Towards preventive health management in native dual-purpose cattle via novel breeding strategies

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This contribution reflects the major scientific objectives of the collaborative EU-project 2-ORG-COWS. The objective of the project is to provide an in-depth evaluation of novel functional traits and associated environmental descriptors as a prerequisite: (a) for the implementation of breeding strategies for local dual purpose cattle kept in grassland systems; and (b) for preventive livestock health management. Based on an interdisciplinary research design involving the disciplines animal breeding, animal husbandry, animal nutrition, and precision livestock farming, the most relevant European dual-purpose cattle breeds will be evaluated with regard to internal and cross breed comparisons focusing on: Novel traits, economic evaluation criteria, selection signatures and biodiversity, and different breeding strategies. The central theme for identical and harmonized health trait recording across country borders is based on sensor technology, which will be implemented in dual-purpose cattle experimental and contract herds. Sensor technology allows longitudinal trait recording of cow behavior, health and welfare traits (e.g. grazing activity, rumination) in close intervals. Management oriented sensor software delivers a large amount of validated data (health, behavior, etc.) from all cows in the experimental herds, defined as level I for trait recoding. An evaluation of indicator traits within a limited set of practical (contract) herds with dual-purpose breeds addresses level II. Most reliable indicator traits will be used for a population wide recording scheme (level III), and also including conventional control breeds for studies on genotype $\times$ environment interactions (G$\times$E). Studies aiming on the identification of G$\times$E imply a detailed characterization of environmental descriptors (rating of the grassland system, ingredients and quantities of the feed ration, meteorological data) on an identical scale all across Europe.