Réseau laitier canadien
Canadian Dairy Network

A Closer Look at Longevity

In the minds of many people, especially producers, longevity is the most important trait associated with dairy production. This belief is quite understandable since the length of time that a cow remains in the herd reflects her ability to meet or surpass the herd owner's minimum expectations regarding production levels and components, somatic cell counts and mastitis resistance, conformation, reproductive and calving performance, disease resistance, temperament, milking speed, etc. The bottom line is that a cow would normally stay in the herd only as long as she is perceived by the owner to be profitable and she remains above the culling thresholds for these various criteria.

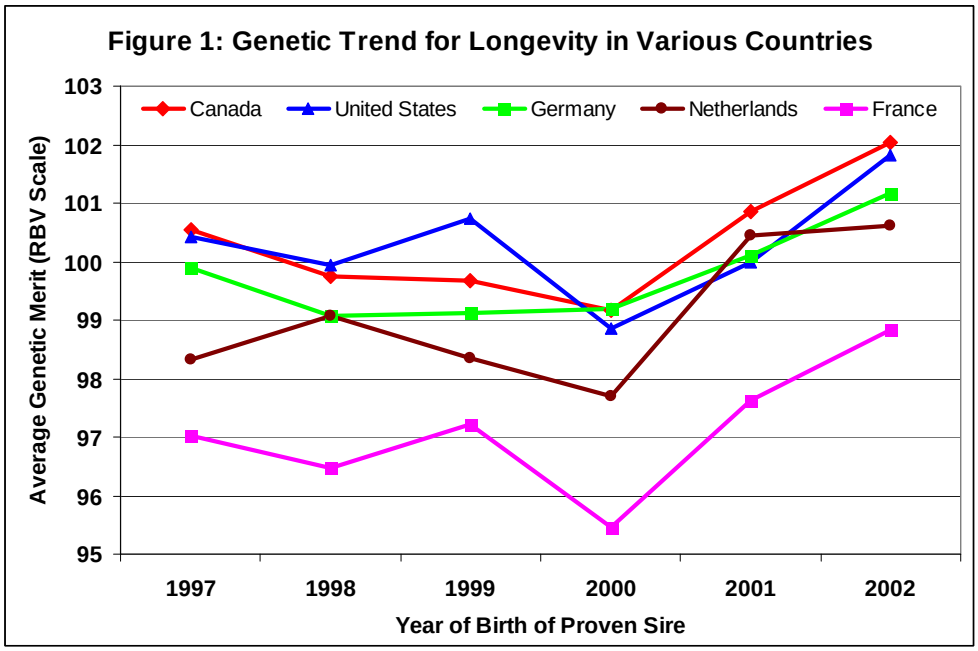
Measuring Longevity

One problem with discussing the topic of longevity is the varying ways to define and measure it. Some people simply want to know the age at disposal, others refer to the length of time between first calving and disposal (i.e.: productive life), and others are most interested in the number of lactations achieved. When combined with production performance as the principle measure of a cow's earned income, total lifetime yields are important to some people whereas others look for profit indicators such as the Profit per day of life value (in dollars) provided by Canadian DHI partners for milk-recorded cows. Each of these measuring sticks is related to longevity, yet they do not mean the same thing and are not truly comparable.

A second problem associated with longevity is that all measures are highly affected by herd management and other non-genetic factors. The easiest example to stress this point, which affected all Canadian dairy cattle populations, was the US border closing in 2003 due to BSE. Since this event abruptly shut down all opportunities for Canadian producers to export surplus animals, the general reaction of producers was to remove older cows from the herd to make room for the group of younger heifers to calve and enter the milking line-up. One must recall, also, that within the supply management system in Canada, it is difficult to significantly increase the allowable levels of production in a short time period. The net impact of this "environmental" factor was a significant decrease in the average age at culling, average length of productive life, average number of lactations, and various other raw measures of longevity. Clearly, the genetic potential of Canadian dairy cattle did not suddenly change with the border closing and this example demonstrates why such phenotypic measures of longevity are not comparable across countries.

Across Country Comparison

Given the fact that each country has its unique situation in terms of herd management, environmental and political factors that affect longevity, the **only** way to make comparisons across countries is on the genetic level. Figure 1 provides the genetic trend realized in various countries based on their respective pool of proven sires. Only birth years from 1997 to 2002 are presented to ensure that a sufficient number of bulls with actual daughter survival data were used for each country and year of birth.



In most countries, including Canada, there was a negative genetic trend for cohorts of A.I. young sires born up to 2000, but desirable genetic trends afterwards. The upward genetic trends for bulls born after 2000 is a reflection of increased attention placed on longevity (i.e.: Herd Life in Canada) for the selection of sires of sons by A.I. organizations globally and in national selection indexes, such as the LPI formula. While the countries with major Holstein populations presented in Figure 1 all have similar rates of genetic progress for longevity in recent years, Canada remains world leader for offering superior genetics for this trait.

A True Phenotypic Measure of Longevity?

As outlined earlier, longevity in the dairy herd is a unique trait. There are many raw, phenotypic measures but they are not truly comparable since they are subject to many outside forces that affect producer decisions regarding herd disposals. From a genetic perspective, the aim is to breed dairy cows that will have the genetic potential to withstand any voluntary culling. Given that voluntary culling does occur in all dairy herds, which prevents cows from staying in the herd as long as they are physically able to, perhaps the best measure of longevity in a population is the average age of cows that die of natural causes such as old age? Using this measure of longevity, the average Holstein cow in Canada has the potential to survive to 9.1 years of age, 6.8 years of productive life and just shy of six lactations of production.

In terms of bull proof expression, the Relative Breeding Values (RBVs) used in Canada for Herd Life have a breed average of 100 and an approximate range from 85 (undesired) to 115 (desired). To facilitate the interpretation of Herd Life evaluations, CDN provides five measures of actual daughter survival on a sire by sire basis, along with breed averages for comparison. Of these five measures, those of greatest interest to producers are the daughter survival rates to each of second, third and fourth calving, which average 70, 50 and 31 percent, respectively, for the Holstein breed.

Summary

There can be no doubt that longevity is an important component of profitability in dairy cattle production. Longevity, however, is not a simple trait in itself and is more a reflection of a successful combination of many other traits. Phenotypic measures of survival are numerous but are not comparable across populations, and especially not across countries, due to voluntary disposals by producers and various environmental factors affecting such decisions. For this reason, focus should be given to genetic comparisons across countries, which indicate desired progress in recent years for most major Holstein populations globally, with Canada leading the way. Genetic evaluations for Herd Life in Canada provide an easy way to identify superior sires and Canadian Dairy Network (CDN) also provides actual daughter survival rates for easy interpretation.

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