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STAFF PAPER SERIES

Future of Minnesota Animal Industry
Its Structure, Profitability and Size

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FUTURE OF MINNESOTA ANIMAL INDUSTRY

Its Structure, Profitability And Size

by

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FUTURE OF MINNESOTA ANIMAL INDUSTRY*

Its Structure, Profitability And Size

The purpose of this paper is to suggest some probable changes in the production sector of Minnesota's red meat industry during the eighties. To do this, it first reviews the past trends in hog production and cattle feeding and then considers how these trends might be influenced by some of the major economic and political factors that are evident at this time. Trends and future changes will be discussed with respect to three important industry characteristics--structure (size and number of firms), profitability and locational shifts.

THE PAST

Structure - Two or three decades ago there were many more farms than today, and almost all of them had several small livestock enterprises.

Profitability - Returns to livestock enterprises were relatively low since family labor was viewed as having little alternative use value and low cost lumber plus "do it yourself" carpentry provided low cost facilities.

Location - The corn belt produced over two-thirds of the hogs and one-half of the fed cattle--with Minnesota accounting for about 10 percent of the corn belt share. Minnesota farmers accounted for 7 percent of the total national hog marketings and 5 percent of the fed cattle marketings.

THE PRESENT

Structure - Farm numbers have dropped sharply and many corn belt farms now have no livestock. Only about one-fifth as many farms will produce hogs in 1980 as in 1950 (see figure 1). And, nationally, 40 percent of the hog production comes from about 6 percent of the producers--those who market over 1,000 head per year (see figure 2). Similar dramatic shifts have occurred in numbers of farms and size of operations in other livestock enterprises due to the forces of mechanization and specialization--sometimes referred to as the "industrialization" of agriculture.

The mechanization of agriculture might better be viewed as a result of the out-migration from agriculture as young people leave in response to better off-farm opportunities than as a cause of that out-migration. (See article entitled "The Farm Size Issue: A New Perspective" by Willis Peterson.**) Figure 3 suggests that young people made this choice quite consistently during the 1950's and 1960's. Average farm size increases fairly rapidly during such periods when off-farm opportunities appear

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* Paper presented at the 52nd Annual Meeting of the Minnesota Farm Managers and Appraisers, Inc. on February 7 & 8, 1980, Minneapolis Minn. (Page 1 - 12 in Proceedings of Annual Meeting.)

** Paper presented at the same meeting. (Page 34 - 41 in Proceedings.)

better than farm opportunities as the remaining operating farmers substitute more capital for the out-migrating labor. But when farm earnings increase relative to nonfarm earnings, as they did in the late 1940's and in the early 1970's, net out-migration slows down. In these two periods, out-migration rates of the farm population were only about 3 percent compared to 5.5 percent during the 1950's and 1960's. Likewise, a severe depression, such as occurred in the 1930's, dries up off-farm job opportunities and actually increases farm population for a few years. The number of farm workers also increased in 1973-74 when average per capita farm family incomes actually exceeded nonfarm incomes. These both represent more extreme examples of the principle just outlined, since farm earning opportunities appeared much better relative to nonfarm jobs during these periods.

Profitability - Returns to labor devoted to livestock enterprises have been much closer to what might be earned in the nonfarm sector in recent years because (1) many farmers no longer employ their excess family labor in livestock production and (2) the high capital requirements of specialized facilities deter expansion unless it appears that total production costs will be covered. Therefore, livestock prices tend to cover all production costs of the average producer over a period of years. This allows the superior manager to make very good returns from a livestock enterprise. Historical and projected returns over feed costs for major Minnesota livestock enterprises are shown in table 1.

Location - Hog production is still very closely tied to corn production, but cattle feeding has shifted to the commercial feedlots in the southern plains.

Hog production has shifted some from the eastern corn belt to the western corn belt as off-farm opportunities have attracted more farm labor to city jobs in areas with large, growing population centers (see table 2). But, Minnesota's share of the national market has also declined a bit.

