 percent in 1987, were sold at public terminal markets.

#### 8.2.3 Sheep

##### 8.2.3.1 U.S.

As in the hog and cattle industries, the U.S. sheep sales are, to an increasing extent, going through direct market channels. Figure 27 shows that this share has increased from 54.0 percent in 1960 to 81.4 percent in 1987. Auction sales of sheep have been stable at between 10 percent and 15 percent during the same period. Sheep and lamb sales via terminal public markets were 35.4 percent in 1960, but those sales had decreased to 5.5 percent in 1987.

##### 8.2.3.2 Region and Minnesota

Sheep and lamb marketings are quite similar for the region and for Minnesota. Direct marketing accounted for approximately 60 to 80 percent between 1968 and 1987. The sales through auction and terminal markets vary from year-to-year, and a clear trend is difficult to identify.

#### 8.2.4 Calves

##### 8.2.4.1 U.S.

Calf sales in the U.S. are, like cattle sales, increasingly performed through direct market channels, 42.5 percent in 1960 and 61.0 percent in 1987. But, as Figure 28 indicates, a significant share of the calf sales are conducted at auction markets. In 1960, 32.1 percent of all calves were sold at auctions. This number increased to 62.3 percent by 1976, but has since decreased and was 35.8 percent in 1987. Terminal markets had 25.4 percent of all U.S. calf sales in 1960, but have been losing shares through the period and handled only 3.2 percent of the calf sales in 1987.

##### 8.2.4.2 Region

The regional sales of calves have followed a pattern similar to the national trend. However, sales through terminal markets have a significantly greater share in the region. Even though terminal markets have lost some of the 1968 share (27.5 percent), it was still as high as 17.3 percent in 1987. Direct marketing accounted for 52.1 percent of calf sales in 1968, 37.5 percent in 1974, and 57.7 percent in 1987. The 1987 value is typical for the share marketed directly in the early-1980s. Auction marketings varied from 24.7 percent and 43.3 percent in the early-1970s and seem to have stabilized near 30 percent in the 1980s. The last available data, 1987, show that auction markets had 25.0 percent of the region's calf slaughter marketings.

##### 8.2.4.3 Minnesota

Minnesota calf sales are too small in volume and, thus, too unstable to analyze the markets, but between 1980 and 1987 typically 80 to 90 percent of the state's calf sales have been through direct market channels.

## 9. PRODUCTION VERSUS PROCESSING

In a discussion about livestock processing it is of interest to know whether the livestock produced in a certain geographic area is also processed in the same region or must travel elsewhere. One might argue that the long run success of a region's livestock industry depends on some type of equilibrium between production and processing capacity. Livestock producers near a slaughter facility receive a higher net selling price, and, therefore, higher returns, due to a lower transportation cost than producers that must haul animals great distances. Similarly, slaughter plants that have a ready supply of animals nearby arguably have lower procurement costs than plants with a larger geographic buying area. Also interesting, particularly to a single state, is the location of larger commercial slaughter plants. That is, if a plant is not located within a state's boundaries, thus creating jobs and tax revenues, is it close enough to still be a viable market for the state's livestock producers?

Although data describing this relationship over a long enough period of time are unavailable, the situation between 1983 and 1987 can be examined. Figures 29 and 30 indicate that commercial slaughter is less than total production in both the region and Minnesota. Thus, some livestock must be exported for slaughter rather than shipped in for slaughter. The exception seems to be the sheep industry.

### 9.1 Cattle

The region's cattle slaughter industry slaughters less than the total number of cattle that the region's farmers produce. Between 1983 and 1987, 70 to 80 percent of the region's cattle production was killed in the region.

Plants in states bordering the region (Nebraska and Illinois) were likely recipients of the excess slaughter cattle (Figure 31).

Although several smaller cull cow and bull slaughtering facilities operate in the region, the location of steer and heifer slaughtering plants is more crucial to the future of the beef sector. In particular, plants with an annual capacity of 100,000 head or more are of interest. The region has a total of ten packers meeting this criteria, two in Minnesota, two in Wisconsin, one in South Dakota and five in Iowa. In addition, there are seven plants in Nebraska and two in Illinois that are within 50 miles of the regional boundary. While there are areas within the region that are a great distance from one and particularly two or more packers, the region as a whole is fairly well blessed with packers as there were only 66 of these plants in the U.S. in 1989.

Minnesota's cattle industry seems to be losing slaughter capacity relative to production. Approximately 64.3 percent of the state's production was slaughtered in Minnesota in 1987 compared to 76.2 percent in 1983. Within the state of Minnesota, packer access varies greatly. Southwest Minnesota has two steer and heifer plants and is relatively close to plants in Sioux Falls, South Dakota, and two in northwest Iowa. The remainder of the state is further from packers, as Wisconsin's plants are located on the eastern side of the state.

## 9.2 Hogs

The percentage of hogs slaughtered in the region is higher than for cattle; over 90 percent (95.5 percent in 1987) are generally slaughtered within the region. Iowa is a hog deficit state, slaughtering more than it produces, while the remainder of the states are hog surplus.

As is the case in cattle, the region is fairly well blessed with large commercial hog packers. Although the number changes with plant openings and closings, it had approximately half of the nation's hog slaughtering plants with capacity to slaughter one million head or more per year (Figure 32). Iowa has 12 of the region's 17 plants that were open or scheduled to open as of late-1990. Minnesota had three and South Dakota had two plants. Nebraska and Illinois also have nearby packers.

Except for a low of 65.3 percent in 1985, the Minnesota hog processing industry has been absorbing between 80 and 90 percent of the state's hog production. This number was 83.8 percent in 1987. Minnesota's three packers are located in the southern tier of counties as is the bulk of the state's hog production. One of the plants was closed during most of 1990, but was scheduled to reopen in January 1991. Southern Minnesota producers are also served by packers in southeastern South Dakota and the northern half of Iowa.

### 9.3 Sheep, Lambs, and Calves

The region was a net importer of sheep and lambs to be slaughtered between 1983 and 1986, but in 1987 the region's sheep slaughtering industry processed only 81.4 percent of the region's production. These wide swings are typically tied to the closing of a single plant rather than abrupt changes in production. Minnesota slaughtered 59.3 percent more than its own sheep production in 1983, and in 1987 the Minnesota sheep slaughtering plants slaughtered 2.4 times the state's own production. The situation is quite different from the other livestock sectors.

The portion of calves slaughtered within the region is difficult, if not impossible, to document because only a percentage of the calves in a region are produced for slaughter. The remainder are fed to a mature slaughter

weight as fed cattle or replacement heifers. Therefore, only about 20 percent of the calves produced in the region are slaughtered here. Minnesota calf slaughter is only about 2 percent of the total calves produced in the state.

#### 10. SUMMARY

Livestock slaughter and markets in Minnesota and the Upper North Central region have largely followed national trends. Slaughter volume is determined primarily by livestock inventories and fluctuates with animal numbers. Although regional slaughter volume of cattle and hogs has remained relatively stable over the past 30 years, the regional share of the U.S. total slaughter has declined for cattle and increased for hogs. Minnesota's share of the U.S. total has trended slightly downward. Sheep and lamb and calf slaughter volumes have declined in the region and Minnesota. However, the region's share of sheep and lamb slaughter has increased since 1960 and the share of calf slaughter has dropped only slightly.

The slaughter plant number and size in the region and Minnesota also follow the national trend. The number of FI slaughter facilities has declined for all four species and all categories (U.S., region, and Minnesota). Likewise, the average size of slaughter plants has increased. Minnesota's average plant size is similar to the U.S., but the region's average size is approximately twice the national and state size. The region's higher volume relative to the U.S. reflects the higher volume of large fed cattle and hog slaughtering facilities in Iowa and southern Minnesota. The trend has been to larger cattle and hog slaughter plants. In particular, the percent slaughtered in the largest plants (over 500,000 and 1,500,000 annually for cattle and hogs, respectively) increased throughout the 1980s.

## **APPENDIX**

Table 1. Commercial Livestock Slaughter By Species, 1960-1989: United States, Upper North Central Region, and Minnesota

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
<b>United States</b>	(1000 Head)									
Cattle	25224.3	25634.6	26083.3	27231.7	30867.7	32397.9	33783.4	33928.5	35090.5	35298.3
Calves	8224.9	7701.2	7494.3	6832.9	7253.8	7419.7	6646.9	5919.3	5443.1	4862.8
Hogs	79036.3	77334.7	79334.3	83323.5	83083.7	73852.3	74076.1	82184.5	85219.8	83892.8
Sheep/Lanbs	15899.3	17190.0	16836.8	15821.9	14594.7	13007.5	12738.3	12790.9	11884.1	10690.7
<b>Upper North Central Region</b>										
Cattle	5336.7	5618.1	5761.7	6279.8	7115.4	7547.2	7767.5	8208.4	8719.9	8108.4
Calves	1784.2	1598.6	1471.3	1361.6	1410.8	1523.1	1256.0	1135.0	1007.0	788.2
Hogs	25496.4	25350.8	25455.6	27715.0	28449.7	25879.1	27044.5	30885.6	32678.8	32457.6
Sheep/Lanbs	3310.4	3528.2	2995.2	2508.5	2357.2	2153.5	2173.0	1849.4	1776.2	1503.9
<b>Minnesota</b>										
Cattle	1424.0	1408.5	1393.0	1453.0	1696.0	1607.0	1717.0	1900.0	1985.0	1868.0
Calves	261.2	221.7	202.3	196.5	230.3	232.7	190.4	200.4	155.0	98.0
Hogs	5428.0	5654.0	5566.0	5820.0	5792.0	5210.0	5157.0	5875.0	6232.0	6090.0
Sheep/Lanbs	1073.5	1261.0	995.5	820.0	875.5	772.5	854.0	750.5	672.0	563.0
<b>North Dakota</b>										
Cattle	17.7	96.1	109.2	123.8	153.9	157.2	157.5	183.4	206.9	183.4
Calves	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Hogs	18.4	17.8	17.6	17.0	16.7	17.1	21.5	23.6	29.8	28.6
Sheep/Lanbs	1.5	39.8	71.7	94.2	111.5	72.0	85.8	119.6	133.3	80.4
<b>South Dakota</b>										
Cattle	417.5	457.5	475.5	491.0	560.5	575.0	625.0	729.5	719.5	681.5
Calves	0.1	0.4	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3
Hogs	2154.0	2308.0	2451.0	2654.0	2588.0	2250.0	2356.0	2454.0	2565.0	2517.0
Sheep/Lanbs	568.5	440.0	375.0	387.5	370.5	367.0	425.0	444.5	429.0	376.0
<b>Iowa</b>										
Cattle	2499.0	2738.0	2907.0	3248.0	3630.0	3987.0	4046.0	4229.0	4588.0	4130.0
Calves	389.8	383.1	403.5	347.2	377.1	430.5	331.5	313.5	311.9	261.7
Hogs	14455.0	14231.0	14211.0	15843.0	16571.0	15406.0	16530.0	19493.0	20804.0	20738.0
Sheep/Lanbs	1481.0	1635.0	1485.5	1181.5	976.0	917.5	792.5	519.5	530.5	474.5
<b>Wisconsin</b>										
Cattle	978.5	918.0	877.0	964.0	1075.0	1221.0	1222.0	1166.5	1220.5	1245.5
Calves	1132.5	993.0	865.0	817.5	803.0	859.5	733.5	620.5	539.5	428.2
Hogs	3441.0	3140.0	3210.0	3381.0	3482.0	2996.0	2980.0	3040.0	3048.0	3084.0
Sheep/Lanbs	185.9	152.4	67.5	25.3	23.7	24.5	15.7	15.3	11.4	10.0
<b>Region's Share of United States</b>	(Percent)									
Cattle	21.16	21.92	22.09	23.06	23.05	23.30	22.99	24.19	24.85	22.97
Calves	21.69	20.76	19.63	19.93	19.45	20.53	18.90	19.17	18.50	16.21
Hogs	32.26	32.78	32.09	33.26	34.24	35.04	36.51	37.58	38.35	38.69
Sheep/Lanbs	20.82	20.52	17.79	15.85	16.15	16.56	17.06	14.46	14.95	14.07
<b>Minnesota's Share of Region</b>										
Cattle	26.68	25.07	24.18	23.14	23.84	21.29	22.10	23.15	22.76	23.04
Calves	14.64	13.87	13.75	14.43	16.32	15.28	15.16	17.66	15.39	12.43
Hogs	21.29	22.30	21.87	21.00	20.36	20.13	19.07	19.02	19.07	18.76
Sheep/Lanbs	32.43	35.74	33.24	32.69	37.14	35.87	39.30	40.58	37.83	37.44
<b>Minnesota's Share of United States</b>										
Cattle	5.65	5.49	5.34	5.34	5.49	4.96	5.08	5.60	5.66	5.29
Calves	3.18	2.88	2.70	2.88	3.17	3.14	2.86	3.39	2.85	2.02
Hogs	6.87	7.31	7.02	6.98	6.97	7.05	6.96	7.15	7.31	7.26
Sheep/Lanbs	6.75	7.34	5.91	5.18	6.00	5.94	6.70	5.87	5.65	5.27

(continued)



**Table 1. Commercial Livestock Slaughter By Species, 1960-1989: United States, Upper North Central Region, and Minnesota**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<b>United States</b>	(1000 Head)									
<b>Cattle</b>	35086.7	35650.7	35842.4	33686.8	36811.5	40911.2	42654.4	41856.4	39552.1	33677.6
<b>Calves</b>	4072.3	3689.2	3052.9	2248.8	2987.4	5209.4	5350.1	5517.1	4170.2	2823.9
<b>Hogs</b>	85867.4	94488.2	84759.9	76795.0	81761.9	68686.8	73783.9	77303.0	77315.2	89099.1
<b>Sheep/Lanbs</b>	10551.8	10729.2	10301.0	9597.0	8846.6	7834.9	6713.5	6355.8	5368.9	5017.1
<b>Upper North Central Region</b>										
<b>Cattle</b>	7988.4	7649.8	8019.3	7457.4	7975.3	8183.7	8910.6	8506.5	7385.4	5908.0
<b>Calves</b>	566.6	500.0	404.2	312.5	444.6	837.8	938.8	888.3	662.9	509.2
<b>Hogs</b>	33696.1	36535.1	31796.6	30187.1	31749.5	24718.9	27436.4	29250.7	29943.4	33666.2
<b>Sheep/Lanbs</b>	1196.6	1117.2	1128.3	1078.2	934.1	756.7	814.2	875.8	801.3	894.3
<b>Minnesota</b>										
<b>Cattle</b>	1654.0	1585.0	1493.0	1242.0	1312.5	1547.0	1571.0	1410.2	1324.1	1040.1
<b>Calves</b>	12.1	7.3	7.5	7.8	8.9	17.2	14.2	11.6	a.7	5.9
<b>Hogs</b>	5567.0	6086.0	5087.0	5336.0	5842.0	4428.0	4918.0	4974.1	5111.3	5346.4
<b>Sheep/Lanbs</b>	359.5	247.5	231.3	233.3	207.6	200.0	213.3	277.8	260.0	357.8
<b>North Dakota</b>										
<b>Cattle</b>	195.9	199.8	206.3	172.4	217.3	283.2	273.6	276.0	116.9	57.3
<b>Calves</b>	0.1	0.1	0.1	0.1	0.1	0.4	0.4	1.5	0.4	0.3
<b>Hogs</b>	35.1	38.1	31.6	27.1	33.5	21.9	22.4	20.1	20.3	27.4
<b>Sheep/Lanbs</b>	0.8	0.8	0.9	1.2	1.0	1.3	1.2	0.8	0.6	0.7
<b>South Dakota</b>										
<b>Cattle</b>	661.5	506.0	550.0	559.0	713.0	744.5	822.0	775.6	733.9	552.0
<b>Calves</b>	0.1	0.1	0.1	0.1	0.1	0.6	0.2	0.2	0.2	0.2
<b>Hogs</b>	2606.0	2841.0	2438.0	2340.0	2566.0	2029.0	2245.0	2397.6	2619.3	3232.2
<b>Sheep/Lanbs</b>	377.0	386.0	427.5	450.0	415.0	330.6	314.4	285.0	291.8	371.8
<b>Iowa</b>										
<b>Cattle</b>	4322.0	4281.0	4662.0	4284.0	4447.0	4167.0	4687.0	4556.0	3957.1	3234.8
<b>Calves</b>	207.8	204.7	163.5	97.8	142.7	398.1	463.0	397.0	241.7	155.9
<b>Hogs</b>	22094.0	23787.0	20932.0	19411.0	19832.0	15190.0	17043.0	18653.8	19545.3	22882.4
<b>Sheep/Lanbs</b>	454.5	479.5	465.0	389.3	305.6	220.0	280.2	306.8	243.7	158.5
<b>Wisconsin</b>										
<b>Cattle</b>	1155.0	1078.0	1108.0	1200.0	1285.5	1442.0	1557.0	1488.7	1253.4	1023.8
<b>Calves</b>	346.5	287.7	233.0	206.7	292.8	421.5	461.0	478.0	411.9	346.9
<b>Hogs</b>	3394.0	3783.0	3308.0	3073.0	3476.0	3050.0	3208.0	3205.1	2647.2	2177.8
<b>Sheep/Lanbs</b>	4.8	3.4	3.6	4.4	4.9	4.8	5.1	5.4	5.2	5.5
<b>Region's Share of United States</b>	(Percent)									
<b>Cattle</b>	22.77	21.46	22.37	22.14	21.67	20.00	20.89	20.32	18.67	17.54
<b>Calves</b>	13.91	13.55	13.24	13.90	14.88	16.08	17.55	16.10	15.90	18.03
<b>Hogs</b>	39.24	38.67	37.51	39.31	38.83	35.99	37.18	37.84	38.73	37.79
<b>Sheep/Lanbs</b>	11.34	10.41	10.95	11.23	10.56	9.66	12.13	13.78	14.92	17.82
<b>Minnesota's Share of Region</b>										
<b>Cattle</b>	20.71	20.72	18.62	16.65	16.46	18.90	17.63	16.58	17.93	17.60
<b>Calves</b>	2.14	1.46	1.86	2.50	2.00	2.05	1.51	1.31	1.31	1.16
<b>Hogs</b>	16.52	16.66	16.00	17.68	18.40	17.91	17.93	17.01	17.07	15.88
<b>Sheep/Lanbs</b>	30.04	22.15	20.50	21.64	22.22	26.43	26.20	31.72	32.45	40.01
<b>Minnesota's Share of United States</b>										
<b>Cattle</b>	4.71	4.45	4.17	3.69	3.57	3.78	3.68	3.37	3.35	3.09
<b>Calves</b>	0.30	0.20	0.25	0.35	0.30	0.33	0.27	0.21	0.21	0.21
<b>Hogs</b>	6.48	6.44	6.00	6.95	7.15	6.45	6.67	6.43	6.61	6.00
<b>Sheep/Lanbs</b>	3.41	2.31	2.25	2.43	2.35	2.55	3.18	4.37	4.84	7.13

