

Direct health traits and rearing losses in the total merit index of Fleckvieh cattle

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Routine genetic evaluations for the direct health traits mastitis, early reproductive disorders, ovarian cysts and milk fever were introduced for Fleckvieh cattle in 2010. Since 2013, udder and fertility health traits have been included in the total merit index (TMI) through the udder health index and the fertility index, respectively. For rearing losses, a routine genetic evaluation is currently under development. For the definition of the future TMI, economic values were (re)estimated and the index calculation will be optimized. In order to analyze the genetic gain particularly for fitness and health traits, different weightings of direct health traits were compared. According to the derived values, the relative economic weights per genetic standard deviation would sum up to 19% for all health traits including mastitis, SCC, early reproductive disorders, cysts, milk fever and ketosis. For rearing losses, the relative economic weight is approximately 4.4%. If all traits from the current TMI and the fitness traits ketosis, milk fever and rearing losses were considered, the relative weights of dairy:beef:fitness were 37:13:50. Genetic gains for most traits would be above zero. For fertility, the index weight needs to be increased to achieve noticeable positive genetic gain. As high genetic gains may be obtained for dairy traits due to genomic selection, their weights could be slightly decreased in favour of fertility or other functional traits. This follows breeders' as well as consumers' demands.

Dairy breeding programs focusing on animal welfare and environment – a simulation study

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Swedish dairy producers were asked if 15 given breeding traits are related to productivity, animal welfare or environmental impact in a web based questionnaire. These traits were chosen so that they represent production, functional, traditional and potential future breeding traits. A trait was categorized as either an animal welfare (calving ease, claw and leg health, longevity, mastitis-, disease- and parasite resistance), environmental load (feed conversion, longevity and methane emission) or productivity related (milk yield, longevity, fertility, calving ease, mastitis- and disease resistance, claw and leg health, temperament) if more than 40% of the 468 producers considered the trait to be much related to welfare, environmental load, or productivity. Three breeding program scenarios reflecting producers' preferences regarding; (1) productivity – modeling the genetic change seen the last two decade; (2) animal welfare – 50% of the economic weight proportionally on productivity traits and 50% on animal welfare traits; (3) Environment – 50% economic weight on productivity traits and 50% on environmental traits were developed. The scenarios were simulated for a population of 140,000 Swe. Red dairy cows and compared using the program ZPLAN. Genetic parameters were collected from literature. Results showed that the breeding program emphasizing animal welfare increased the genetic improvement in the animal welfare traits compared to the productivity scenario but had unfavorable genetic change in milk yield. The simulation also showed favorable correlated genetic responses for fertility, temperament and methane emission. The scenario emphasizing reduced environmental load showed genetic improvement in traits categorized as environment related, with maintained genetic improvement in milk yield comparable with the productivity scenario.