Are You Efficiently Replacing Your Herd?

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Introduction

The top 3 costs of producing milk on most dairy farms in the U.S. are feed costs, replacement costs, and labor costs. Normally expressed on a hundredweight basis, these 3 key areas are greatly impacted by management and herd performance.

Conceptually, replacement cost is the cost of maintaining herd size and structure.

Although dairy accountants have various methods to determine replacement costs, all methods are basically similar in concept. The formula [(value of cows sold - cost of replacement)/ cwt milk sold] is the basis for determining replacement costs. Often, cull rate or herd turnover is used to measure herd health and replacement success. When fully considering the concept and implications of replacement cost, it becomes obvious that cull rate or any measure of herd turnover is a poor proxy for herd health or cost of maintaining herd size. The best measuring stick of successful herd replacement is replacement cost/ cwt, and a reasonable goal in most areas of the country is <$1.50/cwt.

Since it is normally expressed on a hundredweight basis, replacement cost is size and production neutral. It can be compared for herds milking 100 or 10,000 cows, or for herds milking 50 or 100 lb/day. In the simplest of terms for a 1000 cow herd, replacement cost is the cost of keeping 1000 cows in the herd day after day.

Cash Method for Determining Replacement Costs

The cash method for determining replacement costs utilizes the following formula:

$$\frac{\text{(cost of raising or purchasing replacements) - (cull cow income)}}{\text{cwt of milk produced}}$$

The first part of the numerator is "*cost of raising or purchasing replacements",* which includes all costs incurred for getting an animal to the day of calving. For home raised heifers, this includes all costs from birth until day of calving, and includes feed, labor, vaccines, health treatments, equipment costs, etc. To answer the question "Should an expense be included in replacement costs?", consider if this cost would go away if the heifers were off-site. If the answer is yes, then it should be part of the replacement cost. For purchased heifers, it includes all costs involved with purchasing the animal, including hauling and commissions. It also includes the costs incurred from the time of purchase until calving, such as feed, labor, and health costs.

The second part of the numerator is "*cull cow income"*, which includes the revenue received from selling cull cows and cull heifers and the revenue received from selling heifers for dairy purposes. In a situation where all heifers are purchased, the value of heifer calves sold can be included in the value of cows sold.

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Comparing Herd Scenarios Using the Cash Method

Table 1 illustrates replacement costs for four 1000 cow herds with varying cull rates, death loss, and production levels. The 4 herds in Table 1 dispel some of the myths related to replacement costs.

Myths Dispelled from Table 1.

- *Myth #1: High cull rate means high replacement costs.* This is often true but not always. Herd D is a high-producing herd that has excellent herd health. Death loss is relatively low and the cull cows are valuable. The dairy ships a lot of milk, which dilutes the replacement costs over more hundredweights.

- *Myth #2. Low production is not a viable business model.* A low production, low input model can be very successful, provided that feed, labor, and replacement costs are low. Lower producing herds can achieve low replacement costs by having low death loss, low cull rate, and high quality culls. Herd C is an example of this.

- *Myth #3. A dairy only sells milk.* Dairy farms also sell a lot of beef. The quality of cows being sold greatly impacts cull cow income and replacement costs. Selling fat, late lactation cows is very different from selling skinny fresh cows or thin lame cows. The high death loss and low value of culls is hurting Herd B.

- *Myth #4. Lowering cull rates will always lower replacement costs.* Depending on market conditions, simply lowering cull rate may not improve replacement costs. Keeping low producing cows and holding on to cows too long to where their cull value is lessened will typically not improve replacement costs.

- *Myth #5. Herd health is tied to cull rate.* Low replacement costs result from a healthy herd where management makes good economic decisions on cows, regardless of cull rate. Herd D is a high-producing herd with a high cull rate but reasonable replacement costs. Unhealthy herds like Herd B have higher death loss, poorer quality culls, and higher replacement costs, despite reasonable cull rates.

Table 1. Replacement costs calculated using the cash method for 4 different herds.

	Herd A	Herd B	Herd C	Herd D
Herd size	1000	1000	1000	1000
Milking cows	850	850	850	850
Milk, lb/cow/day	70	70	60	85
Milk, cwt/year	217,000	217,000	186,000	263,000
Cull rate, %	35	35	25	45
Death loss, %	5	10	5	5
$/cull	$500	$275	$500	$500
Culls/yr to sell	300	250	200	400
Replacements, $/head	$1200	$1700	$1100	$1200
# replacements	350	350	250	450
Replacement cost/cwt	$1.24	$2.42	$0.94	$1.29