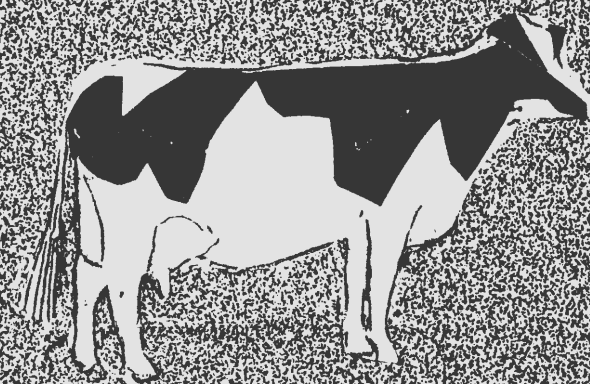


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NORTHEASTERN WASHINGTON

**AN
EFFICIENT
DAIRY
FARM**

AGRICULTURAL EXTENSION SERVICE • WASHINGTON STATE UNIVERSITY • PULLMAN
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COSTS AND RETURNS ON AN EFFICIENT NORTHEASTERN
WASHINGTON DAIRY FARM IN 1962

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In cooperation with the Department of Agricultural Economics, W.S.U.

The Objectives of This Case Study

The primary purpose of the study was to make a complete economic analysis of the dairy farm. There was a two-fold purpose in presenting the data in budget form. First, the budget method can be used by a dairyman to analyze his own dairy operation. Second, the data presented in this case study can be used as a comparative guide for economic milk production.

Data given and methods used in the various tables give the following information:

1. How a total farm budget can be separated into enterprises, such as dairy, beef, etc. (see pages 7 and 8).
2. The tables show capital investment, land use and labor requirements for each enterprise as well as the total for the farm (see pages 3 and 7).
3. The tables list complement of buildings, machinery, and equipment used on the farm, also, the costs of ownership and maintenance (see page 4).
4. The tables show how to calculate unit costs per cow per hundredweight of milk, etc. (see page 6).
5. The method used gives an example of how to set up a table of efficiency measures which will show the dairyman how his costs and returns compare with results achieved by other dairymen (see page 9).

A Northeastern Washington Case Study -- Based on Dairy Herd Improvement (DHIA) figures and the dairyman's actual farm records.

The 84-cow dairy herd uses a farm consisting of 1500 acres in Northeastern Washington. Three hundred and twenty acres of tillable land are used for pasture and silage for the milking herd. The hay is harvested from part of the 320 acres for replacement heifers. The balance of the 1500 acres is scab and timbered pasture and is used for pasture for the replacement stock. A 30-head cow-calf beef enterprise is also maintained on the 1500-acre dairy farm. A complete budget was developed for the entire farm. The complete farm budget, including the beef enterprise, is shown on pages 7 and 8. However, only the costs and returns for the dairy enterprise are shown on pages 3, 4, 5, and 6.

The 1962 dairy herd:

1. There were 84 Holstein cows in the milking herd.
2. The average weight of the cows was estimated to be 1300 pounds.
3. The cows produced an average of 15,730 pounds of milk.
4. The cows produced an average of 619 pounds of butterfat.
5. The butterfat test was approximately 3.9 per cent.
6. Replacement heifers were produced by the dairy herd.^{4/}

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^{4/}A contract was given to raise the heifers to six months of age.

7. Cows were replaced at the rate of 15 per cent per year.
8. The herd size was being increased by raising more than enough heifers for replacement.

Method of Operation

Housing used was loose type loafing sheds. A stanchion type of milking barn was used.

Pastures were non-irrigated. A pasture mixture of alfalfa, brome, and intermediate wheat grass was used. The milking herd was kept on these pastures for only about 3½ months. The dairyman pays \$60 per head to have his heifer calves raised to 6 months of age.

Feeding Practice

Grain used: Approximately 1 pound of grain to 5 pounds of milk. The protein of the grain purchased varied to balance with the protein tested alfalfa hay.

