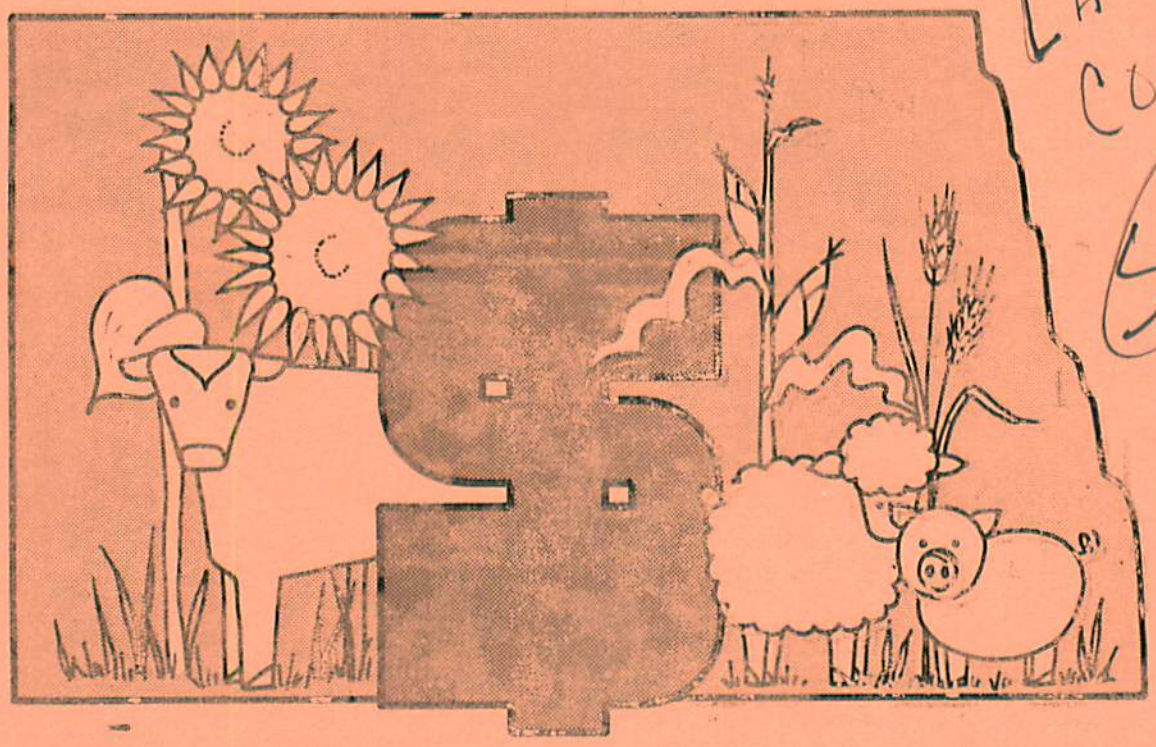
Agricultural Economics Misc. Report No. 90 January 1986



Cost of Producing Farm Commodities in North Dakota

Roger G. Johnson
Mir B. Ali
David M. Saxowsky
Randall D. Little

Department of Agricultural Economics
Agricultural Experiment Station
North Dakota State University
Fargo, North Dakota 58105

Preface

There have been numerous requests for average costs of production for commodities produced by North Dakota farmers. The Cooperative Extension Service of North Dakota State University publishes estimates of crop production costs for the upcoming year as an aid in planning (Reff 1986). These estimates, however, reflect above average yields and good management practices. The budgets presented in this publication are our best estimates of current costs based on average production practices and average yields.

Table of Contents

List of Tables

List of Tables (Continued)

List of Figures

COST OF PRODUCING FARM COMMODITIES IN NORTH DAKOTA

Roger G. Johnson, Mir B. Ali,
David M. Saxowsky, and Randall D. Little*

Introduction

There are several ways to calculate the cost of production. The appropriate approach depends upon the purpose for which the information is to be used. A major difference among studies is the cost attributed to owned assets. The approach used in the following budgets is based on the opportunity cost (returns foregone in alternative uses) of the asset. Costs based on what was originally paid for an asset is another approach sometimes used.

A high degree of variability exists among farmers in their costs of production. Differences occur due to production practices used, size and type of machinery employed, and the yields achieved. This variability not only makes it difficult to arrive at an average cost but also means that the costs of individual farmers may vary considerably from an estimate of the average costs.

Costs presented in this publication do not align with the cash needs of a farm operation. For instance, family labor is a cash cost only to the extent the operator uses cash to meet family living expenses. The amount the operator needs to withdraw from the business per crop acre or per cow depends on the size of operation, whether the family has other sources of revenue with which to meet family living, and the amount of living expenses the family incurs. Operators who raise their feed or livestock replacements will need cash only to meet the cash expenses of raising the feed or replacements. Likewise, annual depreciation on buildings, machinery and equipment, and livestock will not necessarily equal the amount of principal needed to service debt which was used to acquire these. That is, operators' cash needs will vary depending upon the amount of equity they have in the farming operation.

Statewide estimates of average costs were developed for wheat after crop, wheat after fallow, barley after crop, barley after fallow, oats, flax seed, sunflower, sugar beets, cow-calf, and dairy. Also, wheat and barley budgets were developed for western, central, and Red River Valley areas of North Dakota to represent areas with different yield levels and production practices (Figure 1). Wheat and barley budgets after fallow were not developed for the Red River Valley since summer fallow is not a common practice in the area. Average cost estimates were based on normal yields (five-year average, 1980-1984) and prices of inputs prevailing in 1985.

---

*Johnson is Professor, Ali is Research Assistant, Saxowsky is Assistant Professor, and Little is Research Assistant, Department of Agricultural Economics, North Dakota State University, Fargo.

