

## **CHANGES IN BACTERIAL DIVERSITY IN THE RUMEN OF SHEEP CONSUMING *JUNIPERUS MONOSPERMA***

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Shrub encroachment and subsequent loss of grasslands is a serious problem for livestock producers in the southwestern United States. One of the main shrub species of greatest concern is *Juniperus monosperma* (JM). A proposed method for reduction of JM encroachment is to allow small ruminants to intensively graze JM infested areas. Juniper shrubs contain secondary compounds classified primarily as terpenes that are antimicrobial in nature and may be detrimental to microbial populations present in the rumen. A reduction in the viability of the rumen microbial population could result in decreased feed digestibility and compromised animal health. A study was designed using five rumen cannulated crossbred wethers (average body weight 55 kg  $\pm$ 15) in a cross-over design divided into two 20-d periods to determine the effect of JM consumption on the diversity of ruminal bacteria. Juniper leaves were harvested and frozen immediately until fed. Sheep were gradually adapted to a diet of 25% JM leaves and 75% buffalo grass hay over a 10-d period (adaptation). Sheep were fed twice daily and unconsumed feed was placed directly into the rumen via the rumen cannula to ensure equal JM intake across treated animals. Rumen samples were collected every 2-d for the duration of diet adaptation and experimental phases of the study (12 total; 6 per phase). DNA was extracted from ruminal samples for denaturing gradient gel electrophoresis (DGGE) analysis. This analysis allows us to monitor changes in the rumen microbial population without culturing the bacteria. Resulting DGGE profiles were used to calculate diversity indices. A baseline sample was collected prior to the adaptation phase and the difference from baseline for each animal during adaptation and experimental phases was used to determine the effect of treatment. All animals increased in bacterial diversity ( $P < 0.05$ ) during the adaptation phase compared to baseline. Treatment did not affect banding richness or Shannon-Weiner index during adaptation or experimental phases. These data indicate that gradual introduction of JM into diets of small ruminants may allow for adaptation to secondary metabolites present in JM by ruminal bacteria.

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## **ASSESSING THE NUTRITIVE VALUE OF ONE-SEED JUNIPER IN SHEEP**

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One-seed juniper (*Juniperus monosperma*) encroachment on rangelands is a problem in the Southwest. A proposed method of juniper control is consumption by small ruminants, such as sheep and goats. The objective of this study was to evaluate effects of feeding