Hay fed: Thirty-five pounds of alfalfa hay were fed per head per day for 8½ months. Columbia Basin alfalfa hay was fed. Most of the hay tested 18 per cent protein. The baled hay was bought in the stack at \$18 per ton. Hay for replacement stock was raised on the farm.

Silage: Two hundred and forty tons of grass legume silage were produced on the farm.

Conclusions:

The conclusions which follow are based on records of amounts of physical resource used and the dollar costs and returns shown in this dairyman's farm records.

Costs of producing milk were \$3.27^{1/} per hundredweight. Eighty-four cows produced total milk receipts of \$652 per cow. Total dairy receipts plus increase in inventory amounted to \$759 per cow.

Total expenses (except interest on investment and the owner-operator's labor and management) were \$543 per cow.

Return to the owner-operator's labor, management and investment was \$216 per cow. The return to the owner-operator's labor and management was \$143 per cow.

The return of the dairy enterprise to labor and management and capital was \$18,136. The return to the owner-operator's labor and management was \$12,050.

Other input-output cost and return figures are given in the following tables.

^{1/}The cost of \$3.27 is for 4 per cent fat corrected milk. The figure does not include a charge for the owner-operator's labor and management.

A RECORD OF ACHIEVEMENT AS A GUIDE TO DAIRYMEN

The following budget was developed from a case study of the farm records of a northeastern Washington dairy farmer. This dairyman combined top quality proportions of dairy cows, feed, and management with adequate land and capital. These outstanding results are published to be used as a guide or efficiency measures for use of other dairymen. Fill in your own figures beside each budget figure. How do your costs and returns compare with these excellent results?

CAPITAL INVESTMENT, LAND USE, AND LABOR REQUIREMENTS
FOR THE NORTHEASTERN WASHINGTON DAIRY FARM

Dairy Enterprise^{1/}

A. Capital Investment: (Dairy Enterprise only)

Land	\$ 42,000
Farm Buildings and Improvements	34,000
Machinery and Equipment	19,600
Operating Capital	8,000
Cattle, 84 head @ \$300	
67 head of replacements @ \$121	<u>33,325</u>
Total Capital Investment	<u>\$136,925</u>

B. Land Use:^{2/}

320 Pasture and hay land (non-irrigated)

1176 Scab and timbered pasture

4 Farmstead

1500 Total Acres

C. Labor Requirements:

Operator, Full Time

One Man, Full Year (annual salary)

Seasonal hired labor - 640 hours

^{1/}These figures show only costs and returns for the dairy enterprise. The beef enterprise and other income and expense were prorated between enterprises by partial budgeting. The complete farm budget is shown on pages 7 and 8.

^{2/}Land is also used for a 30-head cow-calf beef enterprise.

D. INVENTORY OF BUILDINGS, MACHINERY AND EQUIPMENT USED ON THE NORTHEASTERN
WASHINGTON DAIRY FARM IN 1962^{1/}

	Current Inventory Value	Years of Use	Annual Depreciation	Annual Repairs
<u>Farm Improvements</u>				
Hay Sheds, #1	\$ 6,500	25	\$ 260	\$ 50
#2	6,000	25	240	50
Calf Barn	500	10	50	25
Machine Shed	3,200	25	130	40
Loafing Shed, conventional, #1	2,500	25	100	35
#2	1,500	25	100	25
Concrete Slab	3,400	10	340	--
House for Hired Men	2,000	20	100	75
Milking Barn and Milk House	3,500	15	235	100
2 Silos, 140 tons each	3,600	15	120	50
<u>Fences</u>				
Corrals	500	10	50	50
Fences	3,000	15	200	100
Water System	<u>5,200</u>	25	<u>210</u>	<u>200</u>
Total Farm Improvements	<u>\$41,400</u>		<u>\$2,135</u>	<u>\$ 800</u>
Less Farm Improvements charged to Beef	<u>7,400</u>		<u>460</u>	<u>200</u>
Farm Improvements Charged to Dairy	<u>\$34,000</u>		<u>\$1,675</u>	<u>\$ 600</u>
<u>Farm Equipment and Machinery</u>				
Milking Units	800	6	135	40
Bulk Tank, 1200 gal.	2,000	8	250	40
Tractor & Barn Cleaning Equipment	2,000	8	250	100
Tractor	1,000	6	160	70
Tractor	3,000	8	375	100
Manure Spreader	400	7	55	25
Small Tools	300	6	50	40
Harrow	100	7	15	10
Blower	400	7	55	20
Drill	75	5	15	20
Truck	3,000	8	375	100
Truck	2,500	8	315	100
Forage Wagons	5,400	8	675	90
Plow	400	7	55	20
Disc	400	7	55	30
Springtooth	100	5	20	10
Mower	300	5	60	50
Rake	300	5	60	30
Baler	1,000	5	200	150
Elevator	125	7	20	10
Total Farm Machinery & Equip.	<u>\$23,600</u>		<u>\$3,195</u>	<u>\$1,055^{1/}</u>
Less Farm Mach. & Equip. Charged to Beef	<u>4,000</u>		<u>425</u>	<u>155</u>
Farm Mach. & Equip. Chgd. to Dairy	<u>\$19,600</u>		<u>\$2,770</u>	<u>\$ 900</u>