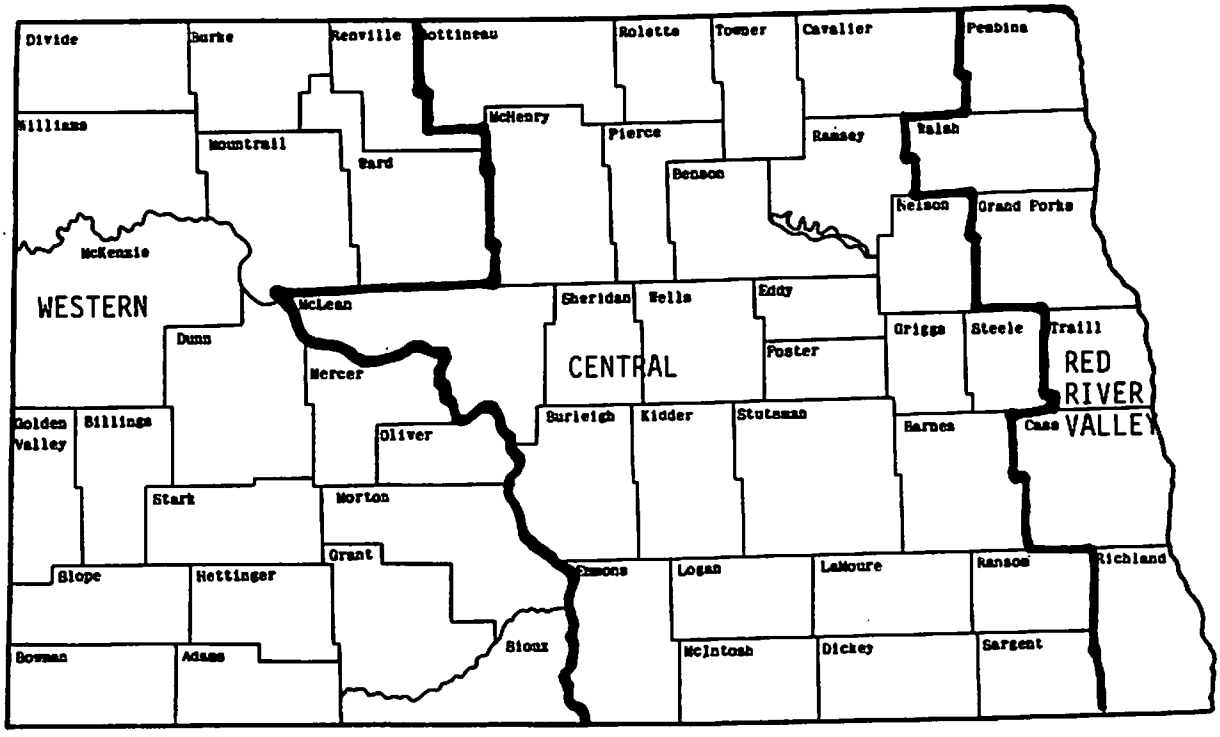


Figure 1. Production Areas of North Dakota

SOURCE: U.S. Department of Agriculture Firm Enterprise Data System - Crop Budgets 1984.

Crop Production Costs

Information concerning production practices, size and type of machinery and inputs used were primarily based on a USDA survey for the year 1983 for all crops except sugar beets (U.S. Department of Agriculture 1984). Information on sugar beets was obtained from the area sugar beet cooperatives, the mail survey of pesticide use from 1982 to 1985 (Dexter et al. 1983-1986), and the 1982 survey of beet growers for tillage practices, size, and type of machinery used (Swenson et al. 1982).

A computer budget generator program was used to develop the cost of production (Kletke 1979). This program computes the costs associated with inputs used, machinery operation, and ownership by applying cost formulas and engineering coefficients.

The cost of operating inputs was computed on a monthly basis. An interest rate of 13.5 percent was charged on all operating expenses. The

total interest was based on the period each expense was incurred until recovered through the sale of product. For interest computation the crop was assumed to be marketed in the harvest month.

Machinery variable costs include repairs, fuel, and lubricant. These costs are a direct function of the hours of use for each machine. Repair costs were based on studies by agricultural engineers on the incidence of repairs for different types of farm machines. Fuel cost was based on horsepower needs of the machine and the price of fuel.

Labor cost was based on total hours of each machine used on an acre multiplied by an adjustment factor (1.1 for tractor and 1.2 for self-propelled machines) and the wage rate. The adjustment factor reflects the time required for adjusting the equipment and lubrication. A higher wage rate was used for sugar beets due to a higher wage rate necessary to acquire labor at harvest time.

Ownership costs are those costs that do not change with annual machine usage. They are costs that would be incurred even if nothing were produced provided the asset is not sold. Ownership costs include machinery replacement cost, interest, and insurance. A modified straight line depreciation method was used in computing replacement cost. Replacement cost is based on current machinery prices rather than the price at the time of purchase which must be used to calculate depreciation for tax purposes. Interest was calculated by multiplying the average capital invested in machinery over the ownership period by a 9 percent interest rate. The real interest rate, 9 percent, (13.5 percent nominal interest rate minus 4.5 percent inflation rate) was used instead of the nominal rate because inflation in machinery values is not included in income.[1] Insurance cost on machinery was based on the average capital invested in machinery.

The land charge for all areas except the Red River Valley assumed a one-third share rental arrangement. Cash rental rate is used in the Red River Valley since share rental is not common there (Johnson 1985). Estimated market price and normal crop yields were the basis in computing the land charge (share rent). Deficiency payment was added to market price to compute share rent for crops after fallow because a landlord shares in deficiency payments under a share lease. Required acreage diversion in fallow areas has little cost because normal summer fallow qualifies as diverted acres. Deficiency payments were not added to share rent for budgets on land previously cropped because in nonfallow areas the deficiency payment is mostly a payment for land diversion. An average cash rent was used in the Red River Valley (Johnson 1985). No cost was imputed for management in these budgets.

Crop budgets with the exception of sunflower did not include a drying cost although an increasing number of small grain farmers dry their

---

[1]USDA budgets used 4.3 percent which represents the 20-year average return to production assets in the agricultural sector.

crop. Until information on the amount of drying typically done by North Dakota farmers is available, it is assumed that drying grain does not significantly alter production costs. The added cost of drying is likely to be offset by reduced machinery costs (less swathing), reduced crop loss, and more timely harvest.

Estimated average production costs for wheat, barley, oats, flax seed, sunflower, and sugar beets are summarized in Tables 1 through 8.