(continued)

**Table 1. Commercial Livestock Slaughter By Species, 1960-1989: United States, Upper North Central Region, and Minnesota**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
<b>United States</b>	(1000 Head)									
Cattle	33806.7	34953.4	35843.3	36648.9	37581.8	36292.7	37288.3	35646.9	35078.9	33917.2
Calves	2588.1	2798.3	3020.9	3076.7	3297.3	3385.3	3408.0	2814.7	2505.8	2172.3
Hogs	96074.1	91575.0	82189.7	87584.3	85168.1	84491.9	79598.2	81080.8	87794.6	88691.5
Sheep/Lanbs	5579.3	6008.1	6448.7	6619.4	6759.0	6165.2	5635.0	5199.6	5293.0	5464.8
<b>Upper North Central Region</b>										
Cattle	5776.8	6214.9	6197.2	6548.7	5809.8	5155.9	5314.1	5098.8	5007.3	4881.1
Calves	396.6	402.3	423.2	449.5	421.8	401.6	396.7	371.4	346.3	319.1
Hogs	36702.4	35282.8	29223.9	32736.8	31911.9	31400.3	30140.8	32154.9	33850.8	34912.5
Sheep/Lanbs	935.5	1077.2	1322.5	1547.9	1809.9	1622.6	1234.1	972.9	975.0	958.8
<b>Minnesota</b>										
Cattle	929.7	1023.2	1037.6	1164.8	1085.6	1025.5	1013.2	999.6	1098.6	1004.4
Calves	5.7	5.2	5.1	4.9	4.4	4.1	3.7	3.0	2.2	2.1
Hogs	5638.8	5522.1	5537.0	5793.5	5506.0	4658.1	5862.1	5947.0	4589.0	5193.6
Sheep/Lanbs	514.0	552.7	595.7	476.3	467.1	437.4	347.1	380.7	395.4	335.7
<b>North Dakota</b>										
Cattle	134.5	165.7	170.0	159.0	182.3	161.4	146.7	81.6	162.0	193.5
Calves	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.0
Hogs	50.7	57.6	49.3	70.2	78.4	85.0	81.0	71.7	81.0	77.8
Sheep/Lanbs	0.9	1.0	1.0	1.0	1.0	0.9	0.8	0.8	0.9	1.2
<b>South Dakota</b>										
Cattle	565.9	600.3	598.4	682.4	688.3	657.8	756.9	569.9	584.8	614.7
Calves	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0
Hogs	3219.4	3085.7	2909.3	3009.3		2980.8	3424.2	3769.2	4004.8	3710.7
Sheep/Lanbs	412.2	423.6	405.5	508.0	498.1	335.2	358.2	87.0	3.4	81.8
<b>Iowa</b>										
Cattle	2999.8	3370.9	3231.5	3296.3	2594.1	1992.8	1969.0	2132.8	1920.1	1862.5
Calves	0.9	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Hogs	25498.1	24154.5	18663.2	21427.6	20885.8	21096.2	18711.2	21262.3	24892.6	25586.3
Sheep/Lanbs	1.7	90.1	309.5	551.0	832.4	840.1	520.5	497.5	566.3	529.2
<b>Wisconsin</b>										
Cattle	1147.7	1054.8	1159.7	1246.2	1259.5	1318.4	1428.3	1314.9	1241.8	1206.0
Calves	389.3	396.4	417.7	444.0	416.8	397.0	392.2	368.0	343.7	317.0
Hogs	2295.4	2462.9	2065.1	2436.2	2104.9	2580.2	2062.3	1104.7	283.4	344.1
Sheep/Lanbs	6.7	9.8	10.8	11.6	11.3	9.0	7.5	6.9	9.0	10.9
<b>Region's Share of United States</b>	(Percent)									
Cattle	17.09	17.78	17.29	17.87	15.46	14.21	14.25	14.30	14.27	14.39
Calves	15.32	14.38	14.01	14.61	12.79	11.86	11.64	13.19	13.82	14.69
Hogs	38.20	38.53	35.56	37.38	37.47	37.16	37.87	39.66	38.56	39.36
Sheep/Lanbs	16.77	17.93	20.51	23.38	26.78	26.32	21.90	18.71	18.42	17.54
<b>Minnesota's Share of Region</b>										
Cattle	16.09	16.46	16.74	17.79	18.69	19.89	19.07	19.60	21.94	20.58
Calves	1.44	1.29	1.21	1.09	1.04	1.02	0.93	0.81	0.64	0.66
Hogs	15.36	15.65	18.95	17.70	17.25	14.83	19.45	18.49	13.56	14.88
Sheep/Lanbs	54.94	51.31	45.04	30.77	25.81	26.96	28.13	39.13	40.55	35.01
<b>Minnesota's Share of United States</b>										
Cattle	2.75	2.93	2.89	3.18	2.89	2.83	2.72	2.80	3.13	2.96
Calves	0.22	0.19	0.17	0.16	0.13	0.12	0.11	0.11	0.09	0.10
Hogs	5.87	6.03	6.74	6.61	6.46	5.51	7.36	7.33	5.23	5.86
Sheep/Lanbs	9.21	9.20	9.24	7.20	6.91	7.09	6.16	7.32	7.47	6.14

Source: USDA, Livestock Slaughter, Annual Reports.

Commercial Slaughter includes federal inspected and nonfederal inspected, but excludes farm slaughter. Hawaii not included in U.S. total in years 1960-1963.

Upper North Central Region includes Minnesota, North Dakota, South Dakota, Iowa, and Wisconsin.

Table 2. Number and Volume of Federally Inspected Livestock Slaughter Plants by Species: U.S., Region, and Minnesota, 1975-1989

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
<b>Cattle: Number of FI Slaughter Plants</b>															
United States	1547	1665	1568	1531	1477	1411	1555	1506	1502	1500	1451	1380	1317	1252	1203
Minnesota	68	73	59	58	57	51	50	47	46	47	47	47	44	43	41
North Dakota	0	38	0	36	0	0	0	0	0	0	0	0	0	0	0
South Dakota	0	8	8	11	11	10	10	10	11	9	10	10	8	7	9
Iowa	29	29	29	27	27	20	19	17	16	17	12	9	11	11	12
Wisconsin	14	12	16	13	13	13	11	11	10	9	9	9	12	12	13
Region	111	162	112	145	108	94	90	85	83	82	78	75	75	73	75
<b>Cattle: Slaughter Volume (1000)</b>															
United States	36903.7	38991.6	38717.0	36947.5	31892.6	31903.1	32707.8	33858.2	34814.8	35782.8	34602.3	35593.8	34004.0	34167.8	33008.8
Minnesota	1441.0	1463.5	1331.5	1254.4	988.6	872.0	954.4	976.4	1096.6	1028.7	968.2	957.2	947.6	1072.5	970.8
North Dakota	0.0	256.8	0.0	103.7	0.0	534.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Dakota	0.0	781.0	738.6	698.4	528.5		563.5	566.4	647.4	657.7	622.4	722.7	535.7	546.0	590.8
Iowa	4071.7	4592.1	4465.9	3871.0	3171.4	2936.6	3289.9	3165.1	3229.1	2522.5	1897.9	1868.0	2054.3	1882.6	1812.7
Wisconsin	1279.6	1393.0	1348.4	1121.4	916.1	1033.0	938.9	1041.6	1139.6	1160.0	1221.7	1321.8	1225.1	1153.8	1156.0
Region	6792.3	8486.4	7884.4	7048.9	5604.6	5376.1	5746.7	5749.5	6112.7	5368.9	4710.2	4869.7	4762.7	4654.9	4530.3
Region/U.S.	18.4	21.8	20.4	19.1	17.6	16.9	17.6	17.0	17.6	15.0	13.6	13.7	14.0	13.6	13.7
Minnesota/Region	21.2	17.2	16.9	17.8	17.6	16.2	16.6	17.0	17.9	19.2	20.6	19.7	19.9	23.0	21.4
<b>Calves: Number of FI Slaughter Plants</b>															
United States	822	897	919	854	745	742	821	836	817	854	831	792	686	603	563
Minnesota	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota	13	0	0	0	9	11	0	0	9	10	7	8	6	4	0
South Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iowa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wisconsin	0	7	0	10	11	10	9	10	9	8	7	8	9	11	9
Region	45	7	0	10	20	21	9	10	18	18	14	16	15	15	9
<b>Calves: Slaughter Volume (1000)</b>															
United States	3893.6	4438.2	4696.3	3620.2	2533.9	2311.1	2469.5	2728.3	2797.6	3018.4	3145.0	3168.6	2643.5	2431.9	2099.4
Minnesota	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North Dakota	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
South Dakota	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iowa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wisconsin	0.0	456.2	0.0	409.4	352.1	390.5	393.7	416.1	442.6	413.9	391.5	382.0	358.2	335.6	
Region	15.8	456.2	0.0	409.4	352.2	390.6	393.7	416.1	442.6	413.9	391.5	382.1	358.2	335.6	316.5
Region/U.S.	0.4	10.3	0.0	11.3	13.9	16.9	15.9	15.3	15.8	13.7	12.4	12.1	13.6	13.8	15.1
Minnesota/Region	99.4	0.0	ERR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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(continued)

**Table 2. Number and Volume of Federally Inspected livestock Slaughter Plants by Species: United States, Upper North Central Region, and Minnesota, 1975-1989 (continued)**

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
<b>Hogs: Number of FI Slaughter Plants</b>															
United States	1189	1322	1231	1229	1232	1235	1388	1344	1330	1341	1310	1250	1182	1150	1114
Minnesota	56	59	54	54	52	49	48	46	45	48	47	44	41	41	39
North Dakota	33	35	32	31	29	29	0	0	0	0	0	0	0	0	0
South Dakota	4	5	5	0	0	0	0	0	0	0	8	0	0	0	9
Iowa	26	26	25	29	28	27	27	25	26	25	22	23	23	22	21
Wisconsin	7	6	10	9	0	0	0	0	0	a	0	0	0	10	10
Region	126	131	126	123	109	105	75	71	71	73	77	67	64	73	79
<b>Hogs: Slaughter Volume (1000)</b>															
United States	64926.0	70453.7	74018.5	74138.9	86526.5	92464.4	87607.5	79258.7	84773.5	82229.5	81564.6	76739.6	78126.7	86355.2	86320.8
Minnesota	4372.4	4858.5	4918.0	5058.3	5324.0	5576.5	5429.4	5482.0	5725.5	5443.5	4585.8	5781.3	5883.9	4619.8	5140.0
North Dakota	12.0	12.6	12.6	11.8	15.4	37.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Dakota	2005.9	2221.5	2373.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2940.6	0.0	0.0	0.0	3684.4
Iowa	15120.9	16975.1	18585.0	19464.6	23060.3	25527.7	23998.3	18582.0	21350.3	20747.6	20938.3	18581.7	21091.4	25190.0	25530.4
Wisconsin	2974.2	3129.7	3128.2	2573.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	198.3	268.9
Region	24485.4	27197.4	29017.3	27107.7	28399.7	31141.3	29427.7	24064.0	27075.8	26191.1	28464.7	24363.0	26975.3	30008.1	34623.7
Region/U.S.	37.7	38.6	39.2	36.6	32.8	33.7	33.6	30.4	31.9	31.9	34.9	31.7	34.5	34.7	40.1
Minnesota/Region	17.9	17.9	16.9	18.7	18.7	17.9	18.4	22.8	21.1	20.8	16.1	23.7	21.8	15.4	14.8
<b>Sheep and Lambs Number of FI Slaughter Plants</b>															
United States	789	878	884	880	835	849	990	986	1016	1034	1008	954	906	877	869
Minnesota	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota	23	27	26	28	24	26	24	23	19	22	19	20	19	18	19
South Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iowa	0	3	0	0	0	0	0	0	0	4	3	0	0	0	0
Wisconsin	0	0	0	0	0	0	0	0	0	0	3	0	0	6	0
Region	23	66	26	28	24	26	24	23	19	26	25	20	19	24	19
<b>Sheep and Lamb: Slaughter Volume (1000)</b>															
United States	7551.9	6473.5	6132.8	5169.0	4895.6	5404.8	5770.8	6265.0	6412.0	6527.8	5946.4	5439.1	5001.9	5167.5	5295.0
Minnesota	0.0	211.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North Dakota	0.5	0.4	0.4	0.4	0.3	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.7
South Dakota	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iowa	0.0	278.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	822.8	824.7	0.0	0.0	0.0	0.0
Wisconsin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Region	0.5	490.7	0.4	0.4	0.3	0.5	0.5	0.5	0.5	823.4	825.1	0.4	0.4	1.0	0.7
Region/U.S.	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	13.9	0.0	0.0	0.0	0.0
Minnesota/Region	0.0	43.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: USDA, Livestock Slaughter

Plants and volume may not be reported for a state if it breaches the confidentiality of an individual firm

**Table 3. Number Volume and Distribution of U.S. Federally Inspected Livestock Slaughtering Plants by Size and Species, 1981-1989**

