AE 93010 June 1993

Economic Impact of Expanded Dairying in North Dakota

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Dairy production has long been one of North Dakota's major livestock enterprises. In recent years, dairy products have ranked second only to cattle and calves as a source of livestock revenue. In 1990, the state had about 88,000 dairy cows, and dairy products accounted for $134,375,000 in gross receipts (North Dakota Agricultural Statistics Service 1992).

The dairy industry has experienced economic stress in recent years, and cow numbers declined about 20 percent statewide from 1988 to 1992. However, large and well-managed dairy operations still can be profitable. Recent dairy enterprise budget analysis indicates that a 500-cow herd achieving annual production of 16,250 pounds per cow and a price of $11.00 per cwt. could be expected to cover all costs and provide a net return to management of about $20,000, or roughly $40 per cow (Aakre 1992).

If additional dairy herds were developed in the state, local and state economies would be stimulated through expenditures for feed, fuel, utilities, labor, and other inputs, including additional income for producers. The *purpose* of this paper is to estimate the economic impact of additional dairying on the North Dakota economy.

The North Dakota Input-Output Model (used in this analysis) consists of interdependence coefficients or multipliers that measure the level of business activity generated in each economic sector from an additional dollar of expenditures in a given sector. (A sector is a group of similar economic units.) For a complete description of the input-output model, see Coon et al. (1985 and 1989). This model estimates the changes in gross business volume (gross receipts) for all sectors of the state economy that arise from the direct expenditures associated with expanded dairy operations. The increased gross business volumes of the various sectors are used to estimate such economic indicators as secondary employment and tax revenue based on historic relationships.

This analysis follows the assumptions of a dairy enterprise budget analysis prepared by Aakre (1992). A 500-cow herd would result in an estimated $852,000 in additional direct expenditures/receipts annually within the North Dakota economy (Table 1). The potential for increased dairying was estimated to be determined in large part by the capacity of the state's milk processing facilities. A telephone survey of milk processing companies indicated that the state's processing facilities had more than 1 million pounds per day of excess processing capacity in the spring of 1993. This processing capacity would be sufficient to accommodate the production from at least 20,000 additional dairy cows. For this analysis, a short-run dairy expansion potential of 10,000 cows (or 20 500-cow herds) was assumed. If this level of herd expansion could be achieved, the direct expenditures would total about $17 million.

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Table 1. Estimated Direct Expenditures From Expanded Dairy Production in North Dakota, 1993

Sector	Per 500-cow Herd	Statewide
	---------thousand dollars---------	
Agriculture livestock	180	3,600
Agriculture crops	97	1,940
Construction	25	500
Transportation	16	320
Communications & public utilities	20	400
Retail trade	129	2,580
Finance, insurance, real estate	61	1,220
Business & personal service	45	900
Professional & social service	38	760
Households	230	4,600
Government	11	220
Total	852	17,040

Sectors that receive substantial direct expenditures include *agriculture--livestock* (for replacements), *agriculture--crops* (for roughage and feed grains), *retail trade* (concentrate feeds, supplies, and repairs), *finance, insurance, and real estate* (interest payments and insurance premiums), and *households* (hired labor and returns to operator labor and management). Because this study addresses the economic impact to the state economy, the cost of a portion of the feed (100 percent of the grain and 50 percent of the alfalfa hay) is *not* included in the direct expenditures. The rationale for excluding these expenditures is that this feed would be sold out of state if the dairying activity were not present. This analysis measures the additional economic impact that results when these resources are retained in the state.

The direct expenditures associated with expanded dairying result in a total impact of about $2.8 million per herd and $56 million statewide (Table 2). Substantial effects occur in the *household* sector ($17.6 million statewide), the *retail trade* sector ($13.1 million statewide), the *agriculture--crops* sector ($3.8 million statewide), and the *finance, insurance, and real estate* sector ($3.5 million statewide), as well as in the *agriculture--livestock* sector. Overall, the secondary impacts are more than twice the direct impacts ($39 million vs. $17 million).

Additional business activity from expanded dairying generates additional state tax revenues. Additional sales and use tax, personal income tax, and corporate income tax receipts associated with expanded dairying are estimated to total about $0.9 million annually (Table 3).

The expanded economic activity resulting from additional dairying also would create additional secondary jobs. Each 500-cow dairy is estimated to generate about 29 secondary jobs, besides the seven persons employed directly in the dairy operation. Statewide, an estimated 580 full-time secondary jobs would be created, as well as 140 direct jobs.

Table 2. Estimated Total (Direct Plus Secondary) Impact From Expanded Dairy Production in North Dakota, 1993

Sector	Gross Business Volume	
	Per Herd	Statewide
	---------thousand dollars----------	
Agriculture livestock	262	5,240
Agriculture crops	192	3,840
Nonmetal mining	5	100
Construction	84	1,680
Transportation	26	520
Communications & public utilities	98	1,960
Agriculture proc. & misc. mfg.	142	2,840
Retail trade	656	13,120
Finance, insurance, real estate	176	3,520
Business & personal service	89	1,780
Professional & social service	97	1,940
Households	880	17,600
Government	89	1,780
Total	2,796	55,920

Table 3. Estimated State Tax Revenue Resulting From Expanded Dairy Production in North Dakota, 1993

Tax	Amount
	-thousand dollars-
Sales and use	607
Personal income	229
Corporate income	85
Total	921

Not all dairy operations are profitable every year. To determine whether dairy would likely be profitable for an individual operation, producers are encouraged to use the service of the NDSU Extension Service's Value-Added Agriculture (V-AA) Specialists. The V-AA Specialists may be contacted through any County Agent or by calling 701 237-7393.

References

Aakre, Dwight. 1992. Unpublished budget analysis for 500-cow dairy operation. Fargo: NDSU Extension Service.

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This project was funded in part by the Value-Added Agriculture Project, Institute for Business and Industry Development, North Dakota State University, Fargo.