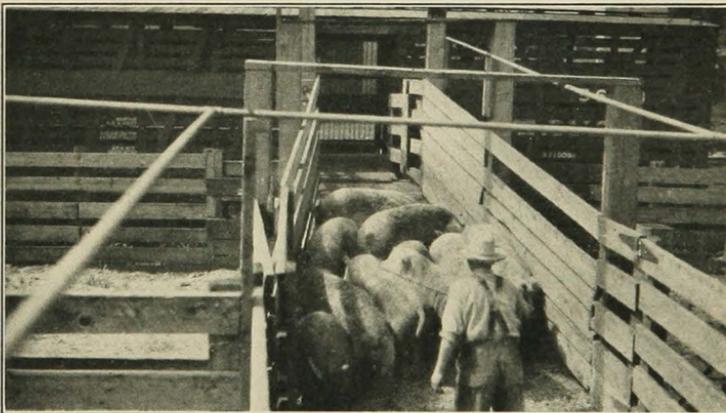


UNIVERSITY OF MINNESOTA
AGRICULTURAL EXPERIMENT STATION

LIVESTOCK SHIPPING
ASSOCIATIONS IN
MINNESOTA

E. C. JOHNSON AND J. B. McNULTY
DIVISION OF AGRICULTURAL ECONOMICS



UNIVERSITY FARM, ST. PAUL

LIVESTOCK SHIPPING ASSOCIATIONS IN MINNESOTA

By E. C. JOHNSON and J. B. McNULTY

INTRODUCTION

The first co-operative livestock shipping association in Minnesota of which there is a record was organized at Litchfield in Meeker County in 1908. Livestock producers soon recognized advantages in co-operative shipping of livestock, and by 1913 the number of associations in Minnesota had increased to 115. A period of great activity in the organization of such shipping associations followed, and by 1919 there were 655 in operation. Since that time the number has diminished. In 1928 there were 603 associations in Minnesota that shipped some livestock and in 1931 only 520. The figure for 1931 includes all associations that shipped some livestock, but many did not ship regularly. The number now providing regular service is considerably less than 520.

The number of co-operative livestock shipping associations in each county in Minnesota in 1931 is shown in Figure 1. Table 1 gives a summary of the number of associations in different sections of the state in 1928 and 1931.

Table 1
Sectional Distribution of Livestock Shipping Associations in Minnesota, 1928 and 1931

District	Number of associations		Percentage change in number of asso- ciations, 1928 to 1931
	1928	1931	
I Northwestern	56	53	- 5.4
II Northeastern	50	43	-14.0
III Central	128	115	-10.2
IV Southwestern	209	201	- 3.8
V Southeastern	160	108	-32.5
Minnesota.....	603	520	-13.8

The number of livestock shipping associations in all sections of the state decreased between 1928 and 1931. Far the largest decrease occurred in southeastern Minnesota. Of the 83 associations that discontinued operations in Minnesota between 1928 and 1931, 52, or 62.7 per cent, were in the southeastern section. The high mortality in that region was caused largely by a great increase in the use of trucks for livestock shipping. Many counties in southeastern Minnesota are near South St. Paul and most of the livestock shipped from points near this market now goes by truck. The growth of interior packing plants that purchase livestock direct from producers is another factor responsible for the decline.

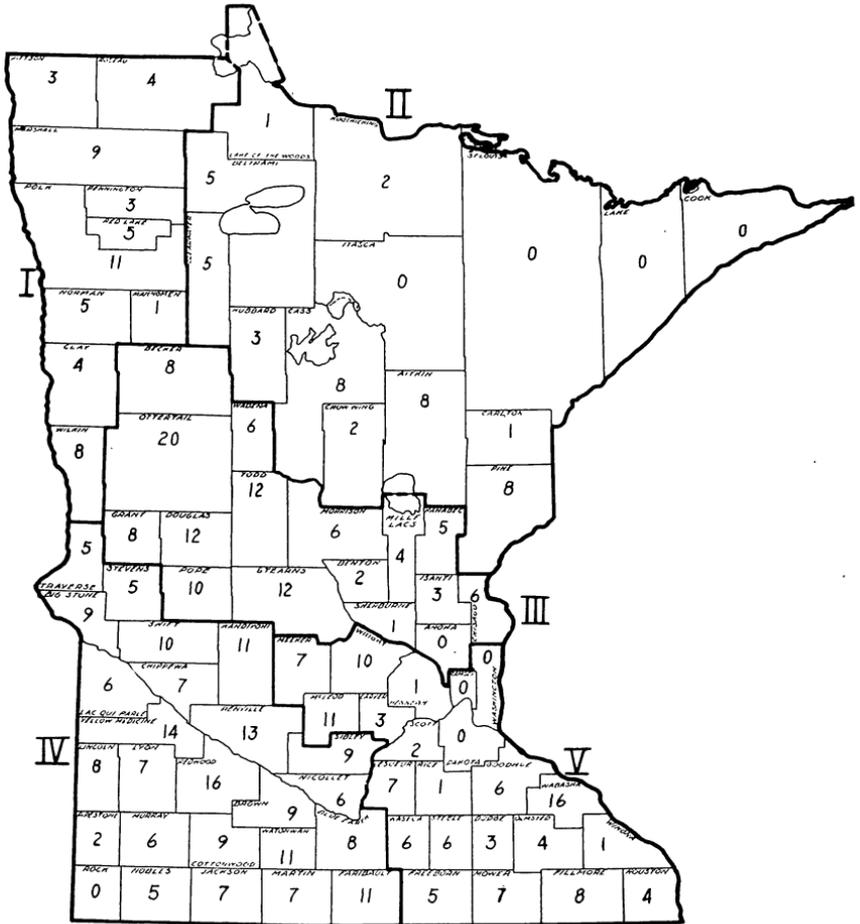


Fig. 1. Number of livestock shipping associations in Minnesota counties in 1931

NUMBER OF ASSOCIATIONS INCORPORATED

Sixty-eight per cent of the associations included in this study were incorporated. Incorporation of co-operative marketing associations is worth while because it limits the liability of members for obligations and losses that the association may incur. Marketing livestock co-operatively involves the handling of considerable sums of money, and incorporation is highly desirable. Unincorporated associations are loosely organized and lack powers granted to incorporated organizations.

Membership

In nearly all associations a membership fee is required of all who market through the association. The usual fee is \$1.00, payable when

the membership is taken or by a deduction from the returns on first shipment. Membership agreements are not used generally, the two associations reported membership agreements which obligated the member to ship all of his livestock through the association.

Volume of Business

While many associations have become inactive in recent years, the volume of livestock handled by each association is greater than formerly. This may be explained by the fact that on the whole it is the smaller and weaker associations that have ceased operations. Furthermore, there has been an expansion in livestock production in many sections of the state which has enabled some associations to increase their volume. A comparison of cars handled by associations in 1919 and 1931 is given in Table 2. The associations reporting are fairly representative of all associations in the state for these years, and it is apparent that a large proportion of the associations in 1919 were small. In 1919, 73.6 per cent of the associations handled less than 100 cars, while in 1931 only 63.2 per cent had a volume less than 100 cars. Similarly, in 1919 only 4 per cent shipped more than 200 cars, while in 1931, 10.4 per cent shipped more than 200 cars.

