

Red Clover Silage as a Replacement for Alfalfa Silage in Dairy Cow Diets



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INTRODUCTION

When ensiled, as much as 60% of the crude protein in alfalfa is broken down to non-protein nitrogen (NPN). High levels of NPN depress protein use by lactating dairy cows. Red clover, a forage legume similar to alfalfa, forms less NPN in the silo. However, widespread use of red clover is limited by its lower yield, lower stand persistency, and slower field drying rates. Five lactation trials were run to determine the relative feeding value of alfalfa and red clover silages for dairy cows. Other studies were conducted on the enzyme in red clover that appears to act to reduce NPN formation.



METHODS

1. Alfalfa & Red Clover Field Wilted & Ensiled in 5 Different Years (Fig. 1).
2. 20 to 28 Cows/Trial; "Switch-Back" Trials used (Cows Switched Diets Every 3 or 4 Weeks).
3. Diets Contained 60% Forage, 36% Processed High Moisture Corn, 3% Soybean Meal.
4. Production & Digestibility Measured (Fig. 2 & 3).
5. The Polyphenol Oxidase (PPO) "Browning" Enzyme Measured in Alfalfa & Red Clover Extracts (Fig. 4 & 5)

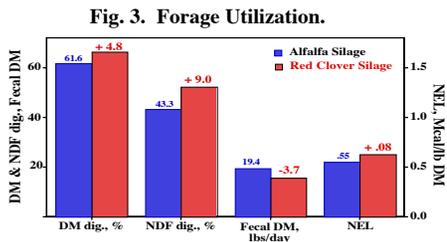
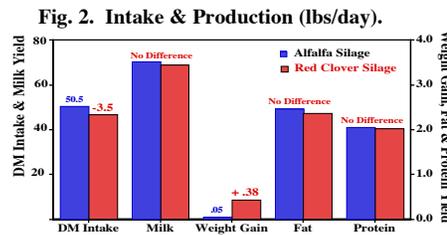
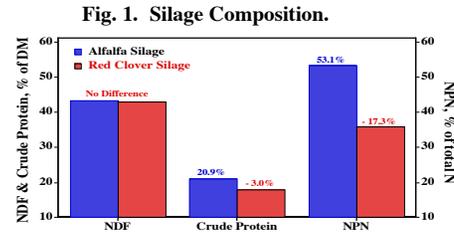
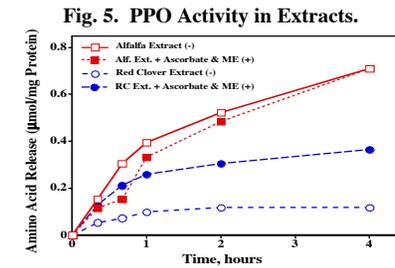


Fig. 4. The PPO Browning Reaction in Extracts.



SUMMARY

Compared to Alfalfa Silage:

1. Red Clover Silage had Equal Fiber but Less Crude Protein.
2. 33% Less Crude Protein was Converted to NPN.
3. Cows Ate Less of Red Clover Diet, had Equal Milk Yields & Produced 19% Less Feces.
4. Digestibility of DM & NDF was Greater on Red Clover.
5. Net Energy was 14% Greater in Red Clover Silage.

Current & Future Research:

1. Red Clover Varieties with Improved Yield & Persistency have been Developed.
2. Work on Transferring the PPO Enzyme to Alfalfa is being Conducted.