TABLE 1. SPRING WHEAT PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.27
Nitrogen	Pounds	0.14	58.40	8.18	0.32
Phosphate	Pounds	0.18	20.50	3.69	0.14
Potash	Pounds	0.07	1.80	0.13	0.01
Herbicide	Acre	7.22	1.00	7.22	0.28
Fungicide	Acre	0.44	1.00	0.44	0.02
Soil test	Acre	0.35	1.00	0.35	0.01
Custom combining	Acre	12.59	0.06	0.76	0.03
Repairs	Acre			7.10	0.28
Fuel-gasoline	Gallons	1.22	1.63	1.99	0.08
Diesel	Gallons	0.96	4.78	4.59	0.18
Lube (15% of fuel cost)				0.99	0.04
Labor	Hours	4.20	1.55	6.51	0.25
Interest on operating capital	Dollars	0.135	12.23	1.65	0.06
Total variable costs[2]				$ 50.44	$1.96
Ownership costs:					
Capital replacement				$ 21.41	$0.83
Insurance				0.90	0.03
Interest	Dollars	0.09	179.44	16.15	0.63
Total ownership costs[2]				$ 38.46	$1.49
Other costs:					
Land charge-share rent (0.333 x 25.75 bu. x $3.30)				$28.30	$1.10
General farm overhead				6.57	0.26
Total other costs[2]				$34.87	$1.35
Total of above costs[2]				$123.77	$4.81
Yield (planted acre)[3]	Bushels		25.75		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 1A. SPRING WHEAT PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN WESTERN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.36
Nitrogen	Pounds	0.14	27.00	3.78	0.20
Phosphate	Pounds	0.18	6.70	1.21	0.06
Herbicide	Acre	4.31	1.00	4.31	0.23
Fungicide	Acre	0.11	1.00	0.11	0.01
Soil test	Acre	0.35	1.00	0.35	0.02
Repairs	Acre			5.73	0.30
Fuel-gasoline	Gallons	1.22	1.20	1.46	0.08
Diesel	Gallons	0.96	3.56	3.42	0.18
Lube (15% of fuel cost)				0.73	0.04
Labor	Hours	4.20	1.33	5.59	0.30
Interest on operating capital	Dollars	0.135	7.52	1.02	0.05
Total variable costs[2]				$34.55	$1.84
Ownership costs:					
Capital replacement				$18.97	$1.01
Insurance				0.68	0.04
Interest	Dollars	0.09	157.99	14.22	0.76
Total ownership costs[2]				$33.87	$1.80
Other costs:					
Land charge-share rent (0.333 x 18.82 bu. x $3.24)				$20.31	$1.08
General farm overhead				4.85	0.26
Total other costs[2]				$25.16	$1.34
Total of above costs[2]				$93.58	$4.97
Yield (planted acre)[3]	Bushels		18.82		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 1B. SPRING WHEAT PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN CENTRAL NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.29
Nitrogen	Pounds	0.14	52.00	7.28	0.30
Phosphate	Pounds	0.18	21.00	3.78	0.16
Herbicide	Acre	5.52	1.00	5.52	0.23
Fungicide	Acre	0.44	1.00	0.44	0.02
Soil test	Acre	0.35	1.00	0.35	0.01
Custom combining	Acre	12.59	0.10	1.26	0.05
Repairs	Acre			7.01	0.29
Fuel-gasoline	Gallons	1.22	1.63	1.99	0.08
Diesel	Gallons	0.96	4.85	4.66	0.19
Lube (15% of fuel cost)				1.00	0.04
Labor	Hours	4.20	1.58	6.64	0.28
Interest on operating capital	Dollars	0.135	12.32	1.66	0.07
Total variable costs[2]				$ 48.43	$2.03
Ownership costs:					
Capital replacement				$ 19.12	$0.80
Insurance				0.68	0.03
Interest	Dollars	0.09	159.33	14.34	0.60
Total ownership costs[2]				$ 34.14	$1.43
Other costs:					
Land charge-share rent (0.333 x 23.90 bu. x $3.30)				$26.26	$1.10
General farm overhead				6.18	0.26
Total other costs[2]				$32.44	$1.36
Total of above costs[2]				$115.01	$4.81
Yield (planted acre)[3]	Bushels		23.90		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 1C. SPRING WHEAT PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN RED RIVER VALLEY OF NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.15	$ 6.84	$0.20
Nitrogen	Pounds	0.14	90.00	12.60	0.37
Phosphate	Pounds	0.18	27.00	4.86	0.14
Potash	Pounds	0.07	7.20	0.50	0.01
Herbicide	Acre	13.00	1.00	13.00	0.38
Fungicide	Acre	0.60	1.00	0.60	0.02
Soil test	Acre	0.35	1.00	0.35	0.01
Repairs	Acre			8.00	0.23
Fuel-gasoline	Gallons	1.22	1.78	2.17	0.06
Diesel	Gallons	0.96	5.26	5.05	0.15
Lube (15% of fuel cost)				1.08	0.03
Labor	Hours	4.20	1.61	6.76	0.20
Interest on operating capital	Dollars	0.135	14.56	1.97	0.06
Total variable costs[2]				$ 63.78	$1.87
Ownership costs:					
Capital replacement				$ 20.48	$0.60
Insurance				0.73	0.02
Interest	Dollars	0.09	170.78	15.37	0.45
Total ownership costs[2]				$ 36.58	$1.07
Other costs:					
Land charge-cash rent				$52.00	$1.53
General farm overhead				8.55	0.25
Total other costs[2]				$60.55	$1.78
Total of above costs[2]				$160.91	$4.72
Yield (planted acre)[3]	Bushels		34.07		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 2. SPRING WHEAT PRODUCTION COSTS FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.27
Nitrogen	Pounds	0.14	14.80	2.07	0.08
Phosphate	Pounds	0.18	13.20	2.38	0.09
Herbicide	Acre	4.97	1.00	4.97	0.19
Fungicide	Acre	0.14	1.00	0.14	0.01
Soil test	Acre	0.32	1.00	0.32	0.01
Custom combining	Acre	12.59	0.10	1.26	0.05
Repairs	Acre			7.29	0.28
Fuel-gasoline	Gallons	1.22	2.59	3.16	0.12
Diesel	Gallons	0.96	5.45	5.23	0.20
Lube (15% of fuel cost)				1.26	0.05
Labor	Hours	4.20	2.11	8.86	0.34
Interest on operating capital	Dollars	0.135	17.26	2.33	0.09
Total variable costs[2]				$ 46.11	$1.76
Ownership costs:					
Capital replacement				$ 22.29	$0.85
Insurance				0.94	0.04
Interest	Dollars	0.09	186.76	16.81	0.64
Total ownership costs[2]				$ 40.04	$1.53
Other costs:					
Land charge-share rent (0.333 x 26.16 bu. x $4.38[3])				$ 38.16	$1.46
General farm overhead				6.31	0.24
Total other costs[2]				$ 44.47	$1.70
Total of above costs[2]				$130.62	$4.99
Yield (planted acre)[4]	Bushels		26.16		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.
[4]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 2A. SPRING WHEAT PRODUCTION COSTS FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN WESTERN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.30
Nitrogen	Pounds	0.14	11.20	1.57	0.07
Phosphate	Pounds	0.18	10.50	1.89	0.08
Herbicide	Acre	4.18	1.00	4.18	0.18
Fungicide	Acre	0.12	1.00	0.12	0.01
Soil test	Acre	0.32	1.00	0.32	0.01
Repairs	Acre			7.03	0.31
Fuel-gasoline	Gallons	1.22	2.56	3.12	0.14
Diesel	Gallons	0.96	5.31	5.10	0.23
Lube (15% of fuel cost)				1.23	0.05
Labor	Hours	4.20	2.08	8.74	0.39
Interest on operating capital	Dollars	0.135	16.93	2.29	0.10
Total variable costs[2]				$ 42.43	$1.87
Ownership costs:					
Capital replacement				$ 22.41	$0.99
Insurance				0.80	0.04
Interest	Dollars	0.09	186.78	16.81	0.74
Total ownership costs[2]				$ 40.02	$1.77
Other costs:					
Land charge-share rent (0.333 x 22.63 bu. x $4.32[3])				$ 32.55	$1.44
General farm overhead				5.51	0.24
Total other costs[2]				$ 38.06	$1.68
Total of above costs[2]				$120.51	$5.33
Yield (planted acre)[4]	Bushels		22.63		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.
[4]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 2B. SPRING WHEAT PRODUCTION COSTS FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN CENTRAL NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$4.56	1.50	$ 6.84	$0.24
Nitrogen	Pounds	0.14	16.50	2.31	0.08
Phosphate	Pounds	0.18	14.50	2.61	0.09
Herbicide	Acre	5.55	1.00	5.55	0.20
Fungicide	Acre	0.17	1.00	0.17	0.01
Soil test	Acre	0.32	1.00	0.32	0.01
Custom combining	Acre	12.59	0.22	2.77	0.10
Repairs	Acre			7.65	0.27
Fuel-gasoline	Gallons	1.22	2.68	3.27	0.12
Diesel	Gallons	0.96	5.55	5.33	0.19
Lube (15% of fuel cost)				1.29	0.05
Labor	Hours	4.20	2.18	9.16	0.31
Interest on operating capital	Dollars	0.135	17.63	2.38	0.08
Total variable costs[2]				$ 49.65	$1.75
Ownership costs:					
Capital replacement				$ 22.41	$0.79
Insurance				0.80	0.03
Interest	Dollars	0.09	186.78	16.81	0.59
Total ownership costs[2]				$ 40.02	$1.41
Other costs:					
Land charge-share rent (0.333 x 28.37 bu. x $4.38[3])				$ 41.38	$1.46
General farm overhead				6.84	0.24
Total other costs[2]				$ 48.22	$1.70
Total of above costs[2]				$137.89	$4.86
Yield (planted acre)[4]	Bushels		28.37		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.
[4]Weighted average yield based on acres planted to hard red spring wheat and durum (1980-1984).