Cattle feeding has made a very dramatic locational shift during the past two decades. The corn belt now feeds less than one-fourth of all the cattle fed in the U.S., while the great plains tier of states now feeds over one-half compared to the 22 percent share they fed 20 years ago. (Table 3 shows fed cattle marketings by selected years. Note that Iowa dropped from the top feeding state in 1970 to fourth place in 1979.) Minnesota's share of the market has also declined--but not quite as much as the corn belt's share. Minnesota accounted for 12 percent of corn belt marketings in 1979 compared with 10 percent 20 years ago. Minnesota is the only corn belt state that marketed more fed cattle in 1979 than in 1965 (700,000 versus 684,000). By contrast, the four southern plains states identified in a 1967 study as the "growth point" in cattle feeding have almost tripled their marketings since 1965.*

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* Hasbargen, Paul and Leonard Kyle, Competitive Position of Cattle Feeding in the Northern Corn Belt, Research Report 77, Agricultural Experiment Station and Cooperative Extension Service, East Lansing, Michigan, 1967.

THE FUTURE

What will happen during this decade? Before trying to be too precise one might remember Proverbs 27:1, "Do not boast about tomorrow, for you do not know what a day may bring forth." But, this does not mean that we should not plan based on what we see coming--as indicated in Proverbs 27:12, "A prudent man sees danger and hides himself; but the simple go on and suffer for it."

The "simplest" assumption about the livestock industry of the 1980's is that it will continue as today. The usual "forecast" of the future is a similar simple extension of recent trend lines another 10 years. Perhaps a somewhat more "prudent" approach would be to consider some recent major changes--and possible future changes--in world conditions and speculate as to the different impact these might have on the structure, profitability and location of U.S. hog and beef production.

The following matrix is used to record the probable directional impact of some of the major forces expected to be in effect during this decade upon the three characteristics we have been considering. A plus mark (+) reflects a judgement that the net effect of this factor is to enhance or encourage a continuation of past trends. A minus (-) indicates a judgement that the net effect of the factor will be to reverse, or at least to hinder, the past directional movement of the trend.

Major New Forces	Probable Impact On Past Trends: Enhancement = (+); Reversal = (-)		
	specialization fewer & larger units	prices and profits	locational shifts
High energy and transportation costs	-	+	-
High grain prices and food shortages	?	+	?
Inflation and monetary problems	-	+	-
Recession, slow economic growth	-	-	-
Trade wars and/or major war	+	+	+
Political and environmental concerns	-	-	+
Shift to rural living	-	-	-

Structure - Higher energy and transportation costs may slow down the trend towards the very large commercial cattle and hog feeding operations because of the economic advantage of feeding wet shelled corn on the farm where it is produced versus the increasing costs of drying and transporting corn out of the corn belt.

However, a partially offsetting factor will be the opportunity for corn belt farmers to make a living from crops alone if periodic world-wide crop shortfalls keep grain prices relatively high. Higher grain prices encourage older, established farmers to discontinue livestock operations if they don't have large land and facility payments that require large business volumes to cover cash flow commitments. On the other hand, higher priced food and high unemployment rates in the city will encourage more people to try to produce their own meat on a small acreage. So, the net effect of this factor upon future structural change is debatable.

Continued high rates of inflation make land purchases impossible to cash flow without being subsidized by earnings from livestock, from other land or from off-farm earnings. This means that there will be increased incentives for young farmers to get into livestock--more so than in the past decade.

A serious recession and slow economic growth (expected because of current low savings rate and anti-business attitudes) would tend to reverse the migration of labor from country to city, thereby encouraging more livestock farms as current larger farm units are split up between several sons.

Wars and rumors of wars tend to increase farm earnings. If earnings increase, there is less incentive for established farmers to continue small livestock enterprises. Also, there could be pressure on rural labor supplies if the draft is reinstated. This would encourage a more rapid shift to larger, more labor efficient livestock operations.

Minnesota political leaders have demonstrated an anti-bigness bias in legislation affecting farmers. This same bias exists in the minds and actions of those concerned about environmental effects of livestock production units. These attitudes are likely to continue to restrict the development of large-scale livestock units in Minnesota in the near future.

