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9-64

Cutting Costs in Dairy Production

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I. By size of enterprise:

- A. On farms where milk production and crop production are complimentary, most efficiencies can be gained with a minimum herd size of 25 to 30 cows. The maximum size of herd is limited largely by the managerial capacity of the operator.
- B. In areas where milk production is not associated with crop production, the size of herd must be considerably larger to gain most efficiencies.
- C. Size and intensity of operation are not as important in periods of stable or falling prices as in periods of price increase.

II. With high producing cows:

- A. Returns to labor and management are about twice as high with 10,000# cows and three times as high with 14,000# cows as with 7,000# cows. (Table I)

III. Through economical feeding programs:

- A. Feed plenty of grain.
 1. Feed cost per 100# of milk are lowest on all-forage rations.
 2. Total cost per 100# of milk are lowest and returns to labor and management highest with medium to high levels of grain feeding (about 1 pound of grain for each 3 pounds of milk.) (Table II)
 3. Because of high labor, power and machinery **prices**, the cost of stored forage has not declined as much as grain. The most profitable levels of grain feeding are somewhat higher than with "normal" price relationships.
 4. Cows with high inherent productivity can profitably use higher levels of grain feeding.
- B. "Good" to "excellent" quality forage is worth from \$3 to \$9 more per ton of hay equivalent than average quality for milking cows. Poor quality roughage is nearly worthless. (Table III)
- C. Costs of producing high quality roughage are not as great as their increased value. (Tables IV and V.) However, making high quality

Table I. Comparative Earning Ability of Cows Per Year With Varying Inherent Productivity

Grade of Cows	Average	Good	Very Good
Inherent Productivity	7,000#	10,000#	13,000#
Production for Highest Returns	7,080	10,300	13,400
Value of Milk Produced @ \$4.00	\$ 283	\$ 412	\$ 536
Value of Cattle Produced*	\$ 75	\$ 75	\$ 75
Total Income	\$ 358	\$ 487	\$ 611
<u>Feed Requirements</u>			
Hay Eq. - Pasture	6,000#	18 6,000	18 6,000
Hay	4,700#	47 4,400	44 4,000
Grain 12-14%	2,000#	49 3,000	73 4,000
Feed Cost for Cow Only	114	135	156
Feed Cost Herd Basis**	154	175	196
Other Costs***	228	235	242
Total Costs	\$ 382	\$ 410	\$ 438
Feed Cost (Cow Only) Per 100# Milk	\$1.61	\$ 1.31	\$ 1.16
Total Cost " " " " "	4.33	3.25	2.71
Net Profit Per Cow	-24.00	77.00	173.00
Return Per Hour Labor & Management	.80	1.64	2.44

* Based on Farm Account Analysis

** Includes \$40 feed cost to cover 1/2 calf, 1/3 yearling heifer and 1/8 two year old heifer.

*** Other Costs Include:

	With "Usual" Equipment	Fully Mechanized
Breeding Charge	\$ 8.00	\$ 8.00
Vet, Med and Death Loss	12.00	12.00
Power, Mach, Elec, Tel & Misc.	38.00	53.00
Building Depreciation & Repair	15.00	15.00
Taxes, Insurance & Interst	42.00	45.00
Labor 100 hours @ 1.00	120.00	100.00
Feed Cost for Replacement Heif.	40.00	40.00
TOTAL	\$275.00	\$273.00

Table III. The Value of Various Qualities of Hay in Producing 10,000 Pounds of Milk With a Good (10,000) Cow.

Item	Grade of Hay				
	Excellent ^a /	Good ^b /	Average ^c /	Poor ^d /	Very Poor ^e /
Gross income	475	475	475	475	475
Good pasture	5,300	5,300	5,300	5,300	5,300
Pound hay	6,000 (@ \$25=75)	5,700 (@ \$20=57)	5,200 (@ \$16=42)	4,000 (@ \$14=28)	3,000 (@ \$12=18)
Pounds grain	1,700	2,500	3,000	4,000	7,000
% Crude protein (winter ration)	10-12	12-14	14-16	16-18	18-20
Price 100# grain mix	\$2.30	\$2.40	\$2.44	\$2.57	\$2.70
Feed costs:					
Cow only	\$130.00	\$133.00	\$131.00	\$147.00	\$223.00
Herd basis	\$170.00	\$173.00	\$171.00	\$187.00	\$263.00
Other costs	\$235.00	\$235.00	\$235.00	\$235.00	\$235.00
Total costs	\$405.00	\$408.00	\$406.00	\$420.00	\$498.00
Net profit	\$ 70.00	\$ 67.00	\$ 69.00	\$ 53.00	\$-23.00
Approximate comparative value of various grades of hay with production prices and rations shown in the table above	\$ 25.00 29.00 33.00 37.30 46.00 50.30	\$ 19.00 23.00 27.00 32.00 41.00 46.00	\$ 16.00 20.00 25.00 30.00 40.00 45.00	\$ 6.00 11.00 17.00 24.00 37.00 43.00	\$-60.00 -52.70 -34.00 -25.30 - 8.00 0

- a/ Well managed, green, succulent pasture, or early cut heat dried hay or early cut sealed silage or "haylage".
- b/ Green, succulent pasture, or early cut mow cured (natural forced air) or field cured with no rain, or early cut silage in upright silo.
- c/ Ordinary legume mix pasture, or early cut rained on field cured hay, or medium cut field cured hay (no rain) or late cut silage in upright silo or early cut silage made in horizontal silo.
- d/ Poor late cut rained on hay or its equivalent.
- e/ Badly weathered hay, straw or fodder.

