

The Livestock Option For North Dakota Farmers

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Public policy makers along with farmers and other businessmen are asking if increased livestock production might be a viable means to enhance income generation and job formation in North Dakota. Quite clearly more livestock production could be supported by the state's forage and feed grain production. But despite the variability of North Dakota farm income and recent trend of income generation well below the national average, North Dakota farmers have not turned to increased production of livestock (Figure 1).

NET INCOME PER FARM

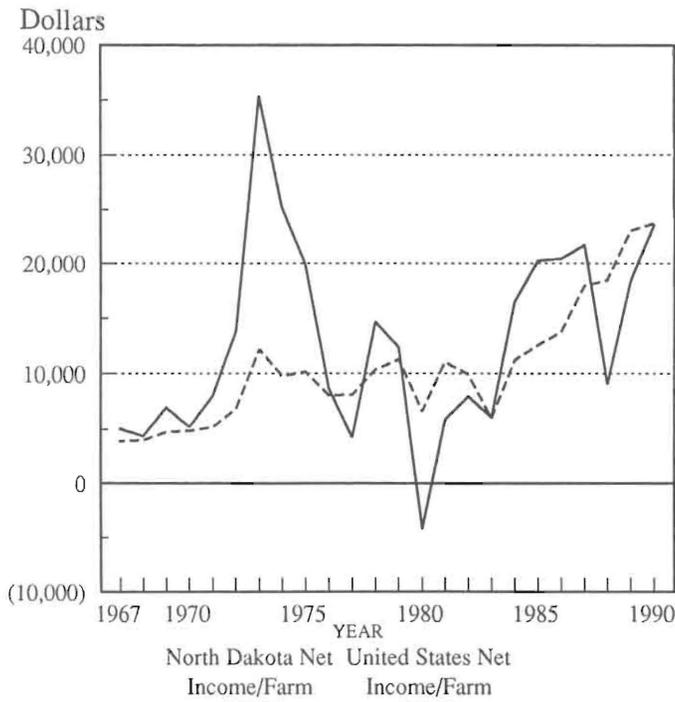


Figure 1. Net farm income per farm including net commodity credit corporation loans and farm households. Source: USDA-ERS, Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics.

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WILL THE TRENDS CHANGE?

Livestock trends in North Dakota indicate a long-term pattern of declining production (Figure 2). That is particularly true in the eastern third of the state where only a small number of beef and dairy cattle herds remain. In the balance of the state cattle numbers have risen somewhat since 1950; however, sheep and poultry numbers have declined during that 40-year time period. Finally, hog numbers have fallen by 32 percent in the same 40-year period.

LIVESTOCK IN ND, JAN 1 INVENTORY

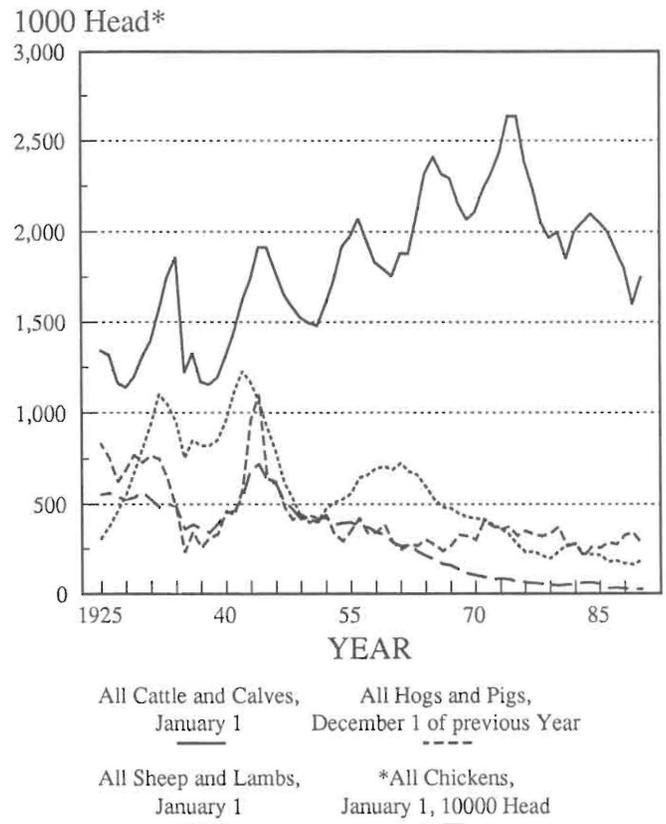


Figure 2. Number of livestock of farms, North Dakota, January 1. Source: Department of Agricultural Economics, Statistics of North Dakota Agriculture, Bulletin 408 Revised, June 1981, and NDSU and USDA North Dakota Agricultural Statistics 1990, Agricultural Statistics No. 59.