The recent reversal of the long time farm-to-city migration trend will bring into being some new small-scale livestock units. These small units will help slow down the rate of decline in the total number of "livestock farms" but may add very little to Minnesota's beef and pork production if they are only part-time farming operations or "rural residents".

On balance, I expect that the annual rate of decline in the number of hog operations will drop considerably below the average annual 3.6 percent drop observed in the U.S. during the past 15 years. In fact, I expect that the number of farms reporting hogs will actually increase in Minnesota during this decade. A drop in U.S. hog operations of 2 percent a year would reduce the number of farms in the nation with hogs to about one-half million in 1990 versus the 631,000 of last year. I don't think the decline will be this much. In fact, my guess is that the number of farms reporting hogs in the western corn belt may not change much during the eighties.

Cattle feedlots which carry cattle to choice slaughter finish may continue to decline nearer the recent rate of 3 percent per year in the U.S.--dropping numbers from the current 123,000 lots to 90,000 by 1990. Minnesota feedlots have been disappearing at a rate of 4 percent per year. However, the factors discussed above should slow this rate to more like 2 percent per year. This would drop feedlot numbers from 10,900 to about 9,000 by 1990. But, I expect to see more "growing" or "backgrounding" operations which overwinter our locally produced feeders on corn silage or haylage and limited grain feeding.

Profitability - Because Minnesota is "at the end of the line" for overseas shipment of feedgrains and soybeans, our livestock producers will have an even greater feed price advantage than they have had in the past because of increased energy and transportation costs. This will increase the relative profitability of livestock production in Minnesota while decreasing the relative profitability of grain production.

Higher grain prices will bring higher livestock prices and higher profits to livestock producers as more farmers (nationally) decide that they can make a living from grain production only. But, there could be some short-term local downward price pressure as Minnesota farmers increase production beyond the current low livestock slaughter capacity in the state.

Although there is not strong evidence one way or the other, recent studies suggest that high inflation rates have historically given farmers a net advantage in gains in commodity prices relative to costs--thus a gain in net returns.*

Poor performance in the general economy during the 1980's will dampen the demand for red meat as the average real income of consumers decreases. This would put downward pressure on livestock prices.

Wars and rumors of wars usually tend to boost farm prices and income.

The bias against bigness and business profits that has been in evidence in Minnesota legislature and in rural areas tends to drive out packing plants, venture capital and people who want to produce livestock in large-scale operations. This puts some upper limits on what larger scale oriented producers might otherwise earn as well as limiting Minnesota's share of the total U.S. livestock production.

The shift to rural living--which could develop into a real exodus from the city--if accompanied by a need to make a living on small farms, will again increase the number of small producers who view their labor as a sunk cost and, therefore, are willing to work for lower than off-farm prevailing wage rates. This factor would increase meat production even in the face of prices that are below average production costs.

In summary, there may be some significant adjustments in Minnesota during the next decade that could put short-term pressures on profits because of a too rapidly expanding meat production sector. (It appears that we might

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* Baker, Timothy G., "Projections Of Financial Performance Variables Under Alternative Levels Of Crop Production And Inflation," Agricultural Finance Review, Volume 39, ESCS-USDA, November 1979.

witness this already in 1980 in Minnesota hog production as our producers refuse to cut back production although a national reduction in pork production is needed.) Hopefully, the pressure of these changes will inspire the Minnesota legislature to look more favorably upon law changes that could help Minnesota producers become more competitive and encourage a reestablishment of more meat packing plants in the state. Given a more favorable political and economic environment, beef and hog production could become even more profitable for those able to do a better than average job of production and marketing.