	1981	1982	1983	1984	1985	1986	1987	1988	1989
<b>Cattle: Number of Plants</b>									
Under 1000 /1	964	904	893	922	940	917	907	876	862
1,000-9,999	315	320	345	313	277	244	203	184	170
10,000-49,999	147	148	129	129	116	105	94	86	75
50,000-99,999	49	50	52	53	44	35	43	36	30
100,000-249,999	47	47	45	47	42	43	37	34	30
250,000-499,999	22	25	24	20	13	17	14	17	16
Over 500,000	11	12	14	16	19	19	19	19	20
<b>Total</b>	<b>1555</b>	<b>1506</b>	<b>1502</b>	<b>1500</b>	<b>1451</b>	<b>1380</b>	<b>1317</b>	<b>1252</b>	<b>1203</b>
<b>Cattle: Volume (1000 head)</b>									
Under 1000	336.7	349.8	334.8	333.4	330.5	318.9	283.0	255.2	224.6
1,000-9,999	1001.2	1035.0	1075.9	932.8	865.6	816.5	688.1	666.3	579.6
10,000-49,999	3797.9	3776.9	3422.4	3211.3	2873.8	2643.6	2206.1	1926.9	1800.7
50,000-99,999	3582.5	3602.2	3635.9	3835.9	3253.4	2629.8	3164.8	2626.9	2142.4
100,000-249,999	7456.4	7013.4	6835.4	7368.0	6641.5	6365.0	6054.7	5322.9	4928.1
250,000-499,999	8043.0	8684.9	8241.0	7025.7	4677.4	5991.8	4741.8	6052.7	5434.2
Over 500,000	8490.1	9396.0	11269.4	13075.7	15960.1	16828.2	16865.4	17317.0	17899.3
<b>Total</b>	<b>32707.8</b>	<b>33858.2</b>	<b>34814.8</b>	<b>35782.8</b>	<b>34602.3</b>	<b>35593.8</b>	<b>34003.9</b>	<b>34167.9</b>	<b>33008.9</b>
<b>Cattle: Percent of Volume</b>									
Under 10,000	4.09	4.09	4.05	3.54	3.46	3.19	2.86	2.70	2.44
10,000-99,999	22.56	21.79	20.27	19.69	17.71	14.82	15.79	13.33	11.95
100,000-499,999	47.39	46.36	43.30	40.23	32.71	34.72	31.75	33.29	31.39
Over 500,000	25.96	27.75	32.37	36.54	46.12	47.28	49.60	50.68	54.23
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
<b>Calves: Number of Plants</b>									
Under 100	622	626	609	645	624	569	479	444	414
100-999	84	95	95	94	81	99	68	61	56
1,000-9,999	66	60	57	52	60	60	83	46	47
Over 10,000	49	55	56	63	66	64	56	52	46
<b>Total</b>	<b>821</b>	<b>836</b>	<b>817</b>	<b>854</b>	<b>831</b>	<b>792</b>	<b>686</b>	<b>603</b>	<b>563</b>
<b>Calves: Volume (1000 Head)</b>									
Under 100	8.8	9.0	9.2	9.9	9.4	9.2	30.1	6.4	6.0
100-999	24.8	27.0	28.9	30.4	27.1	33.2	27.8	20.7	20.8
1,000-9,999	244.5	216.1	195.2	186.0	218.0	211.1	183.6	175.4	183.2
Over 10,000	2191.4	2476.3	2564.3	2792.0	2890.6	2915.0	2402.0	2229.4	1889.5
<b>Total</b>	<b>2469.5</b>	<b>2728.4</b>	<b>2797.6</b>	<b>3018.3</b>	<b>3145.0</b>	<b>3168.5</b>	<b>2643.5</b>	<b>2431.9</b>	<b>2099.5</b>
<b>Calves: Percent of Volume</b>									
Under 100	0.36	0.33	0.33	0.33	0.30	0.29	1.14	0.26	0.29
100-999	1.00	0.99	1.03	1.01	0.86	1.05	1.05	0.85	0.99
1,000-9,999	9.90	7.92	6.98	6.16	6.93	6.66	6.95	7.21	8.73
Over 10,000	88.74	90.76	91.66	92.50	91.91	92.00	90.86	91.67	90.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

(continued)

Table 3. Number, Volume and Distribution of U.S. Federally Inspected Livestock Slaughtering Plants by Size and Species, 1981-1989 (continued)

	1981	1982	1983	1984	1985	1986	1987	1988	1989
<b>Hogs: Number of Plants</b>									
Under 1,000	899	900	885	894	894	860	811	783	739
1,000-9,999	269	232	240	241	222	212	196	206	208
10,000-99,999	110	111	101	107	105	99	88	94	90
100,000-249,999	23	17	21	26	17	16	13	15	21
250,000-499,999	26	32	28	19	22	17	13	8	10
500,000-999,999	23	18	23	21	16	17	25	11	13
1,000,000-1,499,999	28	28	18	20	20	10	13	7	9
Over 1,500,000	10	6	14	13	14	19	23	26	24
Total	1388	1344	1330	1341	1310	1250	1182	1150	1114
<b>Hogs: Volume (1000 Head)</b>									
Under 1,000	294.0	291.6	295.1	278.0	272.1	248.6	319.0	236.4	216.3
1,000-9,999	799.2	706.1	768.3	769.6	668.9	687.6	596.1	611.1	585.4
10,000-99,999	3419.8	3761.9	3359.3	3505.5	3371.1	3359.4	3077.0	3998.8	2984.4
100,000-249,999	3681.7	2851.6	3470.5	4691.9	2634.3	2864.3	2414.2	2641.6	3383.0
250,000-499,999	98a4.5	11491.8	9940.0	6761.2	7778.6	6219.3	5440.7	3370.7	3937.1
500,000-999,999	17186.7	12841.8	17564.5	15856.1	12338.4	12726.6	12576.6	8129.7	9457.7
1,000,000-1,499,999	33896.8	34467.5	22523.0	24403.1	26112.5	12641.9	10114.2	10504.8	12220.8
Over 1,500,000	18444.9	12846.4	26852.9	25963.9	28382.8	37991.9	43588.9	56862.3	53536.0
Total	87607.6	79258.7	84773.6	82229.3	81564.7	76739.6	78126.7	86355.4	06320.7
<b>Hogs: Percent of Volume</b>									
Under 10,000	1.25	1.26	1.25	1.27	1.15	1.22	1.17	0.98	0.93
10,000-499,999	19.39	22.84	19.78	18.19	16.91	16.21	13.99	11.59	11.94
500,000-1,499,999	58.31	59.69	47.29	48.96	47.14	33.06	29.04	21.58	25.11
Over 1,500,000	21.05	16.21	31.68	31.57	34.80	49.51	55.79	65.85	62.02
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
<b>Sheep and Lambs: Number of Plants</b>									
Under 100	717	688	692	703	709	672	653	621	604
100-999	205	223	247	252	214	202	171	176	185
1,000-9,999	41	48	46	49	57	54	60	60	54
10,000+	27	27	31	30	28	26	22	20	26
Total	990	986	1016	1034	1008	954	906	877	869
<b>Sheep and Lambs Volume (1000 Head)</b>									
Under 100	17.6	18.4	19.4	19.5	18.6	16.9	17.1	19.6	15.6
100-999	57.8	62.4	68.7	75.0	60.8	57.3	50.0	50.6	59.2
1,000-9,999	130.3	164.7	138.7	150.8	171.7	166.7	171.3	190.5	170.3
10,000+	5565.1	6019.5	6185.1	6282.5	5695.2	5198.2	4763.5	4906.8	5049.9
Total	5770.8	6265.0	6411.9	6527.8	5946.3	5439.1	5001.9	5167.5	5295.0
<b>Sheep and Lads: Percent of Volume</b>									
Under 100	0.30	0.29	0.30	0.30	0.31	0.31	0.34	0.38	0.29
100-999	1.00	1.00	1.07	1.15	1.02	1.05	1.00	0.98	1.12
1,000-9,999	2.26	2.63	2.16	2.31	2.89	3.06	3.42	3.69	3.22
10,000+	96.44	96.08	96.46	96.24	95.78	95.57	95.23	94.96	95.37
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: USDA, Livestock Slaughter  
1/ Annual slaughter per plant

**Table 4. Packer Feeding: Number of Packers and Volume by All Packers and the Ten largest Packers by Species, 1964-1987**

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
<b>Cattle: United States</b>												
Number of Packers	182	195	189	177	166	155	130	113	107	107	113	108
Volume (1000 Head)	1052.0	1229.5	1384.1	1471.9	1516.2	1814.0	1663.6	1586.0	1847.8	1602.4	1605.9	1410.9
Average (1000 Head)	5.8	6.3	7.3	a.3	9.1	11.7	12.8	14.0	17.3	15.0	14.2	13.1
Number of 10 largest	9	a	a	7	7	7	a	7	9	9	9	8
Volume (1000 Head)	375.4	308.6	410.1	510.2	389.6	517.7	503.0	294.4	292.0	351.0	434.9	387.7
Average (1000 Head)	41.7	38.6	51.3	72.9	55.7	74.0	62.9	42.1	32.4	39.0	48.3	48.5
Percent by 10 Largest	35.7	25.1	29.6	34.7	25.7	28.5	30.2	18.6	15.8	21.9	27.1	27.5
<b>Calves:</b>												
Number of Packers	45	42	42	38	34	25	26	22	17	9	7	10
Volume (1000 Head)	74.7	61.9	89.6	75.9	85.6	71.2	75.9	66.0	32.6	1a.5	17.7	61.2
Average (1000 Head)	1.7	1.5	2.1	2.0	2.5	2.8	2.9	3.0	1.9	2.1	2.5	6.1
Number of 10 Largest	2	1	1	1	2	2	1	1	2	0	1	1
Volume (1000 Head)	34.7	30.8	26.1	25.3	14.8	12.0	7.0	2.0	1.9	0.0	1.5	0.6
Average (1000 Head)	17.4	30.8	26.1	25.3	7.4	6.0	7.0	2.0	1.0	—	1.5	0.6
Percent by 10 Largest	46.5	49.8	29.1	33.3	17.3	16.9	9.2	3.0	5.8	0.0	8.5	1.0
<b>Hogs:</b>												
Number of Packers	31	23	19	24	16	17	17	13	11	12	14	11
Volume (1000 Head)	33.2	43.1	32.8	26.3	41.9	43.1	65.1	75.0	114.4	107.0	93.4	81.6
Average (1000 Head)	1.1	1.9	1.7	1.1	2.6	2.5	3.8	5.8	10.4	8.9	6.7	7.4
Number of 10 Largest	2	2	1	2	2	3	2	3	3	3	3	3
Volume (1000 Head)	2.9	4.0	0.9	6.1	22.5	24.1	43.4	53.7	95.4	69.0	52.4	57.6
Average (1000 Head)	1.5	2.0	0.9	3.1	11.3	8.0	21.7	17.9	31.8	23.0	17.5	19.2
Percent by 10 Largest	a.7	9.3	2.7	23.2	53.7	55.9	66.7	71.6	83.4	64.5	56.1	70.6
<b>Sheep and Lambs:</b>												
Number of Packers	29	20	17	12	16	15	13	12	10	9	9	7
Volume (1000 Head)	867.1	825.9	1295.5	925.6	952.3	1272.9	1233.5	919.2	1403.2	1544.9	1334.0	1009.0
Average (1000 Head)	29.9	41.3	76.2	77.1	59.5	84.9	94.9	76.6	140.3	171.7	148.2	144.1
Number of 10 Largest	6	6	6	5	5	5	5	5	5	5	5	4
Volume (1000 Head)	709.9	676.9	1136.4	714.7	745.0	856.6	827.1	577.4	884.0	806.3	815.0	588.0
Average (1000 Head)	118.3	112.8	189.4	142.9	149.0	171.3	165.4	115.5	176.8	161.3	163.0	147.0
Percent by 10 Largest	81.9	82.0	87.7	77.2	78.2	67.3	67.1	62.8	63.0	52.2	61.1	58.3

(continued)

**Table 4. Packer Feeding: Number of Packers and Volume by All Packers and the Ten largest Packers by Species, 1964-1987 (continued)**

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<b>Cattle: United States</b>												
Number of Packers	100	100	88	82	66	66	66	58	53	41	54	54
Volume (1000 Head)	1672.0	1527.0	1485.0	1326.0	916.0	1164.0	858.0	920.0	765.0	918.0	810.0	1169.0
Average (1000 Head)	16.7	15.3	16.9	16.2	13.9	17.6	13.0	15.9	14.4	22.4	15.0	21.6
Number of 10 Largest	2	7	6	6	6	4	5	4	3	2	4	4
Volume (1000 Head)	570.0	386.0	450.0	505.0	471.0	535.0	404.0	460.0	309.0	475.0	350.0	572.0
Average (1000 Head)	51.3	55.1	75.0	84.2	78.5	133.8	80.8	115.0	103.0	237.5	87.5	143.0
Percent by 10 Largest	34.1	25.3	30.3	38.1	51.4	46.0	47.1	50.0	40.4	51.7	43.2	48.9
<b>Calves:</b>												
Number of Packers	14	13	12	13	14	8	9	15	16	14	14	10
Volume (1000 Head)	51.0	49.0	56.0	57.0	40.0	28.0	54.0	86.0	51.0	67.0	78.0	106.0
Average (1000 Head)	3.6	3.8	4.7	4.4	2.9	3.5	6.0	5.7	3.2	4.0	5.6	10.6
Number of 10 Largest	0	0	0	0	0	0	0	0	0	0	0	0
Volume (1000 Head)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average (1000 Head)	---	---	---	---	---	---	---	---	---	---	---	---
Percent by 10 Largest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Hogs:</b>												
Number of Packers	13	9	11	12	7	9	8	6	4	4	6	7
Volume (1000 Head)	166.0	109.0	90.0	88.0	58.0	105.0	42.0	68.0	25.0	24.0	24.0	97.0
Average (1000 Head)	12.8	12.1	8.2	7.3	8.3	11.7	5.3	11.3	6.3	6.0	4.0	13.9
Number of 10 Largest	2	2	1	0	0	0	0	0	0	0	0	0
Volume (1000 Head)	70.0	51.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average (1000 Head)	35.0	25.5	2.0	---	---	---	---	---	---	---	---	---
Percent by 10 Largest	42.2	46.8	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Sheep and Lambs:</b>												
Number of Packers	7	8	8	10	8	5	5	4	8	7	4	3
Volume (1000 Head)	1064.0	701.0	755.0	677.0	504.0	228.0	103.0	335.0	300.0	492.0	506.0	562.0
Average (1000 Head)	152.0	87.6	94.4	67.7	63.0	45.6	20.6	83.8	37.5	70.3	126.5	187.3
Number of 10 Largest	3	3	3	4	3	4	3	3	4	2	2	2
Volume (1000 Head)	563.0	359.0	333.0	329.0	304.0	193.0	61.0	293.0	243.0	397.0	451.0	505.0
Average (1000 Head)	187.7	119.7	111.0	82.3	101.3	48.3	20.3	97.7	60.8	198.5	225.5	252.5
Percent by 10 Largest	52.9	51.2	44.1	48.6	60.3	84.6	59.2	87.5	81.0	80.7	89.1	89.9

Source: USDA, Packers and Stockyards' Statistical Report, 1987 issue



Table 5. Carcass Grade and Weight Purchases as a Percent of Total Slaughter United States and Selected States by Species

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
<b>United States</b>																															
Cattle	17.2	NA	18.7	20.5	22.6	23.4	23.0	24.3	NA	23.2	25.5	27.2	NA	27.6	32.6	35.3	31.2	29.6	31.9	30.4											
Calves	3.6	NA	4.5	5.0	6.7	5.6	6.2	9.1	NA	9.1	10.5	17.7	NA	17.3	22.2	22.5	30.5	32.2	31.2	36.7											
Hogs	3.8	NA	4.0	4.9	5.2	5.0	6.0	0.9	NA	8.9	10.4	11.5	NA	12.5	14.2	14.6	14.4	16.2	14.7	13.5											
Sheep & Lambs	a.9	NA	9.8	7.4	0.4	7.9	0.8	10.5	NA	0.0	10.1	24.6	NA	10.9	28.9	16.4	21.2	37.1	47.4	35.9											
<b>Minnesota</b>																															
Cattle	26.5	NA	27.4	31.3	34.6	42.7	43.0	42.0	NA	41.8	44.6	51.0	NA	53.4	55.7	56.8	57.9	30.5	56.4	57.3											
Calves	0.9	NA	0.6	16.7	0.0	0.0	0.0	0.0	NA	0.3	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
Hogs	7.0	NA	9.5	11.4	12.6	12.4	17.1	22.9	NA	21.3	23.4	28.0	NA	33.8	30.8	32.4	32.1	30.6	24.1	30.6											
Sheep & Lambs	4.6	NA	8.3	16.0	14.7	20.9	4.0	4.4	NA	6.9	9.3	0.0	NA	2.6	5.1	0.0	1.9	4.9	39.4	0.3											
<b>North Dakota</b>																															
Cattle	6.0	NA	10.3	16.6	14.1	20.7	13.3	10.2	NA	23.7	0.0	2.5	NA	0.7	63.8	28.7	30.2	39.1	40.8	45.0											
Calves	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
Hogs	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	1.6	1.5	0.0	0.0											
Sheep & Lambs	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
<b>South Dakota</b>																															
Cattle	22.2	NA	33.7	32.6	39.5	42.1	41.1	37.4	NA	29.1	12.1	23.7	NA	27.0	20.2	27.5	25.7	24.1	26.7	32.4											
Calves	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
Hogs	3.0	NA	5.1	4.3	0.7	14.2	19.5	29.5	NA	18.3	17.6	16.9	NA	20.2	24.6	26.3	26.4	27.5	23.9	22.2											
Sheep & Lambs	0.0	NA	17.5	13.4	18.7	19.4	20.5	20.6	NA	3.2	3.8	18.9	NA	5.7	11.3	6.0	6.0	6.0	5.9	5.8											
<b>Iowa</b>																															
Cattle	33.8	NA	33.7	29.5	37.6	43.4	41.3	42.9	NA	45.5	52.6	56.7	NA	54.7	52.2	52.9	42.9	38.8	42.1	39.6											
Calves	4.7	NA	10.6	10.6	13.3	8.0	19.0	41.7	NA	30.3	27.9	34.3	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
Hogs	5.9	NA	8.0	6.9	7.7	7.3	8.0	11.8	NA	11.3	12.3	13.0	NA	14.4	18.4	16.3	13.3	16.7	13.2	10.5											
Sheep & Lambs	21.3	NA	6.5	6.5	10.0	7.1	28.6	22.9	NA	12.2	3.0	5.3	NA	0.0	0.0	0.0	0.2	0.0	15.0	17.1											
<b>Wisconsin</b>																															
Cattle	9.0	NA	19.9	37.0	19.5	16.2	21.2	19.6	NA	16.6	19.7	20.3	NA	21.7	32.4	35.2	33.4	35.7	37.0	34.4											
Calves	0.0	NA	4.7	8.5	10.5	11.4	10.2	9.4	NA	18.9	22.1	35.2	NA	21.9	36.9	35.7	40.0	38.0	30.7	30.1											
Hogs	0.9	NA	8.3	a.4	9.4	10.5	10.2	10.5	NA	12.4	10.0	5.7	NA	0.0	8.6	6.1	3.5	2.2	3.9	0.1											
Sheep & Lambs	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0											

Source: Packers and Stockyards' Statistical Report  
 NA Data not available.

