



Extension Extra

ExEx 4019
July 2001
Dairy Science

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

Cow Longevity

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Making sure profitable cows continue to be profitable beyond their second lactation should have a positive economic impact on the net returns of a dairy farm. The rationale behind this statement is that rearing, fixed, and variable costs are spread over three or more lactations. Longevity has been defined as the ability for a cow to delay involuntary culling or to survive to 48 months of age. Productive life could thus be defined as the number of lactations a cow completes, or is expected to complete (death is usually unexpected!), prior to culling.

The economic advantage of retaining a profitable cow as long as possible will obviously be influenced by the feed/milk price ratio during her productive life. Increased longevity will have a positive economic impact when feed to milk price ratio is low. If she maintains a reasonable milk yield, it also makes more economic sense not to cull a cow when beef prices are low. Increased longevity will also allow the farmer to focus on voluntary culling for low productivity and to reduce the number of replacements needed every year.

How Does Genetics Affect Longevity?

Conformation is an important component of breeding and selection decisions in dairy cattle operations. In order to increase profitability, make extended herd life the main objective for genetic selection. The economic importance

of a trait, its heritability, and how well it correlates to other traits should be considered in a genetic program. Several authors have observed how different traits influence the likelihood of a cow staying in the herd.

Hoof traits may have economic effects that can arise directly from the cost of treatment of hoof problems or indirectly from decreased milk yield, lower fertility, earlier culling, and shorter herd life. Higher hoof angles and shorter hoof lengths were favorably related to days open, survival rate, and increase in age adjusted milk yield from first to second lactation (Yoon Seok Choi and McDaniel, 1993).

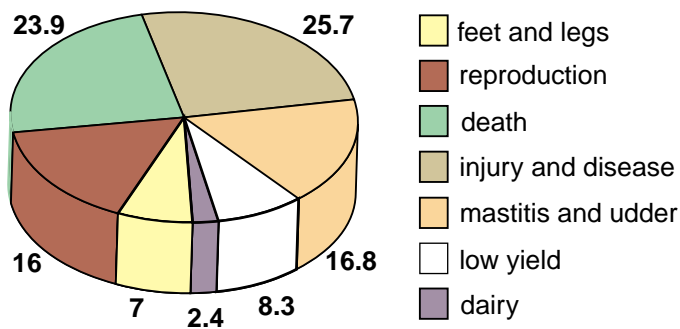
Udder depth and teat placement have been related to longevity (Rogers et al., 1988). Independent of the level of production, rear udder attachment height, fore udder attachment, teat placement, bone quality, and stature were found to have the highest impact in the ability of a cow to remain sound and healthy in a herd. Cows with strongly attached udders were less likely to be culled. Also cows with centered fore teats had more chances of staying in the herd than those with extremely inside or outside teats.

Is longevity hereditary? According to the USDA-AIPL (2000), the PTA for longevity is only 0.09 whereas the PTA for body size composite is 0.40. What this tells us is that management is more important than genetics in determining if a cow will stay in the herd for one more lactation.

Environmental Aspects That Affect Longevity

Although the goal is to keep milking cows as long as possible, detect and cull unprofitable cows as necessary. The major reported reasons for cows leaving the herd for a sample of 113 South Dakota dairies are shown in Figure 1.

Figure 1. Major Reasons for Culling



Even if cow losses to death, low yield (unrelated to management), and sale for dairy purposes are aspects the producer can't control, they only make up approximately 35% of the total cows culled. From a management stand point, one can probably still intervene at least partially in 65% of all culling reasons. Longevity can be improved if management factors with a high impact on feet and legs, reproduction, and mastitis are identified and corrective measures are taken.

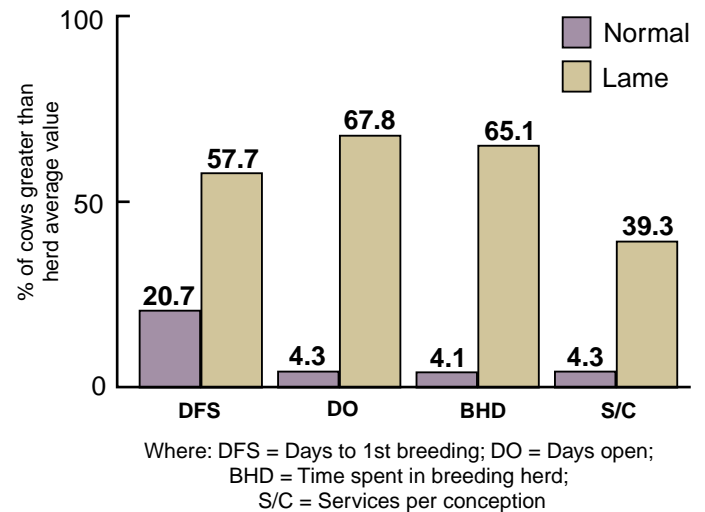
Management Factors and Their Possible Solutions