TABLE 3. BARLEY PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.10
Nitrogen	Pounds	0.14	55.20	7.73	0.17
Phosphate	Pounds	0.18	23.60	4.25	0.09
Potash	Pounds	0.07	2.50	0.18	0.01
Fertilizer application	Acre	4.02	0.04	0.16	0.00
Herbicide	Acre	5.24	1.00	5.24	0.11
Fungicide	Acre	0.26	1.00	0.26	0.01
Soil test	Acre	0.19	1.00	0.19	0.00
Custom combining	Acre	12.62	0.04	0.50	0.01
Repairs	Acre			7.14	0.16
Fuel-gasoline	Gallons	1.22	1.98	2.42	0.05
Diesel	Gallons	0.96	5.07	4.87	0.11
Lube (15% of fuel cost)				1.09	0.02
Labor	Hours	4.20	1.68	7.06	0.15
Interest on operating capital	Dollars	0.135	15.77	2.13	0.05
Total variable costs[2]				$ 47.72	$1.04
Ownership costs:					
Capital replacement				$ 22.37	$0.49
Insurance				0.95	0.02
Interest	Dollars	0.09	187.53	16.88	0.37
Total ownership costs[2]				$ 40.20	$0.88
Other costs:					
Land charge-share rent (0.333 x 45.91 bu. x $2.05)				$ 31.34	$0.68
General farm overhead				6.52	0.14
Total other costs[2]				$ 37.86	$0.82
Total of above costs[2]				$125.78	$2.74
Yield (*planted* acre)	Bushels		45.91		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.

TABLE 3A. BARLEY PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN WESTERN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.13
Nitrogen	Pounds	0.14	21.20	2.97	0.09
Phosphate	Pounds	0.18	12.50	2.25	0.07
Herbicide	Acre	1.82	1.00	1.82	0.05
Fungicide	Acre	0.37	1.00	0.37	0.01
Soil test	Acre	0.19	1.00	0.19	0.01
Repairs	Acre			5.88	0.17
Fuel-gasoline	Gallons	1.22	1.60	1.95	0.06
Diesel	Gallons	0.96	4.14	3.97	0.12
Lube (15% of fuel cost)				0.89	0.03
Labor	Hours	4.20	1.34	5.63	0.17
Interest on operating capital	Dollars	0.135	10.65	1.44	0.04
Total variable costs[2]				$31.86	$0.94
Ownership costs:					
Capital replacement				$22.59	$0.67
Insurance				0.81	0.02
Interest	Dollars	0.09	188.22	16.94	0.50
Total ownership costs[2]				$40.34	$1.19
Other costs:					
Land charge-share rent (0.333 x 33.79 bu. x $1.91)				$21.49	$0.64
General farm overhead				4.65	0.14
Total other costs[2]				$26.14	$0.77
Total of above costs[2]				$98.34	$2.91
Yield (planted acre)	Bushels		33.79		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.

TABLE 3B. BARLEY PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN CENTRAL NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.10
Nitrogen	Pounds	0.14	53.50	7.49	0.17
Phosphate	Pounds	0.18	16.10	2.90	0.07
Potash	Pounds	0.07	0.86	0.06	0.00
Fertilizer application	Acre	4.02	0.03	0.12	0.00
Herbicide	Acre	4.32	1.00	4.32	0.10
Fungicide	Acre	0.15	1.00	0.15	0.00
Soil test	Acre	0.19	1.00	0.19	0.00
Repairs	Acre			7.17	0.16
Fuel-gasoline	Gallons	1.22	2.01	2.45	0.06
Diesel	Gallons	0.96	5.18	4.97	0.11
Lube (15% of fuel cost)				1.11	0.03
Labor	Hours	4.20	1.71	7.18	0.17
Interest on operating capital	Dollars	0.135	14.63	1.98	0.05
Total variable costs[2]				$ 44.59	$1.03
Ownership costs:					
Capital replacement				$ 22.59	$0.52
Insurance				0.81	0.02
Interest	Dollars	0.09	188.22	16.94	0.39
Total ownership costs[2]				$ 40.34	$0.93
Other costs:					
Land charge-share rent (0.333 x 43.47 bu. x $2.01)				$ 29.10	$0.67
General farm overhead				6.06	0.14
Total other costs[2]				$ 35.16	$0.81
Total of above costs[2]				$120.09	$2.76
Yield (planted acre)	Bushels		43.47		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.

