Iowa Livestock Producers' Choice of Markets

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This report covers principally the market choices of Iowa livestock producers during 1954. The findings are based on a sample survey of about 400 Iowa farmers who were interviewed at 3-month intervals. These findings show the market outlets and market sources of the major classes of livestock — cattle, calves, hogs and pigs — sold and bought by Iowa producers. The characteristics of both the livestock producers and their livestock sales and purchases are presented with reference to the reported patterns of market selection.

In 1954, every livestock producer in Iowa had available at least one major market outlet within a 20-mile radius of his farm. Geographical differences occurred, however, in the concentration of livestock production, which affected the spatial distribution of market outlets and market sources for Iowa producers. In 1954, livestock sales per acre of farmland, for example, ranged from $10 to $67 among the 99 counties in Iowa. Generally, the eastern and western parts of the state had the most specialization in livestock production.

According to the 1954 survey data, slaughter cattle were sold by farmers largely through terminal markets. These markets, from the livestock producer’s viewpoint, offered a specialized service in the form of skilled sales personnel and a large number of active buyers. More than half of all steers and heifers sold by Iowa producers were sold through terminal markets.

Terminal markets were not as important as sales outlets for cows and bulls and were much less important as outlets for hogs and calves than they were in the sales of steers and heifers. In 1954, 49 percent of all sales of cows and bulls were through terminal markets, while only 18 percent of all hogs were sold through terminal markets. Nearly all livestock sales by Iowa producers at terminal markets, moreover, involved livestock intended for slaughter.

Meat packing plants, including packer buyers, and auctions were the next most important group of market outlets for cattle used by farmers. Meat packers purchased 22 percent of the total marketings of cattle by farmers in 1954, while 13 percent were sold through auction markets.

Slaughter hogs were sold largely to packing plants and dealers. Sales directly to packing plants and to packer buyers in 1954 were, respectively, 17 percent and 35 percent of total hog sales. Sales through dealers comprised 24 percent of total hog sales. From the producer’s viewpoint, convenience in location was the most important consideration in the choice of packing plants, packer buyers and dealers in the sale of slaughter hogs.

Feeder cattle, calves and pigs were sold largely through auctions or directly to another farmer. Breeding stock followed similar marketing channels. Purchases of feeder and breeding stock also occurred largely through these two markets. Local dealers, in addition, were an important source of feeder pigs.

Differences in marketing services offered by the major types of livestock markets were associated with differences in the livestock characteristics at each major type of market. Terminal markets — the outlet primarily used for slaughter cattle, though in total numbers slaughter hogs also were important — were characterized by relatively large lots shipped relatively great distances and representing relatively high average weight and value per hundredweight when sold.

Packing plants and packer buyers — the predominant outlet for slaughter hogs, though important also as market outlets for slaughter cattle and calves — were characterized by shipments of intermediate lot sizes hauled an intermediate distance, of intermediate average weight and of relatively high value per hundredweight.

Dealers were located, on the average, most conveniently with reference to distance. The local dealer markets also were differentiated from the other major types of markets with reference to the characteristics of the livestock handled.

Auction markets were conveniently located for producers and offered specialized services in the sale and purchase of livestock intended for breeding and feeding. Generally, livestock sales at these markets were in small lots, shipped only a few miles to place of sale, of lighter average weight and of lower average value per hundredweight than the livestock sold at other major market outlets.

Changes during the period from 1940 to 1954 also are cited in this report, of which the most striking was the growth of auction markets. Terminal public markets and packing plants, however, maintained their relative importance as market outlets for slaughter cattle and calves and, because of the secular growth in total marketings, the total sales through these markets increased substantially. Sales of slaughter hogs through packer buyers or directly to packing plants also increased in total volume.

Livestock auctions experienced the largest increase in sales volume through producers’ purchases of feeder cattle and calves. Local dealers, however, became the most important market source for feeder pigs — an activity that partly compensated for their declining importance as outlets for slaughter cattle and hogs.

Thus, each livestock market has developed a unique pattern of services and clientele in response to the needs of particular types of livestock enterprises. As the pattern of livestock production has changed, livestock markets have changed also in relative importance as outlets or sources of livestock for Iowa producers.
Iowa Livestock Producers’ Choice of Markets

BY WILBUR R. MAXI AND NORMAN V. STRAND

Livestock producers in Iowa have a wide choice of markets, including terminal markets, packing plants, packer buyers, dealers, auctions, other farmers and miscellaneous marketing agencies. These markets differ in their services and clientele. Their services also vary according to the class of livestock handled.

Iowa livestock markets have experienced several periods of quite drastic adjustments to changing patterns of livestock marketing. Until 1920, Iowa livestock producers depended largely upon the terminal public markets in both buying and selling of livestock. The advent of motor trucks and improved roads, however, triggered the growth of country markets and the gradual shift of slaughtering plants into areas of concentrated livestock production. In the competitive struggle for the producers' patronage, the specialized services of the public stockyards and commission firms vied with the locational convenience of the country markets.

Today, an expanding network of market news serves to connect the hundreds of country markets with the major central markets. Livestock producers thus are able to compare prices at alternative markets and even obtain bids from several buyers on a given sales lot of livestock. In effect, each of the 1,200 livestock markets and the 180,000 livestock producers in Iowa are tied to a nationwide system of markets and market news reporting.

In a perfect market, a particular quality of livestock would bring an identical price (except for transportation costs) at all pricing points. Under imperfect knowledge, however, the theoretical norm is not attained because of variability in livestock quality, demand and marketings. Additional knowledge about existing livestock marketing practices would be useful, therefore, in evaluating the strengths and weaknesses of the present system of marketing and market news reporting. Moreover, this information would be helpful to livestock market operators in adapting their activities to the changing needs of livestock producers.

A sample survey was undertaken in 1953 and 1954 to obtain a more complete picture of marketing practices and market choices of Iowa livestock producers. In this survey, a panel of about 400 farmers in Iowa was interviewed at quarter-year intervals over an 8-quarter period starting in April 1953. The survey findings serve as the source of data reported in this publication.

OBJECTIVES

The primary objective of this report is to provide a basebook of livestock marketing patterns of Iowa farmers for the calendar year 1954. Future studies of livestock marketing patterns can use this basebook to examine trends and to evaluate changes in the market choices of Iowa livestock producers.

Cattle, calves, hogs and pigs are the major livestock classes bought and sold by Iowa farmers. Hence, this report is limited to the sales and purchases of the four major livestock classes, including their interfarm sales. Livestock intended for slaughter, feeding and breeding are included in the tabular presentations, however, both separately and combined under various market-class descriptions.

The data pertain only to the Iowa population of livestock producers (mostly for the one calendar year—1954). Even though producers' choice of markets in 1954 may apply to existing situations, this report does not include an extrapolation of the findings to more recent years. Some data are available, however, to show the aggregate pattern of farm marketings of livestock for the 35-year period—1924 through 1959. The 1954 data also can be related to the 1940 survey of the Corn Belt Livestock Marketing Research Committee.

Briefly, the 1954 farm marketings of cattle, calves, hogs and pigs were somewhat fewer in total number than in later years, as shown in fig. 1. In comparison with 1940, however, the 1954 livestock marketings were substantially larger in total number. Livestock production in Iowa, which has composed about 15 percent of total

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1 Project 1223 of the Iowa Agricultural and Home Economics Experiment Station. The data used in this study were obtained from the Iowa Livestock Marketing Survey, Project 1223, which was financed by a grant from the Union Stockyards and Transit Company, Chicago, Illinois. The authors are grateful to Francis A. Kutish and Elliott S. Clifton for their contribution in the development of the field surveys and to Sam H. Thompson and Charles Y. Liu for assistance in the preparation of the tabular material upon which this report is based.

2 The early history of livestock marketing in Iowa is covered in: Sam H. Thompson, Economic trends in livestock marketings. John H. Swift Company, St. Louis, 1940.

3 The statistical features of this sample survey are discussed in the appendix.

livestock production in the United States, kept pace with the growth in population and demand for meat during the period since 1940. Cyclical changes occurred, however, in yearly livestock production. The secular and cyclical changes in livestock marketings resulted in two sets of changes in the business volume of each market—changes in total numbers bought and sold and changes in each market’s percentage share of total Iowa sales and purchases of livestock.

FACTORS AFFECTING CHOICE OF MARKETS

Choice of market is a terminal decision in the livestock production process. Early in the production process, rather basic farm decisions are involved in the choice of a livestock enterprise and its relative size (as compared with the previous year or the average size of all such enterprises). The aggregate price effects of farmers’ decisions are involved in the cyclical changes in farm marketings shown in fig. 1. Choice of market, however, relates to the basic production decisions insofar as the pricing process functions with reference to market organization and structure. If markets fail to precisely discover the derived retail market value of livestock, then livestock quality improvement programs based on adequate price-quality differentials are likely to fail. Moreover, lack of reliability in livestock price forecasting may result in excessive dependence on current prices in making basic production decisions. A better understanding of livestock marketing patterns and changes in these patterns, therefore, may contribute to improvements in the market information used in both the production and distribution processes.

Four different sets of factors are cited as relevant to livestock producers’ choice of markets: farm organization, livestock or market class, time of marketing and farmer attitudes. Iowa farms are changing gradually in size, enterprise organization and degree of specialization. Market classes of livestock, particularly the percentage distribution of female stock, also change from year to year as a result of producers’ decisions to increase or decrease the number of animals bred or the number of animals on feed. In addition, current and anticipated price relationships for feed grains, cattle and hogs affect the weight of animals bought and sold, or the time of marketing. Finally, producer preferences affect the choice of particular market outlets or market sources, though these preferences may change because of changes in farm organization, livestock classes or time of marketing.

FARM CHARACTERISTICS

Practically all Iowa farms—186,769 farms, or 96.5 percent of the estimated 198,438 farms in 1954—reported one or more head of livestock on hand or sold during the year. Considerable differences occurred, however, in farm organization and the nature of the livestock enterprise. As suggested in table 1, for example, livestock farms are the dominant type of farm in Iowa, though other types of farms also keep livestock, either cattle, hogs or both.6

6 A farm was classified as livestock, cash grain, dairy and poultry if 50 percent or more of total cash receipts for 1953 were from one of the particular sources of revenue. A farm was a dairy farm also if dairy products accounted for 50 percent or more of total cash receipts. Milk cows represented 50 percent or more of all cows and sales of dairy products together with sales of cattle amounted to 50 percent or more of total receipts. A farm was a general farm if 75 percent or more of the cash receipts came from livestock, grain crops, dairy products and poultry and if it did not fall into any of the other categories. A farm was classified as miscellaneous if it was a truck farm or a type not included in the other five categories.
## Table 1. Estimated Number of Iowa Farms of Specified Type, by Livestock Enterprise, 1954.

<table>
<thead>
<tr>
<th>Livestock enterprise</th>
<th>Livestock</th>
<th>Cash grain</th>
<th>Dairy products</th>
<th>Poultry and eggs</th>
<th>General</th>
<th>Other</th>
<th>All farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle only</td>
<td>4,068</td>
<td>8,884</td>
<td>2,111</td>
<td>1,674</td>
<td>2,153</td>
<td>0</td>
<td>18,996</td>
</tr>
<tr>
<td>Hogs only</td>
<td>4,046</td>
<td>1,237</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>5,285</td>
</tr>
<tr>
<td>Cattle and hogs</td>
<td>119,865</td>
<td>19,829</td>
<td>11,401</td>
<td>753</td>
<td>10,848</td>
<td>0</td>
<td>162,496</td>
</tr>
<tr>
<td>Neither cattle nor hogs</td>
<td>0</td>
<td>1,852</td>
<td>0</td>
<td>1,674</td>
<td>1,674</td>
<td>1,674</td>
<td>6,874</td>
</tr>
<tr>
<td>All farms</td>
<td>127,779</td>
<td>31,902</td>
<td>13,512</td>
<td>4,101</td>
<td>14,670</td>
<td>1,674</td>
<td>193,643</td>
</tr>
</tbody>
</table>

## Table 2. Estimated Number of Iowa Farms Having Specified Livestock on Hand, Dec. 31, 1954.

<table>
<thead>
<tr>
<th>Type of farm</th>
<th>Cattle and calves</th>
<th>Hogs and pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>127,779</td>
<td>114,966</td>
</tr>
<tr>
<td>Cash grain</td>
<td>31,902</td>
<td>18,294</td>
</tr>
<tr>
<td>Dairy products</td>
<td>15,512</td>
<td>9,624</td>
</tr>
<tr>
<td>Poultry and eggs</td>
<td>4,101</td>
<td>765</td>
</tr>
<tr>
<td>General</td>
<td>14,670</td>
<td>11,507</td>
</tr>
<tr>
<td>All farms</td>
<td>191,969</td>
<td>155,144</td>
</tr>
</tbody>
</table>

*Total number of farms excludes 1,674 farms in the “other” type of farm category. Neither cattle nor hogs were reported by any farm in this category of Iowa farms.