^{1/}Total figures show all buildings, machinery and equipment used on the farm.

Costs are then prorated by enterprise.

E. OPERATING BUDGET FOR THE DAIRY ENTERPRISE

Income

1,321,320 pounds of milk	\$ 54,773
17 head culls cows	4,076
42 head calves	1,220
A.C.P. Payments	264
Dividends	157
Gas Refund	<u>236</u>
 Total Income	 \$ 60,726

Expenses

Hired Labor	\$ 5,800
Fuel	900
Machinery & Truck Repair	955
Fertilizer	260
Seed & Seed Treatment	94
Other Crop Expense (Inc. Machine rent)	200
Grain & Feed Supplement	8,630
Hay	8,830
Silage	480
Replacement Heifers ^{1/}	4,800
Bedding	742
Vet and Drugs	260
Breeding Fees	492
D.H.I.A. Testing	355
Dairy Supplies	332
Farm Repairs	600
Taxes and Licenses	1,380
Farm Insurance	903
Electricity	400
Phone and Other Farm Expenses	160
Butterfat tax	350
Milk producers' assessment	1,165
Hauling (milk)	<u>3,057</u>
 Total Operating Expenses	 <u>\$41,145^{2/}</u>

Cash Receipts Less Cash Expenses	\$ <u>19,581</u>
Less Depreciation, \$1,674 on Buildings \$2,770 on Machinery	4,445
Change in Inventory (+)	3,000
Return to Labor Management and Capital	\$ <u>18,136</u>
Interest on Investment:	
4% x \$76,000 = \$3,040 (Land and Improvements)	
5% x \$60,925 = \$3,046 (Operating Interest)	<u>6,086</u>
Return to Labor and Management	\$ <u>12,050</u>

^{1/}Replacement heifers cost include: cost of raising to 6 months - \$60 per head; 4 head purchased @ \$200 per head, grain \$2,600, standing hay \$800; cost of harvest is included in other items.

^{2/}Costs of machines, buildings and other resources used in common with a 30-head cow-calf beef enterprise were prorated from total farm costs.