Location - High energy costs, high inflation rates, slow economic growth and the shift to rural living will all tend to reverse the historical shifts that moved beef and hog production out of Minnesota. High energy and transportation costs will make it relatively more efficient to feed wet corn in the area where it is produced than to dry it and ship it to the southern plains. However, it should be noted that nonfeed costs have risen relatively more in the corn belt than in the southeast and this fact has, to date, largely offset the advantage gained in lower relative feed costs.*

To the extent that inflation continues to escalate land prices faster than the general inflation rate, it magnifies the cash flow problems associated with land purchases; thus, requiring more livestock programs to help meet land payments.

Poor job opportunities in the city, coupled with a growing desire by many to shift to rural living, could actually bring about an increase in Minnesota farm numbers during the 1980's (already Minnesota farm numbers have remained constant for 5 years). This would also help slow down our drop in livestock numbers relative to the rest of the U.S. since small farms are more apt to have livestock programs than large ones.

But, the above forces may be largely offset by (1) higher grain prices which make livestock programs less important to established farmers, (2) a possible decline in manpower availability in rural areas with the reinstitution of the draft and (3) the earlier mentioned negative impact on total Minnesota production of red meats if past attitudes and legislative roadblocks to larger scale livestock operations are maintained. (e.g. the tax loss provision in the Minnesota revenue code, the restrictive corporation laws and the attempts to limit large-scale feedlots via pollution control regulations).

On balance, it appears that the rate of change, if not the direction, in locational shifts in hog production and cattle feeding will moderate during the eighties. In fact, I expect that the sharp decline in the number of livestock producers in Minnesota will come to a halt. I expect an actual increase in the number of Minnesota hog producers during this decade and a regaining of recent historical losses of our share of national pork production. Minnesota will also gain in its share of corn belt cattle feeding during the 1980's. But whether or not future changes in cattle feeding will be sufficient to stop Minnesota's (and the corn belt's) historical decline in the national market share of beef production will depend largely upon the attitudes/objectives and actions of our state agricultural leaders.

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* Hasbargen, Paul R., "Competitive Cattle Feeding," Feedlot Management, October 1979.

SUMMARY AND IMPLICATIONS

Livestock producers have been declining in number and expanding in size. The profitability of livestock has been increasing for the good manager. Minnesota has been producing a declining share of the nation's cattle and hogs. Will these trends continue?

Major forces currently visible suggest to the prudent observer that a simple projection of past trends in livestock production--in its structure, profitability and locational shifts--will likely prove to be wrong. Rather, the analysis presented in this paper suggests the following:

Future structure - Despite the oft repeated concerns expressed at the recent "farm structure" hearings conducted by Secretary of Agriculture Bob Bergland--it appears to me that large farms will not take over agriculture in the eighties. (This fear comes from a simple projection of past trends--it is backward-looking.) It is more likely--if we believe the forces outlined above will be important during the eighties--that the number of Minnesota livestock producers (and farms and "farmers") will actually increase between 1980 and 1990.

Future Profitability - The profitability of beef feeding and hog production operations looks bleak in the short-run--for 1980 and possibly for several years as Minnesota farmers attempt to adjust to relatively lower grain prices (than that enjoyed by producers nearer to export markets) by increasing livestock production. However, the longer term livestock earning potential looks good--especially if a healthier business environment can be developed in this state.

Future Market Shares - Minnesota will likely increase its share of the national hog production during the eighties. It could also hold its national share of beef production--while gaining some of the corn belt's share--if industry leaders and state government provide more positive legislation and improved marketing options for fed cattle.

