

MULTIFACTOR ANALYSIS OF BEHAVIORAL PATTERNS IN PASTURE-RAISED LIVESTOCK USING DATA FROM DYNAMIC SENSORS

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Abstract. *In this study, we present a multifactor analysis of the behavior of free-range grazing cows using data collected from sensors mounted on collars on the animals. GPS, accelerometers, and other dynamic data were used for the automated classification of key behavioral states such as grazing, lying, ruminating, walking, running, and sleeping. By combining spatial and temporal information, as well as movement intensity, an analytical model was developed to assess the condition and welfare of the animals. Formulas for calculating distance traveled, temporal analysis of states, and classification rules based on activity thresholds are presented. Visualizations include time diagrams of behavioral states, GPS tracks, and pie charts of activity distribution. The results demonstrate the potential of sensor technologies for early detection of behavioral deviations, optimization of pasture management, and improvement of animal welfare.*

Key words: Multifactor Analysis, IoT, Sensor Technologies, Behavioral Patterns

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