Table 2
Distribution of Shipping Associations According to Number of Cars Handled

Cars handled	Number of associations reporting		Per cent of total associations	
	1919	1931	1919	1931
Less than 20.....	30	8	12.0	4.9
20- 39.....	44	21	17.6	12.9
40- 59.....	44	25	17.6	15.3
60- 79.....	41	29	16.4	17.8
80- 99.....	25	20	10.0	12.3
100-119.....	18	9	7.2	5.5
120-139.....	16	12	6.4	7.4
140-159.....	13	9	5.2	5.5
160-179.....	4	9	1.6	5.5
180-199.....	5	4	2.0	2.5
200-219.....	3	1	1.2	0.6
220-239.....	0	5	0.0	3.1
240-259.....	4	4	1.6	2.5
260-279.....	1	3	0.4	1.8
280-299.....	2	0	0.8	2.0
300-319.....	0	1	0.0	0.6
320-339.....	0	1	0.0	0.6
340-359.....	0	0	0.0	0.0
360-379.....	0	2	0.0	1.2
Over 380.....	0	0	0.0	0.0
Total number of associations..	250	163		

Associations should have sufficient volume to make at least one shipment a week. Because livestock marketing is largely seasonal, much

livestock being marketed in the fall, an association should handle at least 60 cars a year to enable it to ship regularly every week. In 1919 about one-half of the Minnesota associations shipped less than 60 cars a year, but in 1931 only one-third of the active associations fell below that volume. However, the fact that one-third of the associations do not provide a regular service for the livestock producer shows a serious weakness in the system. At places where there is some doubt as to whether shipments will be made weekly, producers are likely to find other ways of selling their livestock. For veal calves ready for market, a delay of a week may result in a lower market grade, and, therefore, in a loss to the producer, unless a rise in the market should occur meanwhile. For other livestock, a delay of a few days or a week is not so likely to affect the grade as much as with calves, but even with these classes the producer may take a loss if he cannot market at the time the livestock is ready for sale.

Producers of livestock are now able to keep in close touch with market conditions through the daily press or the radio, and they wish to be in a position to take advantage of favorable prices. To do this, they must have the opportunity to sell at least once a week. If their association cannot ship at least once a week, many producers will not support it. With the great improvement in highways there are many producers who can truck livestock to the market or sell to truck buyers, and a few truck shipments are likely to reduce the volume of livestock at a shipping point to an amount which does not allow regular shipments by an association. It is important, therefore, to have the association serve a territory large enough to enable it to ship regularly.

Some livestock shipping associations receive enough livestock to make about two shipments regularly every week throughout the year. Such associations are likely not only to get most of the livestock within their own trade territory but also to draw from other territory which may be served by small associations. Regularity of shipment is one of the important reasons why large associations in many parts of the territory grow while the small associations decline. A striking example is an association seventy miles from South St. Paul, which has maintained a volume of about 250 cars a year for several years, tho confronted with active competition from truckers and independent buyers. While this association has maintained a large volume of business, other associations, with a small volume and less capable management, have gone out of business. It is true that no association is likely to maintain or increase its volume of business under poor management, but it is also true that an association having efficient management but receipts too

light to permit regular shipments at least once a week is likely to find it very difficult to avoid a gradual decline in receipts of livestock.

The volume of business of a shipping association for a given year is sometimes referred to as gross sales. Volume measured in terms of sales, however, is not a good basis for comparison from one year to another, because sales fluctuate with prices and therefore do not necessarily indicate changes in the amount of livestock received. It may be of interest at this point, however, to show the variations in gross sales of livestock shipping associations. Table 3 summarizes the results of a study of the receipts of 106 associations at terminal markets in 1930.

Table 3
Gross Receipts at Terminal Markets—106 Associations, 1930

Gross receipts at terminal market	Number of associations reporting	Gross receipts at terminal market	Number of associations reporting
thousands		thousands	
\$ 0- 25	3	\$375-425	3
25- 75	23	425-475	4
75-125	21	475-525	0
125-175	17	525-575	0
175-225	13	575-625	0
225-275	11	625-675	0
275-325	8	675-725	0
325-375	2	Over 725	1

The gross sales of the 106 associations varied from \$10,362 to \$881,340. Fifty-one, or about one-half, had gross sales of \$75,000 to \$225,000. About one-fourth had sales less than \$75,000; and one-fourth, sales of more than \$225,000. The average was \$113,904. Assuming that the 106 associations are a representative sample of the 520 associations then in operation in Minnesota, the total value of livestock handled by co-operative shipping associations in 1930 was about \$60,000,000.

Expenses

The cost of marketing livestock includes expenses at the local shipping point, transportation charges, and terminal market charges. An analysis was made of expenses of a group of associations for the year 1930. These associations were selling the livestock at South St. Paul, and therefore the expenses will be referred to as home or local expenses, and terminal market expenses. Transportation charges, in the summary of expenses, are included under terminal market expense because these charges are deducted from returns at the terminal market. On this basis of classification, terminal market expenses including transportation make up about three-fourths, and local expenses one-fourth, of all costs of marketing the livestock, excluding hauling costs between

the farm and the local market, and indirect costs like shrinkage. Stated in figures, the terminal market expense, which includes freight, averaged \$66.40 per car and local expense \$19.72, or a total of \$86.12 per car shipped. The average sale value of livestock per car was \$1,534.21. In other words, expenses amounted to 5.6 per cent of the gross sales. This percentage increased in 1931 and 1932, because the prices of livestock declined. This reduced the value per carload, while expenses did not decline proportionately. Expenses remain comparatively fixed, so that when prices decline the farmers receive a smaller per cent of the gross returns, and when they rise they receive a larger per cent.

Two-thirds of the local marketing expense was paid to the local manager for his services and one-third covered such home expenses as fees for the secretary and directors, liability insurance, manager's bond, auditing, feed, bedding, nails, partitions, ropes, and payment for livestock that died or was crippled in transit.

Table 4
Relation of Number of Cars Handled to Local Costs Per Car and Per Cent of Total Net Receipts Returned to Shippers

Number of associations reporting	Cars handled		Cost per car	Per cent of total net receipts at local shipping points returned to shippers
	Range	Total		
15.....	Under 50	489	\$24.38	98.34
36.....	50- 99	2,612	21.00	98.74
21.....	100-149	2,626	19.29	98.86
9.....	150-199	1,514	18.29	98.96
12.....	200 and over	3,159	\$18.20	99.04

The per cent of net receipts (gross sales less terminal marketing expenses) returned to shippers showed a gradual and consistent gain as the number of carloads handled increased (Table 4). Net receipts returned to shippers ranged from 96.5 per cent for one association handling 8 cars to 99.3 per cent for an association handling 230 cars annually. The smaller association spent 3.5 per cent and the larger only 0.7 per cent of its net receipts for local marketing expenses. Twenty-one associations handling 150 cars or more, annually, returned from 98.2 per cent to 99.3 per cent of their annual net receipts to shippers. The average was 99.02 per cent. Two-thirds of the group returned 99 per cent or more. For 15 associations handling less than 50 cars, the net receipts returned to patrons ranged from 96.5 per cent to 99.2 per cent, with an average of 98.34 per cent. Only one-eighth of this group returned 99 per cent or more of their net receipts to shippers.

