A MATTER OF CULLING

Economics play a main role in the decision to cull

The time comes when every dairyman will have to decide to keep or remove a cow from the dairy. Ideally that would be a clear-cut decision, but in reality, the variables that need to be considered can lead to an interesting numbers game.

Besides the cow's health and milk production, economic factors, such as current market prices, replacement heifer costs, heifer production and expected market trends, will determine if a replacement will be more profitable for the dairy.

Reasons to cull

"In many cases, cows leave the herd because of a poor transition from dry to fresh," says Michael Overton, DVM, MPVM, a dairy production medicine specialist at the University of California, Davis - Veterinary Medicine Teaching and Research Center in Tulare, Calif. "Culling due to calving problems or deaths associated with metritis are easy to associate with problems during the transition period; in many cases, however, cows that are culled later in lactation due to lameness, reproduction and mastitis may have developed these problems as a direct result of transition issues."

According to 10-year DHI-Provo data[1], the rolling herd average culling rate ranges from 34.3 to 37.3 percent. In a study[2] by the National Animal Health Monitoring System (NAHMS), the top four reasons producers culled were udder or mastitis problems, reproduction problems, poor production and lameness or injury.

"In an ideal world we would have these disease processes under control, and we would do much more culling strictly from a production standpoint," Overton says. "But far too often, health problems, such as lameness, limit our ability or willingness to more aggressively market lower producing cows."

Jerry Olson, DVM, senior veterinarian for Pfizer Animal Health, agrees there may be multiple reasons for culling. It may be a combination of issues that causes the producer to remove the animal.

"You may have to do a mental check to see how many strikes a cow has against her," Olson says. "Does she have a history of clinical mastitis? Is her age a factor? These other reasons help determine whether to cull her or not."

The economics of culling

Both Olson and Overton agree that making the final decision to cull is ultimately based on economics—is the cow profitable for the dairy? Each dairy has an optimal number of cows that enable it to operate at maximum capacity, and each cow occupies a "position" or "slot" on the dairy. To make sure the dairy is running at top production, the individual slots have to be evaluated to make sure the best cow occupies that slot. The current cow's profitability needs to be compared to that of an average replacement heifer.

"Rule number one is to fill all the slots," Olson says. "Then once they are filled, you want them to be as profitable as they can be."

Overton says that due to the previously mentioned health and management factors that may force some culling decisions, producers frequently keep less profitable, but otherwise healthy cows in the herd too long. Producers will keep cows so that all slots are full because either they don't want to purchase animals or they don't have enough replacement heifers coming in to fill the slots.

When producers look beyond the cash costs, and instead begin looking at the long term economics—e.g., replacement heifer costs, milk prices, beef market value—they may realize that it's advantageous to purchase additional replacements. When milk prices are high, the replacement needs to produce less extra milk to pay for herself to warrant the earlier cull of another cow.

"Typically the replacement is going to cost the dairyman, on average, somewhere between $1.50 to $2.00 per day of her life," Overton says. "Depending on the price of milk, the price of feed and the expected productive life of the cow, the amount of additional (or marginal) milk that needs to be produced could vary anywhere between 15 to 25 lbs per day above that of the cow she is replacing." (see calculations example below)

Unfortunately, Overton says, dairymen try to keep all the cows they can when milk prices are high because they want to send as much milk flow off the dairy as possible. Although it may seem like the right short term answer, the better strategy may be to market the poor producers and replace them with higher producing animals, especially if the milk price is expected to remain high.

Ironically, according to Overton, a similar situation happens when prices are low. A producer may not want to sell animals because it costs much more (in terms of milk) to replace them. However, a cow will eventually go below her break even point; then it can be more difficult to replace her because of low prices and the additional amount of milk that is required to pay for that animal.

In addition to asking producers why they culled, the NAHMS study[3] investigated when in the lactation cycle producers are culling. The study analyzed the percent of culls based on herd size and days in milk. Medium and large herds (100-499 cows and 500+ cows, respectively) were more likely to cull in the first 50 days in milk as compared to small herds (less than 100 cows). Furthermore, research[4] by the University of Minnesota shows that 25 percent of culls occur in the first 60 days of lactation.

The number of days in milk when culling occurs is a good indicator of whether the cull was selective or not.[5] Those early in lactation are typically not selective voluntary culls and are of particular concern. Mark Kirkpatrick, DVM, senior veterinarian for Pfizer Animal Health, says culling at this time is usually due to difficulties in calving, troubles with transitioning, metabolic problems or injuries.

"The fresh cow period becomes increasingly critical with a first-calf heifer because she is now at a point where she's starting to pay back her cost of development," Kirkpatrick says. "Good obstetric procedures are a must to assist cows in delivery. Cleanliness and proper lubrication is critical. If proper procedures aren't in place, the cow or heifer may be damaged and have to be culled."

Vaginal tears during delivery may become infected, Kirkpatrick continues, and if left untreated, they can become life threatening. In addition, retained placentas, metritis, hypocalcemia and nutritional deficits can have a severe negative impact on animals in the transition period.

Lameness due to hoof and leg problems, such as foot rot and hairy heel wart, causes significant loss of body condition, reduced milk production and markedly reduced reproductive performance. Another factor to consider is the socialization of the first calf heifer. Heifers are easily intimidated by older members of the herd. If heifers are not segregated, fresh pens are overstocked or the heifers are not acclimated to head locks, these individuals can suffer nutritional deficits and lead to decreased production and increased culling rates.

