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Session 14

Theatre 11

How Corsican cattle breeders consider the adaptation of their breed: an exploratory approach

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To understand the genetic basis of adaptation, The GALIMED project proposes a multidisciplinary approach on 14 cattle breeds in the Mediterranean zone. This project combines population genetic, environmental, and livestock farming systems data to characterize the cattle and its management practices, quantify diversity, detect genetic variants and selection signals associated with adaptation to harsh conditions. This adaptation relies on both natural and artificial selection, linked with breeders' practices. We present here how the breeders considered adaptation of the Corsican cattle breed within their livestock farming systems. Our work is based on 20 semi structured interviews of breeders. They were chosen so as to cover the diversity of situation in the island (mountain and plain breeders, different geographical area, breeders in and out of the breed association). The interviews concerned the farming systems and the point of views of breeders about the breed and its adaptation. A thematic analysis of interviews has been conducted. We identify topics and traits of adaptation expressed by the breeders, and make counts to appraise their importance among their discourse. The topics for the characteristics of adaptation are, ranked by order of importance: autonomy for feeding, morphology and visible aspect, reproduction, adaptation to the environment, spatial and social behaviour, resistance to biotic and abiotic aggression. The criteria corresponding to each topic (abilities of the animals within the breed) are detailed and discussed. We finally discuss how such an approach could be improved to be applied on other breeds, and in particular for the other cattle breeds concerned by the GALIMED project, to implement a comparative approach.

Session 14

Poster 12

A preliminary investigation into GxE in first lactation South African Holstein cows

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Genotype × environment interaction (G×E) in dairy cattle is a contentious issue that is usually ignored in genetic evaluations. It can, however, play a significant role in the accuracy of breeding values in different environments, if it exists, with a negative impact on genetic response when it is ignored. The purpose of the study was to investigate a possible genotype by environment interaction in first calf South African Holstein cows for both production and reproduction traits. Data from 100,975 cows on a total mix ration (TMR) and 22,083 pasture based cows were used. They were the progeny of 4,391 sires and 84,935 dams produced over a period of 11 generations. Traits analysed were milk production (corrected to a 305-day equivalent) and age at first calving (AFC). Both were recorded over a period of 30 years from 1980-2010. Production or AFC in each environment (TMR vs. pasture) was treated as a separate trait. Bivariate analyses, using an animal model in ASREML, were used to obtain genetic correlations between the traits measured in each environment. The genetic correlation for milk production measured in the two different environments was 0.90 (0.027) and that of age at first calving 0.28 (0.12). The heritability estimates for milk production were 0.23 (0.008) under the TMR system and 0.32 (0.015) for the pasture based system, while the estimates for AFC were 0.063 (0.005) and 0.055 (0.009), respectively. The rather large scale effect in the heritability (0.23 → 0.32) as well as the correlation of less than one for milk production between the two environments indicates that a GxE might exist. However, the low genetic correlation between the two environments for AFC is much more real and indicates that GxE should be taken into account when sire selection are done.