Table 5
Relation of Number of Cars Handled to Local Costs

Number of associations	Number of carloads handled	Local marketing costs per carload		
		Manager's salary	Other local cost	Total cost per carload
15.....	Under 50	\$17.33	\$7.05	\$24.38
36.....	50- 99	14.48	6.52	21.00
21.....	100-149	13.20	6.09	19.29
9.....	150-199	13.10	5.19	18.29
12.....	200 and over	\$11.52	\$6.68	\$18.20

Costs for the services of the manager declined consistently per car with increases in the number of cars handled (Table 5). Though other local expenses per car showed a tendency to increase in associations with volumes of 150 cars or more, this increase was not sufficient to overcome the decrease in the cost of management; therefore, there was a gradual decline in total local costs from \$24.38 for associations handling under 50 cars to \$18.20 for associations handling 200 carloads or more.

Table 6
Relation of the Number of Cars Handled to Good Business Practices

Number of associations reporting	Size of associations	Books audited		Manager bonded		Liability insurance		Paying directors		Paying secretary	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
67	Under 150 cars	6	8.9	5	7.5	16	23.8	23	34.3	16	23.9
22	Over 150 cars	7	31.8	5	22.7	15	68.2	18	81.8	6	27.3

The somewhat higher home expense for items other than management among the larger associations is accounted for, in part at least, by the fact that many of these provided additional services important to the successful operation of any business. The fact that some associations appear to have operated successfully without providing for these special services should not be regarded as proving that these were unnecessary cost items. Chances of becoming involved in financial or managerial difficulties are increased when such important services as those in Table 6 are dispensed with.

Of the 27 associations handling 50 cars or less (Table 7), 5, or 18 per cent, hired managers for 6 cents or less, and 15, or 55 per cent, hired managers for 8 cents or less per 100 pounds. Of the 34 associations handling 50 to 99 cars, 11, or 33 per cent, hired managers for 6 cents or less per 100 pounds, and 30, or 90 per cent, hired managers for 8 cents or less per 100 pounds. Eleven, or 40 per cent, of the associations handling 50 cars or less hired managers for 10 cents or more, while only 3, or less than 10 per cent, of the associations handling 50

to 99 cars paid managers as much as 10 cents or more per 100 pounds. All associations handling 150 cars or more paid 8 cents or less per 100 pounds. Two associations handling less than 50 cars paid managers the maximum of 15 cents per hundred.

Table 7
Relation of Number of Cars Handled to the Cost Per Hundred Pounds for Manager's Services in 87 Associations

Rate per 100 lbs. paid managers	Number of associations classified by number of carloads shipped				Total number of associations
	Under 50	50-99	100-149	150 and over	
cents					
5.....	1	2	0	3	6
6.....	4	9	6	3	22
7.....	2	9	7	1	19
8.....	8	10	4	1	23
9.....	1	1	0	0	2
10.....	9	3	1	0	13
Over 10.....	2	0	0	0	2
Total	27	34	18	8	87

Table 8
A Comparison of Amounts Paid Managers in 1919 and 1931*

Amount paid to manager per year	71 shipping associations, 1919		93 shipping associations, 1931	
	Number	Per cent	Number	Per cent
\$ 0- 249.....	4	5.63	2	2.15
250- 499.....	5	7.04	7	7.52
500- 749.....	14	19.71	7	7.52
750- 999.....	9	12.67	14	15.05
1,000-1,249.....	11	15.49	19	20.43
1,250-1,499.....	12	16.90	8	8.60
1,250-1,749.....	5	7.04	6	6.45
1,750-1,999.....	7	9.85	10	10.75
2,000-2,499.....	2	2.81	8	8.60
2,500-2,999.....	1	1.40	4	4.30
\$3,000 and over.....	1	1.40	8	8.60

* Minn. Agr. Exp. Sta. Bull. 201—Table IX, p. 28.

Payment to Managers

In 1919 earnings of shipping association managers ranged from \$148 to \$3,530, with an average of \$1,130. In 1931 earnings ranged from \$173 to \$5,165, with an average of \$1,475. In 1919, 65 per cent received earnings ranging from \$500 to \$1,500, 22 per cent over \$1,500, and 13 per cent under \$500. In 1931, 52 per cent received earnings ranging from \$500 to \$1,500, 38 per cent received over \$1,500, and 10 per cent received under \$500. Because of growth in the volume of business and general increase in costs, the proportion receiving over \$1,500 in 1931 showed a marked increase over that of 1919.

Of 121 associations studied, 82 per cent paid managers a flat rate per hundred pounds, 13 per cent paid a flat rate per carload, and 5 per cent paid a straight salary. Ninety per cent of the associations handling over 150 cars paid at a flat rate per 100 pounds. Five out of six associations that paid a straight salary handled less than 150, and one handled more than 150 cars. The flat rate per car varied with the amount of livestock handled in some associations; for example, \$20.00 for the first car and \$10.00 for the second car; or \$15.00 for the first car and 4 cents per hundred pounds for all over one car. Some associations, paying on a per hundredweight basis, varied the rate with the amount of livestock; for example, 7 cents per hundred pounds for the first car, and 6 cents per hundred pounds for all over one car. In one small association the rate was 15 cents per hundred on the first car and 10 cents per hundred on all over one car. However, a flat, uniform rate per 100 pounds was most commonly paid to managers.

Amount of Manager's Time Devoted to Work

In 83 associations studied, 15 per cent of the managers gave all of their time, 55 per cent gave more than one-half, and 30 per cent gave less than one-half, to shipping association work. Two-thirds of the managers worked on their own or rented farms when not engaged in shipping association work. Among those in 20 other types of supplementary work were manager of local elevator, manager of feed and coal store, manager of implement company, secretary of creamery, assessor, auctioneer, railroad station agent, operator of meat market, operator of restaurant, livestock buyer.

SHRINKAGE IN LIVESTOCK

Most farm products, including livestock, are subject to some waste, deterioration, or shrinkage in marketing. Such losses must be included as cost of marketing. In general, livestock weighs less when it reaches a market than when it is received at the local shipping point. This loss in weight is referred to as shrinkage, and, if it reduces the value of a carcass, it must be considered as a cost of marketing. Because of the importance of this factor, livestock shipping associations must give it careful consideration, if livestock is to be marketed efficiently.