## Table 3. Estimated Number of Cattle and Calves on Specified Type of Farm, by Livestock Class, Dec. 31, 1954.

<table>
<thead>
<tr>
<th>Type of farm</th>
<th>Milk stock</th>
<th>Beef breeding stock</th>
<th>Home raised Feeder</th>
<th>Purchased</th>
<th>Total (1,000 head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>1,118.3</td>
<td>1,098.9</td>
<td>990.4</td>
<td>1,849.0</td>
<td>5,056.6</td>
</tr>
<tr>
<td>Cash grain</td>
<td>176.3</td>
<td>195.9</td>
<td>134.2</td>
<td>160.5</td>
<td>606.9</td>
</tr>
<tr>
<td>Dairy products</td>
<td>246.2</td>
<td>40.4</td>
<td>33.8</td>
<td>1.1</td>
<td>321.5</td>
</tr>
<tr>
<td>Poultry and eggs</td>
<td>25.9</td>
<td>9.2</td>
<td>10.8</td>
<td>0.9</td>
<td>46.8</td>
</tr>
<tr>
<td>General</td>
<td>126.9</td>
<td>80.4</td>
<td>55.2</td>
<td>38.3</td>
<td>300.8</td>
</tr>
<tr>
<td>Total</td>
<td>1,693.6</td>
<td>1,424.8</td>
<td>1,224.4</td>
<td>1,389.8</td>
<td>6,312.6</td>
</tr>
</tbody>
</table>


Somewhat fewer farms reported cattle, calves, hogs or pigs on hand at the end of the 1954 calendar year than during the year (table 2). Total farm marketings of livestock were at a lower level in 1954 than in 1953 or 1955, as shown in fig. 1. Hence, livestock numbers on Dec. 31, 1954, were affected by the general upward movement in livestock numbers. Though hog marketings were fivefold the number of cattle and calves sold by Iowa farmers in 1954 and 1955, fewer farms reported hogs and pigs on hand than reported cattle and calves.

Cattle and calves kept mainly for milk made up a major part of the total breeding stock on Iowa farms, as shown in table 3. Home-raised feeders on hand were fewer in total number than beef breeding stock or purchased feeders. Most of the purchased feeders were on livestock farms.
Livestock farms accounted for 80 percent of the cattle and calves on hand Dec. 31, 1954. Estimated average number of head of cattle and calves per farm ranged from 41 on livestock farms to 19 on poultry and egg farms.

Farm inventories of hogs and pigs were relatively small in relation to farm marketings, as illustrated partly in table 4. Livestock farms again accounted for most of the farm inventories on Dec. 31, 1954. Average number of head of all hogs and pigs on hand ranged from 84 on livestock farms to 26 on dairy farms.

In July 1953, the sample of Iowa farmers was interviewed regarding various practices in the choice of markets. Considerable market information was available, according to these interviews. At least one daily newspaper was received by 89 percent of the farmers, while 93 percent received at least one farm paper or magazine. Despite the large proportion of farmers subscribing to both sources of information, only 5 percent of the farmers indicated the daily newspaper as the best source of information in making price forecasts 5 to 6 months ahead, while 21 percent indicated farm papers and magazines as best for this purpose. Radio, however, was listed as the best information source on price forecasts by 14 percent of the farmers. Only 5 percent specifically listed land-grant college and U. S. Department of Agriculture reports as best. Though a wide variety of informational sources was indicated, at least 80 percent of the farmers did not compare prices in different markets for cattle or hogs.

Both buyer and seller cited the element of uncertainty in judging the market value of livestock. Some livestock producers reduced this uncertainty by obtaining bids or price quotations from several different buyers. The 1954 survey data showed that bids or other price indications were obtained on 78 percent of the steers sold and on 67 percent of the mixed lots of steers and heifers sold. Also, 74 percent of the barrows and gilts sold were obtained on bid or were priced before the sale. However, only 55 percent of the calves, 42 percent of the cows and bulls, 41 percent of the sows, 33 percent of the boars and stags and 27 percent of the vealers were handled in this manner. Moreover, in 1954, all feeder pigs were sold without prior bids or price indications.

A producer may decide to sell his livestock at a more distant market and, hence, he may compare prices at several markets. In the 1953 survey, 74 percent of Iowa livestock producers reported making market price comparisons. These producers thus reduced some of the uncertainty of selecting the best market for their livestock.

Various practices were used in the comparisons of market prices. The average price was used by 60 percent of the producers making price comparisons. The producers using the top price, the low price, or a price range were almost equally divided. The different practices stemmed from differences in livestock characteristics and in personal evaluations of different market characteristics.

Producers using the average price in making market comparisons were asked to list their reasons for this practice. Most of the respondents believed that they had average stock; hence, they expected an average price on their sales. Nevertheless, a considerable element of pricing uncertainty was apparent in the replies obtained from the sample of producers.

### LIVESTOCK CLASSES

Slaughter livestock made up the major part of the 3,777,000 cattle, 293,500 calves and 16,853,300 hogs and pigs sold by Iowa producers in 1954 (table 5). Eighty-two percent of the cattle and calves were intended for slaughter. Marketing of slaughter hogs was 90 percent of the total sales of hogs and pigs.

Total purchases of cattle and calves in 1954 amounted to 64 percent of the total sales, while...

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**TABLE 4. ESTIMATED NUMBER OF HOGS AND PIGS ON SPECIFIED TYPE OF FARM, BY LIVESTOCK CLASS, DEC. 31, 1954.**

<table>
<thead>
<tr>
<th>Type of farm</th>
<th>Barrows and gilts</th>
<th>Sows and gilts</th>
<th>Boars and stags</th>
<th>Pigs under 3 months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
<td>6,702.9</td>
<td>2,108.8</td>
<td>80.8</td>
<td>722.3</td>
<td>9,614.8</td>
</tr>
<tr>
<td>Cash grain</td>
<td>481.3</td>
<td>127.5</td>
<td>3.7</td>
<td>117.8</td>
<td>730.3</td>
</tr>
<tr>
<td>Dairy products</td>
<td>66.7</td>
<td>136.1</td>
<td>7.2</td>
<td>36.4</td>
<td>246.4</td>
</tr>
<tr>
<td>Poultry and eggs</td>
<td>35.1</td>
<td>14.3</td>
<td>1.0</td>
<td>0.0</td>
<td>50.4</td>
</tr>
<tr>
<td>General</td>
<td>462.4</td>
<td>106.8</td>
<td>5.2</td>
<td>36.2</td>
<td>611.6</td>
</tr>
<tr>
<td>Total</td>
<td>7,746.4</td>
<td>2,493.5</td>
<td>97.9</td>
<td>912.7</td>
<td>11,253.5</td>
</tr>
</tbody>
</table>

* The United States Department of Agriculture reports 11,156,000 head on hand as Jan. 1, 1955. For source, see footnote to table 3.

---

**TABLE 5. ESTIMATED NUMBER OF LIVESTOCK SOLD BY IOWA FARMERS FOR SPECIFIED USE, BY LIVESTOCK CLASS, 1954.**

<table>
<thead>
<tr>
<th>Intended use</th>
<th>Cattle</th>
<th>Calves</th>
<th>Hogs and pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slaughter</td>
<td>3,074.8</td>
<td>211.1</td>
<td>16,743.4</td>
</tr>
<tr>
<td>Feeder</td>
<td>344.6</td>
<td>64.6</td>
<td>1,092.3</td>
</tr>
<tr>
<td>Herd or breeding</td>
<td>311.1</td>
<td>14.3</td>
<td>423.1</td>
</tr>
<tr>
<td>Unknown</td>
<td>46.5</td>
<td>2.9</td>
<td>134.6</td>
</tr>
<tr>
<td>All uses</td>
<td>3,777.0</td>
<td>283.5</td>
<td>16,853.3</td>
</tr>
</tbody>
</table>
The pattern of livestock purchases differed sharply from the pattern of sales (see table 9). Other farmers and auctions were more important as sources of livestock purchased than as market outlets for livestock sold. In addition, local dealers were an important source of feeder pigs. Market choices among livestock producers varied according to the degree of specialization in livestock production (table 10). Much of this affinity between type of market and degree of specialization, however, was related to the market classes of livestock sold by different producers. Among producers with similar farm production characteristics and market classes of cattle and calves, a similar pattern of market selection was observed.

1 These estimates of the number of markets are based on a forthcoming report on Iowa livestock markets.

1954 survey data were used to examine the correlation, if any, between specialization in livestock production and marketings of different livestock classes. Iowa farms were classified into four groups with respect to the percentage of total cash receipts derived from livestock sales during 1954. The four percentage groups and the number of farms in each group were as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25</td>
<td>36,009</td>
</tr>
<tr>
<td>25 to 49</td>
<td>24,470</td>
</tr>
<tr>
<td>50 to 74</td>
<td>39,741</td>
</tr>
<tr>
<td>75 and over</td>
<td>98,423</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>193,648</strong></td>
</tr>
</tbody>
</table>

Thus, nearly half of all Iowa farms in 1954 derived 75 percent or more of their cash receipts from the sale of livestock.1

Iowa farms reporting livestock sales as less than half of total farm sales accounted for only 13 and 12 percent, respectively, of all cattle and calves sold and all hogs and pigs sold (table 7). These percentages, however, varied widely among the several livestock classes, particularly for cattle and calves. Only 6 percent of the steers sold originated among the less specialized producers (farms reporting livestock sales as less than 50 percent of total farm sales), but 33 percent of the dairy heifers, 30 percent of the dairy cows, 28 percent of the vealers, and 22 percent of the feeder pigs originated among these producers. Less than 15 percent of the total sales of any market class of hogs and pigs—barrows and gilts, sows, boars and stags, feeder pigs and gilts for breeding—originated from this producer group. A majority of the less specialized livestock producers reported grain sales as a major source of cash receipts.

The major markets used by Iowa producers in 1954 and the total number of each located in Iowa, were as follows: 1 terminal public market, 49 packing plants and their packer buyers, 660 local independent dealers, 170 auctions and a large fraction of the 187,000 farms reporting sales of livestock. Local cooperative associations, of which 34 were reported, local retailers and miscellaneous markets were unimportant in the statewide pattern of livestock sales and purchases.7 In addition, a large number of out-of-state markets were available to Iowa producers.

Most cattle were sold through public stockyards, auctions or packer buyers (including those at packing plants), as shown in table 8. Auctions, however, were the most important outlet for calves. Packer buyers and the public stockyards handled most of the hogs and pigs sold by Iowa farmers.

The major markets used by Iowa producers in 1954 and the total number of each located in Iowa, were as follows: 1 terminal public market, 49 packing plants and their packer buyers, 660 local independent dealers, 170 auctions and a large fraction of the 187,000 farms reporting sales of livestock. Local cooperative associations, of which 34 were reported, local retailers and miscellaneous markets were unimportant in the statewide pattern of livestock sales and purchases.7 In addition, a large number of out-of-state markets were available to Iowa producers.
Feeders were purchased during the last 4 months of the year. Farm marketings of feeder calves (table 14). Most 102

ward earlier farrowings and earlier marketings. The 1954 calendar year marked the beginning of a secular trend to­

tern for cattle and calves was related to the out­

teriod for breeding were purchased during the first quarter-year, while boars, feeder pigs and gilts for breeding were purchased during the final 3- or 4-month period. Though practically all the sows, boars and gilts purchased were intended for breeding, a marked difference existed in the bi­

monthy distribution of purchases. For all market classes, however, only a few purchases were re­

ported during July and August.

**Producer Attitudes**

Panel members were interviewed regarding their reasons for selling each lot of livestock through the specified market rather than through an alternative market. Essentially, four major types of reasons were given: the degree of market competition, mostly in terms of market price; the location and convenience of the market; the type of animal sold; and various special reasons stated by a relatively small number of respondents. All reasons were given on the basis of number of head of livestock involved rather than the number of lots.

The degree of competition at the preferred market—indicated by the number of buyers and sellers—was stated as the most important reason for each of the three major classes of livestock sold. The notion of "most competition" was re­

> These interviews were completed during April 1953 and July 1953.

The uniformity in patterns of market selection among livestock producers is illustrated in the market choices in the sale of hogs and pigs (table 11). The distribution of market classes of hogs and pigs is almost the same among livestock pro­

ducers reporting varying degrees of specialization. Again, the distribution of market classes of livestock is a more reliable indicator of producers' selection of market outlets than the distribution of producers according to the percentage of total cash receipts derived from livestock sales.

Farm marketings of all cattle and calves were quite uniformly distributed over the year. Con­

iderable differences occurred, however, among the market classes listed in table 12. The time of marketing among various livestock classes was related through the production process that generated these marketings, such as milk production or breeding of cattle kept mainly for beef. Most of the variability in the bimonthly marketing pat­

tern for cattle and calves was related to the out­

pats of these two types of livestock enterprises.

Bimonthly sales of hogs and pigs (table 13) followed the characteristic seasonal pattern asso­

ciated with hog marketings. The 1954 calendar year marked the beginning of a secular trend toward earlier farrowings and earlier marketings.

Farm purchases of cattle and calves during 1954 corresponded in their temporal pattern with farm marketings of feeder calves (table 14). Most feeders were purchased during the last 4 months of the year.

