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Towards new breeding tools in a context of climate change: first results of the RUMIGEN project on new phenotypes for heat tolerance traits

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Session: Sustainability in the context of animal recording

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ABSTRACT

The objective of the RUMIGEN project, financially supported by the EU, is to develop breeding programs aiming for resilient and efficient cattle production, managing the trade-offs between production and resilience to extreme climate conditions. RUMIGEN is designed under a multi-disciplinary approach that mixes competencies in both genetics and social sciences. The genetic approach aims to enhance genomic selection using three levers: quantitative genetics, genome editing, and epigenetics.

One of the objectives of RUMIGEN is to enlarge selection criteria and to provide genomic tools to select dairy cows tolerant to heat stress. Studies are dedicated to the definition of heat-tolerance traits based on production, reproduction and health records, as well as to the study of the trade-offs between these traits and those already selected. In addition, RUMIGEN also aims to analyze the effect of heat stress during the gestation on the performance of the next generation. These analyses are based on performances recorded in commercial herds in France, Spain and the Netherlands (i.e., milk performances and somatic cell scores recorded by Milk Recording Organizations, and performances on fertility derived from IA events), in combination with meteorological data obtained from the corresponding Meteorology Agencies. Records are associated to meteorological information at the farm level, in order to measure the impact of heat stress. First results obtained in different breeds and in a large range of farming and climatic situations showed that the combination of both types of information was relevant to measure the decline of performances due to heat stress and to define heat stress indicators and new traits for future breeding tools.

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