TABLE 3C. BARLEY PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN RED RIVER VALLEY OF NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.08
Nitrogen	Pounds	0.14	69.50	9.73	0.18
Phosphate	Pounds	0.18	39.70	7.15	0.13
Potash	Pounds	0.07	6.40	0.45	0.00
Fertilizer application	Acre	4.02	0.06	0.24	0.00
Herbicide	Acre	8.13	1.00	8.13	0.15
Fungicide	Acre	0.42	1.00	0.42	0.01
Soil test	Acre	0.19	1.00	0.19	0.00
Repairs	Acre			7.44	0.14
Fuel-gasoline	Gallons	1.22	2.02	2.46	0.04
Diesel	Gallons	0.96	5.22	5.01	0.09
Lube (15% of fuel cost)				1.12	0.02
Labor	Hours	4.20	1.77	7.43	0.14
Interest on operating capital	Dollars	0.135	19.54	2.64	0.05
Total variable costs[2]				$ 56.91	$1.04
Ownership costs:					
Capital replacement				$ 22.67	$0.41
Insurance				0.81	0.01
Interest	Dollars	0.09	188.91	17.00	0.31
Total ownership costs[2]				$ 40.48	$0.74
Other costs:					
Land charge-cash rent				$ 52.00	$0.95
General farm overhead				7.85	0.14
Total other costs[2]				$ 59.85	$1.09
Total of above costs[2]				$157.24	$2.87
Yield (planted acre)	Bushels		54.70		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.

TABLE 4. BARLEY PRODUCTION COST FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.11
Nitrogen	Pounds	0.14	12.90	1.81	0.04
Phosphate	Pounds	0.18	9.70	1.75	0.04
Herbicide	Acre	6.09	1.00	6.09	0.15
Soil test	Acre	0.10	1.00	0.10	0.00
Custom combining	Acre	12.62	0.11	1.39	0.03
Repairs	Acre			8.73	0.22
Fuel-gasoline	Gallons	1.22	2.88	3.51	0.09
Diesel	Gallons	0.96	6.81	6.54	0.16
Lube (15% of fuel cost)				1.51	0.04
Labor	Hours	4.20	2.43	10.21	0.25
Interest on operating capital	Dollars	0.135	19.56	2.64	0.07
Total variable costs[2]				$ 48.78	$1.20
Ownership costs:					
Capital replacement				$ 26.04	$0.64
Insurance				1.10	0.03
Interest	Dollars	0.09	218.29	19.65	0.49
Total ownership costs[2]				$ 46.79	$1.16
Other costs:					
Land charge-share rent (0.333 x 40.51 bu. x $2.60[3])				$ 35.07	$0.87
General farm overhead				5.88	0.15
Total other costs[2]				$ 40.95	$1.01
Total of above costs[2]				$136.52	$3.37
Yield (planted acre)	Bushels		40.51		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.

TABLE 4A. BARLEY PRODUCTION COST FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN WESTERN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.13
Nitrogen	Pounds	0.14	5.50	0.77	0.02
Phosphate	Pounds	0.18	4.00	0.72	0.02
Herbicide	Acre	4.41	1.00	4.41	0.12
Soil test	Acre	0.10	1.00	0.10	0.00
Custom combining	Acre	12.62	0.16	2.02	0.06
Repairs	Acre			8.66	0.24
Fuel-gasoline	Gallons	1.22	2.97	3.62	0.10
Diesel	Gallons	0.96	7.01	6.73	0.19
Lube (15% of fuel cost)				1.55	0.04
Labor	Hours	4.20	2.35	9.87	0.28
Interest on operating capital	Dollars	0.135	20.11	2.71	0.08
Total variable costs[2]				$ 45.66	$1.28
Ownership costs:					
Capital replacement				$ 25.00	$0.70
Insurance				0.89	0.02
Interest	Dollars	0.09	208.35	18.75	0.53
Total ownership costs[2]				$ 44.64	$1.25
Other costs:					
Land charge-share rent (0.333 x 35.66 bu. x $2.46[3])				$ 29.21	$0.82
General farm overhead				5.09	0.14
Total other costs[2]				$ 34.30	$0.96
Total of above costs[2]				$124.60	$3.49
Yield (planted acre)	Bushels		35.66		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.

TABLE 4B. BARLEY PRODUCTION COST FOLLOWING FALLOW (INCLUDES ONE ACRE OF FALLOW) BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN CENTRAL NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Two Acres	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$3.00	1.50	$ 4.50	$0.10
Nitrogen	Pounds	0.14	18.50	2.59	0.06
Phosphate	Pounds	0.18	14.00	2.52	0.06
Herbicide	Acre	6.94	1.00	6.94	0.16
Soil test	Acre	0.10	1.00	0.10	0.00
Custom combining	Acre	12.62	0.08	1.01	0.02
Repairs	Acre			9.61	0.22
Fuel-gasoline	Gallons	1.22	3.05	3.72	0.08
Diesel	Gallons	0.96	7.20	6.91	0.16
Lube (15% of fuel cost)				1.59	0.04
Labor	Hours	4.20	2.72	11.42	0.26
Interest on operating capital	Dollars	0.135	20.91	2.82	0.06
Total variable costs[2]				$ 53.73	$1.22
Ownership costs:					
Capital replacement				$ 28.09	$0.64
Insurance				1.00	0.02
Interest	Dollars	0.09	234.12	21.07	0.48
Total ownership costs[2]				$ 50.16	$1.14
Other costs:					
Land charge-share rent (0.333 x 43.94 bu. x $2.56[3])				$ 37.46	$0.85
General farm overhead				6.09	0.14
Total other costs[2]				$ 43.55	$0.99
Total of above costs[2]				$147.44	$3.36
Yield (planted acre)	Bushels		43.94		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Deficiency payment added to market price because landlord normally shares in deficiency payment under a share lease.

