WISCONSIN - Co-Ensiling Temperate Grasses Could Preserve Protein Quality

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Preserving high-quality forage in the north-central U.S. is a challenge due to potentially high levels of protein degradation during ensiling. Some forage species, such as red clover, produce high levels of polyphenol oxidase (PPO) and *o*-diphenols which inhibit protein breakdown during the ensiling process. Previous work has shown some temperate grasses (i.e., orchardgrass and smooth bromegrass) contain high levels of PPO, but insufficient *o*-diphenols to inhibit protein breakdown during ensiling. Other grasses such as tall fescue and timothy contain high levels of o-diphenols, but no PPO activity.

Experiments were conducted to evaluate the feasibility of co-ensiling a high-PPO grass with one that contains high levels of *o*-diphenols. Forages were cut, wilted to the appropriate moisture level, chopped, and macerated before ensiling in plastic-wrapped bales. Ensiled treatments contained single forages (controls) and mixtures of a PPO grass with an *o*-diphenol grass. After 30 days of ensiling, silage bales were opened and fed to young lambs. Total feed intakes were measured, as well as feces and urine excretion. Protein-use efficiency was calculated for each feeding trial.

Ensiling a PPO grass with an *o*-diphenol grass increased crude-protein metabolizability by 25 to 90%, depending upon the grass combinations. This work indicates co-ensiling grasses could benefit protein preservation and animal performance.