**Table 6. Livestock Markets, Dealers, and Order Buyers, United States and Select States, 1981-1986**

		1981	1982	1983	1984	1985	1986
<b>United States</b>	<b>Terminal Markets</b>	27	24	24	24	24	21
	<b>Auctions</b>	1750	1781	1786	1608	1590	1564
	<b>Total</b>	1777	1805	1810	1632	1614	1585
	<b>Dealers/Order Buyers</b>	6261	6171	5900	6033	5790	5799
<b>Minnesota</b>	<b>Terminal Markets</b>		1	1	1	1	1
	<b>Auctions</b>	49	52	53	46	45	41
	<b>Total</b>	50	53	54	47	46	42
	<b>Dealers/Order Dealers</b>	317	265	259	284	255	221
<b>Region</b>	<b>Terminal Markets</b>	6	6	6	6	6	5
	<b>Auctions</b>	266	273	274	248	239	239
	<b>Total</b>	272	279	280	254	245	244
	<b>Dealers/Order Buyers</b>	1231	1372	1379	1333	1291	1111
<b>North Dakota</b>	<b>Terminal Markets</b>		1	1	1	1	1
	<b>Auctions</b>	24	24	24	22	19	21
	<b>Total</b>	25	25	25	23	20	22
	<b>Dealers/Order Buyers</b>	106	77	91	93	97	75
<b>South Dakota</b>	<b>Terminal Markets</b>	1	1	1	1	1	1
	<b>Auctions</b>	49	52	51	50	47	49
	<b>Total</b>	50	53	52	51	48	50
	<b>Dealers/Order Buyers</b>	199	199	190	217	209	155
<b>Iowa</b>	<b>Terminal Markets</b>	2	2	2	2	2	2
	<b>Auctions</b>	116	116	117	100	97	95
	<b>Total</b>	118	118	119	102	99	96
	<b>Dealers/Order Buyers</b>	227	538	506	431	433	401
<b>Wisconsin</b>	<b>Terminal Markets</b>		1	1	1	1	1
	<b>Auctions</b>	28	29	29	30	31	33
	<b>Total</b>	29	30	30	31	32	34
	<b>Dealers/Order Buyers</b>	332	332	333	308	297	259

Source: Packers and Stockyards' Statistical Report

**Table 7. Percent of Livestock Purchases by Type of Market Outlet and Species**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<b>Cattle: United States</b>																		
Direct	65.3	68.6	72.2	73.0	69.6	65.9	66.3	69.4	73.4	76.4	77.1	77.4	78.1	77.6	78.7	80.1	79.8	80.2
Terminal	18.4	15.9	13.2	11.9	13.9	14.4	12.9	12.0	10.6	9.5	8.6	8.1	7.0	7.1	6.6	5.4	4.4	4.2
Auction	16.3	15.5	14.6	15.1	16.4	19.7	20.8	18.6	16.0	14.1	14.3	14.5	14.9	15.3	14.7	14.5	15.8	15.6
<b>Calves: United States</b>																		
Direct	34.0	32.4	31.6	30.9	30.4	32.4	30.0	35.5	37.3	40.9	43.8	42.7	42.8	48.4	50.2	54.7	57.5	61.0
Terminal	11.4	8.6	7.7	8.2	6.5	8.3	7.7	7.3	9.0	7.4	6.4	9.1	4.3	4.5	2.9	3.0	3.3	3.2
Auction	54.6	39.0	60.7	60.9	63.1	59.3	62.3	57.2	53.7	51.7	49.9	48.2	52.9	47.2	46.9	42.3	39.2	35.8
<b>Hogs: United States</b>																		
Direct	68.5	69.3	70.4	70.3	70.0	71.6	71.5	71.7	73.8	74.6	76.7	78.4	79.0	76.8	82.8	84.2	87.6	88.8
Terminal	17.1	16.9	16.3	17.3	17.6	16.3	17.1	15.6	15.9	14.7	13.5	11.6	12.0	14.2	10.3	9.0	7.5	6.3
Auction	14.3	13.8	13.3	12.4	12.4	12.1	11.5	12.7	10.3	10.7	9.8	10.0	8.9	9.0	6.8	6.8	4.9	4.9
<b>Sheep: United States</b>																		
Direct	72.5	74.0	74.3	73.0	75.1	74.4	75.2	75.8	78.9	82.7	80.5	78.0	81.3	82.4	78.9	80.4	83.5	81.4
Terminal	15.1	13.6	13.7	12.3	11.5	10.0	9.8	11.0	10.0	9.3	7.6	7.0	7.7	6.0	8.9	8.7	5.1	5.5
Auction	12.4	12.4	12.0	14.7	13.5	15.6	15.0	13.2	11.1	7.9	12.0	15.0	11.0	11.6	12.2	10.9	11.4	13.1
<b>Cattle: Minnesota</b>																		
Direct	61.1	61.4	64.3	71.2	67.3	62.7	NA	66.7	75.2	71.5	NA	74.1	64.9	65.4	68.1	74.8	69.6	70.9
Terminal	36.5	37.6	34.1	27.2	29.7	28.1	NA	27.7	20.8	25.9	NA	19.5	24.9	24.9	21.8	14.0	13.0	14.6
Auction	2.4	1.0	1.6	1.7	3.0	9.2	NA	5.6	4.0	2.6	NA	6.4	10.2	9.7	10.2	11.2	17.3	14.4
<b>Calves: Minnesota</b>																		
Direct	82.8	66.7	66.7	0.0	33.3	7.7	NA	18.2	10.0	57.1	NA	86.1	80.6	82.4	86.5	93.8	88.8	81.5
Terminal	16.4	16.7	0.0	100.0	66.7	46.2	NA	0.0	90.0	28.6	NA	4.1	1.6	0.7	5.3	0.4	0.0	10.1
Auction	0.8	16.7	33.3	0.0	0.0	46.2	NA	81.8	0.0	14.3	NA	9.8	17.8	16.9	8.2	5.8	11.2	8.4
<b>Hogs: Minnesota</b>																		
Direct	75.5	77.2	79.2	77.0	76.9	78.6	NA	81.9	80.3	82.4	NA	85.7	89.1	90.6	92.2	95.5	92.3	95.6
Terminal	24.5	22.8	20.7	23.0	22.7	21.4	NA	17.8	19.1	17.5	NA	13.7	10.2	9.2	7.4	4.3	7.4	3.7
Auction	0.0	0.0	0.0	0.0	0.3	0.0	NA	0.4	0.6	0.1	NA	0.6	0.6	0.2	0.4	0.3	0.2	0.7
<b>Sheep: Minnesota</b>																		
Direct	67.8	79.0	77.7	74.3	74.3	65.2	NA	99.6	59.9	78.9	NA	47.4	72.8	77.1	76.2	76.7	59.3	57.7
Terminal	32.2	21.0	22.3	25.7	25.7	33.1	NA	0.0	23.2	19.6	NA	22.5	24.2	19.9	20.7	20.3	20.9	17.4
Auction	0.0	0.0	0.0	0.0	0.0	1.7	NA	0.4	16.9	1.5	NA	30.1	3.0	3.0	3.1	3.0	19.8	24.8

(continued)

**Table 7. Percent of Livestock Purchases by Type of Market Outlet and Species**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1973	1984	1985	1986	1987
<b>Cattle: North Dakota</b>																		
Direct	34.4	40.1	57.3	59.3	54.1	57.4	NA	37.3	97.0	5.0	NA	38.2	67.0	34.1	34.4	50.7	55.8	52.9
Terminal	40.7	33.8	25.7	21.5	27.6	27.9	NA	17.0	0.0	0.0	NA	26.6	23.4	1a.5	1a.2	14.0	12.8	11.4
Auction	24.9	26.1	17.0	19.3	18.4	14.8	NA	45.6	3.0	95.0	NA	35.2	9.5	47.5	47.4	35.3	31.4	35.7
<b>Calves: North Dakota</b>																		
Direct	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	100.0	100.0	0.0	0.0	0.0
Terminal	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	0.0	0.0	0.0	0.0	0.0	100.0	NA	0.0	0.0	0.0	NA	0.0	100.0	0.0	0.0	0.0	0.0	0.0
<b>Hogs: North Dakota</b>																		
Direct	22.8	100.0	100.0	100.0	100.0	100.0	NA	40.0	100.0	0.0	NA	96.4	95.2	90.4	85.6	al.2	74.3	66.9
Terminal	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	77.2	0.0	0.0	0.0	0.0	0.0	NA	60.0	0.0	100.0	NA	3.6	4.8	9.6	14.4	18.8	25.7	33.1
<b>Sheep: North Dakota</b>																		
Direct	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	100.0	0.0	100.0	100.0	0.0	0.0	0.0
Terminal	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Cattle: South Dakota</b>																		
Direct	66.7	61.6	63.9	59.5	58.9	50.4	NA	44.2	51.3	37.9	NA	49.3	51.0	53.9	55.8	56.7	48.9	54.1
Terminal	22.0	22.0	20.1	17.0	21.7	16.7	NA	20.6	32.6	28.5	NA	24.6	24.7	24.2	24.7	24.3	23.5	24.2
Auction	11.3	16.4	16.0	23.6	19.4	32.9	NA	35.2	16.1	33.6	NA	26.2	24.3	21.9	19.5	19.0	27.5	21.7
<b>Calves: South Dakota</b>																		
Direct	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	100.0	0.0	0.0	15.8	0.0
Terminal	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	84.2	100.0
<b>Hogs: South Dakota</b>																		
Direct	74.5	71.1	68.7	73.2	74.0	74.5	NA	75.5	69.7	71.6	NA	81.6	82.1	86.5	85.4	85.1	75.5	73.3
Terminal	12.5	14.2	15.6	14.4	17.2	19.1	NA	17.6	23.6	24.1	NA	14.9	15.1	12.6	12.0	10.4	12.2	15.4
Auction	13.1	14.8	15.7	12.3	a.7	6.4	NA	6.9	6.7	4.4	NA	3.5	2.8	2.9	2.6	4.4	12.3	11.3
<b>Sheep: South Dakota</b>																		
Direct	31.3	54.7	49.5	51.2	75.8	72.4	NA	67.6	75.5	77.7	NA	76.3	66.6	79.1	82.2	83.6	83.6	83.5
Terminal	41.0	28.4	37.3	28.3	24.2	25.8	NA	32.4	24.1	22.3	NA	23.6	33.1	19.7	16.4	14.5	14.5	14.6
Auction	27.7	16.9	13.2	20.5	0.0	1.8	NA	0.0	0.3	0.0	NA	0.1	0.4	1.2	1.4	1.9	1.9	1.9

(continued)

**Table 7. Percent of livestock Purchases by Type of Market Outlet and Species (continued)**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
<b>Cattle: Iowa</b>																		
Direct	83.6	84.1	82.1	83.5	77.6	74.4	NA	82.9	82.4	87.0	NA	88.9	86.6	75.6	74.2	68.5	63.0	66.2
Terminal	13.1	12.7	11.9	10.2	16.0	17.8	NA	14.5	14.3	7.8	NA	7.0	7.4	12.1	11.7	13.9	15.3	12.9
Auction	3.2	3.2	5.9	6.3	6.4	7.8	NA	2.6	3.3	5.2	NA	4.1	6.1	12.3	14.1	17.7	21.7	20.9
<b>Calves: Iowa</b>																		
Direct	44.7	41.2	31.9	27.7	29.9	53.9	NA	44.7	38.5	47.3	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Terminal	22.3	26.9	30.7	25.7	17.0	13.8	NA	14.6	16.0	14.5	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	33.0	31.9	37.3	46.5	53.1	32.3	NA	40.7	45.5	38.2	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Hogs: Iowa</b>																		
Direct	79.1	78.1	81.9	83.0	81.6	83.8	NA	83.6	83.5	83.1	NA	84.5	07.2	80.0	07.5	09.2	90.3	90.6
Terminal	13.6	16.0	14.0	13.3	14.6	13.5	NA	12.9	14.2	13.1	NA	11.4	9.6	15.5	9.5	9.2	7.9	6.9
Auction	7.2	5.9	4.1	3.7	3.7	2.7	NA	3.5	2.3	3.0	NA	4.1	3.2	4.5	3.0	1.6	1.8	2.5
<b>Sheep: Iowa</b>																		
Direct	79.2	78.4	77.1	77.1	73.9	80.4	NA	78.2	85.1	89.4	NA	0.0	37.6	39.9	38.4	36.6	70.0	69.9
Terminal	15.9	17.0	17.7	16.3	20.5	15.0	NA	16.3	11.5	8.8	NA	0.0	42.9	34.7	36.3	36.7	10.0	10.0
Auction	5.0	4.6	5.2	6.5	5.6	4.7	NA	5.4	3.4	1.8	NA	0.0	19.4	25.4	25.4	26.7	20.0	20.0
<b>Cattle: Wisconsin</b>																		
Direct	39.4	40.8	40.6	39.5	36.3	39.9	NA	43.7	46.2	49.9	NA	30.0	42.5	47.0	51.9	49.0	57.5	49.8
Terminal	35.4	30.5	29.4	34.4	36.9	28.1	NA	30.9	27.2	25.3	NA	34.0	23.3	20.7	18.8	18.2	13.4	15.7
Auction	25.2	28.7	29.9	26.1	26.8	32.1	NA	25.4	26.6	24.8	NA	36.0	34.2	32.3	29.3	32.7	29.0	34.4
<b>Calves: Wisconsin</b>																		
Direct	48.3	41.8	41.6	44.5	41.5	33.4	NA	53.2	58.9	56.9	NA	57.4	57.8	58.4	53.1	59.4	58.5	57.5
Terminal	22.2	22.3	10.5	26.1	19.4	19.7	NA	8.8	11.8	15.7	NA	11.9	14.1	10.5	6.2	9.7	12.7	17.4
Auction	29.4	35.8	47.8	29.4	39.1	46.9	NA	38.1	29.3	27.4	NA	30.7	28.1	31.1	40.7	30.9	20.8	25.1
<b>Hogs: Wisconsin</b>																		
Direct	92.9	90.0	89.1	89.1	88.0	86.5	NA	87.1	84.5	79.8	NA	83.9	78.6	82.4	76.2	83.4	92.5	97.3
Terminal	3.4	6.0	6.7	6.3	7.3	8.6	NA	11.2	13.9	17.3	NA	6.1	6.6	7.4	5.4	5.2	7.1	2.4
Auction	3.8	4.0	4.3	4.6	4.8	4.9	NA	1.7	1.6	2.9	NA	10.0	14.8	10.2	18.5	11.4	0.4	0.2
<b>Sheep: Wisconsin</b>																		
Direct	5.1	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	33.3	100.0	100.0	39.0	100.0
Terminal	90.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Auction	4.0	0.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.0	NA	0.0	0.0	66.7	0.0	0.0	61.0	0.0