Figure 1. Structural Changes In Hog Production

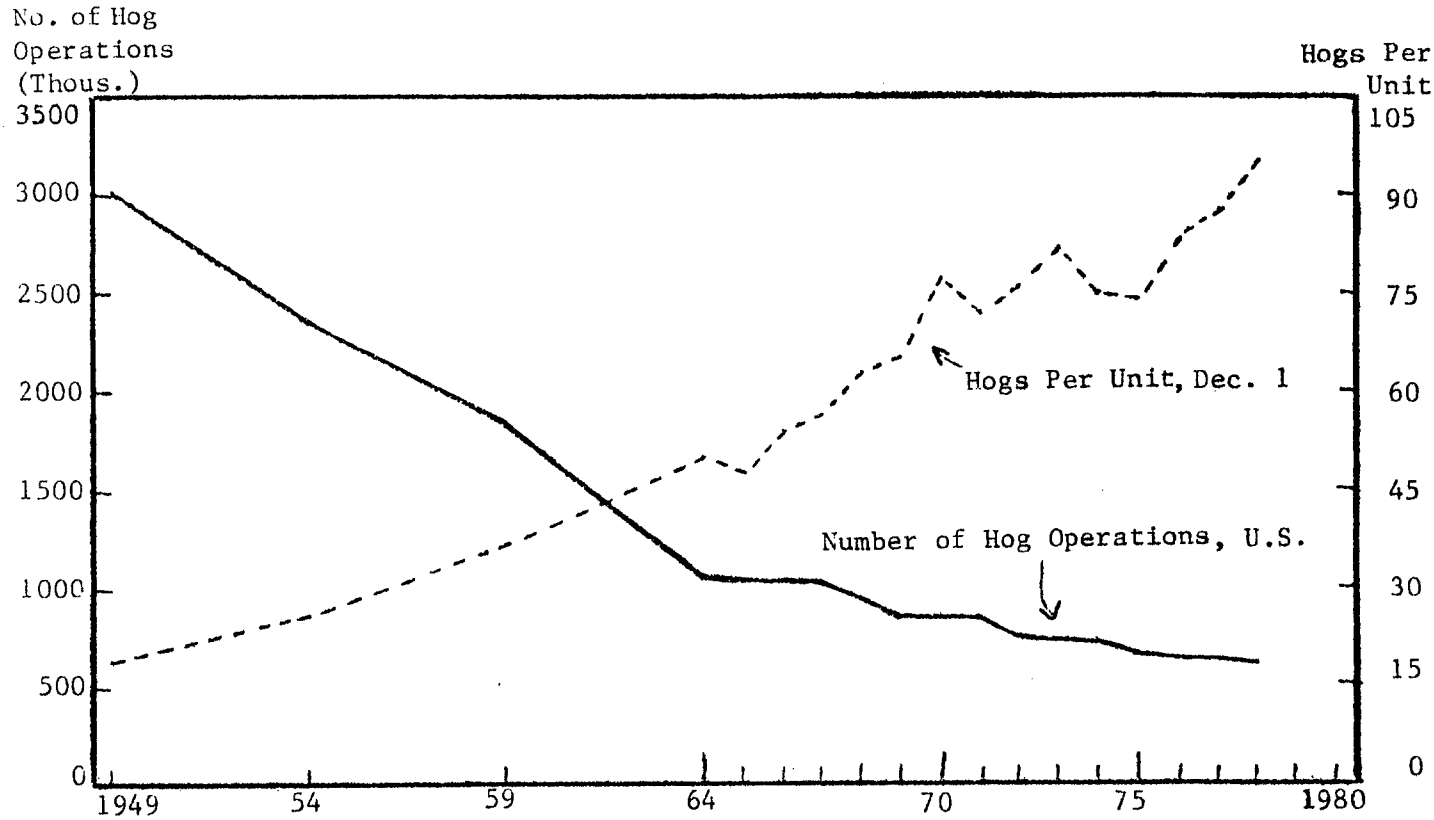

Figure 2. Percent Of U.S. Hog Operations & Inventory By Size Group, 1978

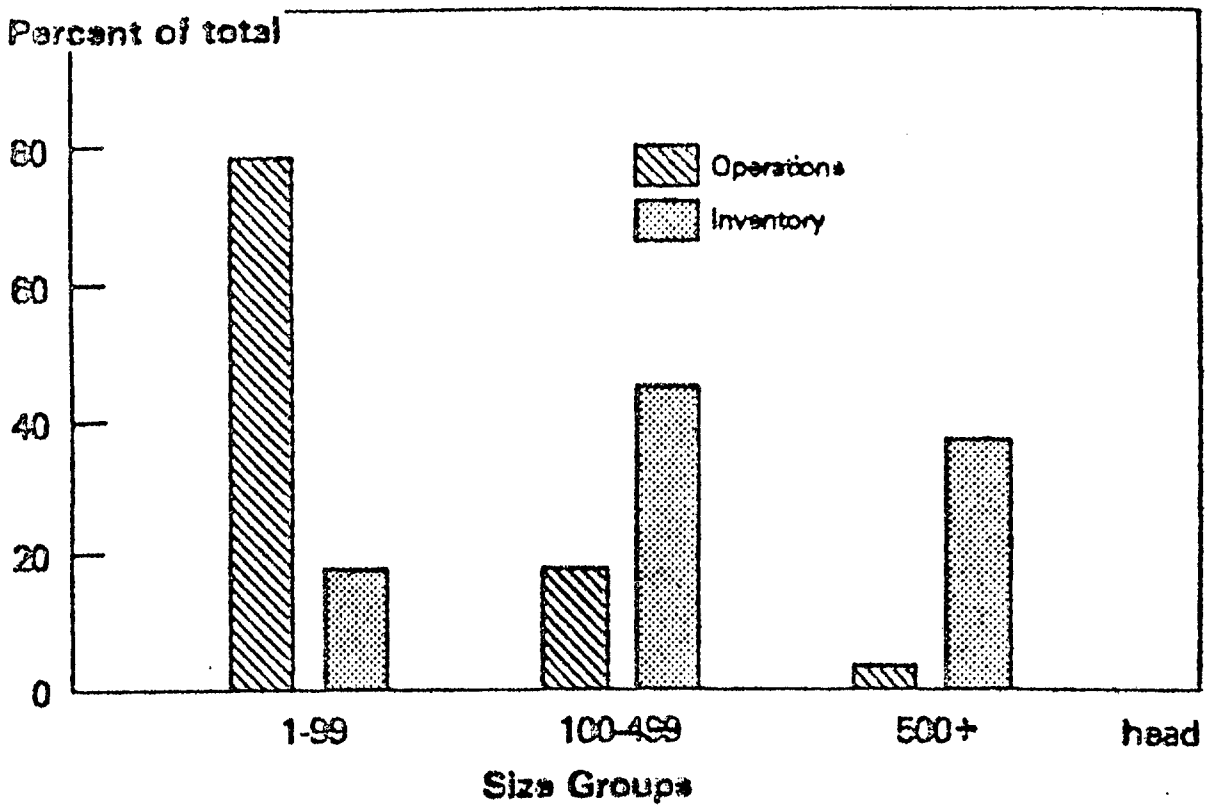

Figure 3. Farm Population And Migration, 1920-77

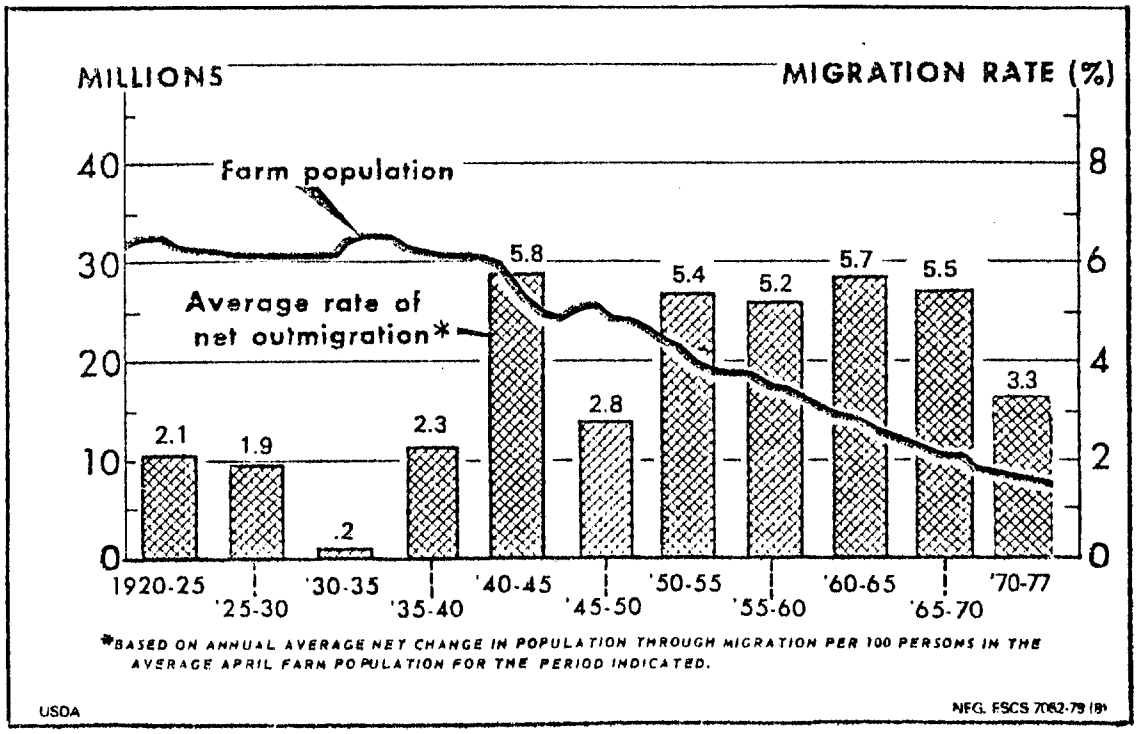

Table 1. Returns Above Feed Costs For Minnesota Livestock Enterprises*

Year	Enterprise Including Breeding Herds				Feeding Enterprises	
	Dairy (cow)	Hogs (cwt.)	Beef (cow)	Sheep (ewe)	Feeder Pigs (cwt.)	Feeder Cattle (cwt.)
1960	$155.52	$10.16	$71.65	$ 5.30	$10.16	$ 5.77
1961	156.03	5.44	23.81	2.93	5.44	2.48
1962	115.38	4.92	27.49	4.80	2.40	6.18
1963	129.56	2.43	19.05	12.27	-.22	-6.09