TABLE 5. OATS PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$1.80	1.95	$ 3.51	$0.09
Nitrogen	Pounds	0.14	20.00	2.80	0.08
Phosphate	Pounds	0.18	11.70	2.11	0.06
Herbicide	Acre	1.05	1.00	1.05	0.03
Custom combining	Acre	12.54	0.09	1.13	0.03
Repairs	Acre			7.26	0.20
Fuel-gasoline	Gallons	1.22	3.04	3.71	0.10
Diesel	Gallons	0.96	4.49	4.31	0.12
Lube (15% of fuel cost)				1.20	0.03
Labor	Hours	4.20	1.96	8.23	0.22
Interest on operating capital	Dollars	0.135	6.92	0.93	0.03
Total variable costs[2]				$36.24	$0.97
Ownership costs:					
Capital replacement				$16.92	$0.45
Insurance				0.60	0.02
Interest	Dollars	0.09	140.98	12.69	0.34
Total ownership costs[2]				$30.21	$0.81
Other costs:					
Land charge-share rent (0.333 x 37.20 bu. x $1.30)				$16.10	$0.43
General farm overhead				4.00	0.11
Total other costs[2]				$20.10	$0.54
Total of above costs[2]				$86.55	$2.33
Yield (planted acre)[3]	Bushels		37.20		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Average yield of straw estimated to be 0.6 tons/acre. USDA survey for the year 1983 indicated 36 percent of straw was harvested. Therefore, straw harvested on an average is 0.22 tons/acre (0.6 x .36).

TABLE 6. FLAX SEED PRODUCTION COSTS FOLLOWING CROP BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Bushel of Production
Variable costs:					
Seed	Bushels	$6.75	0.82	$ 5.54	$0.49
Nitrogen	Pounds	0.14	15.80	2.21	0.19
Phosphate	Pounds	0.18	3.70	0.67	0.06
Herbicide	Acre	4.80	1.00	4.80	0.42
Soil test	Acre	0.12	1.00	0.12	0.01
Custom combining	Acre	12.56	0.02	0.25	0.02
Repairs	Acre			7.45	0.65
Fuel-gasoline	Gallons	1.22	2.44	2.98	0.26
Diesel	Gallons	0.96	5.26	5.05	0.44
Lube (15% of fuel cost)				1.20	0.11
Labor	Hours	4.20	2.05	8.61	0.75
Interest on operating capital	Dollars	0.135	9.61	1.30	0.11
Total variable costs[2]				$40.18	$3.52
Ownership costs:					
Capital replacement				$18.11	$1.59
Insurance				0.65	0.06
Interest	Dollars	0.09	150.92	13.58	1.19
Total ownership costs[2]				$32.34	$2.83
Other costs:					
Land charge-share rent (0.333 x 11.42 bu. x $5.00)				$19.01	$1.67
General farm overhead				4.91	0.43
Total other costs[2]				$23.92	$2.09
Total of above costs[2]				$96.44	$8.44
Yield (planted acre)[3]	Bushels		11.42		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.
[3]Average yield of straw estimated to be 1.29 tons/acre. USDA survey for the year 1983 indicated 22 percent of straw was harvested. Therefore, straw harvested on an average is 0.28 tons/acre (1.29 x 0.22).

TABLE 7. SUNFLOWER (OIL) PRODUCTION COSTS BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Hundredweight of Production
Variable costs:					
Seed	Pounds	$3.00	3.50	$ 10.50	$1.01
Nitrogen	Pounds	0.14	45.10	6.31	0.61
Phosphate	Pounds	0.18	6.10	1.10	0.11
Herbicide	Acre	7.10	1.00	7.10	0.68
Insecticide	Acre	8.61	1.00	8.61	0.83
Bird Repellent	Acre	0.40	1.00	0.40	0.04
Soil test	Acre	0.41	1.00	0.41	0.04
Custom operation	Acre	4.40	0.05	0.22	0.02
Drying Cost	Cwt	0.31	4.52	1.40	0.13
Repairs	Acres			5.97	0.58
Fuel-gasoline	Gallons	1.22	1.65	2.01	0.19
Diesel	Gallons	0.96	5.90	5.66	0.55
Lube (15% of fuel cost)				1.15	0.11
Labor	Hours	4.20	1.52	6.38	0.62
Interest on operating capital	Dollars	0.135	19.85	2.68	0.26
Total variable costs[2]				$ 59.90	$5.77
Ownership costs:					
Capital replacement				$ 19.82	$1.91
Insurance				0.84	0.08
Interest	Dollars	0.09	166.13	14.95	1.44
Total ownership costs[2]				$ 35.61	$3.43
Other costs:					
Land charge-share rent (0.333 x 10.38 cwt. x $8.00)				$ 27.65	$2.67
General farm overhead				8.33	0.80
Total other costs[2]				$ 35.98	$3.47
Total of above costs[2]				$131.49	$12.66
Yield (planted acre)	Cwt		10.38		

[1]Information on production practices and inputs used were based on USDA crop budgets for the technology year 1983.
[2]Totals do not tally due to rounding error.

TABLE 8. SUGAR BEET PRODUCTION COSTS BASED ON 1985 PRICES AND FIVE-YEAR AVERAGE YIELD (1980-1984) IN RED RIVER VALLEY OF NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity[1]	Cost Per Acre	Cost Per Ton of Production
Variable costs:					
Beet seed	Pounds	$16.22	1.68	$ 27.25	$ 1.67
Nitrogen	Pounds	0.14	57.40	8.04	0.49
Phosphate	Pounds	0.18	43.30	7.79	0.48
Potash	Pounds	0.07	15.60	1.09	0.07
Herbicide	Acre	11.05	2.45	27.07	1.66
Fungicide	Acre	4.68	1.74	8.14	0.50
Insecticide	Acre	10.22	0.81	8.28	0.51
Custom operation	Acre	10.71	1.00	10.71	0.66
Hand thinning	Acre	33.00	0.23	7.59	0.47
Hand weeding	Acre	22.00	0.60	13.20	0.81
Custom hauling	Acre			3.72	0.23
Repairs	Acre			18.25	1.12
Crop insurance	Acre			3.36	0.21
Miscellaneous	Acre			5.80	0.36
Fuel-gasoline	Gallons	1.22	12.20	14.88	0.91
Diesel	Gallons	0.96	16.13	15.48	0.95
Lube (15% of fuel cost)				4.55	0.28
Labor (hired and unpaid machine labor)	Hours	5.60	5.01	28.06	1.72
Migrant housing				3.51	0.22
Social Security & Workmen's Comp.				4.38	0.27
Interest on operating capital	Dollars	0.135	101.36	13.68	0.84
Total variable costs[2]				$234.83	$14.41
Ownership costs:					
Capital replacement				$ 51.70	$3.17
Insurance				1.95	0.12
Interest	Dollars	0.09	434.74	39.13	2.40
Total ownership costs[2]				$ 92.78	$ 5.69
Other costs:					
Land charge-cash rent	Acre			$ 62.00	$3.81
General farm overhead				8.99	0.55
Co-op share	Dollars	0.09	490.00	44.10	2.71
Total other costs[2]				$115.09	$ 7.06
Total of above costs[2]				$442.70	$27.16
Yield (planted acre)	Tons		16.30		

