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PLANT AMINES CAN AFFECT RELEASE OF LUTEINIZING HORMONE IN SHEEP

B. B. Carpenter, R. D. Randel, T.D.A. Forbes and D. R. Tolleason

Background. Toxic plants occur in native ranges throughout Texas. In South Texas, Guajillo is a common leguminous shrub which offers browse of high nutritional quality. However, guajillo also contains a class of plant chemicals known broadly as 'amines' which, when over consumed by sheep and goats can cause a type of paralysis. In extreme cases, 50% death losses have been reported. The amine, N-menthyl-B-phenethylamine (NMPA) has been reported to cause elevated levels of noradrenaline (NE). Under certain conditions NE also has the potential to affect the release of the reproductive hormone, luteinizing hormone (LH). Therefore, the goal of this study was to determine if NMPA could affect LH and, if so, whether or not noradrenaline or adrenaline was involved. Our ultimate goal is to evaluate the potential for inhibited reproduction in animals which browse guajillo.

Research Findings. Twenty-seven Rambouillet wethers were used. They were evenly divided into three treatments: TRT 0 (control); TRT 2 (2 mg NMPA/2.2 lbs body weight) and TRT 4 (4mg NMPA/2.2 lbs body weight). They were dosed with NMPA and challenged with a releasing hormone for LH and blood was collected and analyzed for LH, adrenaline and noradrenaline (NE).

We found that in the treated animals, the NE peak blood plasma concentrations were reached more rapidly than in control animals. A fewer number of the treated wethers responded to the releasing hormone with a rise in LH (Table 1). Thus NMPA appears to cause an inhibition of LH release which is associated with NE response.

Table 1. Number of wethers exhibiting LH peaks within 55 minutes post NMPA-dosage

TRT 0	vs.	TRT 2	TRT 0	vs.	TRT 4
(9/9) ^a		(6/9) ^b	(9/9) ^a		(6/9) ^b

X² differ (p <.06)

Application. Because LH is necessary for proper egg development in the female and proper sperm development in the male, it is apparent that guajillo has the potential to affect fertility. Unfortunately, the levels of plant intake necessary to cause this are not currently known.

In South Texas, guajillo is not necessarily undesirable, but consumption is known to increase in overgrazed pastures. Sheep and goats (and possibly cattle) are subject to adverse effects from over consumption. Therefore, managers should bear this in mind when developing grazing systems and/or drought management strategies.

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