Source: Packers and Stockyards' Statistical Report

Figure 1. Annual Commercial Hog and Cattle slaughter, United States

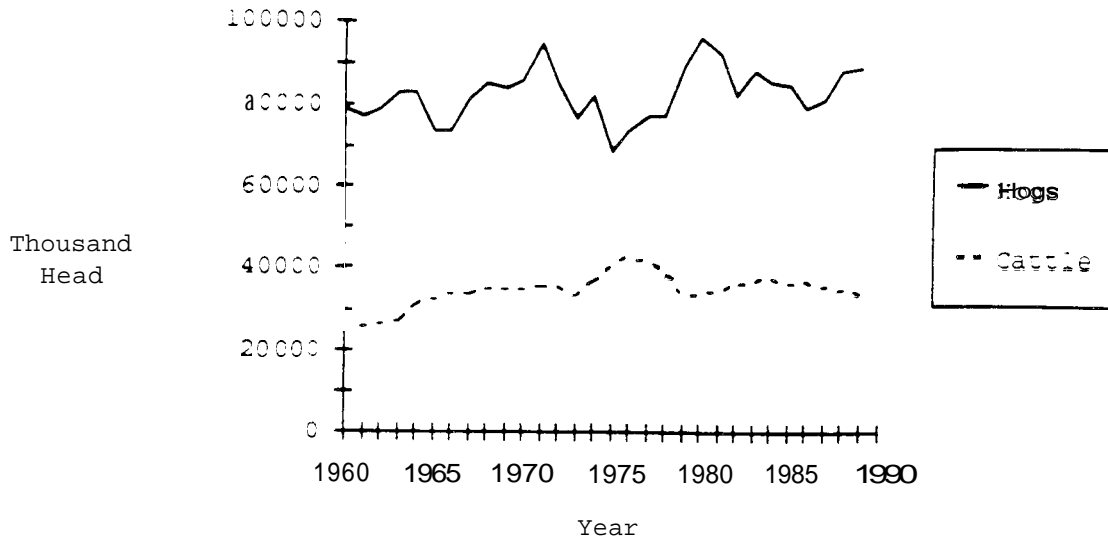


Figure 2. Annual Commercial Calf and Sheep and Lamb Slaughter, United States

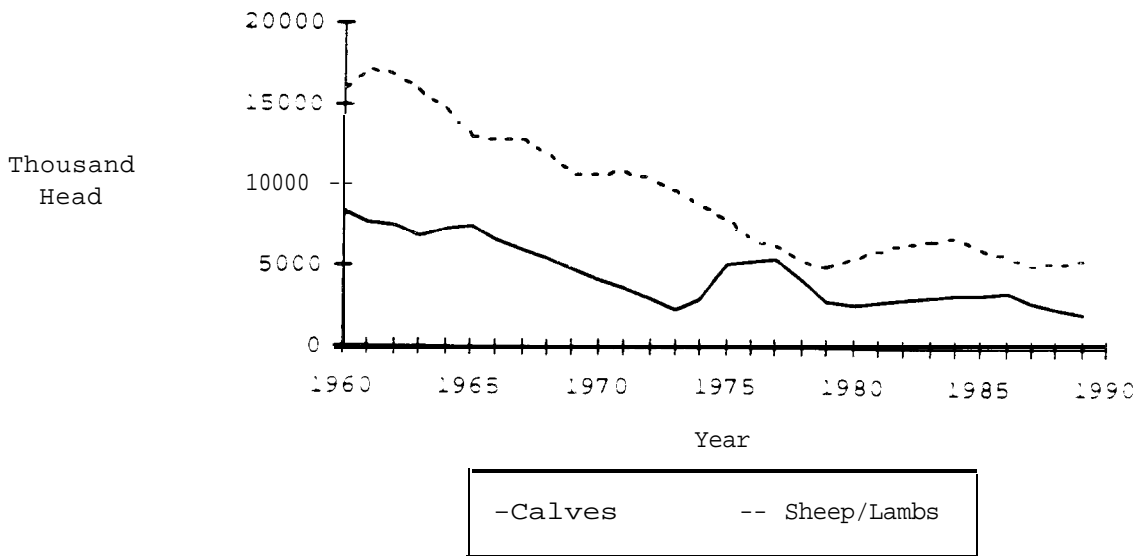


Figure 3 Annual Commercial Cattle, Calf, and Sheep Slaughter in Upper North Central Region

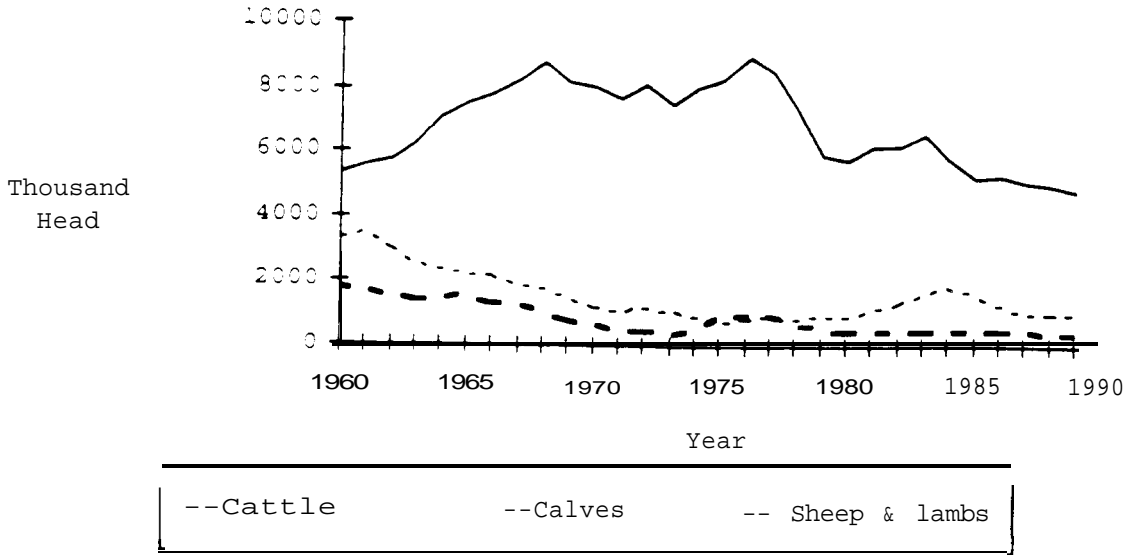


Figure 4. Upper North Central Region's Share of United States Commercial Slaughter

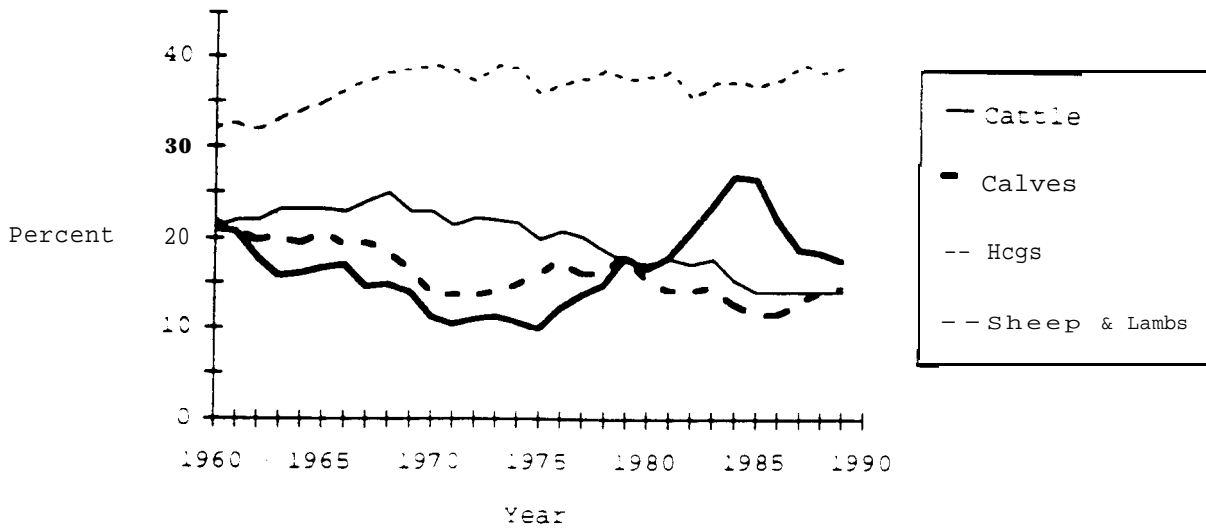


Figure 5. Annual Commercial Hog Slaughter in the Upper North Central Region

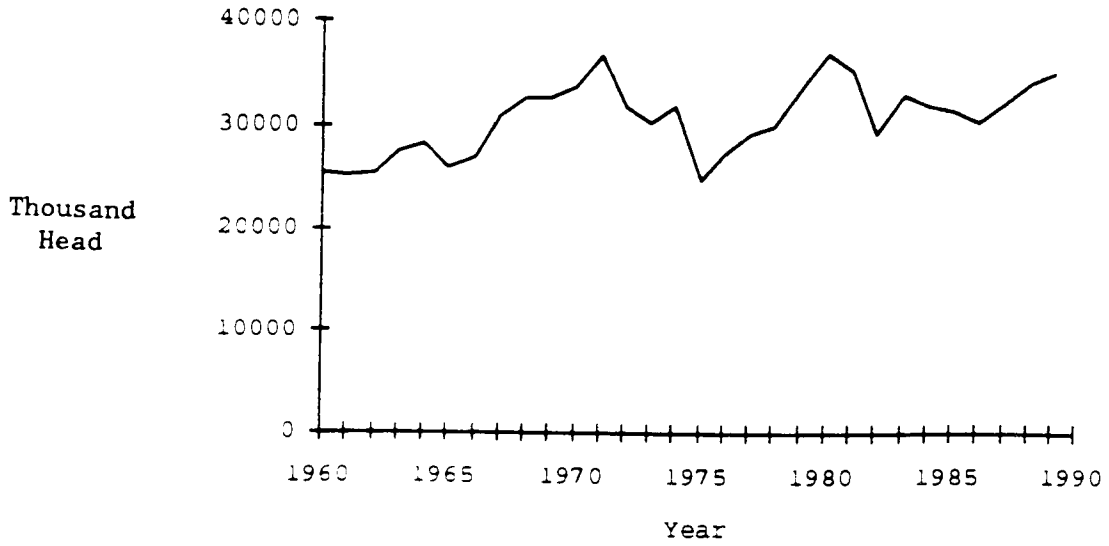


Figure 6. Annual Commercial Calf and Sheep and Lamb Slaughter in Minnesota

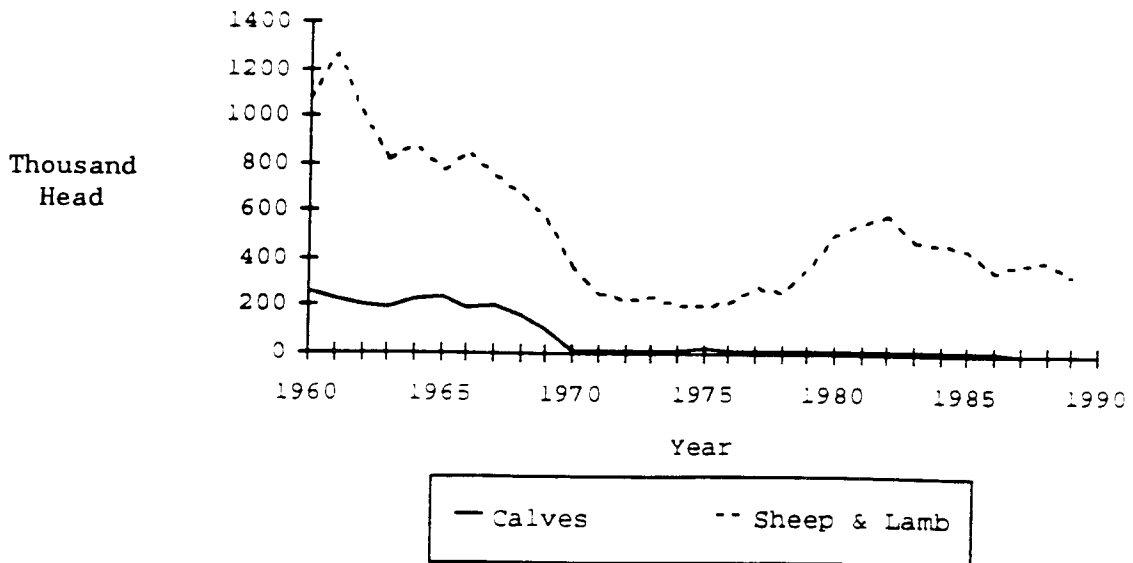




Figure 7. Annual Commercial Hog and Cattle Slaughter in Minnesota

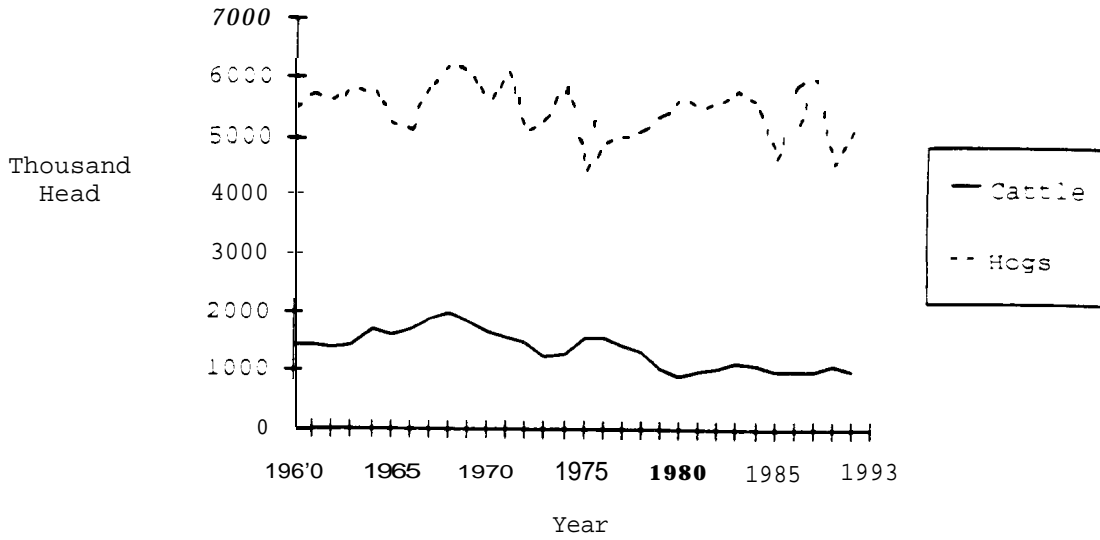


Figure 8. Minnesota Share of Upper North Central Region's Commercial Slaughter

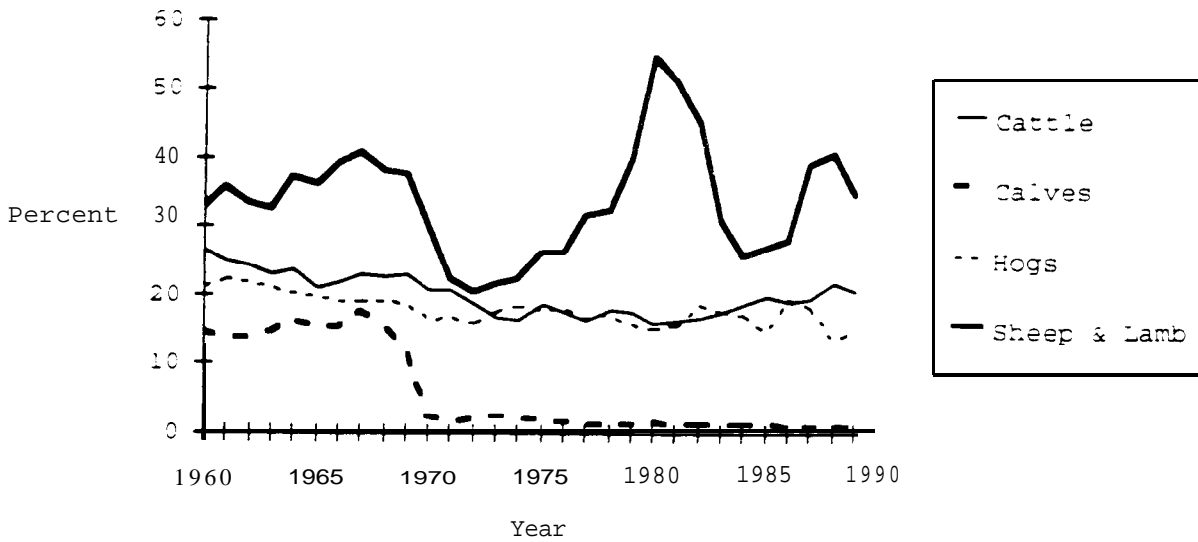


Figure 9 Average Annual Cattle Slaughter Per Facility at Federally Inspected Slaughtering Plants