To throw some light on the causes of shrinkage, an analysis was made of shrinkage in a large number of rail shipments. The livestock studied was received from livestock shipping associations at Minnesota points from 30 to 350 miles from the South St. Paul market. For only a few consignments did the distance exceed 300 miles, and the livestock was not unloaded for feeding en route. Shipments were classified by

zones, as follows: Under 100 miles, 100-199 miles, and 200-299 miles. Shrinkage was determined by subtracting the weight when the animals were sold at the terminal market from the weight when delivered at the local shipping point. Because there is some loss of weight in moving livestock from a farm to a local shipping point, the results obtained in this study show a somewhat lower shrinkage than if weights had been taken before the livestock left the farm. As few farms are equipped with scales for weighing livestock, the usual practice of shippers is to use weights at the local shipping point in determining shrinkage. Because the procedure for determining shrinkage followed in this work is the same as that used by shippers generally, the observations made may be useful to shippers interested in making comparisons, or in obtaining further information. Readers should not conclude that the general effects of distance from market herein reported will be observed when livestock is shipped more than 300 miles. For longer distances, and especially under unfavorable climatic conditions, shrinkage is likely to include some actual loss in carcass weight, whereas, for the distances studied in this investigation, the shrinkage may have been caused entirely by losses from the digestive system. Under the latter conditions, feeding after arrival at the market can be an important factor in reducing shrinkage.

The feeding and handling, both before and after delivery to the local shipper, are very important, they are not the only factors affecting shrinkage. Observations based on the home and market weights of 18,385 cattle, 27,933 calves, 100,706 hogs, and 24,252 sheep indicate that the distance from the market and seasonal or climatic conditions also influence shrinkage. An analysis of the influence of these two factors is given in the following paragraphs.

Table 9

A Comparison of the Shrinkage of the Different Kinds of Livestock, for a Period of 3 Years, 1929-1931 (Shrinkage Expressed on a Percentage of Home Weight)

Kind	No. of head	Per cent of shrinkage
Cattle	18,385	1.97
Calves	27,933	4.31
Hogs	100,706	1.38
Sheep	24,252	3.89

Shrinkage in calves and sheep was about three times, and that in cattle about one and a half times as much as that in hogs, when, as in Table 9, the calculations included all shipments under 300 miles for all seasons. Inasmuch as cattle, calves, hogs, and sheep were received from

nearly all of the 56 consigners studied, the question, whether the marked differences observed in the shrinkage of these four species might be caused in part by differences in distances from market, need not be considered.

Table 10
Relation of Distance to the Shrinkage of Livestock, 1929-1931

Kind	Average all distances	Under 100 miles	100 to 199 miles	200 to 299 miles
	per cent	per cent	per cent	per cent
Cattle	1.97	2.38	2.27	1.52
Calves	4.31	3.87	4.60	4.03
Hogs	1.38	1.23	1.13	1.70
Sheep	3.89	4.08	3.91	3.81

The data of Table 10 give evidence of a striking contrast between hogs and cattle in the effect of distance on shrinkage. For example, the shrinkage in a 20,000-pound shipment of cattle would, according to the data of Table 10, be 476 pounds when shipped less than 100 miles, and 304 pounds when shipped 200-299 miles. This is a 36 per cent decrease in cattle shipped the longer distance. In a 20,000-pound shipment of hogs, the shrinkage would be 246 pounds when shipped less than 100 miles and 340 pounds when shipped 200-299 miles. This is an increase of 38 per cent in hogs shipped the longer distance.

The decreases in shrinkage in hogs and cattle shipped 100-199 miles, as compared with shrinkage in shipments of less than 100 miles, Table 10, are so slight that they might easily be a result of errors in weighing. This should be kept in mind in comparing shrinkages in shipments under 100 miles with shrinkages in shipments of 100-199 miles in both hogs and cattle. It is significant, however, that the shrinkage in hogs, tho approximately the same in the first two zones, increased decisively in shipments from the third zone. Apparently, hogs are in a better condition to "take in a fill" when shipped 100-199 miles than when shipped 200-299 miles. Very probably this is because of the tendency of hogs shipped this longer distance to be worn out, and, as a result, to be unable to eat enough to make up for the losses from the digestive system in transit. More time for rest before feeding and weighing should, on the basis of this explanation, result in a reduced shrinkage.

Table 11
A Comparison of the Seasonal Shrinkage of Livestock

Kind	Yearly average	Winter	Spring	Summer	Fall
	per cent	per cent	per cent	per cent	per cent
Cattle	1.97	2.39	2.26	1.40	1.80
Calves	4.31	5.01	4.30	3.46	4.16
Hogs	1.38	0.86	1.33	1.72	1.72
Sheep	3.89	1.81	3.45	4.74	4.36

Sheep and calves had fairly uniform shrinkages of approximately 4 per cent, regardless of the distance shipped.

Table 11 indicates that the shrinkage in cattle and calves was greatest in winter, while that in hogs and sheep was greatest in summer. Apparently, cattle and calves suffer more from exposure to cold than from exposure to heat, whereas the reverse is true of hogs and sheep. It is not true, however, that sheep and hogs are immune to cold; hogs shipped in extremely cold weather, if not bedded heavily, may arrive with frosted hams. This suggests the need of special care in preparing a car for shipping livestock, and especially for cattle and calves in cold weather. For hogs, frequent sprinkling in extreme heat, or even icing the car, is good practice, to keep the shrinkage at a minimum. Fall shipments of hogs shrank as much as summer shipments. This may be the result of a tendency to overload cars in the fall when the heaviest movement of hogs takes place.

Table 12
A Comparison of the Seasonal Shrinkage in Livestock When Shipped
Varying Distances

	Winter	Spring	Summer	Fall	Average all seasons, 1929-1931
miles	per cent				
Cattle					
Under 100.....	2.34	2.81	1.38	2.44	2.38
100-199.....	2.75	2.28	2.08	2.05	2.27
200-299.....	1.99	2.05	0.78	1.34	1.52
Calves					
Under 100.....	4.10	4.06	3.58	3.18	3.87
100-199.....	5.36	4.32	3.85	4.73	4.60
200-299.....	4.83	4.41	2.93	4.16	4.03
Hogs					
Under 100.....	0.73	1.42	1.84	1.99	1.23
100-199.....	0.60	1.17	1.24	1.41	1.13
200-299.....	1.17	1.48	2.24	1.93	1.70
Sheep					
Under 100.....	1.83	4.45	5.82	4.11	4.08
100-199.....	1.96	3.06	5.29	4.42	3.91
200-299.....	1.20	3.56	3.43	4.32	3.81

Observations on the effect of both distance and seasons may be made from Table 12.

Cattle shipped 100-199 miles tended to maintain a high shrinkage in summer, while those shipped less than 100 or 200-299 miles showed shrinkages that were decidedly lower in summer. A possible explanation is that cattle shipped over 200 miles arrived more hungry and thirsty, and therefore were likely to consume more feed and water at the market than those shipped 100-199 miles. It appears that cattle shipped less

than 100 miles in summer, with a shrinkage of 1.38 per cent, lost less, particularly of the solids in the digestive system, than cattle shipped longer distances. Consequently, this loss was more nearly balanced by heavy water consumption than in the case of cattle shipped 200 miles.

As with cattle, the minimum shrinkage in calves resulted when shipments were made in the summer months and from points 200-299 miles from market. Because veal calves are not likely to consume much dry feed, regardless of the distance shipped, this marked reduction in shrinkage may have resulted from heavy water consumption after arrival, or from more favorable climatic conditions en route to market, or from both. No doubt the high shrinkage observed in calves in winter seasons, for all distances, was caused very largely by exposure to wintry weather. Cold and exposure would tend to cause a loss of weight without stimulating an appetite for water.

