

Future needs and challenges in dairy cattle breeding – based on a survey with Austrian farmers

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Changing circumstances of production and the possibilities of genomic selection are the reason for the project 'OptiGene' to redesign breeding goals and breeding programs for the main dairy breeds in Austria. To observe the needs and challenges of Austrian cattle breeders, an internet survey with about 30 questions was conducted from March to August 2012. The main topics of the survey were the individual breeding goal of the respondent, usage of services offered by breeding organizations and also agricultural and socio-political topics. The results show that the individual breeding goals of Fleckvieh and Brown Swiss breeders have shifted mainly from dairy towards fitness traits during the last decade (dairy: -8, beef: -6, fitness: +10, conformation: +4 percentage points – on average). The ranking of the single traits in the individual breeding goal confirms this observation: The top 5 individual breeding goals are fertility, longevity, udder conformation, udder health and fat/protein-kg. Being asked for the most important traits for bull selection, the farmers answered: udder conformation, fertility, fitness index, longevity and somatic cell count. The farmers were also asked for the relevance of new traits in a future breeding goal. With little differences between breeds claw health, inter- and cross-sucking and metabolism ranked first followed by feed and energy efficiency. Asked for the biggest challenges of Austria cattle breeding in the next 10 years, breeders ranked increasing energy costs, low prices of agricultural products and increasing costs for crop first. The participatory elaboration of the breeding goal is the base to optimize the different steps in the breeding process to achieve the long-term genetic gain desired by the farmers.

Breeding pigs for heat tolerance: challenges to face

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Heat stress (HS) impacts the efficiency of pig production systems, by decreasing animal performance and welfare. Above 24-25 °C, feed intake decreases to reduce body heat production, with subsequent negative impacts on pig performance and farmer profit. Finding solutions for improving heat tolerance (HT) in pigs is crucial, particularly with the expected effects of climate change. As observed in other livestock species, previous studies have shown genetic variability of HT in growing pigs and sows. Evaluating and potentially taking into account GxE interactions in HT is crucial, as they can reflect animal difference on the ability to cope with HS. A first strategy, to improve HT, already used by some international breeding companies, consists in selecting pigs for usual performance traits in hot environments. Another strategy would be to find indicators of HT and include them in the breeding goal or use as additional selection criteria so as to obtain robust pigs that maintain high performance levels in different environments. A major challenge for including HT traits in breeding schemes is to define relevant indicators of HT to be routinely recorded in most selection environments. Moreover, the correlation between HT predictors and performance traits must be assessed. Results generally indicate unfavourable correlations. Depending of the level of antagonism, different strategies could be used to implement HT breeding schemes. An estimation of the economic value of breeding for HT is needed to properly weigh them in selection index and to choose between selection strategies. Finally, genome-enabled technologies will facilitate the selection of HT pigs by providing significant associations with molecular markers. We will review these different aspects to propose strategies for breeding for heat tolerance in pigs.