Summary

The effect of additives with different proteolysis inhibition mechanisms on the composition of protein fractions, silage microbiome and rumen degradability of alfalfa protein

The main objectives of this study were to evaluate the effectiveness of additives with different mechanisms of proteolysis inhibition by analyzing the composition of protein fractions, *in vitro* rumen degradability of protein and the microbiome of alfalfa silage. Additional objectives were to determine the optimum level of additives, to evaluate the feasibility of using faba bean husk as a silage additive, and to determine the effectiveness of dry ice depending on the degree of alfalfa wilting before ensiling

The above objectives were achieved in three research tasks. Alfalfa was ensiled in different proportions with bird's-foot trefoil (research task I), faba bean husk (research task II) and dry ice at three degrees of wilting of the plant material (research task III).

Based on the results, it should be concluded that the most effective addition in reducing proteolysis of ensiled alfalfa was the co-silage with bird's-foot trefoil in a 50:50 ratio, as well as the application of dry ice addition at the level of 1 g and/or 2 g to the wilted alfalfa. The addition of faba bean husk proved effective in inhibiting proteolysis, but only at levels of 18.0% and 24.0%, which lowered the silage value and increased the proportion of the indigestible fraction of crude protein. Alfalfa silage with bird's-foot trefoil had the lowest *in vitro* degradability of protein.

Key words: alfalfa, proteolysis, protein fractions, *in vitro* degradability, silage microbiome