A combination of agricultural export growth, government farm subsidies, and periods of strength in crop prices contrasted with periods of weaknesses in most livestock prices all contributed to declining interest in--and to less perceived need for--livestock production by North Dakota farmers.

Now, however, circumstances appear to have changed. Despite the current resurgence in wheat exports, long-term agricultural export growth may be more difficult to achieve. Federal budget constraints may cause reduced farm subsidies, at least in inflation adjusted terms. The proposed General Agreement on Tariffs and Trade (GATT) seems unlikely to either markedly reduce market distorting subsidies and surpluses or to reduce the disparity between U.S. farm export subsidies and those of the European Economic Community (EEC). World supply/demand relationships, which have been suppressing crop prices, point to stronger crop prices in 1992. However, the longer term outlook remains somewhat more austere and reasonably consistent with trends of the past decade.

Conversely, feeder cattle prices from 1987 to 1991, hog prices in 1986 to 87 and 1990 to 91, and sheep prices from 1985 to 1989 were more favorable. While the next several years may see lower feeder cattle prices because of cyclical increases in numbers, the shorter liquidation phase of the hog cycle, now under way, may offer opportunities to profitably enter hog production within the next few years. Sheep and goat production, particularly on land infested with leafy spurge, may be a viable alternative. For North Dakota farmers who experience declining--or only stable--income levels and with continued financial stress for heavily leveraged operators, attention understandably turns toward means to enhance farm income. Livestock production is an alternative that merits consideration.

Table 1. Beef cow budget 1990, North Dakota, revised 1992 beef cow head selling weaned calves in fall.

INCOME				
Steers	43 head	522 lbs	\$.89/lb	\$19977
Heifers	24 head	493 lbs	\$.83/lb	\$9821
Cull Cows	14 head	900 lbs	\$.42/lb	\$5292
Cull Hfrs	4 head	875 lbs	\$.60/lb	\$2322
Cull Bull	1 head	1700 lbs	\$.52/lb	\$884
Total Income Per Herd				\$38074
Total Income Per Cow				\$381
EXPENSE				
		40% Debt	0% Debt	
Feed Costs		\$197	\$197	
Livestock Expense		\$58	\$58	
Interest of Feed and L.S. Exp.		\$3	\$0	
Fixed Expense		\$94	\$26	
Total Cost Per Cow		\$352	\$281	
Returns to Operator and Unpaid Labor		\$29/cow	\$100/cow	

Any discussion of why North Dakota producers should consider livestock production alternatives should be premised first on the potential capacity of livestock to increase net income of farm families and, secondly, on increasing business activity in North Dakota communities. Other arguments for increased livestock production include improved financial resilience of farm businesses; greater use of the state's forage base, adding value to its feed grain crops; and more fully utilizing labor and management skills of farmers.

NDSU Extension Service livestock enterprise budgets were examined to determine the potential for enhancing net income to farmers (Ext. Service, 1990. Revised, 1992). NDSU Extension Service 1990 beef cow budgets (Table 1) suggest a likely gross return per cow of about \$381 for a herd of 100 cows with spring calves sold in the late fall. If no debt capital is used to finance the operation, returns of \$100 per cow to operator, unpaid family labor, management and equity capital appear achievable. This budget assumed an 85 percent calf crop and sale weight for steer calves of 528 pounds at \$.89 and for heifer calves of 498 pounds at \$.83. For the same operation with 40 percent debt financing, the returns to operator, family labor, management and equity capital would be \$29 per cow. These NDSU Extension Service budgets demonstrate that even with declining fed cattle prices, there currently are net returns from cow/calf production.

Management and Equity Capital

Hog production in 1986-87 and 1990-91 was profitable. The liquidation of the U.S. inventory now underway will limit that profitability in the near term. However, NDSU Extension Service budgets indicate, based on a hog price of \$39 per cwt, that a 150-sow farrow to finish operation with no debt could generate total annual gross income of \$1,357 per sow and return \$221 per sow to labor, management and equity capital (Table 2). Even with 80 percent debt capital financing, the operation could generate total annual return of \$95 per sow to labor, management and equity capital. While somewhat more conjectural, poultry — and perhaps even fish farming — may provide profitable opportunities for North Dakota farmers.