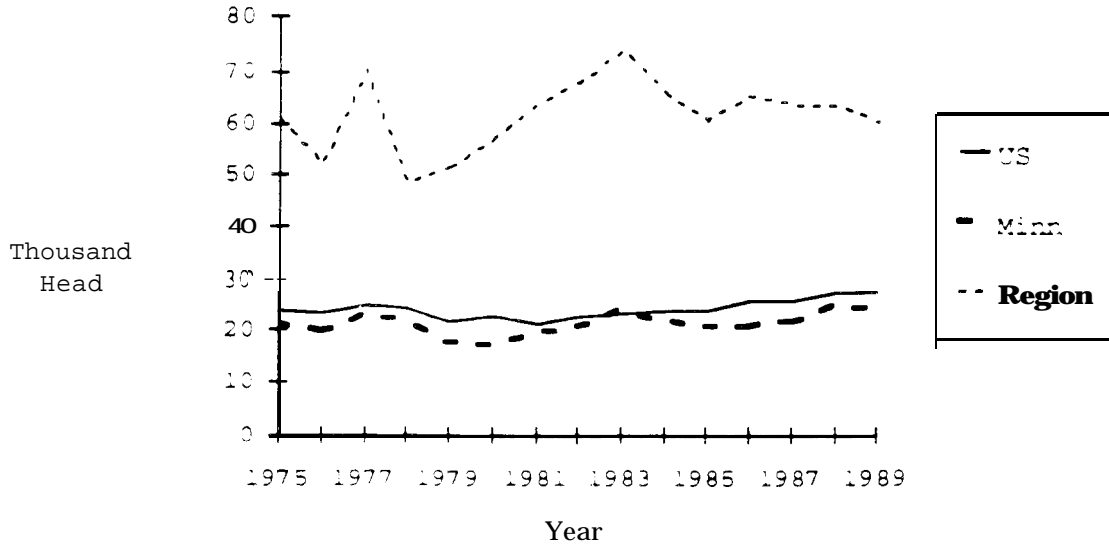


Figure 10. Average Annual Hog Slaughter Per Facility at Federally Inspected Slaughtering Plants

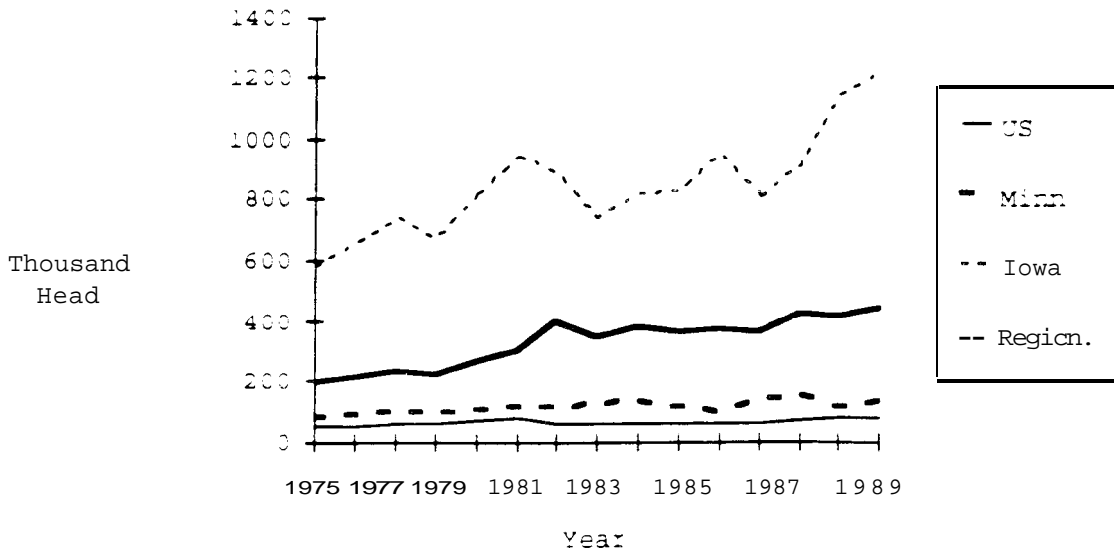


Figure 11. Federally Inspected Livestock Slaughtering Plants; United States Total by Species, 1975-1989.

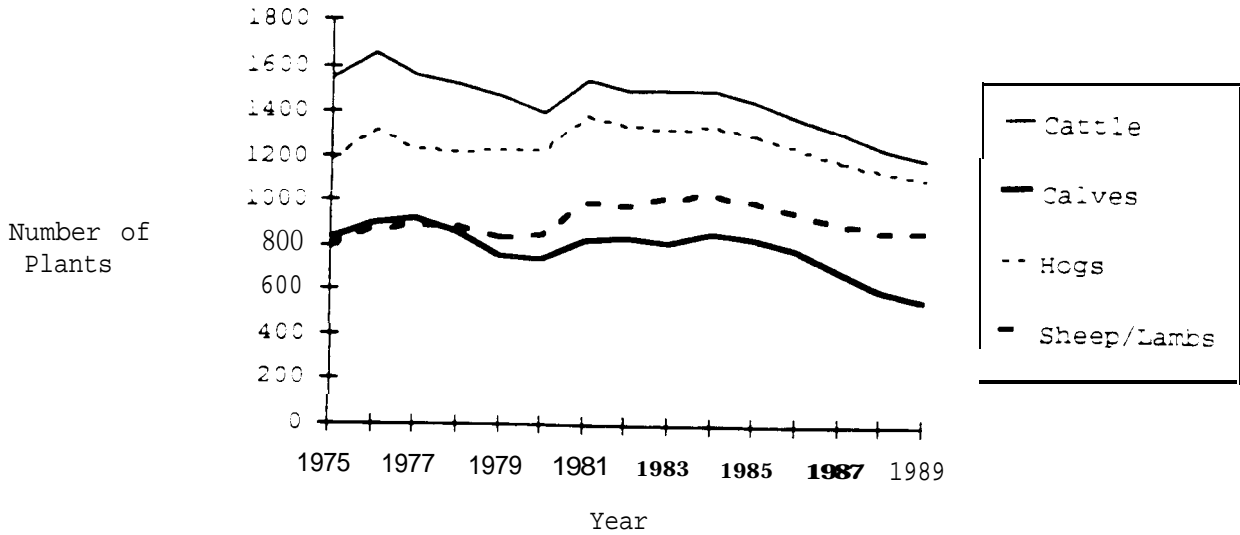


Figure 12. Federally Inspected Livestock Slaughtering Plants; Upper North Central Region Total by Species, 1975-1989

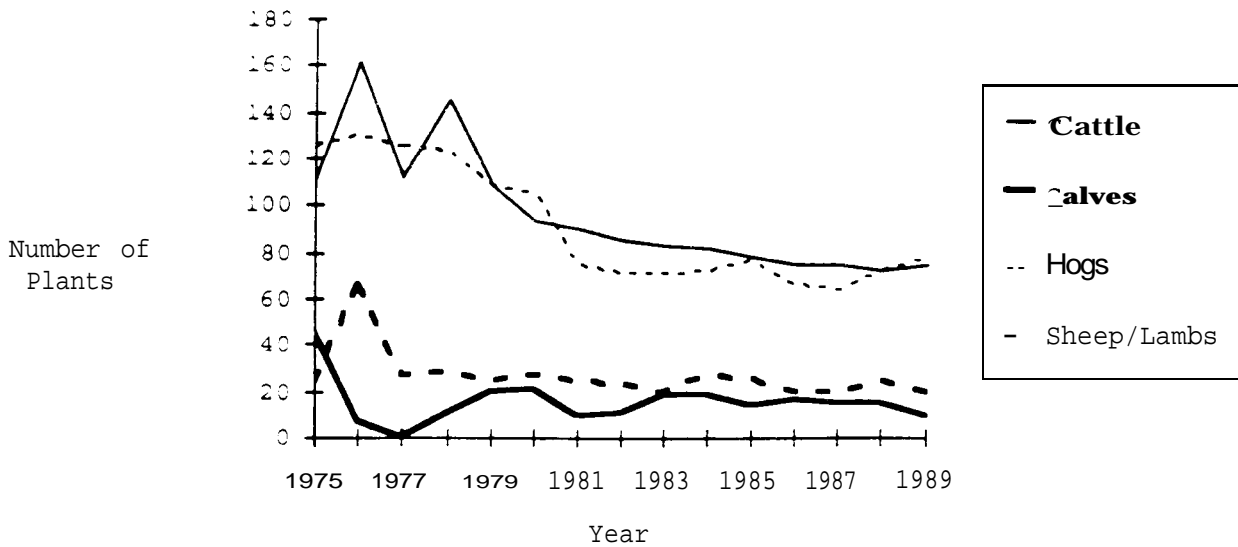


Figure 13. Federally Inspected Cattle and Hog Slaughtering Plants in Minnesota



Figure 14. Number of Federally Inspected Cattle Slaughtering Plants as a Percent of the 1975 Number

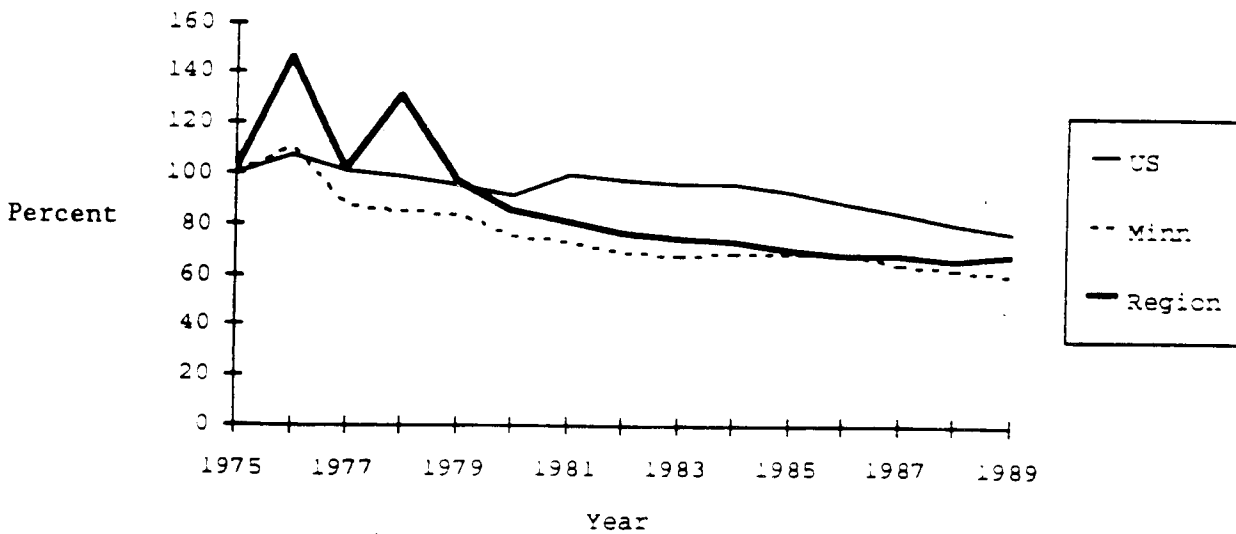


Figure 15 Number of Federally Inspected Hog Slaughtering Plants as a Percent of the 1975 Number

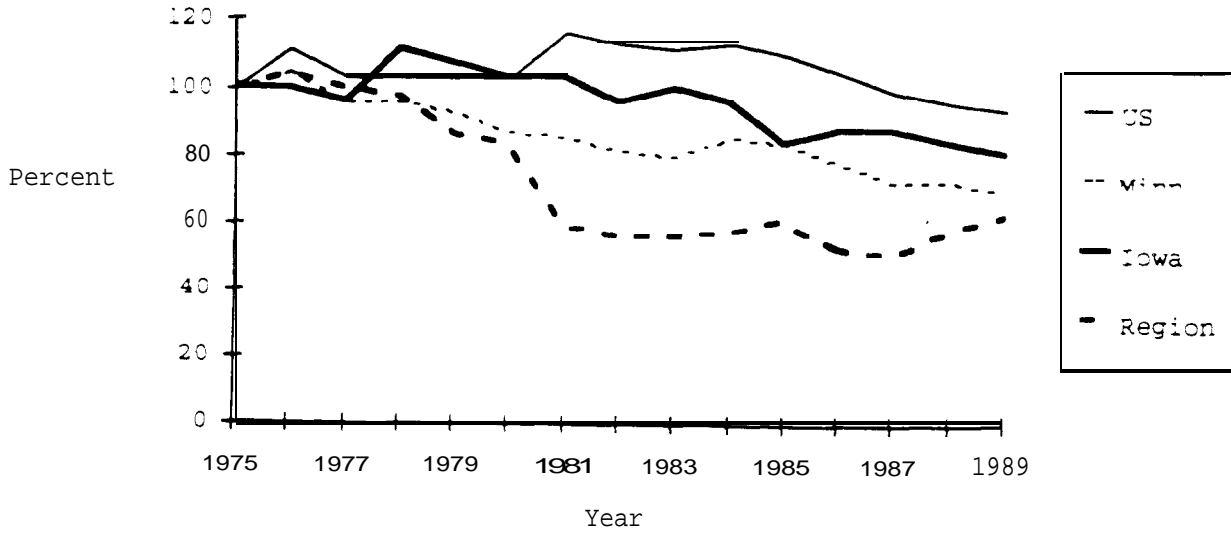


Figure 16. Number of Federally Inspected Cattle Slaughtering Plants as a Percent of the Number by Annual Slaughter, United States

