

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 2 *Dairy Research (1984-2014)*

Article 147

1985

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Recommended Citation

Call, Edward P. (1985) "The impact of culling on production and profit," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 2. <https://doi.org/10.4148/2378-5977.3072>

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THE IMPACT OF CULLING ON PRODUCTION AND PROFIT

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Summary

Profit or loss in the dairy enterprise is dependent upon yearly production per cow and degree of capitalization. Higher producing cows convert feed into milk more efficiently. Cows of similar body size have similar maintenance requirements, regardless of level of yearly production. The successful dairy enterprise must establish yearly production goals needed to satisfy cash flow requirements and then implement management procedures to obtain maximal yearly milk per cow on the number of cows required to meet the herd's goal.

Introduction

Profitability in the dairy enterprise is dependent upon a number of factors. Each operator needs to decide the annual pounds of milk marketed to create the necessary cash flow to remain viable. For example, if one million pounds of milk is required to generate adequate dollars, then the next decision is the numbers of cows required to generate this level of production. Cows respond differently because of their genetic potential, but feeding and management account for about 75% of the variation among cows. In the example of one million lb of milk per year, 100 cows producing 10,000 lb annually will meet the requirement. This example will almost surely fail. At current economic conditions, a 20,000 lb average production will meet with success, providing the producer is not over-capitalized in facilities and machinery. The primary reason for success or failure is determined by individual cow maintenance cost, i.e., the cost of keeping cows alive regardless of their level of yearly production. Table 1 illustrates this principle in Kansas DHIA herds, assuming that body weight is constant among cows.

Procedures

The dairy diversion program (DDP) in 1984-85 provided an opportunity in the Kansas State University dairy herd (DTRC) to demonstrate the effects of culling for production and health-related reasons on the net income of the operation. It was assumed that about 3.0 million lb of milk were required to justify the DTRC and maintain sufficient cows for the intended teaching and research activities of the herd. Other assumptions and variables that were held constant for the purpose of this study were:

1. Milk price was static at \$12.47/cwt.
2. Dairy maintenance feed costs were \$1.22 per cow throughout the study.

3. Feed costs were established at 1983 levels and were considered to be \$826 per cow in 1983 and \$874 per cow in 1984 when production increased by 11%.
4. Other costs of production were obtained from the Southwest Dairy Economic Analysis, Oklahoma State University and were held constant at 1983 levels. The values were \$1,096 for 1983 at an average production of 16,216 lb per cow and \$1,150 for 1984 when production increased 11% by greater culling pressure.

Results and Discussion

The basis for culling was primarily low production, with some cows removed for chronic mastitis and other health-related problems. Culling for low production was emphasized at the end of the 4th mo. of lactation, when the average cow has produced about 50% of the yearly total. The effect of culling is shown in Table 2. Herd size was reduced by 21 cows with a 1.5% decline in total pounds of milk marketed and a subsequent decline in total income. Because of effective culling, average production per cow resulted in an increase of 11% in rolling herd average to 17,984 pounds per cow. Table 3 notes the effect on maintenance costs of milking fewer cows and the increased feed requirement for an 11% increase in average milk production. While feed costs were essentially the same, milking 21 fewer cows resulted in an 11% reduction in maintenance costs. The effect of culling was a decrease of 6% in total feed cost, even with an increase of 11% in production per cows. Table 4 summarizes the total costs of producing about the same volume of milk with fewer cows. Other costs increased with higher levels of production. However, the lowered feed costs resulted in a decrease of 6.5% in the total cost of production.

Assuming a normal culling rate of 30 percent, fewer cows mean fewer cull cows for dairy beef under routine operations. This effect can be seen in Table 5. Not including the 21 extra cows culled in 1984, income from cull cows was about \$3000 less in 1984. This decrease in cash flow was more than offset by the decrease in total cost in 1984 from the increased efficiency of production. The endpoint of culling with a corresponding increase in production resulted in an increase of 87% in net income. In addition, 1.5% less milk was marketed, which contributed to decreasing the surplus.

Recommendations

1. Determine the total annual production required to justify the capital investment in a dairy operation.
2. Establish a minimum-level production per cow based upon the current economic situation.
3. Implement feeding and management procedures to obtain or better the minimum level of production per cow per year.
4. Utilize financial and production records, such as farm management and D.H.I.A., to make sound management decisions.

Table 1. The effect of rolling herd average (RHA) per cow on feed costs and income-over-feed costs in 462 Kansas Holstein herds in 1984.

Rolling Herd Avg. (lb)	Daily Bulk Tank Wt. (lb)	Yearly Feed Costs		Income-Over- Feed Costs
		Maintenance + Milk	= Total	
\$				
10,700	33	445	207 = 652	626
13,570	43	445	322 = 676	861
17,410	55	445	440 = 885	1225
19,150	60	445	513 = 958	1351

Table 2. Comparison of variables at the DTRC during the last two years.

Year	Cows	Milk/Cow (lb)	Milk/Year (lb)	Income/Year (\$)
1983	188	16,216	2,896,178	361,153
1984	167	17,984	2,853,162	355,789

Table 3. Differences in maintenance and milk feed costs at the DTRC during 1983 and 1984.

Year	Cows	Feed Cost		Total Feed Cost
		Maintenance + Milk	=	
\$				
1983	188	83,716	71,547 =	155,288
1984	167	74,365	71,593 =	145,958

Table 4. Comparison of feed costs and other costs of producing milk at the DTRC during 1983 and 1984.

Year	Cows	Other Costs + Feed Costs		=	Total Costs
		\$			
1983	188	206,048	155,288	=	361,336
1984	167	192,050	145,958	=	338,008

Table 5. Effect of culling on profitability of the DTRC during 1983 and 1984.

Year	Cows	Total Milk	-	Total Cost	=	Profit (Loss)	+	Cull Cows	=	Net Income
				\$						
1983	188	361,153		361,336		(-183)		27,072	=	26,889
1984	167	355,789		338,008		17,781		24,048	=	50,847