Livestock prices, of course, are cyclical. Any successful business plan should be formulated to recognize that current cattle prices may reflect the top of the price cycle and hog prices the bottom of the price cycle.

Increased livestock production for the state would also add increased business activity as demand for production inputs and services increase. Production inputs include buildings, equipment, feed and veterinary supplies. Professional services ranging from veterinarians to feed ration formulation to finance would be in greater demand as well. Input-output studies at NDSU's agricultural economics department indicate the indirect impact on the North Dakota economy of a dollar's worth of livestock production exceeds that of a dollar's worth of crop production by more than 20 percent (Hertsgaard et al., 1984). For example, each dollar of livestock revenue results in \$.49 in

Table 2. Hog farrow to finish budget, North Dakota 1990, revised 1992.

INCOME				
Slaughter Hogs	14.07/ Sow	240 lbs	@ \$39.00/cwt	\$1317
Feeder Pigs	.00/ Sow	40 lbs	@ \$ 1.00/lb	\$ 0
Cull Sows	30%/ year	400 lbs	@ \$30.00/cwt	\$ 40
Cull Boars	4.00/ head	450 lbs	@ \$26.00/cwt	\$ 4
Purchase Rpl Gilt	0%/ year	0 lbs	@ \$ 0.00/cwt	\$ 0
Sow Death Loss	3%/ year	400 lbs	@-\$30.00/cwt	\$ -4
Total Income/Sow				\$1357
EXPENSE				
			80% Debt	0% Debt
Feed Costs			\$ 755	\$ 755
Livestock Expense			\$ 223	\$ 233
Interest on Feed and Livestock Expense			\$ 32	\$ 0
Fixed Expense				
Bld, Fac, and Sows			\$ 148	\$ 148
Investment Interest/Sow			\$ 104	\$ 0
Total Cost Per Sow			\$1262	\$1136
Returns to Operator and Unpaid Family Labor, Mgmt., and Equity Capital			\$ 95/Sow	\$ 221/Sow

direct and indirect economic activity. That compares to \$3.69 generated by each dollar of crops revenue.

Underutilized grassland, hayland, and crop residue could be a source of livestock feedstuffs. Beef cow herds and sheep flocks can be wintered on straw, grass, and grass hay if alfalfa hay or protein supplements are available as calving and lambing approaches.

Livestock can also effectively utilize low-quality grains. If dairy, cattle feeding, swine production and poultry production are profitable, value can be added to feed grain crops by marketing those crops through livestock.

Crop residue may also be underutilized in North Dakota. According to the 1987 Census of Agriculture, 980,918 acres of cover crop, 1,218,830 acres of idle cropland [including Conservation Reserve Program (CRP) acres], and 171,804 acres of woodland were not harvested. Additionally, only a small percentage of available residue was collected for livestock feed from the vast majority of the state's 26.9 million acres of harvested cropland. Moreover, some of the additional 2.3 million acres in CRP since 1987 might be devoted to animal agriculture when the current contracts expire.

Available labor and management resources are an important consideration in supporting increased livestock production. Some grain producers may have as much as 500-800 annual hours of available labor that could be productively utilized in livestock operations. These operations can be complementary with crop farming. The strong management skills many producers possess could, with minimum redirection, be effectively used in profitable livestock enterprises. In some cases a livestock enterprise could prove more profitable than commuting to off-farm employment.

A final rationale for increasing livestock production is as a means of reducing variability in farm income. Crop yields are subject to substantial weather-related variability in the Great Plains. Moreover, in a worldwide marketplace crop prices demonstrate considerable volatility as well. Livestock enterprises, even with cyclical variability, can add a stabilization of farm cash flow and income that can help assure the farmer's ability to meet fixed production costs, including debt servicing. Profitable livestock enterprises, of course, enhance total operator incomes.

WHAT ARE THE FUTURE OPPORTUNITIES?

A number of opportunities appear to exist for North Dakota farmers to expand livestock production and, by so doing, to improve farm profits and community-based economic growth. The most likely alternatives include beef cattle and swine production. Opportunities may also exist in poultry, sheep, goat, fish, wild game, and exotic animal production.

New dairy cattle operations may not offer significant growth potential for a variety of reasons including distance from processing and markets and the very large initial fixed investment. However, for those North Dakotans currently in dairying, a profitable option may be to improve the performance of existing dairy herds. Raising the average production of a herd to the U.S. average could improve the profitability of a dairy farm producing at the state's average output.