1964	148.35	3.62	11.87	6.88	3.05	1.38
Avg. 1960-64	140.96	5.29	30.77	6.44	4.17	1.94
1965	141.25	11.90	10.75	11.06	7.75	7.12
1966	197.29	8.37	52.76	12.20	5.84	.68
1967	245.53	6.11	33.28	6.49	.85	4.87
1968	273.02	7.07	43.02	10.32	2.37	8.22
1969	276.88	13.37	35.11	11.32	6.87	.95
Avg. 1965-69	226.79	9.36	34.98	10.27	4.73	4.37
1970	321.62	4.70	46.22	9.24	-.29	3.28
1971	324.89	5.68	48.06	11.63	3.95	12.65
1972	331.38	15.53	106.38	11.67	10.04	12.26
1973	371.53	21.34	106.05	13.24	13.29	7.54
1974	303.48	7.76	-138.58	-1.63	3.80	-21.16
Avg. 1970-74	330.58	11.00	33.62	8.83	6.16	2.91
1975	301.13	24.16	-77.73	4.56	14.75	8.77
1976	523.31	13.38	-46.45	12.99	5.64	-7.43
1977	612.46	17.72	18.78	34.58	10.92	8.99
1978	873.74	27.75	224.42	23.83	13.37	29.88
Avg. 1975-78	577.66	20.75	29.76	18.99	11.17	10.05
Projected**	890.00	20.00	140.00	25.00	10.00	12.00

* Historical returns are from the summaries of records kept by farmer members of the Southwest Farm Management Association.

** These are the returns over feed costs associated with suggested planning prices for the next 5 years. For details of costs and returns, write and ask for the appropriate planning guide (dairy, hog, cattle, sheep, beef cow northern or southern). Address requests to: Extension Farm Management, 249 Classroom Office Building, University of Minnesota, 1994 Buford Ave., St. Paul, MN 55108.