The bimodal purchase pattern for hogs and pigs correlated with the spring and fall pig crops (table 15). In 1954, a major part of the barrows, gilts and sows were purchased during the first quarter-year, while boars, feeder pigs and gilts for breeding were purchased during the final 3- or 4-month period. Though practically all the sows, boars and gilts purchased were intended for breeding, a marked difference existed in the bi­

monthy distribution of purchases. For all market classes, however, only a few purchases were re­

ported during July and August.

**Producer Attitudes**

Panel members were interviewed regarding their reasons for selling each lot of livestock through the specified market rather than through an alternative market. Essentially, four major types of reasons were given: the degree of market competition, mostly in terms of market price; the location and convenience of the market; the type of animal sold; and various special reasons stated by a relatively small number of respondents. All reasons were given on the basis of number of head of livestock involved rather than the number of lots.

The degree of competition at the preferred market—indicated by the number of buyers and sellers—was stated as the most important reason for each of the three major classes of livestock sold. The notion of "most competition" was re­

> These interviews were completed during April 1953 and July 1953.

The uniformity in patterns of market selection among livestock producers is illustrated in the market choices in the sale of hogs and pigs (table 11). The distribution of market classes of hogs and pigs is almost the same among livestock pro­

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monthy distribution of purchases. For all market classes, however, only a few purchases were re­

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**Producer Attitudes**

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The degree of competition at the preferred market—indicated by the number of buyers and sellers—was stated as the most important reason for each of the three major classes of livestock sold. The notion of "most competition" was re­

> These interviews were completed during April 1953 and July 1953.
### TABLE 12. ESTIMATED PERCENTAGE OF CATTLE AND CALVES SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Bimonthly period</th>
<th>Steers and heifers</th>
<th>Dairy heifers</th>
<th>Bulls</th>
<th>Beef cows</th>
<th>Dairy cows</th>
<th>Calves</th>
<th>Vealers</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>15</td>
<td>10</td>
<td>18</td>
<td>27</td>
<td>19</td>
<td>7</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>March - April</td>
<td>15</td>
<td>2</td>
<td>17</td>
<td>17</td>
<td>12</td>
<td>8</td>
<td>22</td>
<td>15</td>
</tr>
<tr>
<td>May - June</td>
<td>16</td>
<td>12</td>
<td>14</td>
<td>11</td>
<td>15</td>
<td>8</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>18</td>
<td>22</td>
<td>14</td>
<td>12</td>
<td>9</td>
<td>3</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>20</td>
<td>12</td>
<td>16</td>
<td>11</td>
<td>20</td>
<td>29</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>16</td>
<td>41</td>
<td>21</td>
<td>22</td>
<td>25</td>
<td>45</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 13. ESTIMATED PERCENTAGE OF HOGS AND PIGS SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Bimonthly period</th>
<th>Barrows and gilts</th>
<th>Sows</th>
<th>Boars and stags</th>
<th>Feeder pigs</th>
<th>Gilts for breeding</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>15</td>
<td>7</td>
<td>9</td>
<td>24</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>March - April</td>
<td>17</td>
<td>10</td>
<td>37</td>
<td>12</td>
<td>37</td>
<td>16</td>
</tr>
<tr>
<td>May - June</td>
<td>11</td>
<td>35</td>
<td>12</td>
<td>12</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>9</td>
<td>29</td>
<td>6</td>
<td>27</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>20</td>
<td>11</td>
<td>14</td>
<td>14</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>28</td>
<td>8</td>
<td>22</td>
<td>11</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 14. ESTIMATED PERCENTAGE OF IOWA FARM PURCHASES OF CATTLE AND CALVES IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Bimonthly period</th>
<th>Steers and heifers</th>
<th>Dairy heifers</th>
<th>Bulls</th>
<th>Beef cows</th>
<th>Dairy cows</th>
<th>Calves</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>11</td>
<td>29</td>
<td>19</td>
<td>20</td>
<td>15</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>March - April</td>
<td>12</td>
<td>10</td>
<td>20</td>
<td>9</td>
<td>22</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>May - June</td>
<td>6</td>
<td>7</td>
<td>24</td>
<td>11</td>
<td>6</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>8</td>
<td>0</td>
<td>17</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>38</td>
<td>0</td>
<td>11</td>
<td>18</td>
<td>26</td>
<td>63</td>
<td>39</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>24</td>
<td>54</td>
<td>18</td>
<td>35</td>
<td>30</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 15. ESTIMATED PERCENTAGE OF IOWA FARM PURCHASES OF HOGS AND PIGS IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Bimonthly period</th>
<th>Barrows and gilts</th>
<th>Sows</th>
<th>Boars and stags</th>
<th>Feeder pigs</th>
<th>Gilts for breeding</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>29</td>
<td>30</td>
<td>10</td>
<td>17</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>March - April</td>
<td>39</td>
<td>34</td>
<td>9</td>
<td>14</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>May - June</td>
<td>13</td>
<td>21</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>6</td>
<td>5</td>
<td>21</td>
<td>22</td>
<td>35</td>
<td>22</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>8</td>
<td>7</td>
<td>52</td>
<td>27</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
vealed as the most important reason cited with reference to a third of the cattle and calves sold and over a fourth of the hogs. The “most convenient” market, however, was the dominant reason in the choice of the specified market outlet for hogs, while “type of animal” and “special considerations” were relatively more important in the choice of market outlets for calves than for cattle and hogs.

Producers' attitudes on choice of markets were related to the market outlets used for each class of cattle (table 16). Thus, price or the degree of competition was most important with reference to the primary market outlets for slaughter cattle. The belief that a particular market offered the best price was important with respect to packer buyers and dealers (who frequently quoted a price to the producer upon examination of the livestock). The idea of a favorable degree of competition at the terminal market or the packing plant encouraged many producers to select these markets, though a specific price for the cattle was not quoted prior to shipment to the market outlet.

Convenience, type of animal and miscellaneous considerations were important in the choice of the primary market outlets for feeder cattle and cattle intended for breeding purposes. Special considerations were important in the sales to packer buyers. Producers generally expressed a preference for a net price transaction, or one that did not involve deductions for commissions and other charges. Some producers were solicited by the buyer, or the buyer quoted a price. These practices were cited also among the special considerations in table 16.

The notion of a competitive market was an important consideration in the choice of market outlets for calves and vealers (table 17). However, the number of sales through market outlets other than auctions was relatively small. Hence, the reasons cited with reference to the other markets pertained to a relatively small number of sales.

The degree of competition was cited most frequently as a reason for selecting terminal markets rather than any alternative markets in the sale of hogs (table 18). Price was cited more frequently in connection with the market agencies having personnel customarily visit farms and quote a price upon inspection of the hogs of marketable weights. Convenience was mentioned most frequently with reference to the leading markets for hogs. Auctions were selected because of two reported considerations—the occurrence of a high degree of competition and the suitability of these markets for the sale of feeder pigs.

MARKET CHOICES FOR CATTLE AND CALVES

The patterns of marketings and purchases of cattle and calves of Iowa producers for each of the major markets—public stockyards, packer buyers, local dealers, auctions and other farmers—involve essentially two important variables: the market class of livestock and the distance to market. The implications of these two basic elements of market selection are discussed in later sections of this report. Presently, the market choices for different market classes of cattle and calves are examined with reference to their sales and purchases by Iowa livestock producers.

SALES

In table 19, sales of the major market classes of cattle and calves in 1954 are shown according to intended use. In 1954, practically all slaughter cattle and calves were beef animals. Only 10 percent of the total sales intended for slaughter were dairy heifers, dairy cows or vealers. Further

---

### TABLE 16. ESTIMATED PERCENTAGE OF CATTLE SOLD THROUGH SPECIFIED MARKET, BY REASON FOR CHOICE OF MARKET, IOWA, JAN.-JUNE, 1953.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Terminal public markets</th>
<th>Packing plants</th>
<th>Packer buyers</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most competition</td>
<td>42</td>
<td>48</td>
<td>28</td>
<td>23</td>
<td>27</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Best price</td>
<td>48</td>
<td>18</td>
<td>32</td>
<td>21</td>
<td>19</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Most convenient</td>
<td>24</td>
<td>12</td>
<td>22</td>
<td>12</td>
<td>22</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Type of animal</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>36</td>
<td>99</td>
<td>31</td>
</tr>
<tr>
<td>Special considerations</td>
<td>2</td>
<td>18</td>
<td>32</td>
<td>17</td>
<td>22</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>All reasons</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 17. ESTIMATED PERCENTAGE OF CALVES AND VEALERS SOLD THROUGH SPECIFIED MARKET, BY REASON FOR CHOICE OF MARKET, IOWA, JAN.-JUNE, 1953.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Terminal public markets</th>
<th>Packing plants</th>
<th>Packer buyers</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most competition</td>
<td>92</td>
<td>81</td>
<td>19</td>
<td>19</td>
<td>22</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Best price</td>
<td>8</td>
<td>0</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Most convenient</td>
<td>0</td>
<td>14</td>
<td>31</td>
<td>24</td>
<td>16</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>Type of animal</td>
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<td>0</td>
<td>24</td>
<td>0</td>
<td>29</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Special considerations</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>0</td>
<td>90</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>All reasons</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 18. ESTIMATED PERCENTAGE OF HOGS SOLD THROUGH SPECIFIED MARKET, BY REASON FOR CHOICE OF MARKET, IOWA, JAN.-JUNE, 1953.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Terminal public markets</th>
<th>Packing plants</th>
<th>Packer buyers</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most competition</td>
<td>60</td>
<td>34</td>
<td>22</td>
<td>18</td>
<td>35</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Best price</td>
<td>16</td>
<td>35</td>
<td>38</td>
<td>16</td>
<td>44</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Most convenient</td>
<td>16</td>
<td>32</td>
<td>30</td>
<td>14</td>
<td>46</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>Type of animal</td>
<td>8</td>
<td>0</td>
<td>9</td>
<td>2</td>
<td>31</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Special considerations</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>11</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td>All reasons</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
thermore, less than 0.5 percent of the total feeders were dairy stock. Dairy heifers and dairy cows, however, accounted for 41 percent of the total sales of breeding stock.

SLAUGHTER CATTLE AND CALVES

Terminal public markets were the principal market outlet for all slaughter steers and heifers, except dairy heifers (table 20). Auction markets, however, were the most important outlets for the livestock sold less frequently at terminal markets—cows, bulls and calves. Packer buyers, though not a highly favored market for any one market class, accounted for the second largest percentage of the total sales of livestock sold in the largest numbers—steers and heifers, including the mixed lots of steers and heifers.

Public terminal markets, packing plants and auctions were the principal market outlets used by Iowa farmers in the sale of cattle and calves. Practically all—99.9 percent—of the cattle and calves sold by farmers to packing plants, either directly or through packer buyers, were intended for slaughter. A major part of all the cattle sold through the other specified markets were slaughter cattle. Only 4 percent of the sales through terminal markets were not for slaughter, while 21 percent of the sales through dealers and 36 percent of the sales through auctions were in the herd or feeder category.

Sales of slaughter cattle and calves occurred quite uniformly during the year. The third quarter period, however, was marked by an increase in the rate of marketings through the two most important outlets, terminal markets and packer buyers (table 21). Sales through packer buyers and local dealers were marked by an inverse correlation in the bimonthly percentages for these two outlets.

FEEDER CATTLE AND CALVES

Auctions or local sales barns were the major market outlets for feeder cattle and calves (table 22). Each market class had, however, a unique percentage distribution of market outlets. The bimonthly distribution of sales through each of four major market outlets generally corresponded to a pattern of peak sales during the winter months and lower sales during July and August (table 28).

BREEDING CATTLE AND CALVES

Sales of breeding stock accounted for only 8 percent of total 1954 sales of cattle and calves. Bulls and calves, moreover, made up less than 16 percent of the total sales of breeding stock. Hence, the data in table 24 on market outlets are based on a rather limited number of reports. Nevertheless, in comparison with the tabular material cited earlier, a consistent pattern of market selection is presented in table 24.

