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## Economic Impact of Expanding Swine Production in North Dakota

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Swine production is an important livestock enterprise on North Dakota farms. In 1991, the 253,000 hogs marketed made swine the state's third largest source of livestock revenue, after cattle and dairy (North Dakota Agricultural Statistics Service 1992). Although mirroring year-to-year fluctuations of the national hog cycle, the volume of swine production and marketings in North Dakota has been relatively stable over the past 15 years. However, structural changes occurring in the nation's pork industry may lead to new opportunities for expanded hog production in North Dakota.

Some of the more significant changes occurring in the pork industry nationally are (1) a trend toward large-scale, intensively managed units which account for an increasing share of hog farrowings and marketings and (2) greater integration of the pork production, processing, and marketing process, with large integrated agribusiness firms playing a greater role (Hale, Senechal & Co. 1991). Some observers feel that the changes taking place in the pork industry could create expansion opportunities for hog production in North Dakota.

A recent feasibility study indicated that a 1,200-sow farrow-to-finish operation, hypothetically located in southwestern North Dakota, could be quite profitable (Hale, Senechal & Co. 1991). Further, the state possesses a number of advantages as a site for expanded swine production, based on large-scale confinement facilities. These advantages include (1) large supplies of relatively inexpensive feed barley, (2) relatively cool summers with low humidity, and (3) less chance for widespread disease because of low hog density.

Expanding hog production in the state would stimulate local and state economies through expenditures for feeds, fuel, utilities, and other inputs, including additional net income for producers. The *purpose* of this report is to estimate the economic impact of expanding hog production 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, e.g., the firms engaged in retail trade make up the retail trade sector.) 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

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direct expenditures associated with expanding hog production. The increased gross business volumes are used to estimate secondary employment and tax revenue based on historic relationships.

This analysis follows the assumptions of the swine feasibility report prepared by Hale, Senechal & Co. (1991). New swine facilities were assumed to consist of 1,200 sows, with about 24,250 market hogs produced annually once the facility was in full production. Initial capital investment in buildings, facilities, and equipment was estimated at \$2.9 million, or \$2,100 per sow. Annual revenue would be about \$2.6 million once the facility was in production--of which \$1.9 million would be received by various sectors of the North Dakota economy (Table 1). The potential for increased pork production in the state within the next few years was assumed to be five 1,200-sow facilities. This was based on the recent expansion of swine production in North Carolina, where the breeding herd inventory grew 17 percent and the market hog inventory increased 19 percent from 1990 to 1991 (Hale, Senechal & Co. 1991). Expansion of the North Dakota breeding herd inventory by 6,000 sows (5 facilities x 1,200 sows) would constitute a 17 percent increase from the 1991 level.

Expanding pork production in North Dakota could result in annual direct expenditures to in-state entities of about \$1.9 million per facility or \$9.6 million statewide (Table 1). Sectors that would receive substantial direct expenditures include *agriculture, crops* (for feed grains), *households* (hired labor plus net profit), and *retail trade* (premises, purchased feeds, and other

<u>Sector</u>	<u>Per Facility</u>	<u>Statewide (5 Facilities)</u>
	<i>thousand dollars</i>	
Agriculture, livestock	52	260
Agriculture, crops	465	2,325
Construction	129	645
Transportation	92	460
Communications and public utilities	57	285
Retail trade	298	1,490
Finance, insurance, and real estate	77	385
Business and personal services	35	175
Professional and social services	30	150
Households	644	3,220
Government	44	220
TOTAL	1,923	9,615

supplies). Since this study addresses the economic impact to the state economy arising from expanded pork production, about 51 percent of the feed costs and 50 percent of the expenditures for breeding livestock are *not* included in the direct expenditures. The

reason for excluding these expenditures is that 51 percent of the feed costs were estimated to represent North Dakota feed grains that would otherwise be sold outside the state, and 50 percent of expenditures for breeding livestock were assumed to be payments to suppliers located outside the state.

The direct expenditures associated with expanding swine production would result in a total impact of \$5.8 million per facility or about \$29.2 million statewide (Table 2). Substantial effects would occur in the *household* sector (\$9.8 million, statewide), the *retail trade* sector (\$7.4 million, statewide), and the *agriculture, crops* sector (\$2.8 million, statewide). The secondary impacts would be more than twice the magnitude of the direct impacts (\$19.6 million vs. \$9.6 million).

<u>Sector</u>	<u>Gross Business Volume</u>	
	<u>Per Facility</u>	<u>Statewide</u>
	<i>thousand dollars</i>	
Agriculture, livestock	187	936
Agriculture, crops	563	2,816
Construction	263	1,314
Transportation	112	558
Communications and public utilities	223	1,116
Ag processing and misc. manufacturing	159	795
Retail trade	1,490	7,448
Finance, insurance, and real estate	336	1,678
Business and personal services	133	667
Professional and social services	159	796
Households	1,968	9,840
Government	225	1,123
Other	14	68
TOTAL	5,831	29,156

Additional business activity from expanding swine production would generate additional state tax revenues. Additional sales and use tax, personal income tax, and corporate income tax receipts associated with expanding swine production would total about \$517 million, statewide (Table 3).

Each swine production facility would employ 12 people full time, year-round (Hale, Senechal & Co. 1991). The expanded economic activity that additional hog production would support also would create additional secondary jobs. An estimated 363 full-time secondary jobs (68 per facility) would be created, besides the persons employed directly in the hog operations.

Table 3

Estimated State Tax Revenue Resulting  
From Additional Farrow-to-Finish  
Swine Facilities in North Dakota, 1993

<u>Tax</u>	<u>Amount</u> <i>thousand dollars</i>
Sales and use	344.8
Personal income	127.9
Corporate income	44.8
TOTAL	517.5

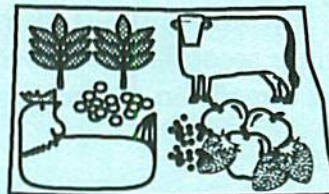
Expanded hog production could provide increased income for farm operators and also additional gross business volume, employment, and tax revenues for the North Dakota economy. Instead of exporting raw feed grains, hog production and other livestock enterprises can represent an opportunity to increase the value of the state's agricultural products *before* they leave the state. The economic benefits of adding value to agricultural products before they leave the state can be expected to be shared widely. In addition to the direct and secondary impacts previously estimated, a substantial expansion of hog production in

North Dakota could lead to growth in linked industries such as slaughter plants and feed processing facilities.

Not all hog operations are profitable every year. To determine whether swine production 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

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