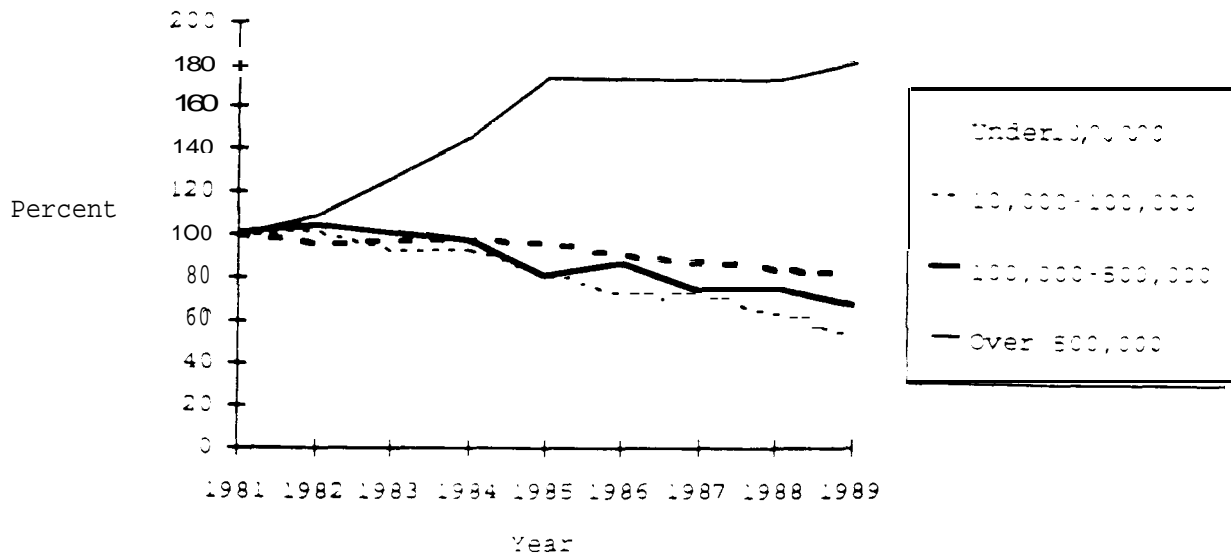


Figure 17. United States Cattle Slaughter by Plant Size, 1981-1989

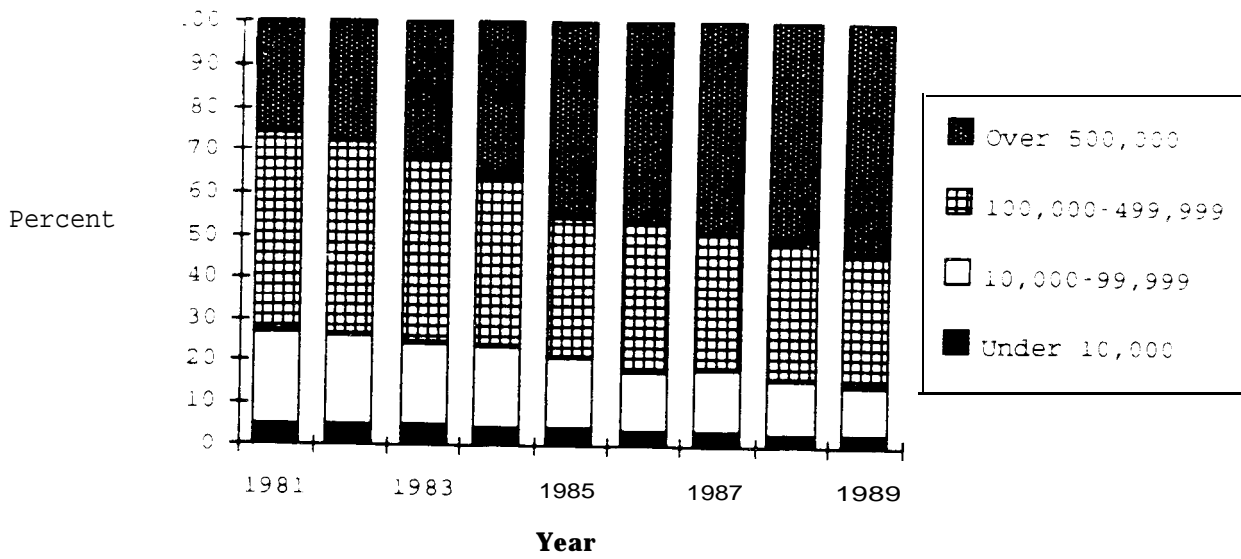


Figure 18. Number of United States Federally Inspected Hog Slaughtering Plants as a Percent of the 1981 Number, Annual Slaughter

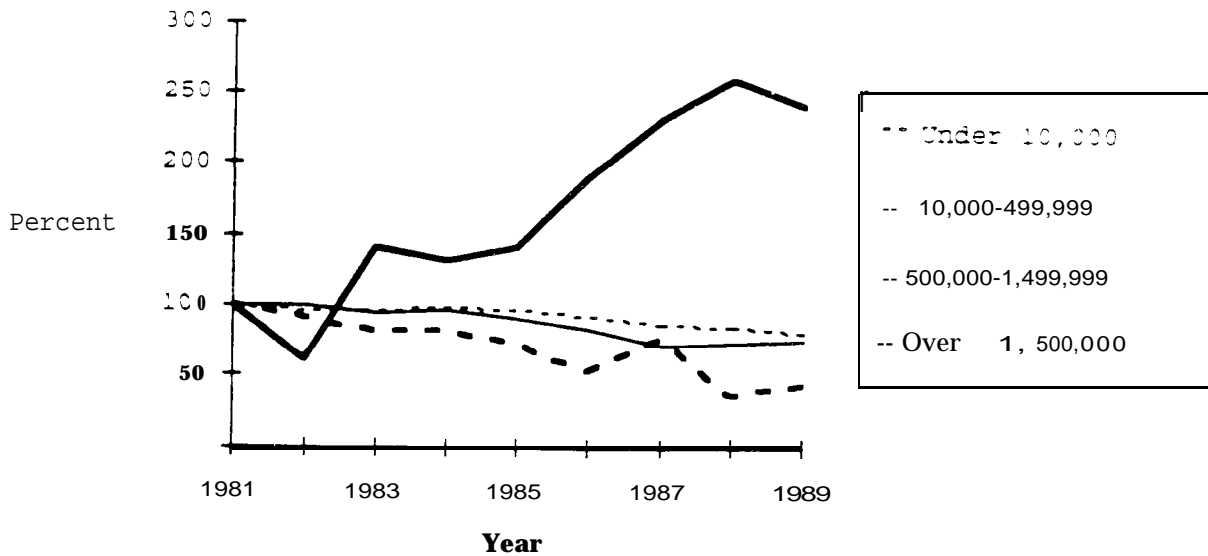


Figure 19 United States Federally Inspected Hog Slaughter by Size of Slaughtering Plant, 1981-1989

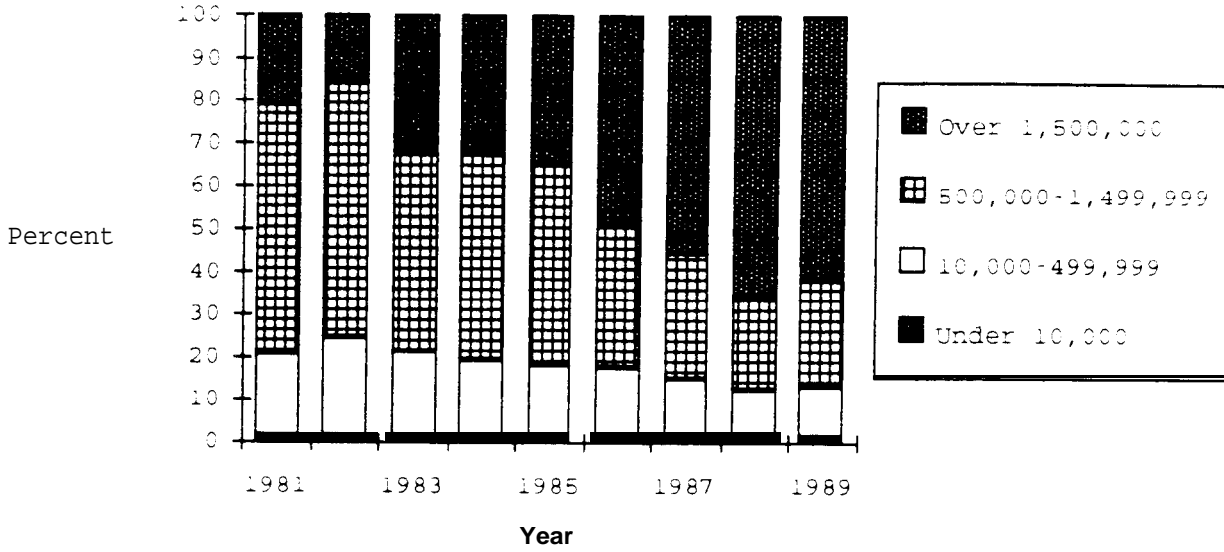


Figure 20. Number of Cattle Fed by Slaughter Packers Nationally by Relative Size of Packer

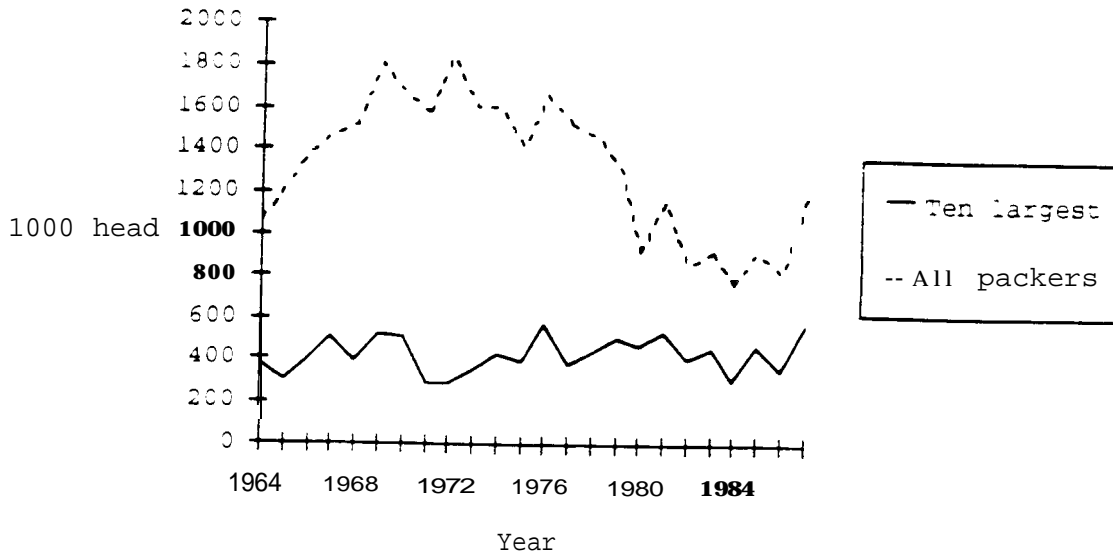


Figure 21. Average Size of Cattle Feeding Operations Run by Slaughter Packers by Relative Size of Packer

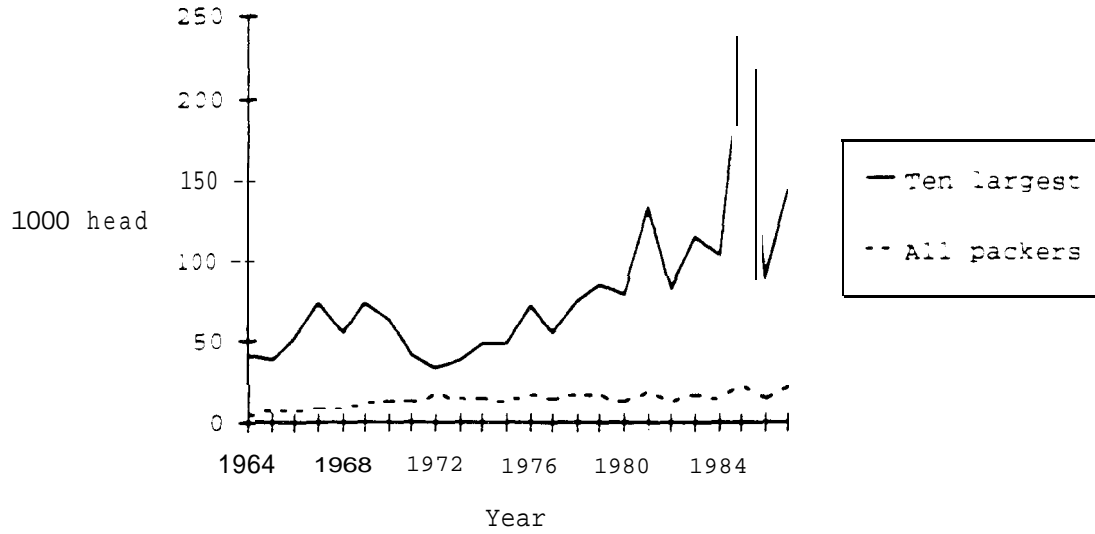


Figure 22. Average Size of Hog Feeding Operations Run by Slaughter Packers





Figure 23. Number of Sheep and Lambs Fed by Slaughter Packers by Relative Size of Packer

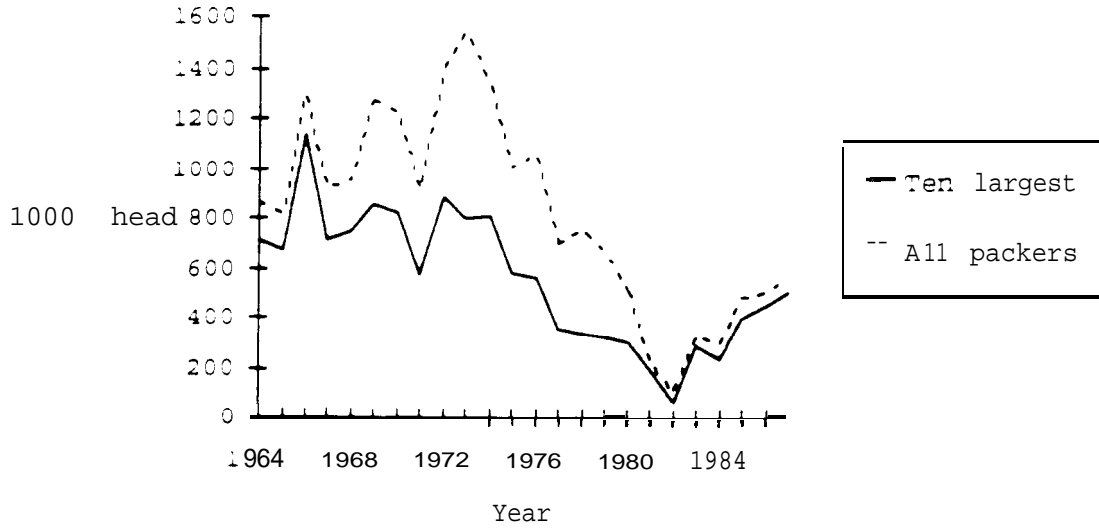


Figure 24. Average Size of Sheep and Lamb Feeding Operations Run by Slaughter Packers by Relative Size of Packer