F. COSTS AND PHYSICAL INPUTS FOR THE DAIRY ENTERPRISE 1962

Item	Amount and Cost of Material Used	Total Cost	Cost Per	Your
			100 lbs. Milk (1,308,460 lbs. 4% fat corrected)	Estimate of Costs ^{1/}
Hired Labor.....	One man full yr., + 640 hrs. seasonal labor @ \$1.25/hr. (prod. & harvesting silage, fencing, etc.)	\$ 5,800	\$.4433	
Fuel.....	Gas, oil, grease	900	.0688	
Machinery and Truck Repairs.....	See inventory page	955	.0730	
Fertilizer.....		260	.0199	
Seed & Seed Treatment.....		94	.0072	
Other Crop Expense.....		200	.0153	
Grain and Supplement.....	3,146 lbs./cow at \$65/Ton	8,630	.6596	
Alfalfa.....	4½ Tons/cow at \$23.50/Ton	8,830	.6748	
Silage.....	3 T/cow cost of standing forage \$480. Other costs incl. in item of fuel, mach. labor, etc.	480	.0367	
Home grown hay.....	100 T used for young stock (costs incl. in other items)	--	--	
Replacement heifers.....	20 head x \$60 (cost of raising to 6 mo.) 4 head x \$200, standing hay \$800, grain \$2,600 + costs of harvesting hay are included in other items	4,800	.3668	
Bedding.....	Shavings	742	.0567	
Vet and Drugs.....		260	.0199	
Breeding Fees.....		492	.0376	
D.H.I.A. Testing.....		355	.0271	
Supplies.....	Soap, brushes, fly spray, strainers, lime	332	.0254	
Farm Repairs and Upkeep.....	See Inventory Page	600	.0459	
Taxes and Rent.....		1,380	.1055	
Farm Insurance.....		903	.0690	
Electricity.....		400	.0306	
Phone & Other Farm Expenses.....		160	.0122	
Butterfat Tax.....		350	.0267	
Milk Producers' Assessment.....		1,165	.0890	
Hauling Milk.....		3,057	.2336	
Total Operating Expense.....		<u>\$41,145</u>	<u>\$3,1446</u>	
Depreciation.....	\$1,675 on Bldgs., \$2,770 on Machinery	4,445	.3397	
Interest.....	4% x \$76,000 = \$3,040 (Land & Improvements) 5% x \$60,925 = \$3,046 (Operating Interest)	6,086	.4651	
Total Economic Cost.....	Includes Dairy By-Products	<u>\$15,676</u>	<u>\$3,9494</u>	
Less Income from Dairy By-Products				
Cull Cows.....	17 head @ \$240	4,076	.3115	
Calves.....	42 head @ \$29	1,220	.0932	
ACP Payments.....		264	.0202	
Misc. Dividends.....		157	.0120	
Gas Refund.....		236	.0180	
Change in Inventory (+) ^{2/}		3,000	.2293	
Total Cost of Producing cwt. of milk ^{3/}		<u>\$42,723</u>	<u>\$3,2652</u>	

^{1/}Your estimate of cost when input items are changed. ^{2/}The change in inventory was due to raising more calves than needed for replacement; thus, increasing the size of the herd. ^{3/}These figures do not include a charge for the owner-operator's labor and management.

CAPITAL INVESTMENT, LAND USE, AND LABOR REQUIREMENTS FOR THE DAIRY FARM FOR 1962^{1/}

A. Capital Investment:	<u>Dairy</u>	<u>Beef & Other</u>	<u>Total</u>
320 acres @ \$100, 118 acres @ \$30	\$ 42,000	\$25,400	\$ 67,400
Farm buildings and improvements	34,000	7,400	41,400
Machinery and equipment	19,600	4,000	23,600
Operating capital	8,000	1,000	9,000
Cattle, 84 head @ \$300, 67 head young stock \$8,125; Dairy beef, 30 head @ \$200, 8 head @ \$125	<u>33,325</u>	<u>7,000</u>	<u>40,325</u>
Total Capital Investment	<u>\$136,925</u>	<u>\$44,800</u>	<u>\$181,725</u>

B. Land Use:

320 acres pasture and hay land (non-irrigated)

1176 scab and timbered pasture

4 farmstead

1500 Total Acres

C. Labor Requirements:

Operator, full time

One Man, full year (annual salary)

Seasonal hired labor - 640 hours

^{1/}These cost and return figures show all enterprises conducted on the farm.