Housing

Cow comfort is of utmost importance in order to increase longevity. Poorly designed or maintained stalls do not allow cows to lay down as much of the time as needed (usually 12 h/day). Alleys that are too smooth (slippery), excessively abrasive, or wet with manure slurry will also predispose cows to lameness in what has been termed the 'hoof inflammatory syndrome,' characterized by laminitis, white line separation, and heel erosion.

Hoof disorders are among the greatest costs affecting the dairy industry. These can be either direct (treatment) or indirect costs due to decreased reproductive performance, decreased production, and/or premature culling. Work performed at Michigan State University (Sprecher et al., 1997) showed cows were eight times more likely to be culled if they fell into the "lame group" (Fig. 2).

Figure 2. Relationship Between Hoof Health and Reproductive Performance



Feeding

Proper nutrition is a critical component if a cow is to maintain a healthy and productive life. Monitor nutrition programs carefully from the moment a heifer is born and throughout her future productive life. Many health disorders are directly or indirectly related to inadequate feeding and nutrition. Calving difficulty, retained placenta, metritis, and udder edema have all been implicated in one way or another with proper nutrition. Metabolic disorders and their complications such as hypocalcaemia, fatty livers, ketosis, displaced abomasums, acidosis, and laminitis may also result from dietary inadequacies. Insufficient amounts of effective fiber in the diet can result from a low forage/grain ratio, different rates of grain fermentation, or particle size.

Even when all these constraints are theoretically identified and met, mixing, delivering, or dairy cattle sorting of the feed may result in unexpected health problems. Some useful suggestions to troubleshoot dietary problems are to check how many cows are chewing their cud, record changes in dry matter intake, and check the manure for consistency and presence of undigested feed particles. If the producer waits until changes in milk composition are observed, it might be too late to avoid some of these health-related issues.

Climate

Always keep in mind that temperature changes at both ends of the spectrum have an effect on nutritional requirements. These changes should go hand in hand with the corresponding dietary and/or management modifications. If the producer fails to do so, health, current production, and reproduction might be affected, eventually increasing the chances for a cow leaving the herd prematurely.

General milking and management principles

Mastitis is probably one of the major reasons for milk production losses and culling. Jones (1999) suggested that, in general, milk yield in cows with clinical mastitis is depressed by 500 lb during first lactation and 1,000 lb per lactation in second lactation or older cows. Annual culling rates due to mastitis can be as high as 35% of the herd. Some of the differences between high and low SCC herds can be observed in Table 1.

Table 1. Differences in mastitis control strategies between Washington herds with low and high SCC

SCC	High	Low
Average	460,000	175,000
Milk production/cow	17,299	21,021
% Cows infected	14.6	3.0
Differences in management		
Order of milking		High producers first and cows with clinical mastitis last
% Culled because of mastitis	74	50

Source: Modified from Jones, M.G. 1999.

Simple management practices such as milking cows with mastitis last can have a great impact on cow longevity. This can be achieved by following some of the National Mastitis Council (NMC) guidelines for culling cows:

- Cull cows producing more than 20% below herd average.
- Cull first-calf cows producing 30% or more below herd average.
- Cull cows with chronic, clinical mastitis infection.

- Keep no calves from the bottom 15-20% of the cows.
- Sell calves and yearlings from all low-producing cows.

Although some of these guidelines might appear initially to decrease longevity, the opposite will actually be true if they are followed closely. According to the NMC, culling is the most practical means for eliminating chronic infections. There is little justification for keeping cows with consistently high SCC as they can act as reservoirs of infection presenting a risk to non-infected cows in the herd.

Summary

With the deterioration of milk prices, keeping profitable dairy cows profitable as long as possible becomes critical in order to improve the net returns of a dairy farm. This is the result of spreading rearing, fixed, and variable costs over more lactations. Genetics and the environment play a critical role in determining the chances for a cow to enter her third lactation. Although the producer might sometimes be reluctant to do so, culling cows at the right time and for the right reason might be the best way to improve longevity of the herd in the future.

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ExEx 4019 - 150 copies printed by CES at a cost of 9 cents each. July 2001.