Sales of breeding stock, which were composed

---

**TABLE 20. ESTIMATED PERCENTAGE OF SPECIFIED CLASSES OF CATTLE AND CALVES SOLD BY IOWA FARMERS, BY INTENDED USE, 1954.**

<table>
<thead>
<tr>
<th>Livestock class</th>
<th>Slaughter</th>
<th>Feeder</th>
<th>Herd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>61.8</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Beef heifers</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Dairy heifers</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Mixed steers and heifers</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Beef cows</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Dairy cows</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Bulls</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Calves</td>
<td>27.4</td>
<td>26.2</td>
<td>2.0</td>
</tr>
<tr>
<td>All classes</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

---

**TABLE 21. ESTIMATED PERCENTAGE OF SPECIFIED CLASSES OF CATTLE AND CALVES SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY MARKET, 1954.**

<table>
<thead>
<tr>
<th>Bimonthly</th>
<th>Terminal</th>
<th>Packer</th>
<th>Local</th>
<th>Auctions</th>
<th>Other</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>public</td>
<td>buyers*</td>
<td>dealers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. - Feb.</td>
<td>16</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>March - April</td>
<td>13</td>
<td>15</td>
<td>26</td>
<td>19</td>
<td>29</td>
<td>14</td>
</tr>
<tr>
<td>May - June</td>
<td>16</td>
<td>18</td>
<td>26</td>
<td>19</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>16</td>
<td>24</td>
<td>26</td>
<td>17</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>21</td>
<td>19</td>
<td>26</td>
<td>13</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>20</td>
<td>16</td>
<td>15</td>
<td>16</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

---

**TABLE 22. ESTIMATED PERCENTAGE OF FEEDER CATTLE AND CALVES SOLD BY IOWA FARMERS THROUGH SPECIFIED MARKETS, BY LIVESTOCK CLASS, 1954.**

<table>
<thead>
<tr>
<th>Market</th>
<th>Steers</th>
<th>Heifers</th>
<th>Mixed steers and heifers</th>
<th>Cows and bulls</th>
<th>Calves</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal public</td>
<td>15.1</td>
<td>6.4</td>
<td>26.6</td>
<td>63.5</td>
<td>0.2</td>
<td>16.3</td>
</tr>
<tr>
<td>Local dealers</td>
<td>17.0</td>
<td>8.3</td>
<td>26.6</td>
<td>67.4</td>
<td>0.2</td>
<td>18.3</td>
</tr>
<tr>
<td>Auctions</td>
<td>62.0</td>
<td>23.0</td>
<td>26.6</td>
<td>67.4</td>
<td>0.2</td>
<td>19.3</td>
</tr>
<tr>
<td>Farmers</td>
<td>28.6</td>
<td>15.8</td>
<td>26.6</td>
<td>67.4</td>
<td>0.2</td>
<td>24.2</td>
</tr>
<tr>
<td>Other</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>All markets</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

---

* Including sales through packer buyers.
largely of heifers and cows, followed the same bi-monthly pattern as the sales of feeder cattle and calves (table 25). Since sales through other markets constituted only 2.4 percent of total sales, data on bimonthly sales through these markets were not shown separately.

### TABLE 23. ESTIMATED PERCENTAGE OF SPECIFIED CLASS OF BREEDING CATTLE AND CALVES PURCHASED BY IOWA FARMERS THROUGH SPECIFIED MARKETS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Period</th>
<th>Steers and heifers</th>
<th>Bulls</th>
<th>Calves</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bimonthly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. - Feb.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March - April</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May - June</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July - Aug.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PURCHASES

Purchases of cattle and calves according to intended use included largely steers, heifers and calves (table 26). Only two market classes of cattle and calves were included among the purchases of feeders, as compared with seven market classes among feeder sales. Since the purchases of feeders constituted 50 percent of the total purchases of cattle and calves, estimates on four of the six market classes in table 26 are based on a rather small number of reports.

### TABLE 26. ESTIMATED PERCENTAGE OF SPECIFIED CLASS OF CATTLE AND CALVES PURCHASED BY IOWA FARMERS, BY INTENDED USE, 1954.

<table>
<thead>
<tr>
<th>Livestock class</th>
<th>Feeder</th>
<th>Herd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers and/or heifers</td>
<td>81.6</td>
<td>12.1</td>
</tr>
<tr>
<td>Dairy heifers</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Dairy cows</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Beef cows</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Bulls</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Calves</td>
<td>11.1</td>
<td>0.0</td>
</tr>
<tr>
<td>All classes</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* These percentages may be converted into absolute values by using the data in table 6.

### FEEDER CATTLE AND CALVES

Auctions were the primary market sources, while terminal markets, local dealers and other farmers were secondary market sources for feeder cattle and calves purchased by Iowa farmers (table 27). Frequently the auction markets served as outlets for feeder cattle and calves purchased by the auction operators on their own account. Local dealers also used these markets to sell feeders bought directly from ranchers.

A major part of the 1954 purchases of feeder cattle and calves occurred during the fourth quarter (table 28). Furthermore, the major purchases of feeders occurred somewhat earlier in the fall than did the major sales of feeders by Iowa farmers. This pattern of sales and purchases was related partly to the number of cattle and calves on hand. The bimonthly patterns of market transactions in feeder cattle and calves, therefore, were subject to change during the cycle (that started in 1949 and reached a peak in cattle inventories in 1956).

### BREEDING CATTLE AND CALVES

Though the purchases of breeding stock were small, a variety of market classes and market sources were involved in 1954 (table 29). However, auctions and other farmers were reported as the market sources of 4.3 percent of total purchases. Again, the individual percentages must be interpreted with somewhat more caution than the estimates based on a large number of sales.

Breeding cattle and calves were purchased largely during the fall and winter months (table 30). Typically, only 16 to 17 percent of the purchases occurred during the May through August period.

### CHANGES IN MARKET CHOICES, 1940-54

Market selection among Iowa livestock producers changed somewhat over the 14-year period from 1940 to 1954 (table 31). In terms of total sales and purchases of Iowa producers, the per-

* Additional data on the operation of Iowa livestock markets are reported in the forthcoming report cited earlier.
percentage shares for terminal public markets, local dealers and other farmers were reduced, but for auction markets these percentages increased. Sales to packer buyers, including sales directly to packing plants, accounted for about 20 percent of total sales over this 14-year period. In terms of absolute changes in the number of cattle and calves bought and sold, auctions, packing plants and terminal markets were more important in 1954 than in 1940 as outlets for cattle and calves. In addition, purchases through auctions increased twofold during this period. These increases in sales and purchases were associated largely with the secular growth in livestock numbers, though some of these changes were due also to the decline in sales through local dealers.

**MARKET CHOICES FOR HOGS AND PIGS**

Sales and purchases of hogs and pigs are influenced sharply by the breeding intentions of producers. Increases in hog numbers are associated first with the withholding of gilts for breeding purposes. Marketings of slaughter hogs thus may not correspond with the number of pigs saved 6 to 9 months earlier. A change in the sex distribution of farm marketings, therefore, is an early indication of changes in breeding intentions and the size of the pig crops 6 to 18 months later. This cyclical pattern of hog production and marketings must be recognized in the interpretation of data on sales and purchases of hogs and gilts.

**SALES**

In 1954, 80 percent of all hogs and pigs sold by Iowa producers were slaughter barrows and gilts, 7 percent were feeder pigs, and only 1 percent were gilts for breeding (table 32). The remaining 12 percent of total sales comprised sows, boars and stags which were sold for slaughter or breeding purposes.

**TABLE 28. ESTIMATED PERCENTAGE OF SPECIFIED CLASSES OF HOGS AND PIGS SOLD BY IOWA FARMERS, BY INTENDED USE, 1954.**

<table>
<thead>
<tr>
<th>Market class</th>
<th>Slaughter</th>
<th>Feeder</th>
<th>Hilt</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1940</td>
<td>1954</td>
<td>1940</td>
<td>1954</td>
</tr>
<tr>
<td></td>
<td>(1,000 head)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal public markets</td>
<td>1,364</td>
<td>1,789</td>
<td>54</td>
<td>67</td>
</tr>
<tr>
<td>Packing plants</td>
<td>641</td>
<td>875</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Local dealers</td>
<td>263</td>
<td>160</td>
<td>61</td>
<td>29</td>
</tr>
<tr>
<td>Concentration yards</td>
<td>323</td>
<td>297</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>Auctions</td>
<td>135</td>
<td>542</td>
<td>57</td>
<td>218</td>
</tr>
<tr>
<td>Local cooperatives</td>
<td>37</td>
<td>60</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Farmers and others</td>
<td>65</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>All markets</td>
<td>2,438</td>
<td>3,326</td>
<td>424</td>
<td>414</td>
</tr>
</tbody>
</table>

* Based on 1940 data reported in S. D. Agr. Exp. Sta. Bul. 365 and on 1954 data obtained from the Livestock Marketing Survey cited earlier in this report. Estimated sales or purchases through unspecified markets are distributed proportionately among the specified markets; hence, these totals differ from those in table 7.

* Farm survey data for 1940 show that about two-thirds of the concentration yards in the Corn Belt were owned by local dealers, while packing plants owned one-third of the yards. The 1954 survey data do not include this additional market characteristic. Hence, differences in sales and purchases through packing plants and local dealers for the 2 years are partly due to this difference in classification.

---

**TABLE 29. ESTIMATED PERCENTAGE OF CATTLE AND CALVES PURCHASED BY IOWA FARMERS THROUGH SPECIFIED MARKETS, BY LIVESTOCK CLASS, 1954.**

<table>
<thead>
<tr>
<th>Market</th>
<th>Unspecified markets</th>
<th>Terminal public markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef cattle</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Dairy cattle</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Calves</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

---

**TABLE 30. ESTIMATED PERCENTAGE OF HERD CATTLE AND CALVES PURCHASED BY IOWA FARMERS, IN SPECIFIED MONTHS, BY MARKET, 1954.**

|-------------------------------|-------------|---------------|------------|-------------|--------------|-------------|-------|

---

**TABLE 31. ESTIMATED TOTAL SALES AND PURCHASES OF CATTLE AND CALVES THROUGH SPECIFIED MARKETS, BY LIVESTOCK CLASS, IOWA 1940 AND 1954.***

<table>
<thead>
<tr>
<th>Market</th>
<th>Sales</th>
<th>Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1940</td>
<td>1954 1940</td>
</tr>
<tr>
<td>Cattle</td>
<td>Slaughter</td>
<td>Feeder</td>
</tr>
<tr>
<td></td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Terminal public markets</td>
<td>1,364</td>
<td>1,789</td>
</tr>
<tr>
<td>Packing plants</td>
<td>641</td>
<td>875</td>
</tr>
<tr>
<td>Local dealers</td>
<td>263</td>
<td>160</td>
</tr>
<tr>
<td>Concentration yards</td>
<td>323</td>
<td>297</td>
</tr>
<tr>
<td>Auctions</td>
<td>135</td>
<td>542</td>
</tr>
<tr>
<td>Local cooperatives</td>
<td>37</td>
<td>60</td>
</tr>
<tr>
<td>Farmers and others</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td>All markets</td>
<td>2,438</td>
<td>3,326</td>
</tr>
</tbody>
</table>

* Based on 1940 data reported in S. D. Agr. Exp. Sta. Bul. 365 and on 1954 data obtained from the Livestock Marketing Survey cited earlier in this report. Estimated sales or purchases through unspecified markets are distributed proportionately among the specified markets; hence, these totals differ from those in table 7.
SLAUGHTER HOGS

Packer buyers, including direct sales to packing plants, local dealers and terminal markets represented the market outlets for 97.4 percent of the slaughter hogs sold by Iowa producers in 1954 (table 33). The percentage distribution of sales among the major market outlets was quite similar among the three market classes of hogs, except perhaps for the somewhat larger sales of boars and stags through auctions.

In summary, the distribution of the annual Iowa hog marketings among alternative livestock markets differed greatly from the distribution of marketings of cattle and calves. A number of factors may account for this difference. First, the value of an average lot of hogs was less than the value of an average lot of cattle and calves. Moreover, the skills required in selling slaughter hogs generally were less—at least in the opinion of the producer—than the skills required in selling cattle. Hence, proximity to market was a more important consideration in the sale of hogs than the specialized services available at more distant markets.

Bimonthly sales of slaughter hogs followed a bimodal distribution, as suggested by table 34. The bimonthly pattern differed, however, among the several market outlets. Sales through local dealers were marked by the smallest degree of intertemporal variability, while sales through the minor slaughter hog markets were exceptionally variable from month to month.

FEEDER PIGS AND OTHER HOGS

Other farmers and auctions were the major market outlets for feeder pigs and hogs intended for breeding purposes (table 35). The bimonthly pattern of feeder pig sales through the two major market outlets shows a bimodal distribution comparable to the sales pattern for slaughter hogs, except for a time-interval lag of 2 to 4 months (table 36). The intertemporal pattern changes abruptly, however, depending upon the position of the hog cycle and producers' breeding intentions.

Sales of breeding stock were concentrated in the first 3 or 4 months of the 1954 calendar year (table 37). The intertemporal sales pattern for breeding stock departed from the bimodal sales distributions cited earlier, partly because of peculiarities in the monthly pattern of sows farrowing. Breeding stock purchased early in 1954 were available for production of both the spring and fall pig crops. Typically, part of the sows farrowing in the spring would be kept through the summer for breeding later in the same calendar year. The monthly level of sales of breeding hogs would be influenced, therefore, by the extent of multiple farrowings during the year.

Purchases

Pig purchases were made up almost entirely of feeder pigs, though a small number of pigs intended for breeding purposes at some later time

TABLE 32. ESTIMATED PERCENTAGE OF SLAUGHTER HOGS AND PIGS SOLD BY IOWA FARMERS THROUGH SPECIFIED MARKETS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Market</th>
<th>Barrows and gilts</th>
<th>Sows and stags</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal public markets</td>
<td>12.8</td>
<td>19.0</td>
<td>15.1</td>
</tr>
<tr>
<td>Packer buyers*</td>
<td>14.9</td>
<td>19.8</td>
<td>17.4</td>
</tr>
<tr>
<td>Local dealers</td>
<td>25.4</td>
<td>27.8</td>
<td>26.7</td>
</tr>
<tr>
<td>Auctions</td>
<td>6.5</td>
<td>2.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Local cooperatives</td>
<td>1.4</td>
<td>0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Other</td>
<td>0.1</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>All markets</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Including sales at packing plant.

