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**Health and welfare monitoring of dairy cows through an integrated data platform focusing on heat stress**

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**Abstract:**

**Background/Objective:** The performance and health of dairy cows can only be maintained at high levels if the farmer responds early to health and welfare problems. Dairy cows are primarily influenced by their environment and management. The most important factors are housing and milking systems, feeding and daily treatments, climatic parameters and heat stress management. The aim of the present study was to combine all the different parameters (animal, climatic and genetic information) in the central DigiMuh Cloud to analyze the individual responses and resilience of cows.

**Methods:** The study was conducted in a naturally ventilated dairy barn in Brandenburg, Germany, as part of the DigiMuh project (BMEL/BLE funded). All lactating cows on the farm were equipped with a rumen bolus (smaXtec, Austria) and some cows additionally with a respiration rate sensor (Gouna, Germany). Data from the herd management system, from a body condition score camera and climatic parameters (air temperature, relative humidity, wind speed, solar radiation, status of the fans, curtains and sprinklers) were also recorded.

**Results:** Barn and animal data from the various digital applications have been interfaced into the DigiMuh Cloud (Wille Engineering, Germany). This helps both farmers and researchers to better manage, analyze, and interpret the individual pieces of information from the previously isolated applications and provide it in real time in the form of an application-oriented dashboard (Dr. Hornecker, Germany).

**Conclusion:** The combination of all data in one cloud greatly facilitates analysis of individual animals and herd responses, with a current focus on heat stress responses in dairy cows. A long-term goal is to improve heat stress tolerance through genetic selection, using the extensive phenotypic and genotypic data to provide tools for selection decisions.

**Keywords:** early warning system, animal welfare, dairy cow, heat stress, data platform