

Feed intake, Digestion, Milk Production, and Milk Composition in Dairy Cows Fed Natural Plant Extracts.

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There is increasing interest in using plant extracts as 'natural' feed additives to manipulate ruminal fermentation and improve feed efficiency in ruminants. Extracts of some plants, e.g., *Yucca schidigera*, have been evaluated for their anti-microbial effects and for their potential to modulate ruminal fermentation and improve nutrient utilization in ruminants. More recently, essential oils have attracted attention for their potential as alternatives to feed antibiotics and growth promoters in livestock. Essential oils are naturally occurring volatile components that can be distilled from plant tissues by distillation methods. Strong anti-microbial effects of essential oils have been demonstrated against a wide range of microorganisms, including ruminal bacteria. Few studies to date have focused on the effects of essential oils on dairy cow metabolism and performance, and none to our knowledge, has compared essential oils against other extracted plant compounds such as yucca saponins extracts or condensed tannins.

The objective of this study was to determine the effects different plant extracts on feed intake, digestion, and milk performance of dairy cows. Four lactating Holstein cows (87 days in milk) used in a 4 x 4 Latin square design were fed for ad libitum intake a TMR without supplementation (Control), or supplemented with cinnamon extract (1 g/day; cinnamaldehyde), yucca saponins (60 g/d; *Yucca Schidegera*), and condensed tannins (150 g/d; Quebracho).

Feed intake averaged 22.9 kg/d and was not influenced by plant extracts addition. Apparent digestibilities of crude protein and fibre were similar between cows fed plant extracts and those fed TMR without additive. Production of milk and milk concentrations of protein and fat were not affected by plant extracts addition and averaged 33.1 kg/d, 3.52%, and 4.31% respectively.

Implications: Although plant extracts have been shown to favourably alter ruminal fermentation in laboratory studies, it may be a challenge to achieve similar results in vivo.