Beef production may be the alternative enterprise with the most potential if livestock enterprises are added to a cash grain farm. Cattle production currently is the state's largest livestock enterprise. North Dakota producers provide less than 2 percent of the nation's beef supply, so increased output is not likely to

materially impact national supply/demand relationships. Beef production often can be increased with only modest investment in fixed assets. While competitive demands on management may occur during calving, generally speaking, crop and livestock production can be complementary. Finally, North Dakota has surprisingly large quantities of roughage--usable by beef cattle--that currently go unused.

Unused roughage and readily available feed grains could provide an excellent opportunity for more North Dakota cattlemen to background at least a portion of their calf crop. However, profitability may decline when backgrounding calves during the liquidation phase of the cattle price cycle.

The volume of roughage in the form of bean, wheat, barley, and oat straw that is available as a residue of crop production is documented in Table 3. Currently, only a small amount is utilized in livestock production. Even after accounting for the value of the residue as fertilizer and in erosion control, and after calculating the cost of collection, the feed value substantially exceeds the total cost of the residue. For example, bean straw has a feed value of \$31.92/ton and a cost of under \$20. Wheat straw has a feed value of about \$36/ton and a cost of about \$18.50. More than 268,000 tons of bean straw are potentially available and over 10 million tons of wheat straw are potentially available.

North Dakota is also a relatively minor player nationally in pork production with only 0.5 percent of the nation's output. Swine production, while substantially more management-intensive than beef production, also is complementary with crop production in terms of timing of management demands. While fixed capital investment can be quite high under some production systems, the initial costs may be minimized by converting unused buildings to less intensive systems of swine production.

Finally, the most compelling reason for increasing swine production is to add further value to the 4.3 million tons of feed barley and corn produced in North Dakota (North Dakota Agricultural Statistics Service). Currently only about 1.2 million tons are estimated to be consumed by livestock in North Dakota.

For farmers with very few resources, sheep and goats may provide increased stability of income. However, while the financial barriers to entry are relatively low, the management requirements are quite high at certain times of the year. The Hettinger Research Extension Center sheep project has successfully demonstrated that the needed management skills can be both successfully taught and quickly learned by new producers. With sheep and goats, income stability and utilization of leafy spurge infested pastures may be as important as income enhancement.

Both poultry and fish production may hold promise for North Dakota farmers. A recently completed NDSU feasibility study of the broiler industry suggests the state could profitably develop an integrated broiler production and processing industry to supply western United States and Canadian markets (Golz). A major determinant in developing such an industry may be whether or not North Dakotans are interested in the kinds of jobs and income potential the poultry industry can provide. Meanwhile, generally profitable turkey production enterprises continue in the central part of the state.

Aquaculture also holds interest for some entrepreneurs in the state. While the potential is interesting, there is not yet enough experience to develop confidence that such ventures can consistently be profitable. However, pilot ventures now beginning production could provide that confidence once some years of operating experience are acquired.

Table 3. Average collectible crop residue in North Dakota

	Collectible Tons	Collection Costs	Fertilizer Value	Value of Erosion	Total Cost Per Ton ¹	Feed Value ²
Spring Wheat	6,755,306	12.88	2.07	3.49	18.44	36.12
Durum Wheat	3,296,548	12.88	2.07	3.49	18.44	36.12
Winter Wheat	331,278	12.88	2.07	3.49	18.44	36.12
Barley	3,815,214	12.88	2.47	2.92	18.27	36.98
Oats	103,040	12.88	2.55	4.16	19.59	48.16
Corn	2,650,957	12.88	4.41	1.65	18.94	42.62
Beans	268,026	12.88	2.49	4.50	19.87	31.92

¹ Fertilizer value and erosion control foregone and the cost of collections.

² Feed value is calculated based on total digestible energy of the residue relative to prairie hay, as found in M.E. Ensminger "Feeds and Nutrition Digest." Five-year average price of prairie hay, \$43/ton, is used as reported by North Dakota Crop and Livestock Service.

Source: **Biomass Resource Assessment and Potential for Energy in North Dakota**. Johnson, Roger G., and Dean A. Bangsund, Department of Agricultural Economics, North Dakota State University.

SUMMARY

On balance, then, a reasonably wide range of opportunities exists for profitably increasing livestock production in North Dakota. Beef cattle appear to hold the greatest impact for the state, with swine second. Depending on the preferences of North Dakotans, a profitable integrated poultry industry appears attainable. As with most new ventures, individual producers may wish to start at a relatively small scale to gain experience and test profitability. However, it is useful to remember meaningful income enhancement occurs only when a commercial scale of production is reached.

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