Table VI. Comparison of the Costs and Returns for Various Methods of Winter Forage Feeding of Dairy Cattle, per acre. ^{1/}

Item	Hay, two cuttings ^{2/}	Hay, three cuttings ^{3/}	Grass Silage ^{4/}	"Haylage" ^{5/}	Corn Silage ^{6/}
Yield, Hay Equivalent, tons ^{7/}	3.0	4.0	4.4	4.4	6.0
Returns to Labor, Management, and Winter Forage ^{8/}	\$85	\$116	\$129	\$138	\$ 178
All Crop costs ^{9/}	\$62	\$ 76	\$ 90	\$ 98	\$ 113
Return to Labor and Management	\$23	\$ 40	\$ 39	\$ 40	\$ 65
Change in Returns, vs Hay, 2 cuttings	-	\$ 17	\$ 16	\$ 17	\$ 42
For 25 acres	-	\$425	\$400	\$425	\$1050

1/ Based on studies in several states and by USDA, and on information in "Manual for Dairy Herd Management, I.D. 30, Purdue University, April, 1959. Figures based on 25 acres of forage harvested, and cows producing 10,000 pounds of milk annually. Rotation grazing in summer.

2/ Cut in bloom stage, first cutting rained on - poor quality; second cutting average quality. Stored in one story barn, fed directly into hay feeders.

3/ Cut in bud stage, first and second cuttings conditioned; average to good quality. Stored in one story barn, fed directly into hay feeders.

4/ Wilted silage (65-70%) stored in upright concrete silo with unloader and auger bunk; 3 cuttings, bud stage. Good quality.

5/ "Half-dry" grass silage (40-45%) stored in air tight silo with bottom unloader, auger bunk; 3 cuttings, bud state. Excellent quality.

6/ Stored in concrete upright silo with unloader, auger bunk. Good quality.

7/ Grass and corn silage converted to hay at 3 tons equal to 1 ton. These are amounts preserved for feeding.

8/ Based on annual returns to dairy cows above all costs except labor, management, and winter forage. Adjusted for quality of forage. Cows producing 10,000 pounds of milk annually.

9/ Includes taxes, interest on land, fertilizer, seed, and all labor and equipment and storage costs.

Table VIII. Comparison of the Costs and Returns for Various Methods of Summer Forage Feeding of Dairy Cattle, per acre. 1/

Item	Continuous Graze	Rotation Graze 2/	"Strip" Graze 3/	"Green Chop" 4/	Grass Silage 5/	"Haylage" 6/	Hay, three cuttings 7/
Yield, Hay Equivalent, tons	2.25	2.75	3.25	4.1	4.4	4.4	4.0
Returns to Labor, Management, and Summer Forage 8/	\$ 58	\$ 68	\$ 80	\$103	\$109	\$110	\$97
<u>All crop costs 9/</u>	<u>\$ 34</u>	<u>\$ 41</u>	<u>\$ 46</u>	<u>\$ 79</u>	<u>\$ 78</u>	<u>\$ 79</u>	<u>\$76</u>
Return to Labor and Mgmt.	\$ 24	\$ 27	\$ 34	\$ 24	\$ 31	\$ 31	\$21
Change in Returns, vs. continuous graze	-	\$ 3	\$ 10	\$ 0	\$ 7	\$ 7	\$-3

- 1/ Based on studies in several states and by USDA, and on information in "Manual for Dairy Herd Management", I. D. 30, Purdue University, April, 1959. Figures based on 25 acres of summer forage, and cows producing 10,000 pounds of milk annually. Winter forage hay in all cases.
- 2/ Field divided into 3 parts; excess first growth harvested for later summer feeding.
- 3/ Fences moved daily to provide one day's grazing; excess first growth harvested for later summer feeding.
- 4/ Chopped into self feeding wagons twice daily. Yield less than grass silage due to cutting at smaller size on part.
- 5/ Wilted silage (65-70%) stored in upright concrete silo with unloader, and auger bunk; only operating costs included for storage and feeding facilities.
- 6/ "Half-dry" grass silage (40-45%) stored in airtight silo, bottom unloader, and auger bunk; only operating costs included for storage and feeding facilities.
- 7/ First and second cuttings conditioned, average quality hay. Stored in one-story barn, fed directly into hay feeders.
- 8/ Based on annual returns to dairy cows above all cost except labor, management, and summer forage. Adjusted for quality of forage. Cows producing 10,000 pounds of milk annually. No allowance made for differences in bloat.
- 9/ Includes taxes, interest on land, fertilizer, seed, and all labor and equipment and storage costs, including manure hauling.

Table X. Approximate Number of Cows Milked per Hour with Various Milking Systems and with Different Degrees of Skill. 1/

System	Average Operator	Highly Skilled	Maximum Potential
	cows per hour		
Stanchion	20	30	-
3-in-line Side opening parlor	24	28	-
Double 3, Tandem walk-through parlor	27	32	-
Double 4, Herringbone	34	43	48
Double 5, Herringbone	42	53	59

1/ Based on USDA study, pipeline used in all cases.

Table XI. Time Saved in Milking Operation by Average Operator with Various Milking Systems Compared to Stanchion Barns, for Three Herd Sizes. 1/

System	20 cows	40 cows	60 cows
	hours saved per year		
3-in-line, Side opening parlor	102	204	306
Double 3, Tandem walk-through parlor	158	316	474
Double 4, Herringbone	252	504	756
Double 5, Herringbone	320	640	960

1/ Based on two milkings per day and 305 day lactations. Using 100 hours per cow and replacements as the average annual labor requirement will provide an estimate of possible herd expansion with available labor. Consider additional feed and capital needs.