Hogs showed a shrinkage that varied from a minimum of 0.6 per cent for a distance of 100-199 miles in winter to a maximum of 2.24 per cent for a distance of 200-299 miles in summer. For all seasons, hogs shipped from 100-199 miles shrank less than for the other distances.

According to the data of Table 12, shrinkage in sheep was highest, 5.8 per cent, in summer shipments of less than 100 miles, and lowest, 1.2 per cent, in winter shipments. Shrinkage in winter shipments of 200-299 miles was approximately one-third as much as in spring, summer, and fall shipments. These observations emphasize the extent to which shrinkage in sheep may vary as a result of seasonal conditions. With the exception of fall, when there was little variation, shrinkage in all seasons, and for the three-year period, was less in shipments of 200-299 miles than in shipments of less than 100 miles. In the summer season, shrinkage declined from a maximum of 5.82 per cent, in shipments of less than 100 miles, to 3.43 per cent in shipments of 200-299 miles. This decrease in shrinkage noted in longer shipments may have been due to a tendency among sheep to become "more settled" as the period in transit increased, and, therefore, to arrive at the market in a better condition for "taking on a fill." If this is the explanation, it seems probable that the higher shrinkages observed in shipments under 100 miles might have been reduced if longer periods had been taken for rest before feeding and weighing.

The reader is cautioned against drawing the conclusion that distance from market or seasonal conditions will account for all variations in shrinkage. Some shippers who mark all animals at the time of delivery report little or no shrinkage. A few even report gains. When livestock is branded and weighed at the time of delivery, each consignor takes his

own shrinkage. This discourages heavy feeding by producers just before shipment. Such livestock reach the terminal market with keen appetites. Much feed is consumed, and shrinkage is greatly reduced or there may be none at all.

Obviously, feed consumed a few hours before slaughter cannot add much to the carcass or dressed weight of livestock. So heavy filling before slaughter may be uneconomical. However, it is a practice at terminal markets, where livestock is received from points varying widely in distance, to feed before slaughter to obtain fair sale weights.

PRORATING SHIPMENTS

Prorating involves the distribution of the receipts, expenses, losses, and shrinkage among the different consignors. In a group of 86 associations studied, 81, or 94 per cent, use a "flat rate by species." This rate, which is usually higher for calves and sheep than for cattle and hogs, includes all local and terminal marketing costs, including the manager's salary. The rate on the different species is uniform throughout the year. Less than 3 per cent of the associations use the "single shipment pool method," a plan by which the expenses and receipts are prorated on each individual shipment and a rate sufficient to cover the expenses is charged. Obviously, this rate will vary with different shipments, depending on whether the car was loaded to capacity, whether there were losses in transit, and on the kind of livestock shipped. About four per cent of the associations used a "combination method" of prorating, the actual terminal marketing expenses being charged directly against each consignor and a flat rate charged to cover local expenses and freight. Since terminal marketing charges are made on a "per head" rather than on a "per hundredweight basis," the "combination method" results in a fairer distribution of terminal marketing expenses. With terminal marketing charges on a per head basis, actual costs per 100 pounds live weight are relatively much higher for light or low valued livestock than for heavy or high valued livestock. Therefore, one of the objections sometimes raised against the use of the "flat rate by species method" is that it results in an unfair distribution of terminal marketing expenses. Shippers of light weight or low valued livestock pay less, while shippers of heavy or high valued livestock pay more than they would if each were charged actual terminal marketing expenses. However, the "flat rate by species" method is simple and results in a reasonably fair distribution of marketing expenses.

In the 86 associations studied, managers did the prorating in 63, local secretaries in 12, local banks in 5, and commission firms in 6.

EFFECT OF TRUCKING ON LIVESTOCK SHIPPING ASSOCIATIONS

Recent years have witnessed a great increase in the use of motor trucks for transportation of livestock. For example, in 1925 at the South St. Paul market, 5.1 per cent of the cattle, 11.9 per cent of the calves, 6.0 per cent of the hogs, and 5.5 per cent of the sheep arrived in trucks, while in 1932 corresponding percentages were 40.6, 66.3, 52.4, and 20.9. The vast improvement of roads and increased efficiency of trucks have been largely responsible for the increase in the use of trucks. Farmers, particularly those who live within a territory of 75 miles from market, have found the truck convenient for transporting livestock. Its use gives greater independence in marketing than does the use of the railroad. In many cases it may cost more to ship by truck, but many farmers are willing to pay a higher price for the added convenience and independence.

Livestock shipping associations were built up around railroad transportation. They were a means by which producers were able efficiently to assemble carload lots of livestock for sale at a terminal market. The return to the producer was the sale value of his livestock at the market less actual marketing expenses. The use of trucks soon reduced the volume of shipping associations near the market so much that it was difficult to get the volume necessary for regular shipments and efficient operation. As a result, a large number of shipping associations have been forced out of business by motor trucks.

It is exceedingly difficult for an association to meet truck competition. Some associations have done so by providing trucking service from the farm to the local shipping point and then shipping by rail. Associations located more than one hundred miles from the market may find, after careful study, that a combination of truck and rail service is the most economical method of marketing livestock. If such is the case, an aggressive policy by the directors and manager usually will enable the association to meet truck competition. In territory closer to the market, where the truck may be the most economical method of transporting livestock, producers may find it to their advantage to maintain the association as a trucking association and by so doing obtain better trucking service, possibly at a lower cost.

PRACTICES OF ASSOCIATIONS USING TRUCKS EXCLUSIVELY

At present there are 27 shipping associations in Minnesota that use trucks exclusively for hauling livestock to the terminal market. About ten of these are within a radius of 60 to 70 miles from the South St.

Paul market. In a few instances the truck has been brought into use because there was no railroad in the natural trading center of the community, but in a much larger number of instances the truck has been adopted because the association was not receiving enough livestock to make regular shipments by rail, or because of the shipper's demand that a trucker come direct to the farm to collect the livestock.

In most associations using trucks exclusively, particularly those handling a small volume, the truck driver is also the manager. No direct charge is made for management, tho the truck driver's charge no doubt includes a small fee for such managerial services as he performs. In some of the larger associations a special charge provides for a manager. Here the manager receives and often solicits orders for livestock, decides when and to whom shipments shall be made, accompanies the truck driver to the farm, supervises the loading, and mails the checks to the consignors. In all associations livestock is listed with the manager. When enough is listed to make a fair-sized load, the truck driver goes to each farm to gather the livestock and then hauls it direct to market. With few exceptions, loading yards are owned by the railroad companies and cannot be used by associations shipping by truck. For this reason, home weights are not taken on trucked livestock except by a few associations that have built their own yards and equipped them with scales.

In nearly all associations the manager owns the truck, though he may, and in larger associations usually does, employ a driver. Trucks vary from 1½ to 8 tons in capacity.

In general, associations located from 60 to 70 miles from the market weigh and sell livestock upon arrival without feed or water, while associations located farther from market feed and water before selling. Livestock is sold on the following day, the same as rail shipments. The manager of one association, located 140 miles from South St. Paul says, "It takes 5 to 6 hours to get to market by truck and 16 to 17 hours by rail. Our truck arrives at terminal market about midnight. This gives livestock a good chance to rest before being fed and watered on the following day." Another advantage of the shorter period required for transportation is that producers can more easily take advantage of sudden shifts in the market.