TABLE 34. ESTIMATED PERCENTAGE OF SLAUGHTER HOGS SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Market</th>
<th>Terminal public</th>
<th>Packer buyers*</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb................</td>
<td>11.0</td>
<td>13.0</td>
<td>17.0</td>
<td>16.0</td>
<td>37.0</td>
<td>100.0</td>
</tr>
<tr>
<td>March - April.............</td>
<td>14.0</td>
<td>12.0</td>
<td>15.0</td>
<td>30.0</td>
<td>13.0</td>
<td>100.0</td>
</tr>
<tr>
<td>May - June...............</td>
<td>14.0</td>
<td>14.0</td>
<td>15.0</td>
<td>23.0</td>
<td>13.0</td>
<td>100.0</td>
</tr>
<tr>
<td>July - Aug.................</td>
<td>13.0</td>
<td>10.0</td>
<td>15.0</td>
<td>2.0</td>
<td>12.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Sept. - Oct..............</td>
<td>21.0</td>
<td>20.0</td>
<td>16.0</td>
<td>12.0</td>
<td>30.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Nov. - Dec................</td>
<td>29.0</td>
<td>26.0</td>
<td>22.0</td>
<td>14.0</td>
<td>25.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Including direct to packing plant.

TABLE 35. ESTIMATED PERCENTAGE OF FEEDER PIGS SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Market</th>
<th>Feeder</th>
<th>Sows</th>
<th>Breeding or herd use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal public</td>
<td>0.7</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Packer buyers*</td>
<td>1.2</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Local dealers</td>
<td>6.2</td>
<td>12.9</td>
<td>12.6</td>
</tr>
<tr>
<td>Auctions</td>
<td>16.3</td>
<td>12.9</td>
<td>12.4</td>
</tr>
<tr>
<td>Farmers</td>
<td>44.3</td>
<td>81.9</td>
<td>76.7</td>
</tr>
<tr>
<td>Other</td>
<td>0.0</td>
<td>12.9</td>
<td>12.4</td>
</tr>
<tr>
<td>All markets</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 36. ESTIMATED PERCENTAGE OF FEEDER PIGS SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY LIVESTOCK CLASS, 1954.

<table>
<thead>
<tr>
<th>Market</th>
<th>Barrows</th>
<th>Boars</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb................</td>
<td>2.0</td>
<td>0.0</td>
<td>2.0</td>
</tr>
<tr>
<td>March - April.............</td>
<td>30.0</td>
<td>26.0</td>
<td>28.0</td>
</tr>
<tr>
<td>May - June...............</td>
<td>16.0</td>
<td>12.0</td>
<td>14.0</td>
</tr>
<tr>
<td>July - Aug.................</td>
<td>16.0</td>
<td>16.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Sept. - Oct..............</td>
<td>19.0</td>
<td>19.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Nov. - Dec................</td>
<td>12.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 37. ESTIMATED PERCENTAGE OF HERD HOGS, SOLD BY IOWA FARMERS IN SPECIFIED MONTHS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Market</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb................</td>
<td>33.0</td>
<td>34.0</td>
<td>35.0</td>
</tr>
<tr>
<td>March - April.............</td>
<td>23.0</td>
<td>26.0</td>
<td>26.0</td>
</tr>
<tr>
<td>May - June...............</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>July - Aug.................</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Sept. - Oct..............</td>
<td>7.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Nov. - Dec................</td>
<td>20.0</td>
<td>15.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 38. ESTIMATED PERCENTAGE OF SPECIFIED CLASS OF HOGS AND PIGS, PURCHASED BY IOWA FARMERS, BY INTENDED USE, 1954.*

<table>
<thead>
<tr>
<th>Livestock class</th>
<th>Intended use after purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrows and gilts</td>
<td>3.3</td>
</tr>
<tr>
<td>Sows</td>
<td>0.1</td>
</tr>
<tr>
<td>Boars and stags</td>
<td>0.1</td>
</tr>
<tr>
<td>Pigs</td>
<td>96.5</td>
</tr>
<tr>
<td>Gilts</td>
<td>15.8</td>
</tr>
<tr>
<td>All classes</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* These percentages may be converted into absolute values using the data in table 6.

also were included (table 38). The breeding stock purchased consisted of mostly gilts (i.e., female hogs 3 months or older that had not farrowed prior to the time of purchase) and sows.

FEEDER HOGS AND PIGS

Farmers, local dealers and auctions were the principal market sources for feeder hogs and pigs. Purchases from other farmers and local dealers,
respectively, accounted for 39 percent and 36 percent of total purchases, while 25 percent of the total was purchased through auctions. (Since the patterns of market selection for barrows, gilts and pigs were practically the same, the detailed data are not presented in a separate table.)

Purchases of feeder hogs and pigs in 1954 were concentrated in the fall and winter months (table 39). This purchase pattern differed somewhat from the hog sales patterns cited earlier. Again, the level of hog inventories on farms influenced the timing of feeder purchases during 1954, particularly with reference to the individual market sources.

**BREEDING HOGS AND PIGS**

Occurrence of specialization again was evident among market sources in farmers' purchases of hogs and pigs intended for breeding. Other farmers were major market sources of gilts, sows and boars, while purchases of gifts through auctions and pigs through local dealers and auctions also were quite large (table 40). These data suggest differences in the procurement channels for the several market classes of breeding stock based largely on the age of the stock purchased.

A general increase in the size of swine enterprises occurred during the 2 years prior to the 1955-56 peak in hog marketings. Hence, the somewhat higher rate of purchases during the latter part of 1954 would have followed the rise in hog prices and the related shift in breeding intentions (table 41). Also, the major share of the purchases from local dealers and auctions occurred 1 or 2 months earlier than the purchases from other farmers.

**CHANGES IN MARKET CHOICES, 1940-54**

Iowa livestock producers were involved in several marked shifts in the pattern of market selection for hogs and pigs. Sales of hogs through packer buyers or directly to packing plants more than doubled during the 1940-54 period (table 42). Moreover, purchases of feeder pigs and breeding stock through local dealers quadrupled during this period. Both sales and purchases through auctions also increased sharply. Practically all of these increases were related to the secular or cyclical increases in sales and purchases of hogs and pigs. However, some reallocation of market shares occurred among the several market outlets and sources.

Changes in market shares (as a percentage of total hog sales or purchases of Iowa producers) were obtained largely at the expense of sales and purchases through terminal markets or directly to other farmers. Though local dealers lost several percentage points in their share of all hogs sold by Iowa producers, a much larger relative increase occurred in their sales to Iowa producers. Local dealers enjoyed considerable flexibility in their procurement activities; hence, these dealers were able to obtain large numbers of feeder pigs from supply sources in nearby states for sale to Iowa producers. Auction markets offered the facilities for transactions in small lots where a considerable number of buyers would contribute to an active market. Thus, auctions handled the livestock classes generally sold or bought in small lots.

**DISTANCE TO MARKET AND LOT SIZE**

Market choices of Iowa livestock producers are related to the characteristics of livestock bought...

---

**TABLE 40. ESTIMATED PERCENTAGE OF HERD HOGS AND PIGS PURCHASED BY IOWA FARMERS THROUGH SPECIFIED MARKETS, BY MARKET. 1954.**

<table>
<thead>
<tr>
<th>Market</th>
<th>Boars and sows</th>
<th>Gilts</th>
<th>Pigs</th>
<th>All classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>March - April</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>May - June</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
<td>17.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

---

**TABLE 41. ESTIMATED PERCENTAGE OF BREEDING HOGS AND PIGS PURCHASED BY IOWA FARMERS IN SPECIFIED MONTHS, BY MARKET. 1954.**

<table>
<thead>
<tr>
<th>Bimonthly period</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. - Feb.</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>March - April</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>May - June</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>July - Aug.</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Sept. - Oct.</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Nov. - Dec.</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
and sold, such as the number of head per lot or the average weight per head. Distance to market outlet or market source, however, relates to market organization and the services available for buying and selling different market classes of livestock. Hence, the survey findings on market selection are examined in terms of (1) the average distance to various markets used by Iowa producers and (2) the average size of sales or purchase lot for specified markets and livestock classes.

**LIVESTOCK SALES**

Each of the major classes of markets may be characterized by the degree of concentration of its clientele at varying distances from the market. A large sales volume at any market involves an extensive supply area or an intensive coverage in the limited geographical area. The total number of livestock and the total number of markets, however, are the major external restrictions on the business volume of individual markets. The entry of new firms and the liquidation of old firms affect the size distribution of businesses in a specific market group and, hence, the degree and nature of competition within each market group. Thus, the economics of lot size and distance to market only partially explain the Iowa livestock marketing patterns.

Substantial differences occur in lot size and distance to market among the major market classes of livestock. These differences are attributed to the pattern of livestock enterprises in Iowa. Sales patterns for cattle and calves, therefore, are examined first with reference to the selected sales characteristics—lot size, average weight and distance to market—reported for each sales lot.10

**CATTLE AND CALVES**

*Lot size.* Sales of cattle and calves varied greatly in lot size depending upon the market class and market outlet. Both slaughter and feeder sales averaged about 5 head per lot, but substantial differences occurred among specific market classes of livestock. Slaughter steers and heifers generally were sold in lots of 10 head or more, except for sales through auctions (table 43). Slaughter cows, bulls and calves were sold in much smaller lots—only 1 or 2 head at a time. Thus, the distribution of sales according to livestock class affected the average lot size for any market, but particularly for local dealers and auction markets (which handled a relatively large proportion of the livestock classes sold in small lots).

Most sales through packer buyers, including sales at packing plants, and terminal markets were in lots of 20 head or more (table 44). Though a substantial number of sales through local dealers were in large lots, 50 percent of these sales were in lots of less than 10 head. These percentage differences resulted partly from differences in the percentage distribution of livestock classes sold through these markets (as shown in the tabular material cited earlier). Feeder cattle and calves were sold in lots of size comparable to slaughter cattle and calves (table 45). A considerable number of cull breeding stock was intended for slaughter, however, which contributed to the variability in the lot size distribution for slaughter cattle. Feeder cattle sales were confined entirely to steers and heifers, and these occurred in sales lots of above-average size. Feeder calves, like vealer calves intended for slaughter, were handled in relatively small lots.

The distribution of feeder sales according to lot size in table 46 again illustrates the effect of livestock class on the average size of sales lot reported for each market outlet. Because substantial numbers of calves, steers and heifers were sold directly to other farmers for feeding purposes, the average number of head per sales lot ranged from 1 to 50 and over, which corresponded with the expected distribution of lot sizes for the specified livestock classes.

**Sales of cattle and calves intended for breeding**

### TABLE 43. ESTIMATED NUMBER OF HEAD PER LOT OF SPECIFIED CLASSES OF SLAUGHTER CATTLE AND CALVES SOLD BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Animal class</th>
<th>Terminal markets</th>
<th>Packing plants</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Heifers</td>
<td>9</td>
<td>6</td>
<td>12</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Cows</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bulls</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Calves</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Vealers</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>All classes</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

* Few or no sales.

### TABLE 44. ESTIMATED PERCENTAGE OF SLAUGHTER CATTLE AND CALVES OF SPECIFIED LOT SIZE SOLD BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Terminal markets</th>
<th>Packing plants</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3</td>
<td>9</td>
<td>14</td>
<td>22</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>4 to 9</td>
<td>14</td>
<td>11</td>
<td>22</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>10 to 19</td>
<td>20</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>20 to 49</td>
<td>49</td>
<td>42</td>
<td>30</td>
<td>6</td>
<td>39</td>
</tr>
<tr>
<td>50 and over</td>
<td>8</td>
<td>23</td>
<td>9</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

* Including sales through packer buyers.

### TABLE 45. ESTIMATED NUMBER OF HEAD PER LOT OF FEEDER CATTLE AND CALVES SOLD BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Livestock class</th>
<th>Terminal markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>12</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Heifers</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mixed steers and heifers</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Calves</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>All classes</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

### TABLE 46. ESTIMATED PERCENTAGE OF FEEDER CATTLE AND CALVES OF SPECIFIED LOT SIZE SOLD BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Terminal markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3</td>
<td>3</td>
<td>14</td>
<td>22</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>4 to 9</td>
<td>14</td>
<td>76</td>
<td>41</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>10 to 19</td>
<td>19</td>
<td>10</td>
<td>31</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td>20 to 49</td>
<td>64</td>
<td>10</td>
<td>15</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>50 and over</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
or herd use comprised, on the average, about 3 head per lot. All reported sales in the 1954 survey occurred in lots of less than 20 head (table 47). All sales through local dealers, moreover, were in lots of less than 10 head.

Average weight. Considerable data were collected on the weight of each animal sold during each 3-month reporting period. Memory bias in reporting was small because of the short interval between surveys. Average weight differences among the specified market classes of cattle and calves represented largely differences in grade and degree of finish. The heavier steers and heifers, for example, typically brought the higher prices. Each livestock class, however, presented a different weight-price relationship.