Late lactation culls are not all voluntary. Some of the most frequently cited reasons for removal are poor reproduction or low milk production. While listed as two separate reasons they may in effect be one and the same. Did the cow have trouble reproducing or did she run out of production trying to conceive? Inefficient reproduction protocols will put good cows at risk for removal simply because they run out of break-even production levels. Observing reasons for both early and late lactation culling may lead producers to change management practices at the transition period, implement systematic breeding programs and improve mastitis control to reduce the number of culls.

Recording culling reasons

Several factors may skew producers' culling records. Kirkpatrick advises producers who re-use ear tags to develop a way to distinguish between the animal that was culled and the second animal wearing the tag. Consider appending the character "X" to the front of an ID if the record system will allow it to create a unique ID. Alternatively, don't re-use tags for 13 months to facilitate analysis of the last year's culling data. Most programs are not set up for the re-use of tags; therefore the system doesn't recognize that a cow has been culled because the number is still in the system.

In addition, Overton and Kirkpatrick say culling records are often times not very accurate because there are multiple reasons for culling, but most record systems only allow for the capture of one reason. Therefore, the reason recorded is subject to the interpretation of the dairyman or the herdsman who is making the cull at that time.

Overton provides a classic example of multiple reasons to cull a cow. A producer has a fourth lactation cow that is somewhat thin; she's 400 days in milk and her milk production is down to 45 lbs; she's not pregnant, and she's lame in the right rear foot. When the cow leaves the dairy, what reason should be recorded for her leaving? Many would code this cull as low milk or maybe as a reproductive cull. However, it could be that the lameness is the ultimate reason due to its negative effect on reproduction and milk production.

"It's difficult to interpret," Overton says. "What is more important, however, is to have monitoring tools on the dairy that identify problems earlier in the process. This will allow producers to address those issues that occurred in the dairy's recent history and are occurring now."

Kirkpatrick says that's one reason he likes the updated 100-Day Contract℠ Manager software by Pfizer Animal Health. Producers can look at culls not only for the whole herd but also for individual cohorts. Kirkpatrick says the cohort analysis is invaluable because it gives more refined, timely data than a yearly analysis.

"The cohort data gives us patterns for culling," Kirkpatrick says. "And we can clearly see the times when a dairy is having the most involuntary culls."

Olson adds that such a management tool can identify an issue the producer was unaware of and motivate him/her to make improvements or changes to practices in order to minimize the number of culls at key production times.

Making the final decision

"Ultimately, all replacements are economic decisions," Overton says. "It's just that we would like to make a better economic decision sooner, if possible."

A producer could keep a cow with severe lameness or mastitis although she would not have very high production. It's an obvious economic decision in this case, he says, but less obvious for many producers is the economic decision to remove a cow that's perfectly healthy but only producing 40 or 45 lbs.

According to Kirkpatrick, being able to decide when the animal leaves the farm allows producers to prep the cow and make sure she is a quality beef animal. He says many producers will bring total mixed ration refusals to those animals once the decision has been made to remove her from the milking string. The ability to decide to remove her from the dairy allows the producer to provide a higher quality product to the market and to obtain higher profits.

"Voluntarily removing her from the herd means two things to the producer," Kirkpatrick says. "He gets the chance to pick which cows are removed and the chance to decide when to remove them. Both of these are critical decisions."

Olson adds that producers have to be careful not to equate the overall culling rate with profitability.

"Producers need to focus on profitability per slot on the dairy," Olson says. "Making sure each slot on the dairy is as profitable as possible will help determine if a cow should remain on the dairy or be replaced."

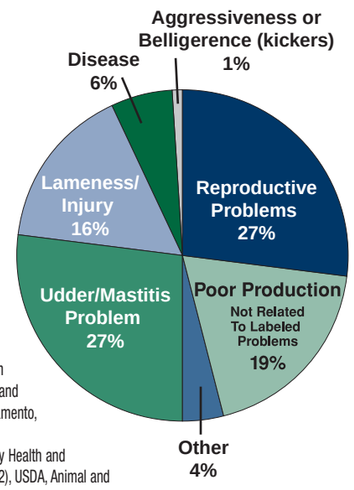
How to calculate the cost of a replacement heifer

Overton uses a standard formula to calculate the cost of a replacment heifer:

Steps		Example
Cost of replacement heifer		$1,850.00
Salvage value of culled cow	-	$400.00
Expected life of cow (in months x 30)	÷	900
Replacement cost per day	=	$1.61
Milk price per lb		$0.12
Marginal feed cost per lb of milk	-	$0.04
Marginal milk value per lb		$0.08
Additional lbs of milk needed per day*		19

**Replacement cost/day ÷ Marginal milk value/lb*

Figure 1.
Percent of Dairy Cows Culled by Producer-reported Reason for Culling[6]



References:

[1,4] Proceedings from the DHI-Provo 49th Annual Herd Management Conference and Workshop (November 6-7, 2003) Sacramento, CA, p. 29.

[2,6] Dairy 2002 Part 1: Reference of Dairy Health and Management in the United States (2002), USDA, Animal and Plant Health Inspection Service, p. 43.

[3,5] Dairy 2002 Part III: Reference of Dairy Cattle Health and Health Management Practices in the United States (2002), USDA Animal and Plant Health Inspection Service, p. 52.