In most associations hauling livestock direct from farm to market, the producer is charged a flat rate sufficient to cover the cost of assembling and hauling. Terminal marketing costs are added as a separate charge. This plan results in a distribution of expenses similar to that which results when the "combination method" is used for rail shipments. However, some of the larger truck associations are, like many rail associations, using the "flat rate by species method."

A large number of the associations transporting livestock by truck obtain some income through a patronage dividend from a co-operative commission firm to which a large part or all of their livestock is consigned. Because this dividend exceeds the amount needed for ordinary sinking fund purposes, it is frequently used for reducing the cost of trucking. Out of a total cost of 25 cents for trucking, the producer member may, for example, pay 20 cents and the association 5 cents per 100 pounds. Because independent truckers are likely to find it difficult to compete with these reduced rates, this practice helps the association to maintain its volume.

Some truck associations have at their disposal surpluses accumulated when shipments were made by rail and charges made on a "flat rate by species" basis. Quite frequently such funds are used as a sinking fund, or for defraying part of the cost of trucking, or both. Unless some means of replacing sinking funds is adopted, these associations will be forced to suspend operations when such funds are exhausted. The reduced costs of trucking, however, serve to increase the volume handled by the association for the time being.

A limited number of truck associations are using a "flat rate by species" for determining costs of marketing. The sinking fund is included in the flat rate and is not used to reimburse shippers for losses resulting from accidents in transit. Such losses are covered by commercial insurance provided by the owner of the truck.

Each consignor's livestock handled by truck associations is weighed and sold separately at the terminal market, each taking his own shrinkage. There is a charge of 25 cents for each additional weighing, if there are more than three. If requested, an individual account sales statement and an individual check are issued by the commission firm for each shipper's livestock without additional cost. Because the expense of trucking each consignor's livestock is usually deducted before the check is written, there is no further prorating to be done. Some associations, especially those operating on a flat rate per 100 pounds, usually request but one account sales statement and one check covering the total sales. Such associations must prorate receipts and expenses among the consignors as in the case of associations shipping by rail.

WHEN TO SELL

Most of the livestock received by shipping associations in Minnesota is consigned to South St. Paul and sold by commission firms. The problem of when to sell, from the standpoint of the associations shipping to South St. Paul, is largely one of deciding the day of the week

on which to ship. Since most of the associations shipping by rail make only one shipment a week, it is important to select a day that is convenient for the farmer. To some extent the train schedules limit selection, but for most points the schedules permit shipment on several days of the week.

Some managers indicated that they shipped on a certain day of the week because they felt that on the average prices were highest on that day. It was interesting to observe, however, that the managers differed in their opinions, some believing that one day had higher prices while others favored another day.

Because of this difference of opinion, it was decided to make an analysis of prices of hogs and calves at South St. Paul by days. Quotations of top prices at South St. Paul, published by the Bureau of Agricultural Economics, were used. Top prices rather than average prices were used because they could be obtained with less work and in the case of hogs represented about the same grade each day of the week. Presumably, top butcher hogs of a certain weight classification would be hogs of about the same quality each day in a large public market like South St. Paul, and hence a comparison of top prices would be a comparison of hogs of the same grade. The same is not true of calves, at least not to the same extent, because there is less uniformity of quality in top calves.

Table 13 is a summary of the results of the analysis of quotations on top hogs. The data included quotations for the five-year period 1927-31.

Average daily top prices of hogs do not vary greatly, tho Friday shows a slightly higher price than the other days of the week. This is true of all seasons of the five-year period studied, with the exception of the summer and fall of 1927 and the fall of 1928 and 1930. The five-year average price on Friday exceeded the second highest price by 7 cents, 6 cents, 4 cents and one cent in winter, spring, summer, and fall, respectively. The five-year average price on Friday, without regard to seasons, was 5 cents higher than on the second highest day for the period. Thursday was the second highest day in the winter, summer, and fall seasons and for the five-year period. Saturday was the second highest day in the spring season.

Out of a total of 478 observations, the average price on Friday was as high or higher than the price on any other day 133 times, or 28 per cent of the time. Furthermore, Friday's price was as low or lower than the price on other days of the week only 46 out of 467 times, or about 10 per cent of the time. Obviously, the higher average price on Friday was not the result of exceptionally high prices paid on a few Fridays.

If the number of times prices were either highest or lowest were equally distributed among the different days of the week, Friday's price would have been highest only 79 times and lowest 78 times.

Table 13

Average Price on Each Day of the Week for Top Hogs, 200-250 Pounds,
1927-1931, South St. Paul

	1927	1928	1929	1930	1931	5-year average	
Winter							
Monday.....	\$11.55	\$ 8.03	\$10.01	\$10.07	\$7.50	\$ 9.43	
Tuesday.....	11.52	8.06	10.01	10.09	7.49	9.43	
Wednesday....	11.48	8.02	10.09	10.04	7.41	9.40	
Thursday.....	11.50	8.03	10.14	10.10	7.42	9.44	
Friday.....	11.59*	8.10*	10.17*	10.17*	7.54*	9.51*	.07†
Saturday.....	11.54	7.96	10.10	10.08	7.46	9.42	
Spring							
Monday.....	9.66	9.45	10.95	9.76	6.87	9.34	
Tuesday.....	9.70	9.47	10.85	9.76	6.81	9.32	
Wednesday....	9.59	9.53	10.84	9.73	6.85	9.31	
Thursday.....	9.60	9.52	10.91	9.79	6.93	9.35	
Friday.....	9.83*	9.58*	10.98*	9.88*	6.96*	9.45*	.06†
Saturday.....	9.82	9.55	10.94	9.76	6.90	9.39	
Summer							
Monday.....	10.54	11.62	11.19	9.83	6.60	9.96	
Tuesday.....	10.58*	11.63	11.13	9.76	6.51	9.92	
Wednesday....	10.56	11.63	11.10	9.76	6.48	9.91	
Thursday.....	10.54	11.63	11.19	9.87	6.68	9.98	
Friday.....	10.55	11.65*	11.23*	9.94*	6.71*	10.02*	.04†
Saturday.....	10.46	11.51	11.23*	9.76	6.66	9.92	
Fall							
Monday.....	8.79	9.03*	9.20	8.38	4.40	7.96	
Tuesday.....	9.34	8.96	9.17	8.34	4.36	8.04	
Wednesday....	9.30	8.86	9.23	8.41	4.35	8.03	
Thursday.....	9.28	8.88	9.24	8.52*	4.45*	8.07	
Friday.....	9.29	8.91	9.28*	8.49	4.45*	8.08*	.01†
Saturday.....	9.37*	8.89	9.24	8.41	4.42	8.07	
Yearly average							
Monday.....	10.14	9.53	10.34	9.51	6.34	9.17	
Tuesday.....	10.28	9.53	10.29	9.49	6.29	9.18	
Wednesday....	10.23	9.51	10.31	9.49	6.27	9.16	
Thursday.....	10.23	9.51	10.37	9.57	6.37	9.21	
Friday.....	10.32*	9.56*	10.41*	9.62*	6.41*	9.26*	.05†
Saturday.....	\$10.30	\$ 9.48	\$10.38	\$ 9.50	\$6.36	\$ 9.20	

* Highest price on a particular day for the season.