The average weight per head of slaughter cattle and calves sold in 1954 through the major market outlets for the specified livestock classes is shown in table 48. Generally, the lighter animals in each livestock class were sold through auctions or local dealers.

Feeder cattle sold by Iowa farmers in 1954 weighed 270 to 347 pounds less, on the average, than the corresponding market classes of slaughter cattle (table 49). Both feeder and slaughter calves, however, were almost the same average weight at the time of sale.

Cattle and calves intended for breeding or herd use were sold almost entirely—94.4 percent—to other farmers and through auctions. The average weight per head of each of the livestock classes sold in 1954 was essentially the same for the two major market outlets, as shown in table 50.

Distance to market. Data on the average weight per head and the average number of head per lot logically precede a discussion of factors affecting the distance to market. Large scale operations and large sales lots go together. Furthermore, large lots and greater value per pound (as indicated by heavier marketing weights) enhance the importance of selecting the most favorable market outlet. Distance to market, though an important consideration when one or 2 head of cull breeding stock are sold or when prices and grades are quite readily determined, is a less critical factor in the sale of large lots of high-quality cattle. Considerable pricing uncertainty exists in the latter situation, which overshadows the additional transportation and other marketing costs associated with sales through the more distant markets. The more distant markets, moreover, generally deal with a larger number of patrons, and these markets also tend to be fewer in total number because of the facilities, degree of specialization and other scarce inputs required to provide the necessary marketing services.

Slaughter cattle and calves sold through auctions and local dealers in 1954 were hauled an average distance of 14 miles or less, while sales through terminal markets involved an average distance of haul of 110 miles (table 51).

The percentage of total sales of slaughter cattle and calves of specified lot size sold by Iowa farmers, by market, 1954.

<table>
<thead>
<tr>
<th>Terminal class markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>1,057</td>
<td>1,039</td>
<td>1,055</td>
<td>1,081</td>
</tr>
<tr>
<td>Heifers</td>
<td>876</td>
<td>861</td>
<td>926</td>
<td>893</td>
</tr>
<tr>
<td>Mixed steers</td>
<td>909</td>
<td>904</td>
<td>982</td>
<td>946</td>
</tr>
<tr>
<td>Cows</td>
<td>1,079</td>
<td>1,089</td>
<td>1,197</td>
<td>1,092</td>
</tr>
<tr>
<td>Bulls</td>
<td>1,189</td>
<td>1,471</td>
<td>975</td>
<td>1,276</td>
</tr>
</tbody>
</table>

* Few or no sales.

Distance in miles specified classes of slaughter cattle and calves sold by Iowa farmers and hauled a specified distance, by market, 1954.

<table>
<thead>
<tr>
<th>Terminal class markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>119</td>
<td>45</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Heifers</td>
<td>105</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Mixed steers</td>
<td>87</td>
<td>50</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Cows</td>
<td>105</td>
<td>32</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Bulls</td>
<td>105</td>
<td>23</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Calves</td>
<td>48</td>
<td>26</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Mixed steers and heifers</td>
<td>33</td>
<td>21</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Vealers</td>
<td>26</td>
<td>17</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>All classes</td>
<td>110</td>
<td>28</td>
<td>30</td>
<td>14</td>
</tr>
</tbody>
</table>

* Including sales through packer buyers.

Distance in miles specified classes of feeder cattle and calves sold by Iowa farmers were hauled to market, by market, 1954.

<table>
<thead>
<tr>
<th>Terminal class markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>119</td>
<td>45</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Heifers</td>
<td>105</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Mixed steers</td>
<td>87</td>
<td>50</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Cows</td>
<td>105</td>
<td>32</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Bulls</td>
<td>105</td>
<td>23</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Calves</td>
<td>48</td>
<td>26</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Mixed steers and heifers</td>
<td>33</td>
<td>21</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Vealers</td>
<td>26</td>
<td>17</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>All classes</td>
<td>110</td>
<td>28</td>
<td>30</td>
<td>14</td>
</tr>
</tbody>
</table>

* Few or no sales.
and calves by specified mileage blocks is shown for each market outlet in Table 52. Practically all sales of Iowa producers through local dealers and auctions originated within a 50-mile radius of the market. Only 19 percent of the animals sold through terminal markets originated within the same 50-mile radius.

The somewhat greater “drawing power” of auction markets in the sale of feeder cattle and calves is suggested by the data in Table 53 on average distance of haul. The local feeder supply area of auctions appears larger partly at the expense of feeder sales through terminal markets.

The distribution of feeder sales between terminal markets and auctions is related to distance of haul from farm to market, as shown in Table 54. Local dealers travel over a considerable area to solicit business; hence, some feeder sales can be expected through dealers whose places of business are 50 to 99 miles from the producer.

Cattle and calves intended for breeding or herd use were hauled an average distance of only 11 miles in 1954. Distance data on sales directly to other farmers (which accounted for 68.5 percent of total herd sales) were not available; hence, no tabular material is presented on sales through this outlet of cattle and calves intended for breeding or herd use. Sales through auctions made up 25.9 percent of total sales, but the average hauling distance on these sales ranged only from 13 to 18 miles with an average distance of 15 miles.

Since distance entails costs, the more distant markets must offer certain additional services to compensate for the added costs and inconvenience of transportation. Livestock producers react to the availability of specialized cattle marketing services at the markets with the extended supply areas with sales consequences depicted in Fig. 2. Sales of all cattle and calves through terminal markets, for example, exceeded in number the total sales through any other market despite the greater distance to these terminal markets. (The percentage of all cattle and calves sold through each market outlet and the average distance of haul are shown by the broken lines in Fig. 2. The solid lines are used to show the percentage of total sales in each specified mileage block with reference to hauling distance.)

Terminal markets, packing plants, packer buyers, dealers and auctions each, in that order, were progressively closer, on the average, to the Iowa farm which sold slaughter cattle and calves. Shipments to terminal markets generally exceeded 50 miles in length of haul. The Sioux City, Omaha and Chicago terminal markets accounted for most of the terminal market sales of Iowa producers. On the other hand, about 170 auctions were located in Iowa and were available to Iowa producers. The livestock auctions used in marketing Iowa cattle and calves were located within 20 miles of any livestock producer. Thus, the average distance of haul to auctions was considerably less than to terminal markets.

HOGS AND PIGS

Lot size. Sales of hogs and pigs occurred in substantially larger lots than the sales of cattle and calves, though on a total market value basis the two sets of lots were not comparable. For example, the average lot size of slaughter hogs was 14 head in comparison with an average of 5 head per lot of slaughter cattle and calves. (Even if both hogs and cattle were valued at $20.00 a hundredweight, the lot of hogs would sell for only

<table>
<thead>
<tr>
<th>Distance in miles</th>
<th>Terminal markets: public dealers</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>0</td>
<td>42</td>
<td>37</td>
<td>22</td>
</tr>
<tr>
<td>10 to 24</td>
<td>0</td>
<td>26</td>
<td>51</td>
<td>36</td>
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<tr>
<td>25 to 49</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>11</td>
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<tr>
<td>50 to 99</td>
<td>63</td>
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<td>0</td>
<td>16</td>
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<tr>
<td>100 and over</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Totals</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
$692, while the cattle would sell for $925.) Again, breeding stock sold for slaughter went to market in smaller lots than the barrows and gilts, as shown in table 55. Except for sales through terminal markets and directly to packing plants, the average size of lot for a specified livestock class showed no significant differences among the major market outlets.

The 20- to 49-head lot of slaughter hogs was the modal size for each of the major market outlets (table 56). The lot-size distribution for auctions, however, was bimodal—a result of the widespread use of auctions in the sale of barrows and gilts as well as cull breeding stock.

A marked difference occurred in the average lot size of feeder sales when compared with sales of hogs intended for breeding or herd use (table 57). The size of the former was over ninefold the size of the latter and over fivefold the average size of a lot of sows and gilts sold for breeding. These differences in sales patterns occurred for each of the major market outlets.

Typically, feeder pigs were sold in lots of 50 head or more (table 58). Local dealers, however, usually handled lots of 20 to 49 head, but these sales amounted to only 6.2 percent of the total feeder sales.

The lot-size distribution of sales intended for breeding or herd use varied among the three outlets cited earlier, as shown in table 59, but again the sales through local dealers were quite small—1.8 percent of the total sales of this livestock class. Many sales comprised only 1 animal, while lots of 4 or 5 head also were quite numerous. A more detailed breakdown of lot size would show a multimodal distribution of sales corresponding with the distribution of the livestock classes—sows, gilts, boars, and stags.

Average weight. Hogs sold for slaughter were not differentiated according to any estimated grade or quality. Moreover, heavier weights among hogs failed to correspond with more desirable meat quality as in the sale of slaughter cattle.

Generally, the market classes of slaughter hogs in 1954 corresponded with quality differentials on a rather rough basis. Large differences in average weight per head also were apparent among the specified market classes, as illustrated in table 60. No significant average weight differences for a specified market class were indicated, however, among the major market outlets for slaughter hogs. (The large differences among markets handling boars and stags are based on a very few observations, and, hence, are subject to considerable sampling error.)

Sales of hogs and pigs intended for feeding or breeding showed considerable variability in average weight per head among the three major market outlets (table 61). The degree of over-all weight variability was attributed largely to the auctions, which generally handled the animals of heavier weight.

Distance to market. Most hogs and pigs were sold locally or through nearby terminal markets.

Distance to market presented a distinguishing characteristic for the two major species. On the average, cattle and calves were hauled two to three times as far to market as were hogs and pigs. Producers faced less price variability in the sale of hogs than in the sale of cattle; hence, producers were willing to incur somewhat less loca-
Nevertheless, slaughter hogs sold through terminal markets were hauled an average distance of 64 miles—or somewhat more than half the distance for slaughter cattle (table 62). Moreover, these distance relationships by species were about the same for each country market, except in the case of sales through packer buyers. The average data in effect reveal a greater concentration of packer buying of slaughter hogs than of slaughter cattle.

The skewness of the distribution of sales according to distance of haul is revealed in table 63. Except for sales through terminal markets, practically all slaughter hogs were sold through markets located within 50 miles of each producer. Moreover, the modal mileage group for the latter markets was “under 10” miles, or about a tenth of the average hauling distance of sales in the modal mileage group for the terminal markets.

Feeder pigs were hauled an average distance of 15 miles. Breeding stock were hauled an average distance of 17 miles.

Sales of hogs and pigs for feeding and breeding involved a typical hauling distance of 10 to 24 miles. Feeder pigs sold to other farmers were hauled less than 10 miles, while 10 percent of the feeder sales through auctions involved a hauling distance of 50 to 99 miles (table 64).

Hogs and pigs sold for breeding and herd use were seldom hauled more than 25 miles to their market outlet (table 65). Because of the few reports of sales to local dealers, however, the mileage distribution of sales through this market outlet may not accurately represent the actual sales pattern.

Selection of a market outlet for hogs presumably involves a different set of market considerations than market selection for cattle in view of the reversal of the distance-sales relationship (fig. 3). Distance to market affects the producer’s choice of market because hauling distance is related to net price and because the nearby markets are more convenient than the more distant markets. Transportation charges and losses from shrinkage, for example, must be deducted from the gross market price to obtain the equivalent farm, or net, price. Apparently as a result of these considerations, Iowa producers sold over half
of their hogs and pigs through the nearby country markets, which involved a hauling distance of less than 10 miles (as illustrated by the modal sales-mileage block in fig. 3).

**LIVESTOCK PURCHASES**

The reported data on livestock purchases of Iowa producers comprise two items of information: average number of head per lot and average distance of haul from the market source. These items are discussed with reference to the livestock purchased for feeding and for breeding or herd use.

**CATTLE AND CALVES**

*Lot size.* Feeder cattle and calves were purchased typically in lots of 20 to 49 head (table 66). Thus, the average lot size of feeder purchases was nearly three times the average lot size of feeder sales. Market differences also occurred in the lot-size distributions of purchases and sales, particularly through local dealers and auctions. Livestock producers buying through local dealers and auction markets came from a much greater distance, on the average, than the producers selling through these markets, as illustrated in tables 66 and 46, respectively.

Cattle and calves purchased for breeding and herd use were in somewhat smaller lots than sales of the comparable market class, as shown by a comparison of the data in tables 67 and 47. For example, only 9 percent of the purchases through livestock auctions were in lots of 4 head or more, while 35 percent of the sales through auctions were in lots of 4 head or more. Purchases of cattle and calves intended for breeding or herd use, however, were substantially smaller in total number than sales—171,800 head as compared with 326,000 head. Data for another period in the cattle cycle may reveal a larger number of purchases than sales and, hence, a somewhat different set of lot-size distributions by market source and market outlet. Again, an evaluation of the 1954 market patterns of Iowa producers must be related to historical conditions, such as the relative level of farm inventories of cattle (illustrated in fig. 1).

*Distance to market.* Most feeder cattle and calves bought by Iowa producers in 1954 originated from farms and ranches outside Iowa. Hence, the market source usually was more than 100 miles from the producer's farm (table 68). Actually, purchases according to distance of haul were represented by a bimodal distribution. Purchases through local dealers and auctions involved a relatively short hauling distance, while purchases directly from other farmers or ranchers generally involved much greater distances of haul.