TOTAL FARM BUDGET ON THE NORTHEASTERN WASHINGTON DAIRY FARM

E. Operating Budget:	Enterprises		
	Dairy	Beef & Other ^{1/}	Total Farm
<u>Income</u>			
1,321,320 lbs. of milk	\$54,773	\$ --	\$54,773
17 head cull dairy cows, 4 head cull beef cows	4,076	736	4,812
42 head dairy calves, 18 head beef calves	1,220	2,369	3,589
A.C.P. Payments	264	142	406
Dividends	157	30	187
Gas Refund	236	68	304
Custom Baling	--	935	935
TOTAL INCOME	\$60,726	\$4,280	\$65,006
		Beef & Other	Total Farm
<u>Expenses</u>	Dairy	Other	Farm
Hired Labor	\$ 5,800	\$ 223	\$ 6,023
Fuel	900	230	1,130
Machinery & Truck Repair	955	200	1,155
Fertilizer	260	--	260
Seed & Seed Treatment	94	--	94
Other Crop Expense	200	40	240
Grain & Feed Supplement	8,630	10	8,640
Hay	8,830	400	9,230
Silage	480	--	480
Replacement Heifers	4,800	--	4,800
Bedding	742	--	742
Vet and Drugs	260	32	292
Breeding Fees	492	--	492
D.H.I.A. Testing	355	--	355
Dairy Supplies	332	--	332
Farm Repairs	600	200	800
Taxes & Licenses, Soc. Sec.	1,380	300	1,680
Farm Insurance	903	100	1,003
Electricity	400	8	408
Phone & Other Farm Expenses	160	39	199
Butterfat Tax	350	--	350
Hauling	3,057	--	3,057
Milk Producers' Assessment	1,165	--	1,165
Total Operating Expenses	\$41,145	\$1,782	\$42,927
Cash Receipts Less Operating Expenses	\$19,581	\$2,498	\$22,079
Less Depreciation, Buildings: Dairy, \$1,675; Beef, \$460			
Machinery: Dairy, \$2,770; Beef, \$425	- 4,445	885	5,330
Change in Inventory (+)	+ 3,000	1,000	4,000
Return to Labor Management and Capital	18,136	2,613	20,749
Interest on Investment:			
Dairy: 4% x \$76,000 = \$3,040 (Land & Improvements)			
5% x \$60,925 = \$3,040 (Operating Interest)	6,086	--	6,086
Beef: 4% x \$32,800 = \$1,312 (Land & Improvements)			
5% x \$12,000 = \$600 (Operating Interest)	--	1,912	1,912
Return to Labor and Management	\$12,050	\$ 701	\$12,751

^{1/}Beef and other column includes \$935 receipts for custom baling.

EFFICIENCY MEASURES FOR THE NORTHEASTERN WASHINGTON DAIRY ENTERPRISE

	Unit	1962 Per Cow
Average Number of Cows		84
Weight per cow		1,300
<u>Per Cow Averages</u>		
Production of milk	pounds	15,730
Production of butterfat	pounds	619
Milk Receipts (\$54,773) ÷ 84	dollars	652
Total Dairy Receipts, Increase Inventory Inc. (\$63,726) ÷ 84	dollars	759
Total Cash Feed Costs (does not include pasture for cows or pasture and hay grown on the farm for replacement dairy cattle) (\$17,940) ÷ 84		214
Total expenses (except interest on investment) (\$45,590) ÷ 84	dollars	543
Milk receipts over cash feed costs (\$36,833) ÷ 84	dollars	438
Total capital investment (land, buildings, cattle, machinery, etc.) (\$136,925) ÷ 84	dollars	1,630
Return to labor management & investment (\$18,136) ÷ 84	dollars	216
Return to labor and management ^{1/} (\$12,050) ÷ 84	dollars	143
<u>Per Hundredweight, approximately 3.9% milk</u>		<u>Per Hundredweight</u>
Milk Receipts (Gross) 54,773 ÷ 1,321,320	dollars	4.15
Total Cash Feed Costs 17,940 ÷ 1,321,320	dollars	1.36
Milk receipts over feed costs (\$54,773 - 17,940) ÷ 1,321,320	dollars	2.79
Total cost per hundredweight of milk ^{2/} (see last line section F, page 6)	dollars	3.27 ^{3/}

^{1/}An interest charge of 4 per cent was calculated for investment in land and buildings and 5 per cent for operating capital.

^{2/}No charge was made for the owner-operator's labor and management.

^{3/}The \$3.27 per hundredweight is based on 4.0 per cent fat corrected milk.

The \$3.27 cost does not include a charge for the owner-operator's labor and management.