

Selection for Longevity in Canadian Dairy Cattle

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Genetic improvement of longevity involves breeding dairy cows that can produce a live calf, cycle normally, show observable heat, conceive when inseminated, sustain adequate body condition, avoid udder injuries, resist infectious diseases, walk and stand comfortably and produce milk of desirable composition. However, it is difficult to improve longevity through genetics alone. It has low heritability so that breeding for this trait results in only small improvements over time. Moreover, actual longevity measurements can be obtained only when a cow is culled or disposed of, after selection decisions have been made. In order to obtain reliable information for sires on the longevity of their daughters, it is necessary to wait until a minimum number of daughters have been culled or have died. These evaluations may be available too late to be useful in breeding programs. Instead, genetic evaluations for direct longevity that are based on the number of culled daughters is combined with indirect information based on early predictors of future longevity, namely conformation, reproduction, health and management traits.

More than one million records were used to study the association between conformation traits and longevity of Canadian dairy breeds. The study showed significant relationships between conformation traits and longevity of cows. Improvement for conformation traits, through either genetics or management, would increase the longevity of cows. In other words conformation traits can be the key to breeding dairy cattle that will last longer in your herd. At the implementation of the Lifetime Profit Index (LPI) in Canada in 1991, conformation traits (indicators of herd life) had 40% emphasis of the overall index. Later on, in 2001, Herd Life was included in the LPI with a weight of 8%, and, at the same time, udder health was also included in the LPI with 5% emphasis. Thus, the emphasis in the LPI of traits other than production increased first to 43% in 2001 and then up to 49% in 2008 with the inclusion of reproductive traits. Results from a second study demonstrated that the increased amount of emphasis on indicators of longevity in the LPI formula by the Canadian dairy industry has resulted over the past 15 years in a slow but steady genetic improvement for longevity in Canadian Holsteins, approximately one genetic standard deviation.

In conclusion, conformation traits have played a role as indirect predictors of herd life in Canadian dairy breeds and the relative weight of selection for longevity in the Canadian breeding strategy has increased over time.