A bimodal distribution of purchases according to hauling distance was apparent, also, for purchases of cattle and calves intended for breeding or herd use (table 69). Though the total purchases of breeding stock by Iowa producers were less than their sales, and though the average lot size was smaller, the average distance of haul was substantially greater, largely because of purchases

### TABLE 66. ESTIMATED PERCENTAGE OF FEEDER CATTLE AND CALVES IN SPECIFIED LOT SIZE PURCHASED BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Terminal public markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Cooperatives</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>4 to 9</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td>0</td>
<td>8</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>10 to 19</td>
<td>12</td>
<td>20</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20 to 49</td>
<td>73</td>
<td>50</td>
<td>38</td>
<td>80</td>
<td>42</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>50 and over</td>
<td>23</td>
<td>33</td>
<td>20</td>
<td>28</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 67. ESTIMATED PERCENTAGE OF HERD CATTLE AND CALVES IN SPECIFIED LOT SIZE PURCHASED BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Terminal public markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Cooperatives</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3</td>
<td>5</td>
<td>45</td>
<td>91</td>
<td>88</td>
<td>68</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>4 to 9</td>
<td>39</td>
<td>39</td>
<td>9</td>
<td>0</td>
<td>17</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>10 to 19</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>12</td>
<td>15</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>20 to 49</td>
<td>56</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 68. ESTIMATED PERCENTAGE OF FEEDER CATTLE AND CALVES PURCHASED BY IOWA FARMERS AND HAULED A SPECIFIED DISTANCE, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Distance in miles</th>
<th>Terminal public markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Cooperatives</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>40</td>
<td>27</td>
<td>25</td>
<td>18</td>
<td>25</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>10 to 24</td>
<td>0</td>
<td>8</td>
<td>33</td>
<td>0</td>
<td>11</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>25 to 49</td>
<td>18</td>
<td>15</td>
<td>13</td>
<td>20</td>
<td>11</td>
<td>16</td>
<td>16</td>
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<tr>
<td>50 to 99</td>
<td>51</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>100 and over</td>
<td>31</td>
<td>26</td>
<td>18</td>
<td>45</td>
<td>70</td>
<td>28</td>
<td>28</td>
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<td>Total</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### TABLE 69. ESTIMATED PERCENTAGE OF HERD CATTLE AND CALVES PURCHASED BY IOWA FARMERS AND HAULED A SPECIFIED DISTANCE, BY LIVESTOCK MARKET, 1954.

<table>
<thead>
<tr>
<th>Distance in miles</th>
<th>Terminal public markets</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Farmers</th>
<th>Cooperatives</th>
<th>Other</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>0</td>
<td>41</td>
<td>28</td>
<td>19</td>
<td>35</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>10 to 24</td>
<td>0</td>
<td>9</td>
<td>34</td>
<td>12</td>
<td>6</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>25 to 49</td>
<td>18</td>
<td>15</td>
<td>14</td>
<td>11</td>
<td>19</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>50 to 99</td>
<td>50</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>100 and over</td>
<td>31</td>
<td>17</td>
<td>68</td>
<td>27</td>
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<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
from market sources located 100 miles or more from the producer.

HOGS AND PIGS

Lot size. Feeder hogs and pigs often were purchased in lots of 50 head or more (table 70). Generally, auctions handled lots of smaller-than-average size, while local dealers handled lots of above-average size.

Hogs intended for breeding and herd use were purchased most frequently in lots of 10 to 19 head, as shown in table 71. The lot-size patterns were alike for each of the three market sources (through which practically all the hogs were purchased).

TABLE 70. ESTIMATED PERCENTAGE OF FEEDER PIGS IN SPECIFIED LOT SIZE PURCHASED BY IOWA FARMERS, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Cooperatives</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 9</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>10 to 19</td>
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<td>24</td>
<td>0</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>20 to 49</td>
<td>23</td>
<td>0</td>
<td>24</td>
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<tr>
<td>50 and over</td>
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<td>24</td>
<td>23</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE 71. ESTIMATED PERCENTAGE OF HOGS AND PIGS IN SPECIFIED LOT SIZE PURCHASED FOR BREEDING, BY MARKET, IOWA, 1954.

<table>
<thead>
<tr>
<th>Number of head per lot</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Cooperatives</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 9</td>
<td>1</td>
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<td>8</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>10 to 19</td>
<td>10</td>
<td>19</td>
<td>12</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>20 to 49</td>
<td>23</td>
<td>77</td>
<td>82</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>50 and over</td>
<td>23</td>
<td>0</td>
<td>24</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE 72. ESTIMATED PERCENTAGE OF FEEDER HOGS AND PIGS PURCHASED BY IOWA FARMERS AND HAULED A SPECIFIED DISTANCE, BY MARKET, 1954.

<table>
<thead>
<tr>
<th>Distance in miles</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Cooperatives</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>14</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>10 to 24</td>
<td>19</td>
<td>44</td>
<td>0</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>25 to 49</td>
<td>16</td>
<td>100</td>
<td>0</td>
<td>24</td>
<td>16</td>
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<tr>
<td>50 to 99</td>
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<tr>
<td>100 and over</td>
<td>16</td>
<td>4</td>
<td>80</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

TABLE 73. ESTIMATED PERCENTAGE OF HOGS AND PIGS PURCHASED FOR BREEDING AND HAULED A SPECIFIED DISTANCE, BY MARKET, IOWA, 1954.

<table>
<thead>
<tr>
<th>Distance in miles</th>
<th>Local dealers</th>
<th>Auctions</th>
<th>Cooperatives</th>
<th>Farmers</th>
<th>All markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>44</td>
<td>42</td>
<td>70</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>10 to 24</td>
<td>16</td>
<td>41</td>
<td>13</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>25 to 49</td>
<td>16</td>
<td>13</td>
<td>0</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>50 to 99</td>
<td>14</td>
<td>0</td>
<td>6</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>100 and over</td>
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<td>1</td>
<td>18</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Distance to market. The percentage distributions of feeder purchases were quite comparable for hogs and cattle. As shown in table 72, feeder pigs were hauled a greater distance when purchased through local dealers than when purchased through auctions. Feeder purchases through other farmers, however, were represented by a bimodal distribution with a large majority of the purchases originating from a farm 100 miles or more from the purchaser.

Most hogs intended for breeding or herd use were purchased from market sources located 100 miles or more from the producer.
APPENDIX: SURVEY DESIGN

The farm survey upon which this report is based was completed over an 8-quarter period starting April, 1953. A panel of about 400 farmers was selected from a first-phase sample of 2,000 farms, or 1 percent of the farms located in Iowa. The preliminary sample of farmers was stratified according to the size of livestock enterprises, measured in terms of the number of animal units sold in a year. Farms with 1953 sales of less than 50 animal units were designated as class 1 farms, while farms with total sales of 50 to 124 units and 125 units or more were designated as class 2 and class 3 farms, respectively. The second-phase sample included approximately an equal number of each of the three farm classes which represented approximate sampling rates of 1/800, 1/400 and 1/100, respectively, for class 1, class 2 and class 3 farms. In brief, the survey design used in the study may be generally described as a single-stage, two-phase, stratified random cluster sample design, with repeated visits to the selected units forming the sample.

THE DATA

Experience with similar surveys conducted earlier showed that satisfactory data could be obtained from farmers' responses to various types of questions. Many of these responses would be statements of certain things that the farmer had done and why he did what he did. Other replies would be opinions and attitudes related to livestock marketing. It was important in each case to obtain accurate responses applicable both to specific points in time and over longer periods. Since the validity of conclusions to be drawn from the survey would depend greatly on the accuracy of the responses, it was necessary to minimize memory bias. A panel of farmers was created, therefore, which was interviewed every 3 months.

The enumeration took place during the first 2 weeks of April, July and October of 1953 and of January 1955 for the first series of interviews. Each survey was designed to obtain information on the preceding 3 months. A yearly set of records was obtained from those farmers who cooperated during each of the first four series of interviews. The panel used in the second series of interviews consisted of half of the 1953 sample supplemented by an equal number of new farms. Enumeration for the second series was held during the first 2 weeks of April, June and October 1954 and of January 1955.

AREA OF INVESTIGATION

The state of Iowa constituted the area under investigation. According to the United States Agricultural Census of 1950, this region contained 203,159 farms. Of these farms, 1,875 were rural place and urban farms.

All farms lying in Iowa were members of the universe and, hence, potential members of the sample. The census rules were applied to determine whether or not any particular enterprise constituted a farm. If an enterprise was under 3 acres in area, it must have sold a minimum of $150 worth of agricultural products in the previous year to be counted. If it was 3 acres or more in area, it must have produced at least $150 worth of products.

SAMPLE SIZE

Since most of the information desired from the panel of farmers related to livestock marketing, it appeared that the most generally useful sample design would be one which concentrated heavily on the farmers who produced the most livestock. A two-phase sample design was adopted since it is a relatively inexpensive scheme for detecting the large livestock producers.

A sampling rate of 1/100 were applied to the 203,159 farms in the universe, a total of about 2,000 would be expected to come into the sample. This number was too large in view of the available funds. Nevertheless, it was possible to use this large sample to obtain some rough estimates of selected general characteristics of the universe.

The initial phase of the survey formed the phase 1 operation. Of these 2,000 farms, a selection of 400, or roughly one-fifth, was to be taken for the final panel of farms to be carried throughout the year. It appeared reasonably efficient to interview about three farms, on the average, in each location. Hence, an area segment of about 14 farms was considered suitable as a primary sampling unit size.

THE SAMPLE DESIGN

Data from the 1950 Census of Agriculture and the materials of the Master Sample of Agriculture were used to form 49 strata of approximately equal size in terms of number of farms. These strata were formed as groups of whole counties or parts of counties containing approximately 4,200 farms each.

Phase 1 sample. The first-phase sampling procedure consisted of the random selection of three area segments averaging about 14 farms within each stratum. In practice, it was found that the segments ranged in area from 3 to 5 square miles. The actual number of farms found on the 147 sample segments in the April 1953 survey ranged from 4 to 26. The sampling rate on phase 1 was about 1 in 100.

11 Personnel of Iowa State University Statistical Laboratory prepared the survey procedures and supervised the statistical work involved in the preparation of the tabular data reported in this study. Jack Grosh, graduate assistant, Department of Statistics, prepared a draft of this appendix.

12 A similar survey procedure also was carried out in northern Illinois, but the additional procedure is not reported since the Illinois estimates are not given in this report.


14 The sampling rate was 1,982/203,159=1/102.50 in 1953 and 1,999/203,159=1/101.63 in 1954, where 203,159 is the total number of farms in the sampling frame and 1,982 and 1,999 are the number expected in phase 1 in terms of the frame.
Using personal interviews, information was obtained in the phase 1 enumeration on the number of swine and cattle each farm was expecting to market during the calendar years 1953 and 1954. These data were converted into “animal units” (a.u.’s) by regarding a head of cattle as 1 unit and a pig as 1/3 unit. In 1954, data on acreage per farm were collected for each of the phase 1 farms.

**Phase 2 sample.** With the animal unit information available, each farm was put into one of the following classes:

- **Class 1.** Those farms expecting to market less than 50 a.u.’s.
- **Class 2.** Those farms expecting to market 50-124 a.u.’s.
- **Class 3.** Those farms expecting to market 125 and over a.u.’s. Table A-1 shows the distribution into the three classes of the 1,907 phase 1 farms for 1953 and the 1,908 phase 1 farms for 1954.

A random sample of one-eighth of the class 1 farms and one-fourth of the class 2 farms, together with all class 3 farms constituted the phase 2 sample. These subsampling rates were determined by applying a formula for optimum rates (ignoring the cluster structure of the sample):

\[
\frac{n_i}{n} = \frac{W_i s_i}{\sum W_i s_i},
\]

where:
- \(n_i\) = estimated number of phase 2 farms in the \(i\)th class;
- \(n\) = total number of farms in the phase 2 sample;
- \(W_i\) = estimated proportion of all farms in the \(i\)th class;
- \(s_i\) = standard error of estimated (weighted) sales of cattle and hogs for the survey year.

The phase 2 sample distribution is presented in table A-2.

The phase 2 sample farms constituted the panel of farms which were used for the four quarterly sample surveys in each year. Each survey was designed to give information on the preceding months’ operations. As indicated in table A-1 for the 1954 sequence of surveys, half of the 1953 sampling units were retained, and an additional random supplement of sampling units was added to maintain the panel size. The 1954 universe was identical to the 1953 universe, except that no attempt was made in 1953 to distinguish between open country, rural place and urban farms. In March 1954, an additional stratum was created in Iowa to include all urban farms, so the 1954 panel should have the same composition as the 1953 panel; so similar sampling techniques were used. The new panel was obtained by replacing one segment from half of the strata with a new segment and by replacing two segments from the remaining half of the strata by two new segments. Thus, the 1954 panel consisted of matched farms enumerated in 1953 and those from the new or unmatched segments.