Figure 25 Cattle Purchases by Packers by Type of Market, United States

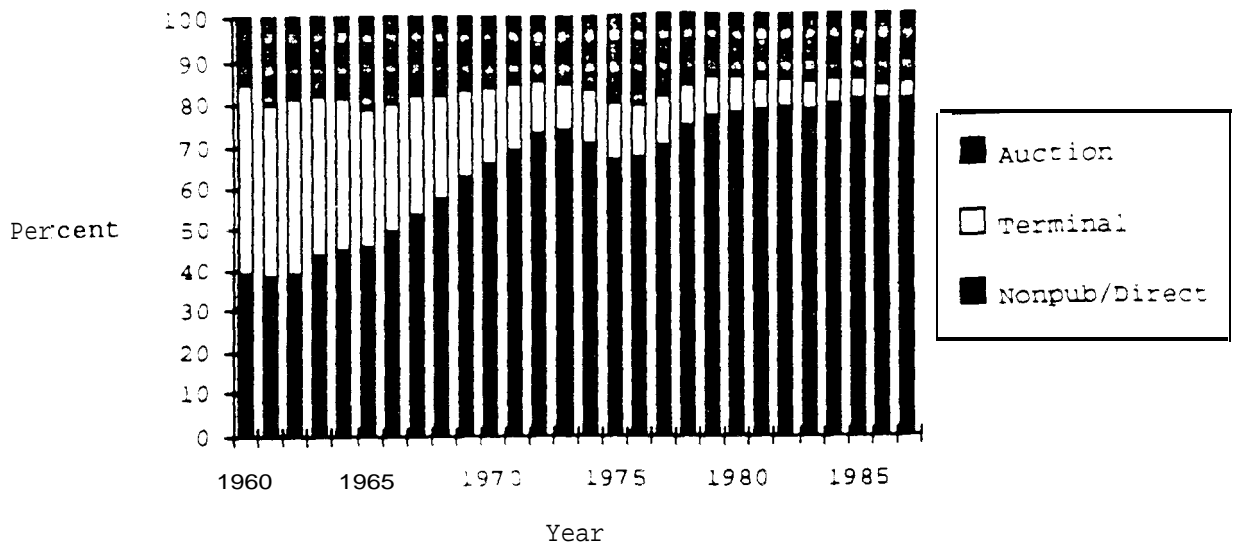


Figure 26. Hog Purchases by Packers by Type of Market, United States

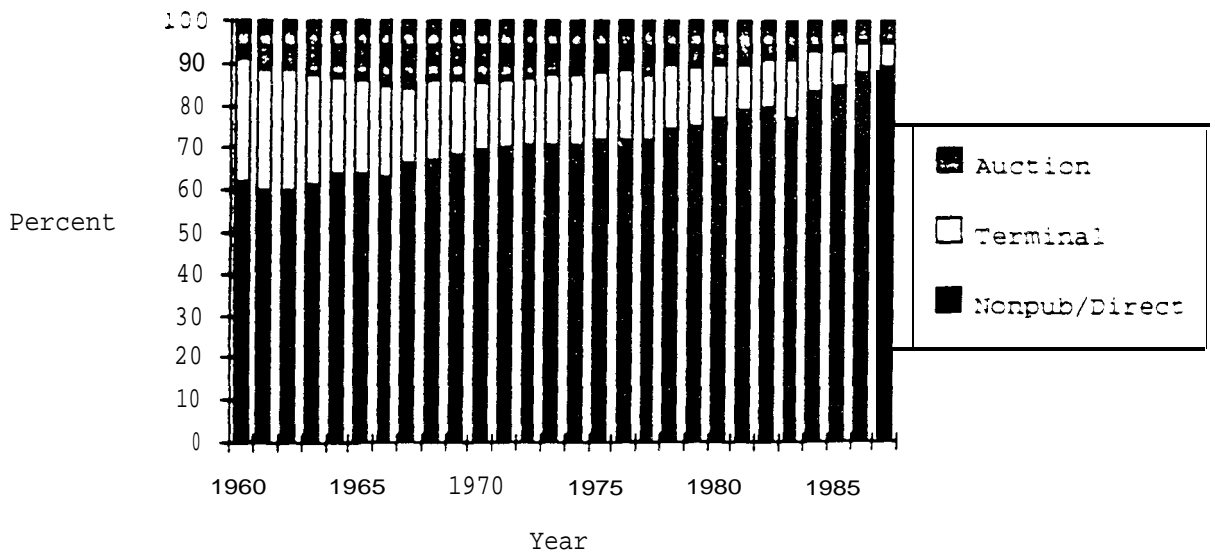


Figure 27. Sheep and Lamb Purchases by Packers by Type of Market, United States

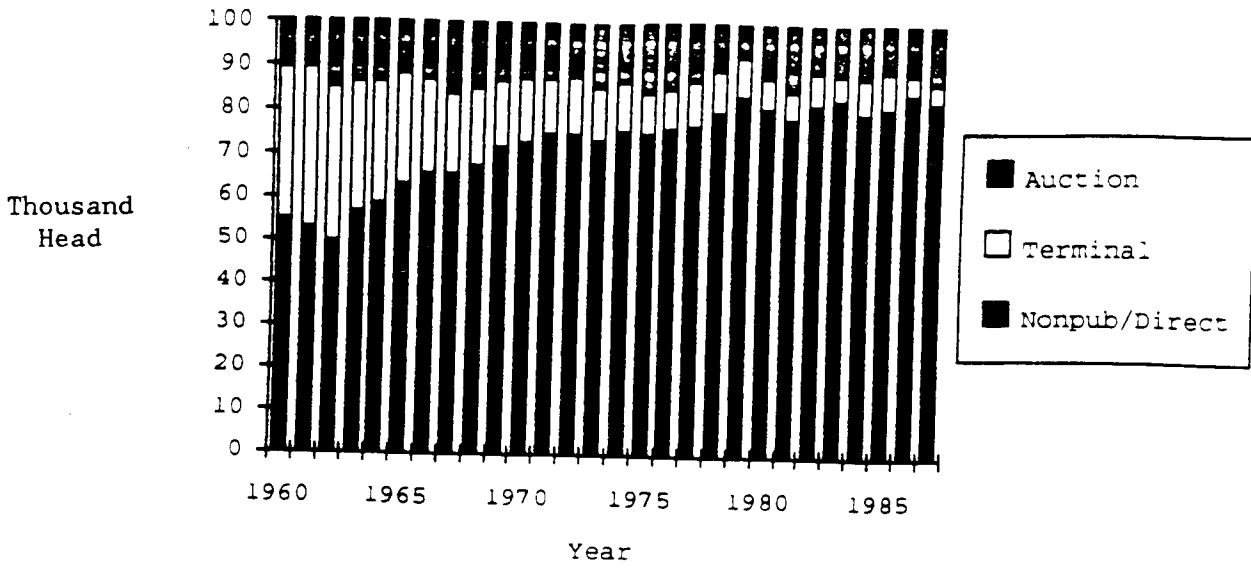


Figure 28. Minnesota Share of Upper North Central Region's Commercial Slaughter

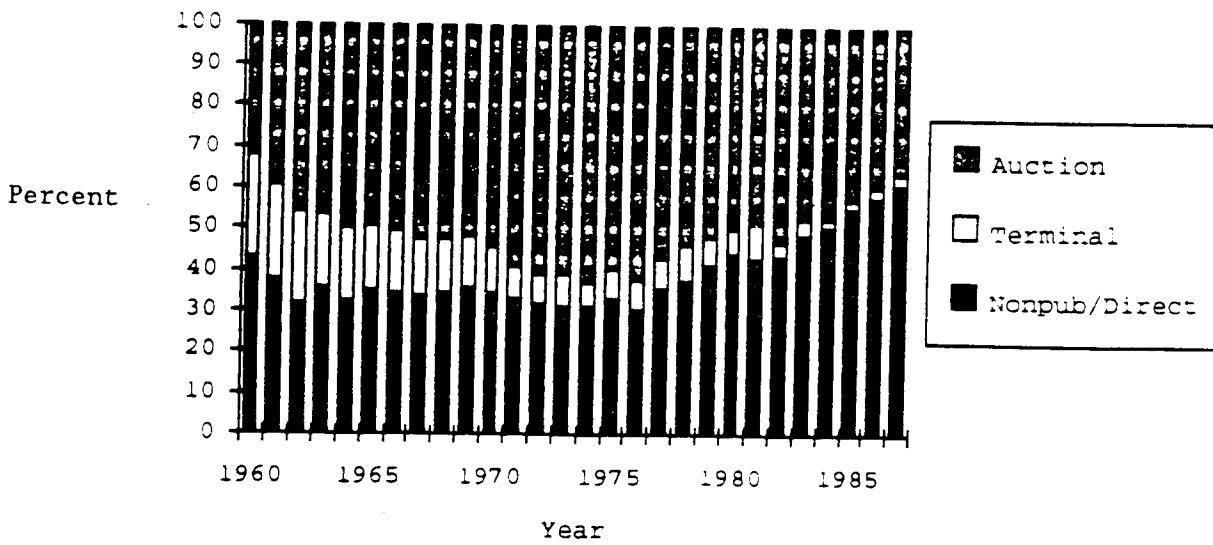
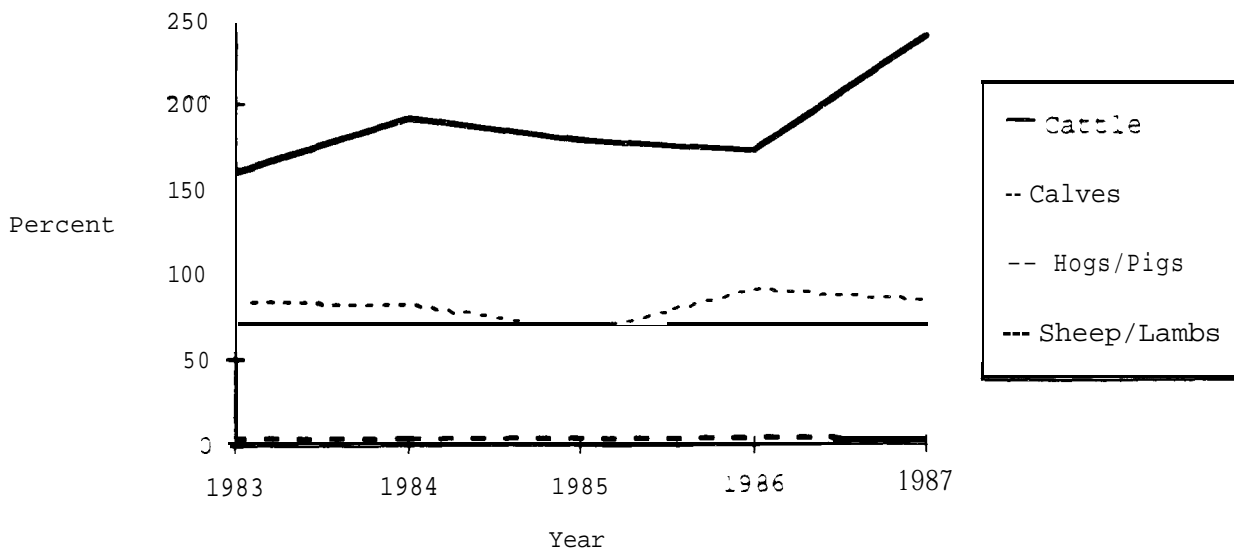


Figure 29. Commercial Slaughter as a Percent of Production, Upper North Central Region



Figure 30. Commercial Slaughter as a Percent of Production, Minnesota



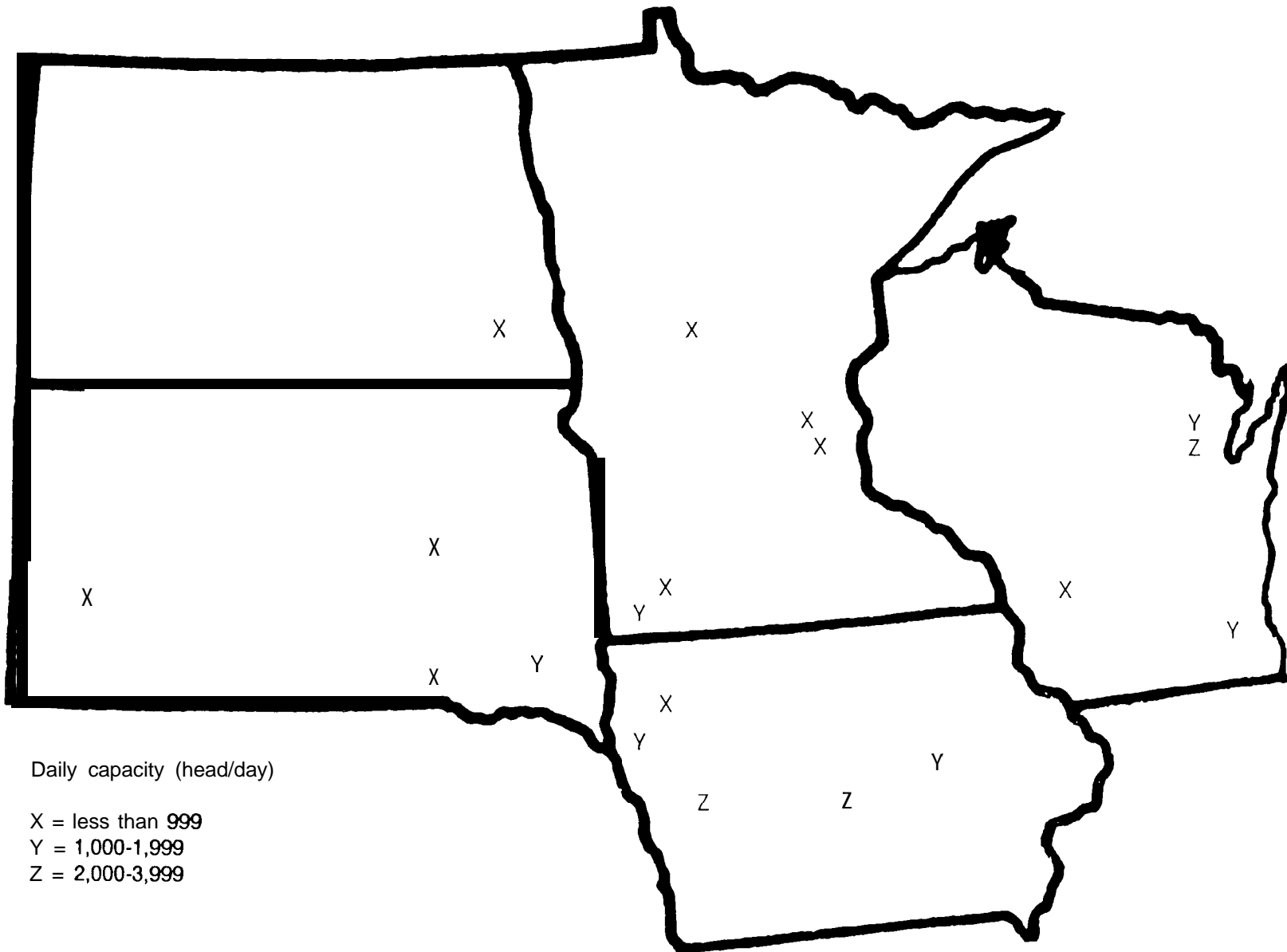


Figure 31. Regional Cattle Slaughter Facilities

(Source: K. Kimle and M. Hayenga, BEEF, December 1990.)

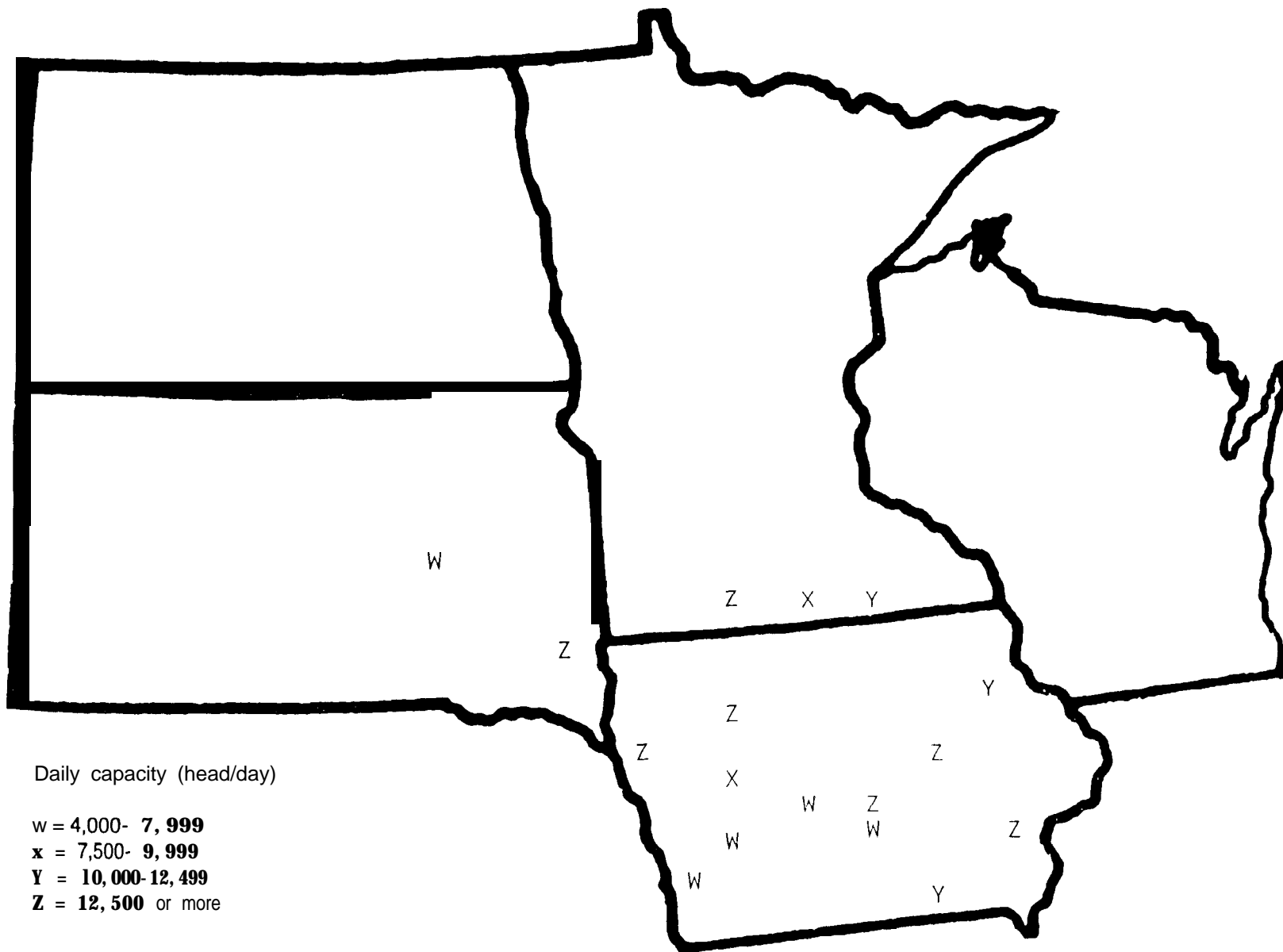


Figure 32. Regional Hog Slaughter Facilities

(Source: M. Hayenga and M. Kimle, National Hog Farmer, November 1990.)

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