

Guess what may be eating your lunch: the hidden costs of cull rate (part 1 of 2)

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As dairy managers strive to retain more dollars from their businesses in the form of profits, it is easy to focus on controlling the big-ticket items such as investing in new facilities or controlling feed expenses. These are certainly worthwhile activities and need to be pursued and managed appropriately. However, an area of control, that may be a hidden profit constraint on several Southeast dairies, deals with cull rate. This is particularly paramount considering the short supply of dairy replacements and their relatively high cost. Moreover, wide variations in cull rate for dairies participating in the Dairy Business Analysis Project prompts investigation into the implications of varying cull rate levels.

Because this issue has several concepts embedded within it, the discussion will be covered in two articles. This first will cover the basic financial results of dairies sorted by cull rate. The second article will deal with the economic implications of different levels of cull rate and how this impacts the cash flow ability and subsequent profitability of dairy businesses.

In order to understand this issue, dairies participating in the Dairy Business Analysis Project were sorted into three groups based on their 1998 annual cull rate. The cull rate was defined as the number of cows that died or were sold divided by the average herd size. Only those dairies providing complete and verifiable information were included in the average. The adjoining table lists selected 1998 financial performance statistics by cull rate group. While the statistics presented in the table are based on operating conditions unique to Florida and Georgia, several concepts are demonstrated that are important to any dairy business.

One of the first things to notice about this group of dairies was the large variation in cull rates among groups. The 24% average cull rate for the low cull rate group (less than 30% cull rate) was 18 percentage points below the 49% average for the high cull rate group (over 40%) with some dairies above and below these averages. Additionally, the high cull rate group accounted for nearly half of the sample (15 dairies).

There are two stories to tell when looking at this information. First, underlying most of the expense differences was variation among groups in heifer raising activity. The total adjusted replacement expense² for the low cull rate group was \$1.03 per cwt. milk sold for the low cull rate group, \$0.63 for the medium group and \$1.40 for the high group. The medium cull rate

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² Adjusted replacement expense was computed as expensed purchases plus depreciation less the loss on sales of capital livestock. The gain/loss on sales was determined by comparing beginning and ending capital livestock inventories to capital livestock purchases, sales, and depreciation. This was independent of herd expansion or contraction.

group posted the lowest adjusted replacement expense² per cwt. milk sold. However, this group also had 0.56 heifers per cow, 10 points above the 0.46 of the high group and twice the 0.28 of the low group. Even with twice as many heifers per cow and higher milk sold per cow (17,799 pounds for the medium cull rate group versus 17,172 pounds for the low group) the medium cull rate group posted adjusted replacement expense² only 39% below the low cull rate group. Conversely, the high cull rate group had the second highest number of heifers per cow (0.46) but posted the highest adjusted replacement expense per cwt. milk sold.

The amount of heifer raising activity drove differences in other expenses as well. Purchased feed expense (\$8.29 per cwt. milk sold) and personnel expense (\$2.91 per cwt. milk sold) were highest for the medium cull rate group. This was related to the relatively large amount of heifers that were raised by this group. Conversely, the low cull rate group raised the least amount of heifers and posted the lowest personnel expense (\$1.71 per cwt. milk sold) and purchased feed expense (\$7.15 per cwt. milk sold), effectively driving total expenses per cwt. milk sold 5% below the medium cull rate group.

This difference in heifer raising activity was also reflected in differences in average total assets per cow. The low cull rate group had \$2,703 average total assets per cow, 48% below the \$5,224 of the medium cull rate group and 33% below the \$4,051 of the high cull rate group. While this does not account for all of the difference in assets per cow, the degree of heifer raising activity certainly affected this and, in turn, the asset turnover ratio.

So what do these seemingly unrelated tidbits of information have to do with controlling cull rate and overall dairy profitability? First, it was evident that the amount of heifer raising activity and cull rate were related to one another. Regardless of whether heifers are purchased or raised, this will affect expenses in the form of purchased feed and labor (heifer raisers) or in replacement expense (non-heifer raisers). As cull rate increases, more animals are needed to maintain herd size, driving subsequent increases in one of these cost areas. This last statement can be observed by looking at the high cull rate group posting the highest adjusted replacement expense (\$1.40 per cwt. milk sold) with heifers per cow (0.46) between the two other cull rate groups.

Second, higher cull rates directly impact the ability of the business to retain profits. This can be seen by looking at the operating profit margin. The high cull rate group posted a 7% operating profit margin, 3 percentage points below the 10% of the low cull rate group and 5 percentage points of the medium cull rate group. The next article in this series will explore this difference in greater detail.

How well is cull rate controlled on your dairy business? Do heifer raising activities mask the costs of problems with a high cull rate or can your business sell excess replacements at current premium prices (or use them to internally expand)? Participants in the Dairy Business Analysis Project are able to directly compare their results to those presented in this and other articles. For more information about the participating, check out the project website (URL <http://dps.ufl.edu/DBAP>).

Dairy Business Analysis Project 1998 preliminary summary information by cull rate¹ group.

Category (per cwt. milk sold)	Less than 30%	30-40%	Greater than 40%
Number of dairies	9	11	15
Total revenues	19.09	20.10	19.09
EXPENSES			
Personnel	1.71	2.91	2.31
Purchased feed	7.15	8.29	7.84
Crops	0.19	0.19	0.43
Machinery	0.87	0.78	0.77
Livestock	1.69	1.48	1.53
Marketing	1.38	0.95	0.97
Real estate	0.67	0.54	0.67
Interest	0.88	0.81	0.63
Other	0.71	0.69	0.81
Machinery depreciation	0.55	0.32	0.43
Building/improvement depreciation	0.12	0.25	0.16
Livestock depreciation	1.25	0.80	0.78
Total expenses	17.16	18.01	17.35
Net farm income from operations²	1.93	2.09	1.74
Number of cows	1,071	934	992
Number of heifers	354	525	556
Milk sold per cow (pounds)	17,172	17,799	15,554
Cull rate ¹	24%	37%	49%
Heifers per cow ³	0.28	0.56	0.46
Adjusted replacement expense per cwt. milk sold ⁴	\$1.03	\$0.63	\$1.40
Average total assets per cow ⁵	\$2,703	\$5,224	\$4,051
Average total liabilities per cow ⁵	\$1,804	\$1,579	\$1,354
Rate of return on assets ⁶	11%	10%	8%
Operating profit margin ⁷	10%	12%	7%
Asset turnover ratio ⁸	1.25	0.75	1.05

¹Cull rate was defined as the total number of cows that died or were sold during the year divided by the average number of cows.

²Net farm income from operations was computed as accrual adjusted revenues minus accrual adjusted expenses. This represents the return to unpaid management and capital.

³Heifers per cow was computed as average number of heifers divided by the average number of cows.

⁴Adjusted replacement expense was computed as expensed purchases plus depreciation less the loss on sales of capital livestock. The gain/loss on sales was determined by comparing beginning and ending capital livestock inventories to capital livestock purchases, sales, and depreciation.

⁵Balance sheet information computed as average between beginning and ending values for year divided by average number of cows.

⁶Rate of return on assets was calculated by adding interest expense to net farm income from operations, subtracting a \$50,000 charge for unpaid management, dividing the remainder by ending total assets.

⁷The operating profit margin was determined by adding interest expense to net farm income from operations, subtracting a \$50,000 charge for unpaid management, dividing the remainder by gross revenues.

⁸The asset turnover ratio was calculated by dividing gross revenues by average total assets.