**Training of Interviewers**

Before the initial enumeration in April 1953, a 5-day training session was held to instruct enumerators in all phases of their work. The training program included instructions on the purpose of the survey, the sampling method, interviewing techniques and interviewer’s responsibilities. The questionnaire was discussed in detail with field practice in all phases of the interview supplementing classroom instruction. In addition, a 1-day “refresher” course took place before each of the subsequent quarterly surveys. Any new enumerators received additional training. The assignments from quarter to quarter for any given enumerator generally comprised the same farms because of both the proximity of the enumerator’s residence to his assignment and the ease of subsequent approaches after initial contact.

**Summary of Coverage Experience**

The subsampling procedure designated certain of the class 1, 2 and 3 farms as units in the phase 2 sample. Field instructions permitted an interviewer to substitute another farm whenever the originaIly designated farmer could not be interviewed because of “refusal” or because he was “away for duration of the survey” or “too busy.” In the case of class 1 and class 2 farms, the enumerator substituted a farm belonging to the same volume class and segment as that of the farm for which no interview was obtained. Substitutions were made at random from among the phase 1 farms not having been previously designated in the phase 2 sample.

Since 100 percent of the class 3 farms were covered in the phase 2 operation, no such substitution was possible for them. The substitution rate was 39/390, or 10 percent, in 1953 for the entire sample, and in 1954 it was 16/202, or 7.9 percent, in the new, unmatched portion of the sample. Previous experience on sample surveys of a similar nature indicated that negligible bias could be expected for items of interest in this survey; e.g., farm acreage, cattle or hogs.

For quarters 2, 3 and 4 of 1953, completion rates were 376/390 = 96.4 percent, 374/390 = 95.9 percent and 361/390 = 92.6 percent, respectively, as realized.

The completion rate that the 1954 panel should have the same composition as the 1953 panel; so similar sampling techniques were used. The new panel was obtained by replacing one segment from half of the strata with a new segment and by replacing two segments from the remaining half of the strata by two new segments. Thus, the 1954 panel consisted of matched farms enumerated in 1953 and those from the new or unmatched segments.
for the 4-quarter match was 357/390 = 91.5 percent. Of the 198 farmers from the 1953 panel who were designated to form the matched portion of the 1954 panel, 19 did not respond during the first quarter of 1954 — a 9.6 percent loss. The total number of interviews obtained in the fifth survey was 357 (179 + 202). Interview rates for the sixth, seventh and eighth quarters of the entire 1954 sample were 373/381 = 97.9 percent, 367/381 = 96.3 percent and 365/381 = 95.8 percent, with an over-all 4-quarter rate of 357/381 = 91.5 percent. Of those 1953 first-quarter farms (including substitutes) which also were designated for the 1954 panel, about 4 percent were lost subsequently during the first year and an additional 10 percent during the second year, giving an overall loss of about 15 percent. Hence a completion rate of approximately 85 percent was realized for those farms retained for 2 years. In making estimates for a 1-year period, only data from farmers who had given all four of the quarterly interviews were used.

ESTIMATES OF POPULATION TOTALS, MEANS AND VARIANCES

The estimator employed was a "post-stratified" estimator, using all 33 combinations of the three livestock volume classes, \( i = 1, 2, 3 \), and 11 acreage size groups, \( j = 1, 2, \ldots, 11 \) as "post-strata." The acreage size groups were taken as follows: 0-29, 30-49, 50-69, 70-99, 100-139, 140-179, 180-219, 220-259, 260-499, 500-999, 1,000 acres and over.

If the number, \( N_{ij} \), of farms in each of the 33 post-strata were known, an unbiased estimate of the population total \( X \) for a farm characteristic would be given by

\[
\hat{X} = \sum_{i,j} \frac{N_{ij}}{n_{ij}} x_{ij} \tag{2}
\]

where \( n_{ij} \) is the phase 2 sample number and \( x_{ij} \) is the phase 2 sample total in the \( i \)th post-stratum.

Since the post-strata were not known, they were estimated from the phase 1 information. Tables A-3 and A-4 show the distribution of the estimated number of farms to the 33 strata in 1953 and 1954. The marginal distribution by acreage size groups may be compared with the corresponding figures from the 1954 Census of Agriculture. It is seen that there is, in general, good agreement. Hence, in what follows we replace the unknown post-stratum size \( N_{ij} \) by the corresponding estimate \( \hat{N}_{ij} \) and the population total \( X \) is estimated by

\[
\hat{X} = \sum_{i,j} \frac{\hat{N}_{ij}}{n_{ij}} x_{ij} \tag{3}
\]

The estimated variance of these estimates employs the between-primary (segments) within-strata components of variation. Thus \( \hat{X}_{ts} \) denotes an estimate of the total of the \( t \)th stratum from the data of the \( s \)th segment, given by

\[
\hat{X}_{ts} = k \sum_{i,j} \frac{\hat{N}_{ij}}{n_{ij}} x_{ij} \tag{4}
\]

where the same post-stratum jack-up factor is employed as in equation 2, and where \( X_{ij} \) is the data sum of the \( i \)th segment in the \( j \)th stratum, and where \( k \) is the number of segments selected from each stratum. Then the estimated total is

\[
\hat{X} = \frac{1}{k} \sum_{t,s} \hat{X}_{ts} \tag{5}
\]

The variance of \( \hat{X} \), \( V(\hat{X}) \), may be estimated from the between-primary within-strata component of variance by

\[
V(\hat{X}) = \frac{1}{k} \sum_{t,s} \frac{X_{ts} - \hat{X}_{ts}}{k} \tag{6}
\]

TABLE A-3. ESTIMATED NUMBER OF FARMS IN IOWA BY ACREAGE GROUP AND LIVESTOCK VOLUME OF SALES CLASS-ES, 1953.*

<table>
<thead>
<tr>
<th>Group acres</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 29</td>
<td></td>
<td></td>
<td></td>
<td>18,539</td>
</tr>
<tr>
<td>30 - 49</td>
<td>9,928</td>
<td>0</td>
<td>30</td>
<td>9,941</td>
</tr>
<tr>
<td>50 - 69</td>
<td>4,906</td>
<td>262</td>
<td>0</td>
<td>5,168</td>
</tr>
<tr>
<td>70 - 99</td>
<td>15,024</td>
<td>1,785</td>
<td>39</td>
<td>17,076</td>
</tr>
<tr>
<td>100 - 139</td>
<td>25,691</td>
<td>4,241</td>
<td>118</td>
<td>30,050</td>
</tr>
<tr>
<td>140 - 179</td>
<td>38,356</td>
<td>14,322</td>
<td>176</td>
<td>53,554</td>
</tr>
<tr>
<td>180 - 219</td>
<td>6,724</td>
<td>10,088</td>
<td>5,601</td>
<td>23,733</td>
</tr>
<tr>
<td>220 - 259</td>
<td>7,779</td>
<td>7,238</td>
<td>25</td>
<td>20,637</td>
</tr>
<tr>
<td>260 - 499</td>
<td>8,896</td>
<td>1,055</td>
<td>211,099</td>
<td>29,567</td>
</tr>
<tr>
<td>500 - 999</td>
<td>10,374</td>
<td>650</td>
<td>1,179</td>
<td>2,663</td>
</tr>
<tr>
<td>1,000 and over</td>
<td>0</td>
<td>236</td>
<td>236</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>134,286</td>
<td>49,918</td>
<td>10,967</td>
<td>195,211</td>
</tr>
</tbody>
</table>

* Based on Livestock Marketing Survey.

TABLE A-4. ESTIMATED AND CENSUS NUMBERS OF FARMS FOR IOWA BY (a) 1954 ACREAGE GROUP AND VOLUME CLASS, LIVESTOCK MARKETING SURVEY, AND (b) 1954 ACREAGE GROUP, CENSUS OF AGRICULTURE.

<table>
<thead>
<tr>
<th>Group acres</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 29</td>
<td>16,737</td>
<td>301</td>
<td>0</td>
<td>17,038</td>
</tr>
<tr>
<td>30 - 49</td>
<td>9,543</td>
<td>151</td>
<td>0</td>
<td>8,695</td>
</tr>
<tr>
<td>50 - 69</td>
<td>4,732</td>
<td>302</td>
<td>0</td>
<td>4,734</td>
</tr>
<tr>
<td>70 - 99</td>
<td>13,172</td>
<td>2,263</td>
<td>0</td>
<td>15,434</td>
</tr>
<tr>
<td>100 - 139</td>
<td>23,372</td>
<td>6,631</td>
<td>202</td>
<td>30,605</td>
</tr>
<tr>
<td>140 - 179</td>
<td>30,348</td>
<td>17,529</td>
<td>382</td>
<td>48,754</td>
</tr>
<tr>
<td>180 - 219</td>
<td>9,941</td>
<td>7,092</td>
<td>1,357</td>
<td>18,398</td>
</tr>
<tr>
<td>220 - 259</td>
<td>8,996</td>
<td>11,152</td>
<td>1,055</td>
<td>21,109</td>
</tr>
<tr>
<td>260 - 499</td>
<td>6,936</td>
<td>11,152</td>
<td>7,228</td>
<td>25,224</td>
</tr>
<tr>
<td>500 - 999</td>
<td>7,745</td>
<td>7,745</td>
<td>1,580</td>
<td>16,070</td>
</tr>
<tr>
<td>1,000 and over</td>
<td>0</td>
<td>3,016</td>
<td>3,016</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>122,438</td>
<td>57,460</td>
<td>14,023</td>
<td>193,921</td>
</tr>
</tbody>
</table>

* The estimated total number of farms in this table differs from the estimates in earlier tables because of rounding errors in the procedure used to obtain individual class totals.

The estimated variance of \( \hat{X} \), \( V(\hat{X}) \), may be estimated from the between-primary within-strata component of variance by

\[
V(\hat{X}) = \frac{1}{k} \sum_{t,s} \frac{(\hat{X}_{ts} - \hat{X}_{t})^2}{k-1} \tag{7}
\]

where \( \hat{X}_{t} \) denotes the phase 2 sample total for the \( t \)th stratum in the \( s \)th segment of the \( t \)th stratum, and \( k \) is the number of segments selected from each stratum. Then the estimated total is

\[
\hat{X} = \frac{1}{k} \sum_{t,s} \hat{X}_{ts} \tag{8}
\]

17 Data on farm size in phase 1 were collected only on the 74 "new" segments in 1954 plus a sample of 24 segments used in 1953 and rechecked in 1954. The size distribution of these 98 segments was assumed to hold for old segments used again in 1953.
Since \( k = 3 \) segments were selected from each stratum, the preceding equations become

\[
\hat{X}_{ts} = 3 \sum_{i, j} \left( \frac{N_{ij}}{n_{ij}} \right) X_{ij, ts},
\]

(9)

\[
\hat{X} = \frac{1}{3} \sum_{t, s} \hat{X}_{ts},
\]

(10)

\[
v(\hat{X}) = \frac{1}{6} \sum_{t, s} (\hat{X}_{ts} - \bar{X})^2
\]

(11)

where \( \bar{X}_t = \frac{1}{3} \sum_s \hat{X}_{ts} \).

(12)

Finally, an estimate of the sample mean is

\[
\hat{X} = \frac{1}{N} = \frac{1}{N} \left( \frac{1}{3} \sum_{t, s} \hat{X}_{ts} \right)
\]

(13)

with estimated variance

\[
v(\hat{X}) = \frac{1}{N^2} V(\hat{X}) = \frac{1}{6N^2} \sum_{t, s} (\hat{X}_{ts} - \bar{X})^2
\]

(14)

**Sampling Errors for Selected Characteristics**

The sampling errors for certain of the estimates previously cited are given in Table A-5. From this table the reader may obtain a general idea of the accuracy of the estimates given herein.


<table>
<thead>
<tr>
<th>Item</th>
<th>Estimate</th>
<th>Standard Deviation</th>
<th>Coefficient of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total hog sales</td>
<td>16,853,329</td>
<td>1,001,378</td>
<td>0.059</td>
</tr>
<tr>
<td>2. Slaughter hog sales</td>
<td>15,143,318</td>
<td>1,635,347</td>
<td>0.062</td>
</tr>
<tr>
<td>3. Total, less slaughter hog sales</td>
<td>3,708,810</td>
<td>336,850</td>
<td>0.097</td>
</tr>
<tr>
<td>4. Slaughter hogs sold directly to packers</td>
<td>2,148,409</td>
<td>210,764</td>
<td>0.100</td>
</tr>
<tr>
<td>5. Total cattle and calf sales</td>
<td>4,670,630</td>
<td>312,666</td>
<td>0.062</td>
</tr>
<tr>
<td>6. Slaughter cattle and calf sales</td>
<td>3,385,521</td>
<td>191,952</td>
<td>0.058</td>
</tr>
<tr>
<td>7. Total, less slaughter cattle and calf sales</td>
<td>787,569</td>
<td>82,970</td>
<td>0.106</td>
</tr>
<tr>
<td>8. Slaughter cattle and calves sold through terminal markets</td>
<td>1,751,676</td>
<td>196,751</td>
<td>0.114</td>
</tr>
<tr>
<td>9. Slaughter cattle and calves sold through auctions</td>
<td>644,320</td>
<td>51,103</td>
<td>0.094</td>
</tr>
</tbody>
</table>