[1]Information on inputs used was obtained from the area sugar beet cooperatives and from the mail survey of pesticide use on sugar beets. Tillage practices and type of machinery used were based on the 1982 survey of sugar beet growers.
[2]Totals do not tally due to rounding error.

Cow-Calf Production Costs

The cow-calf production costs were constructed using information from primarily two sources, "Beef Cow Enterprise Budgets" by Harlan Hughes, an extension agricultural economist at North Dakota State University, and a study done by the Economic Research Service of the United States Department of Agriculture, Economic Indicators of the Farm Sector, Costs of Production, 1984.

According to the 1982 Census of Agriculture, the average beef cow herd in North Dakota has 77 cows. These cow-calf production costs were based on an average size cow herd calving in the spring with a 90 percent calf crop. The herd had a 1 percent cow death loss, a 15 percent heifer retention rate, and a 14 percent cow replacement rate. Heifer and steer calves weighed 420 and 450 lbs., respectively, when sold in the fall after weaning. Cull cows weighed 938 lbs. when sold in the fall. A 4 percent transit shrink was assumed when marketing.

Feed was required for one cow, .15 replacement heifers, and .03 bulls. The cows were pastured for 180 days in a summer pasture program. The prices paid for oats, protein supplement, and hay are averages of prices from the first ten months of 1985 (North Dakota Crop and Livestock Reporting Service 1985).

Bulls were assumed to be used three years and then sold. Bull depreciation is equal to the purchase price minus the salvage value divided by three times the .03 bulls per cow-calf unit.

Interest on buildings and equipment is equal to the average investment per cow times the interest rate. Interest on the cow, replacement heifers, and bulls is equal to their value times the interest rate. An interest rate of 9 percent was used for buildings, equipment and livestock.

Difficulties arise when attempting to allocate costs in an enterprise with multiple products. Such is the case with a cow-calf operation whose gross returns include receipts from the sale of steers, heifers, and cull cows. In this budget, all costs were allocated to hundredweights (cwts) of steer equivalents, which is based on a relationship between steer and heifer prices and steer and cow prices. It is calculated by multiplying the total cwts of steers, heifers, and cows to be marketed per cow-calf unit by the ratio of their respective market prices to the market steer price and summed [(432 x .45 x 63.34/63.34) + (403.2 x .30 x 55.16/63.34) + (864 x .14 x 33.55/63.34)]. This sum is the cwts of steer equivalents produced per cow-calf unit.

The ratios used in determining the steer equivalents are based on average market prices for September, October, and November 1985 for No. 1 muscle thickness, medium frame steers and heifers, and cutter grade cows. Price quotes are from the weekly quotations at the West Fargo livestock market. Estimated average production costs for cow-calf enterprise is given in Table 9.

TABLE 9. COW-CALF PRODUCTION COSTS BASED ON 1985 PRICES AND TYPICAL RATE OF PRODUCTION IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity	Cost Per Cow	Cost Per Hundredweight of Steer Equivalents
Variable costs:					
Feed					
Oats	Bushels	$ 1.30	2.18	$ 2.83	$ 0.77
Protein supplement	Cwt	9.94	0.50	4.97	1.36
Hay	Tons	35.30	2.25	79.43	21.68
Mineral & salt	Cwt	20.00	0.40	8.00	2.18
Vet. & medical expenses				6.50	1.77
Supplies & bedding				5.00	1.36
Fuel & lube				5.50	1.50
Marketing				7.00	1.91
Bull depreciation				17.50	4.78
Repairs (buildings & equipment)				2.00	0.55
Labor	Hours	4.20	8.00	33.60	9.17
Interest on operating capital	Dollars	.135	57.12	7.71	2.10
Total variable costs[1]				$180.02	$49.13
Ownership costs:					
Capital replacement (buildings & equipment)				$ 10.50	$ 2.87
Insurance				1.50	0.41
Interest					
Buildings & equipment	Dollars	.09	75.00	6.75	1.84
Livestock	Dollars	.09	546.75	49.21	13.43
Total ownership costs[1]				$ 67.96	$18.55
Other costs:					
Pasture	AUM	7.00	7.70	$ 53.90	$14.71
General farm overhead				2.60	0.71
Total other costs[1]				$ 56.50	$15.42
Total of above costs[1]				$304.48	$83.10
Production (steer equivalents)	Cwt		3.6643		

[1]Totals do not tally due to rounding error.

SOURCES: Hughes, Harlan G. Beef Cow Enterprise Budgets, Extension Agricultural Economics, North Dakota State University, Fargo, 1985; U.S. Department of Agriculture, ERS, Economic Indicators of the Farm Sector, Costs of Production, 1984, Economic Research Service, 1985.

Milk Production Costs

North Dakota had 1,485 dairy farms in 1982 according to the most recent census data, although 3,689 farms reported having milk cows (Dept. of Commerce-1984). The number of milk cows in North Dakota during recent years has ranged from 93,000 in 1980 to 100,000 in 1984 (North Dakota Crop and Livestock Reporting Service 1985). Farm receipts from dairy products, although not a major commodity on a statewide basis, exceeded $121 million in 1984.

Feed costs and a relatively high level of investment needed per dairy cow comprise a significant portion of milk production costs. Table 10 summarizes costs incurred in producing milk. These cost figures do not include the cost of raising replacements. Instead, all calves are assumed to be worth $100 at birth with a 90 percent calf crop. Replacements are acquired for $1,000 each when they first freshen and depreciated over their expected productive life. The value of cull cows is assumed to be $345 (11.5 cwt at $30/cwt) and is included as a product. Cull rate was assumed at 23 percent annually. The milk equivalent accounts for 107 cwt of milk plus the value of cull cows and calves (107 + [(90 + 79.35)/11.40]).

