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How to select a heat tolerant cow?

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Genetic selection usually works by redirecting energy to production traits at a cost of secondary traits. Any deterioration is either unimportant or compensated by improved management, with some improvement due to the selection index. Genomic selection intensifies the selection process, possibly in both directions. Continued selection for production caused deterioration of heat tolerance, however, cows produce well with heat mitigation devices such as fans and sprinklers. Such devices are justified in areas with a long hot season and high milk prices, and less otherwise. Methodology exists to calculate GEBV for heat tolerance, however, cows that maintain production during the peak of heat stress are more likely to be disposed of, and effects of calving during the peak of the heat cycles can be permanent. Both risks depend on the presence of heat mitigation devices. In environments where intensive management is too expensive, an ideal cows would maintain production during favorable weather, would reduce production during heat stress, and would resume production after the stress is over. Such cows would be identified by larger than expected fluctuations during the lactation. Such fluctuations need to be associated with stress, as general fluctuations are usually associated with health problems (canalization).

Economic weights for traits of economic interest in dairy sheep breeding programs under the context of climate change

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Developing a breeding strategy involves the definition of a breeding objective and the estimation of economic weights of the traits that conform to the breeding objective. Climate change (CC) impacts production systems in many ways; on one side CC currently affects individual performances but also it creates a lot of uncertainty about future climatic and economic scenarios. This work aimed at estimating the economic weights of main traits of economic interest for dairy sheep breeding programs under different climatic scenarios. A deterministic bioeconomic model was developed to estimate the profit of a typical local sheep production system and derive economic values under some future breeding scenarios. Economic values of 0.96 €/l; 17.5€/%; and 18.5 €/% per ewe for milk yield and fat and protein contents, respectively, were obtained for the current scenario. Decays in production due to more frequent exposure to high temperatures in the mid-term were estimated at 0.5 to 1,5%, which would result in a reduction in the economic value of 1.24, 2.08 and 1.76% for milk yield and fat and protein contents, respectively, and this reduction could exceed 10% under worse scenarios. Consequently, it is crucial to assess potential economic losses in future CC scenarios and estimate the economic value of each breeding objective component. This approach is vital for adapting breeding strategies to forthcoming climatic scenarios, by putting emphasis on traits related to adaptation over those solely focused on production.