† Difference between the highest and next highest price of the week.

During the years 1927-31 the general trend of prices was downward; therefore the price recorded for Friday would have been slightly higher if a correction were made for a secular trend.

The trend in the fall season is decidedly downward. Consequently, Friday's price would be slightly higher if corrected for seasonal trend. This is significant because Friday's price in the fall season, altho highest only once, 1927, was very close to the highest in two other fall seasons, 1930 and 1931. In the winter season the price trend was decidedly up-

ward; therefore, a correction for trend would tend to lower Friday's price. However, this correction for trend would not have been sufficient to cause any change in Friday's rank. The downward trend in spring and the upward trend in summer were both too slight to have had any significant effect on Friday's price.

In 30 out of 49 weeks observed in 1927, the receipts were low or next to lowest on Friday. The price was highest or next to highest 21 times, and low or medium 9 times, on these 30 Fridays. In hopes of finding an explanation for the fact that low or medium prices were associated with low receipts on 9 out of 30 Fridays, an examination of the receipts on the Thursdays preceding these 9 Fridays was made, but in only one out of the 9 instances were Thursday's receipts high. Support for the theory that Friday prices were high because receipts were low on Friday or Thursday is further weakened by the fact that in 11 out of the 49 Fridays when receipts were highest or next to highest, the price was lowest or next to the lowest on only 3 Fridays. On the remaining 8 Fridays, when high receipts were associated with either high or medium Friday prices, the receipts on the preceding Thursdays were either medium or high; therefore, Thursday's receipts do not account for the fact that high prices were associated with high receipts in 8 out of 11 Fridays.

In 36 of the 49 weeks observed in 1928, the receipts were lowest or next to lowest on Friday. The price was highest or next to highest 17 times, medium 10 times, and lowest 9 times. Receipts on the Thursdays preceding the 9 Fridays, when low receipts were associated with low prices on Friday, were also either medium or low. On 3 Fridays when receipts were low, the price was low, medium, and high. Thursday's receipts failed to furnish any explanation for the one case where both receipts and prices were highest on Friday.

The general conclusion is that, while the somewhat lower receipts on Thursday and Friday had some influence on the higher price paid for top hogs on Friday, there must be some other factor or condition causing Friday's price to exceed all other days during this five-year period. The average receipts and prices by days for the period are given in Table 14.¹

¹ From 1921-28, both top and average prices averaged higher on Monday than on any other day of the week on the Chicago market. Friday was a very close second to Monday. Lowest prices were received on Wednesdays and Saturdays. No relationship between daily receipts and prices was established. (Bulletin 534—Cornell Agricultural Experiment Station.)

Table 14

Average Receipts of All Hogs and Average Prices of Top Hogs, Each Day of the Week, 1927-1931, South St. Paul

	1927		1928		1929	
	Average receipts	Average price	Average receipts	Average price	Average receipts	Average price
Monday.....	12,654	\$10.14	13,598	\$9.52	15,767	\$10.36
Tuesday.....	9,576	10.28	8,047	9.53	7,077	10.27
Wednesday.....	16,930	10.23	15,352	9.51	13,491	10.31
Thursday.....	10,478	10.10	9,224	9.51	8,356	10.37
Friday.....	9,498	10.29	8,699	9.56	9,598	10.41
Saturday.....	1,424	\$10.26	1,241	\$9.48	1,449	\$10.38

	1930		1931		5-yr. average	
	Average receipts	Average price	Average receipts	Average price	Average receipts	Average price
Monday.....	13,165	\$9.51	15,109	\$6.34	14,064	\$9.18
Tuesday.....	7,576	9.48	10,417	6.29	8,544	9.18
Wednesday.....	12,841	9.46	13,949	6.25	14,523	9.16
Thursday.....	7,658	9.57	9,277	6.31	9,008	9.21
Friday.....	11,066	9.62	12,211	6.41	10,197	9.26
Saturday.....	1,065	\$9.51	1,581	\$6.36	1,352	\$9.20

For good to choice veal calves, the five-year seasonal as well as the five-year straight average price was highest on Friday, second highest on Wednesday, and lowest on Monday. Friday's average price was as high or higher than the average price on any other day 158 times in a total of 531 "highs," and low 81 times in a total of 462 "lows" recorded in this five-year period. If the number of "highs" and "lows" were equally distributed over the five days (no price quotations on calves on Saturday), there would have been an average of 112 "highs" and 92 "lows" per day. Since the price on Friday was "high" more times and "low" fewer times than these two averages representing an even distribution, it appears that the higher price resulted from a tendency for the price on Friday to be maintained at a slightly higher level rather than from any tendency to be unusually high on a limited number of Fridays. It therefore appears that the chance of obtaining top prices on "good to choice" veal calves on the South St. Paul market was better on Friday than on any other one day of the week during this five-year period. It should not be concluded that sales made on Friday were always, or even generally, higher than sales made on other days. Our data merely indicate that from 1927-31 there was a tendency for prices to be highest on Friday. The relationship between receipts and prices of calves was not studied, but it is probable that, as in the case with hogs, no complete explanation would have been found. Nevertheless, any marked daily increase in the number of veal calves or top hogs is

almost certain to destroy the equilibrium for both calves and hogs, and to reduce the price on Friday to the same level as for other days in the week, or lower.

Table 15
Average Top Price on Each Day of the Week for Good to Choice Veal Calves, 1927-1931, South St. Paul

	1927	1928	1929	1930	1931	5-year average	
Winter							
Monday.....	\$12.36	\$12.63	\$14.35	\$14.23	\$10.35	\$12.78	
Tuesday.....	12.33	12.71	14.60	14.29	10.31	12.85	
Wednesday....	12.94*	13.11*	14.71	14.38	10.33	13.09*	
Thursday.....	12.71	12.98	14.61	14.11	10.08	12.90	
Friday.....	12.94*	12.85	14.85*	14.42*	10.40*	13.09*	.0†
Spring							
Monday.....	10.71	13.46	14.38	11.77	9.04	11.87	
Tuesday.....	11.02	13.69	14.54	12.04	9.00	12.06	
Wednesday....	11.42*	13.81	14.92	12.11*	9.11	12.27	
Thursday.....	11.35	13.73	14.77	11.88	9.15	12.18	
Friday.....	11.33	14.04*	15.11*	11.85	9.23*	12.31*	.4†
Summer							
Monday.....	13.35	15.61	15.61	11.61	8.58	12.95	
Tuesday.....	13.54	15.85	16.00	11.86	8.69	13.19	
Wednesday....	13.96	16.23	16.25	12.17	8.64	13.45	
Thursday.....	13.96	15.92	16.04	12.02	8.31	13.25	
Friday.....	14.03*	16.38*	16.31*	12.25*	8.81*	13.56*	.11†
Fall							
Monday.....	11.45	13.57	13.42	11.35	6.69	11.28	
Tuesday.....	11.75	13.73	13.43	11.43	6.54	11.33	
Wednesday....	11.92*	13.88	13.63*	11.50*	6.42	11.47	
Thursday.....	11.77	13.88	13.63*	11.36	6.68	11.46	
Friday.....	11.86	13.94*	13.56	11.42	6.83*	11.52*	.05†
Yearly average							
Monday.....	11.97	13.82	14.44	12.24	8.66	12.22	
Tuesday.....	12.16	13.99	14.64	12.40	8.63	12.36	
Wednesday....	12.56*	14.25	14.88	12.54*	8.63	12.57	
Thursday.....	12.45	14.13	14.76	12.34	8.55	12.45	
Friday.....	\$12.54	\$14.30*	\$14.96*	\$12.48	\$8.82*	\$12.62*	.05†

* Highest price on a particular day for the season.