Grain is calculated on a corn equivalent basis. Silage is valued based on value of hay adjusted for their varying dry matter content. Labor is assumed to be furnished 85 percent by unpaid family members and 15 percent by hired laborers.

Interest on operating capital was computed on cost of grain and DHIA services for a full year adjusted for usage during the year. Interest on silage, hay, and bedding was based on assumption that they were used in ten months. Interest on pasture rent was limited to four months assuming rent is paid in spring and that grazing begins in early summer and is completed by midsummer. Dairy farmers are paid every two weeks. As a consequence of this frequent cash inflow, interest on other variable costs (including the 15 percent hired labor) was limited to two weeks. Milk hauling, marketing, and unpaid labor had no interest charged against them.

Average investment in buildings, land upon which the buildings are situated, and dairy equipment was $1,800 per milk cow and would have an average life of 20 years. Insurance upon these facilities was calculated at $10 per $1,000 of protection and insurable value reflected average value of investment over expected life. Insurance on the dairy cows was computed using a cost of $5 per $1,000 of value.

TABLE 10. MILK PRODUCTION COSTS BASED ON 1985 PRICES AND TYPICAL RATE OF PRODUCTION IN NORTH DAKOTA

Item	Unit	Price Per Unit	Quantity	Cost Per Head	Cost per Hundredweight of Milk Equivalents
Variable costs:					
Feed					
Grain	Cwt	$ 3.875	44.8	$ 173.60	$ 1.42
Corn Silage	Tons	22.40	4.3	96.32	.79
Alfalfa Hay	Tons	58.00	3.77	218.66	1.79
Supplement	Cwt	14.20	6.93	98.41	.81
Trace mineral salt	Cwt	8.00	1.08	8.64	.07
Labor	Hrs	5.00	52.00	260.00	2.13
Milk hauling	Cwt	.60	107.00	64.20	.53
Bedding	Ton	20.75	1.23	25.52	.21
Marketing	Cwt	.16	107.00	17.12	.14
Breeding fees				16.00	.13
Vet. & medical expenses				32.50	.27
Dairy supplies				23.05	.19
DHIA fees				6.96	.06
Fuel, lube, and elec.				53.37	.44
Repairs (Machinery and bldg.)				52.31	.43
Int. on operating capital	Dol	.135	261.17	35.26	.29
Total variable costs				$1,181.92	$ 9.70
Ownership costs:					
Capital replacement and ins.					
Buildings and equipment				$ 99.00	$ .81
Dairy cows				122.45	1.00
Interest on investment					
Buildings and equipment	Dol	.09	900.0	81.00	.66
Dairy cows	Dol	.09	672.5	60.52	.50
Total ownership costs				$ 362.97	$ 2.97
Other costs:					
Pasture	Acres	9.25	3.1	$ 28.67	$ .24
Total of above costs				$1,573.56	$12.91
Production (milk equivalents)	Cwt		121.86		

SOURCES: Gullickson and Holkup, North Dakota Vocational Agriculture Farm Business Management Education 1984, Bismarck Junior College, Bismarck, North Dakota; U.S. Dept. of Agriculture, ERS, Economic Indicators of the Farm Sector, Costs of Production, 1984, 1985; Fisher, G. R., North Dakota DHIA Summary, 1984, Cooperative Extension Service, North Dakota State University.

References

Dexter, Allan G., Dean A. Reynolds, and Allen W. Cattanach. 1983-1986. Sugarbeet Research and Extension Reports. Fargo: North Dakota State University, Cooperative Extension Service and U.S. Department of Agriculture cooperating.

Fisher, G. R. 1985. North Dakota DHIA Summary, 1984. Fargo: North Dakota State University, Cooperative Extension Service.

Gullickson, Les, and Mark Holkup. 1985. North Dakota Vocational Agriculture Farm Business Management Education 1984. Annual report. Bismarck: Bismarck Junior College in cooperation with North Dakota State Board for Vocational Education.

Hughes, Harlan G. 1985. Beef Cow Enterprise Budgets. Fargo: North Dakota State University, Extension Agricultural Economics.

Johnson, Jerome E. 1985. "Trends in 1984 North Dakota Farmland Leasing Patterns." North Dakota Farm Research Bimonthly 43(4). Fargo: North Dakota State University, Agricultural Experiment Station.

Kletke, Darrel D. 1979. Operation of the Enterprise Budget Generator. Research Report P-790. Stillwater: Oklahoma State University, Agricultural Experiment Station.

National Academy of Science. 1978. Nutrient Requirements of Dairy Cattle. Washington, D.C.

North Dakota Crop and Livestock Reporting Service. 1985. North Dakota Agricultural Statistics 1985. Ag. Statistics No. 54. Fargo: U.S. Department of Agriculture, SRS, North Dakota State University, Agricultural Experiment Station, Department of Agricultural Economics, Cooperative Extension Service.

Rice, Billy B. n.d. What is the Value of Standing Corn Crop. Fargo: North Dakota State University, Cooperative Extension Service.

Reff, Tommy. 1986. Farm Management Planning Guide, 1986 Crop Production Costs. Fargo: North Dakota State University, Cooperative Extension Service.

Swenson, Andrew L., and Roger G. Johnson. 1983. Sugarbeet Production Costs in the Red River Valley and Southern Minnesota-1982. Agricultural Economics Miscellaneous Report No. 68. Fargo: North Dakota State University, Agricultural Experiment Station, Department of Agricultural Economics.

U.S. Department of Commerce, Bureau of the Census. 1984. 1982 Census of Agriculture, North Dakota State and County Data, AC82-A-34. Vol. 1, Part 34. Washington, D.C.: Government Printing Office.

U.S. Department of Agriculture, Crop Reporting Board, SRS, 1985. Agricultural Prices. Washington, D.C.: Government Printing Office.

U.S. Department of Agriculture, ERS. 1984. Firm Enterprise Data System, 1983 Crop Budgets for North Dakota. Compiled by Ronald D. Krenz. Stillwater: Oklahoma State University.

U.S. Department of Agriculture, ERS. 1984. Firm Enterprise Data System, 1983 Dairy Budgets for South Dakota. Compiled by Gail D. Garst. Stillwater: Oklahoma State University, Agricultural Economics.

U.S. Department of Agriculture, ERS. 1985. Economic Indicators of the Farm Sector, Cost of Production, 1984. Washington, D.C.: Government Printing Office.

U.S. Department of Agriculture, ERS. 1985. Feed Outlook and Situation Report. FdS-297. Washington, D.C.: Government Printing Office.

cjj/CPF-1