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Nutritive value of ensiled Italian ryegrass and winter cereal mixture in dairy cow
MASTER'S THESIS (MSc)

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ABSTRACT

Climate change, particularly heat stress, is causing economic losses in the global livestock sector, particularly in regions like the Carpathian Basin and extreme heat occurrences in this region are anticipated to increase markedly by the end of the 21st century. The primary goals of this study were to determine the nutritional composition, fermentation characteristics and microbial counts of winter cereals and ensiled Italian ryegrass in dairy cow nutrition. Two distinct winter cereal-based diets were used in the study: Texas (which included 50% of two cultivars of winter triticale, 40% of winter barley and 10% of winter wheat) and Montana (55% of three varieties of Italian ryegrass and 45% of winter oats). The trial was carried out on a medium-sized farm at the Hungarian University of Agriculture & Life Science Kaposvar.

Results on the nutritional composition show that Montana exhibited higher DM (33.94%), CP (11.18%) and TS (6.18%) at the end of the fermentation period as compared to Texas with DM (30.32%), CP (9.36%) and TS (5.28%) indicating better nutrient availability and digestibility. The fermentation process proved effective in both Texas and Montana, with lactic acid production resulting in pH reductions to 4.47 and 5.04, respectively. Ethanol presence indicated elevated mould and yeast activities in Montana (7.27 Log₁₀ CFU/g) relative to Texas (4.53 Log₁₀ CFU/g). Furthermore, microbial counts (Log₁₀ CFU/g) in both mixtures (7.29 for Texas and 8.73 for Montana) surpassed European standards, underscoring potential risks for feed contamination. In conclusion, both silage mixtures demonstrated potential as high-quality feed alternatives for dairy cattle, especially in regions susceptible to drought, despite certain limitations. Additional research is necessary to improve the incorporation of winter cereals and Italian ryegrass within crop rotation systems.