† Difference between the highest and next highest price of the week.

In conclusion, the studies of daily prices for hogs and calves show that the prices tend to be higher at South St. Paul on Friday than on other days of the week, but the difference between days is so slight that managers are not justified in selecting a particular day on the basis of price alone. In most cases the train schedules and the convenience of a particular day from the standpoint of the farmers must be the guide. In large associations and in trucking associations shipping more than once a week, managers have an opportunity to follow market conditions carefully and choose a day when prices are likely to be most favorable. In all associations, managers, by studying market conditions, should be in a position to give farmers information that will be an aid in deciding when to sell their livestock.

WHERE TO SELL

Prior to 1920 the problem of where to sell was not a difficult one for shipping associations in Minnesota. They were organized to sell livestock at the public market, and, with the exception of a few associations in the southern part of the state, were all located within the South St. Paul market area and therefore consigned the livestock to that market. The associations in the extreme southern part of the state consigned livestock to the public markets in Chicago, Sioux City, and Sioux Falls, but South St. Paul received a large share of all the livestock sold by Minnesota farmers. South St. Paul today also receives most of the livestock shipped by Minnesota associations, but, with the increase of business of interior packers, some associations are selling direct to packers.

Since 1920 there has been a great increase in the proportion of hogs sold direct to packers. The Bureau of Agricultural Economics of the United States Department of Agriculture has data which indicate that in 1920 only 25.4 per cent of the hogs sold by Minnesota producers moved direct to packers, while in 1932 the percentage was 44.9. There has been a decentralization of livestock slaughter, and a much larger share of the hogs are now slaughtered at the plants of interior packers. The result has been that in many sections of Minnesota, but particularly in the southern part, instead of consigning livestock to public stockyards, farmers, country dealers, and a few shipping associations are selling livestock at nearby packing plants or buying stations maintained by the packers.

Because they could as a rule assemble livestock more economically than local buyers consigning livestock to a terminal market, shipping associations had little difficulty in meeting the competition in former years. Their large volume of business and the fact that they did not have much expense soliciting livestock gave them advantages over the local dealer. In later years, however, when many local buyers established connections with packers and purchased livestock for direct shipment to packing plants, the shipping associations found it more difficult to compete. Some have been forced out of business by the competition of packer buyers. Others have been able to meet the competition because they had a loyal membership that continued their patronage. A few have sought new outlets, in an effort to compete with direct buyers, and as a result are shipping some livestock direct to packers.

In southern Minnesota there are associations so located that they can ship to South St. Paul, other terminal markets, or to interior packers. Here the problem of where to sell is important, and the very life of the

association is likely to depend on its being able to choose the market where the farmer will get the highest net return. Some of these points are within easy trucking distance of interior packing plants and buying stations. Transportation costs to most of these points are low; terminal charges of yardage and commission are also eliminated in marketing direct. The cash expenses of direct marketing, from many points, therefore, are less than in marketing at the terminal market. Several associations were asked to give reasons why they marketed direct and they all indicated that it was because the expenses of direct marketing were less and that they were forced to do so to hold their business. In other words, some associations must market direct or discontinue operation because of lack of patronage. If they discontinue, the farmer must sell to a local buyer or deal directly with a packing plant. As independent sellers, the farmers have less bargaining power than the associations. That farmers recognize this and value the bargaining power of their associations is evidenced by the fact that some associations now sell livestock direct rather than suffer loss of patronage by being unable to meet the competition of buyers for interior packers.

When an association is consigning livestock to a terminal market to be sold by a commission firm, it has no important selling problem. Such an association is only an assembling agency. On the other hand, the association that has a number of available outlets is faced with an important selling problem. It must choose the market that will give the highest return.

Price differentials among markets vary from time to time. Studies of prices of hogs at different markets by the Division of Agricultural Economics of the University of Minnesota show that (1) there is a wide variation in the price differentials among hog outlets from time to time; (2) interior market differentials do not always change at the same time or to the same extent as terminal markets; (3) the amount of differentials and changes in differentials vary for different kinds of hogs.² Obviously, this means that the manager using direct outlets must study carefully the conditions in each market in order to be able to sell where the best price can be obtained. His association must be not merely a shipping association, but rather a marketing organization which bargains for a price and seeks by efficient selling to get the highest return for its members. A large volume of high-grade livestock and efficient management are essential to successful marketing by associations using direct outlets for livestock.

² Minnesota Farm Business Notes. Sept. 20, 1933. "Price Variations in Minnesota Hog Markets."

CONCLUSIONS

The development of trucking and direct marketing of livestock has been responsible for a great decline in the number of co-operative livestock shipping associations in Minnesota. Reaching a high point of 655 associations in 1919, the number declined until in 1932 there were approximately 400 providing more or less regular shipping service for livestock producers, and the present number probably is less.

While the number of associations has declined, there has been a distinct tendency for the larger and more successful associations to increase their volume of business. Large volume means that the farmer has regular service. It means lower transportation costs, because when the association can ship full cars the management cost per hundred pounds is low. Furthermore, large volume enables the manager to ship straight loads of uniform hogs which command a better price than loads of various grades. Large volume and efficient management are associated because the large association can hire a competent manager.

No factor is of greater importance in the success of a shipping association than management. The association favorably located and operated by an efficient manager is likely to grow. A good manager must know livestock, know their value, and understand how to handle them properly. He must be capable of analyzing market conditions so that he can give the members sound advice on the market. Some associations are so located that they must market some livestock direct to packers if they are to survive. In these associations good management is especially essential because the manager must be able to drive a good sale and select the market where the highest net return will be realized for the producer.

Loyalty of the members is essential to the success of any co-operative livestock shipping association, but one can hardly expect members to be loyal to an association that has little chance to succeed. On the other hand, it is comparatively easy to maintain loyalty if the association can give efficient service and get the highest possible returns for its members. The larger association, well located and efficiently managed, should have little difficulty in maintaining the loyalty of its members.

Developments in livestock marketing seem to point to the fact that the future will see shipping associations continuing to be important agencies for marketing livestock in Minnesota. There may be fewer associations, but those in operation are likely to be larger, more efficiently managed, and engaged in a program of selecting carefully the outlets for livestock, reducing waste in marketing, and providing the packer with livestock more uniformly high in quality.