Table 2. Hog Production: Percent Of U.S. Total By Regions And Selected States[1/]

Region	1940-42 Average	1950-52 Average	1960-62 Average	1970-72 Average	1978 Average
North Atlantic[2/]	2.4	2.2	1.7	1.5	2.3
South Atlantic[3/]	5.9	6.3	6.3	7.7	9.5
North Central	75.2	77.9	80.6	79.2	77.2
N.E. Central[4/]	(30.7)	(30.2)	(32.6)	(28.9)	(25.5)
Illinois	10.8	11.5	14.1	12.5	11.2
Indiana	8.1	8.3	9.2	8.1	7.4
Ohio	6.0	5.2	4.6	4.0	3.3
Michigan	1.7	1.5	1.3	1.2	1.2
Wisconsin	4.0	3.7	3.4	3.1	2.4
N.W. Central[5/]	(44.5)	(47.7)	(48.0)	(50.3)	(51.7)
Iowa	19.7	22.9	22.7	22.9	25.8
Minnesota	7.8	7.2	7.1	6.0	6.8
Missouri	6.5	6.9	7.1	7.7	6.7
South Central[6/]	12.4	11.0	9.3	9.5	9.0
Kentucky	2.1	1.9	2.3	2.1	2.0
West[7/]	4.1	2.6	2.1	2.1	2.0
	100.0	100.0	100.0	100.0	100.0

1/ Based on pounds of liveweight produced in 48 states.
2/ Me., N.H., Vt., Mass., R.I., Conn., N.Y., N.J., Pa., Del., Md., D.C.
3/ Va., W. Va., N.C., S.C., Ga., Fla.
4/ Ohio, Ind., Ill., Mich., Wisc.
5/ Minn., Iowa, Mo., S.D., N.D., Nebr., Kans.
6/ Ky., Tenn., Ala., Miss., Ark., La., Okla., Texas.
7/ Mont., Idaho, Wyo., Colo., N. Mex., Ariz., Utah, Nev., Wash., Ore., Calif.

Source: Derived from data in "Meat Animals, Farm Production, Disposition and Income By States" (selected issues) SRS, USDA.

Table 3. Fed Cattle Marketings And Changes In Marketings By States For Selected Years, 1960-1979

State	Fed Cattle Marketings (thousand head) 1960	1965	1970	1972*	1975	1979	1970 to 1979 Change	1979 Marketings As A % Of 1972	1975
Texas	477	1094	3138	4308	3067	4445	1307	103	145
Nebraska	1434	2438	3609	3990	2795	3975	366	100	142
Kansas	593	857	1890	2405	2264	3214	1324	134	142
Iowa	2565	3293	4583	3986	2645	2890	-1693	73	109
Colorado	738	1144	1915	2291	1838	2239	324	98	122
California	1595	2282	1966	2062	1649	1362	-604	66	83
Illinois	1255	1310	1167	1003	805	920	-247	92	114
Minnesota	600	684	877	935	762	700	-177	75	92
Oklahoma	143	300	542	626	515	669	127	107	130
Arizona	466	650	860	899	729	668	-192	74	92
South Dakota	362	561	552	561	561	575	23	102	102
Idaho	231	271	434	428	330	511	77	119	155
Washington	220	308	348	375	315	406	58	108	129
Indiana	327	428	511	478	346	367	-144	77	106
New Mexico	113	173	393	376	261	343	-50	91	131
Ohio	316	456	429	438	379	300	-129	69	79
Missouri	483	660	684	604	338	230	-454	38	68
Michigan	180	219	253	251	244	219	-34	87	90
Wisconsin	164	194	217	214	186	171	-46	80	92
Oregon	117	167	164	143	149	143	-21	100	96
Pennsylvania	146	116	128	130	117	104	-24	80	89
Montana	115	142	184	247	132	79	-105	32	61
North Dakota	NA	NA	96	85	67	70	-26	82	104
23 States	12640	17747	24934	26835	22494	24600	-334	92	109

* 1972 was a peak year in fed cattle marketings, with U.S. total of 27,670.