David Little Livestock
Range Management Endowment
AT THE UNIVERSITY OF IDAHO

2017 Project Progress Report:
Controlling invasive grass species ventenata (ventenata dubia) invasion in Pacific Northwest rangelands through early-season grazing by goats

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PERSONNEL:

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PRELIMINARY RESULTS for 2017:

BACKGROUND:

Ventenata *(Ventenata dubia)* is an exotic annual grass that has infested rangelands in the inland Northwest, and caused significant damage to rangeland forage through significant declines in forage production.[a] Nutritionally, ventenata is not much different from other forage sources such as cheatgrass in terms of crude protein content or NDF digestibility, but its palatability for livestock is quite poor. Reasons for low utilization of ventenata as forage are unclear. It is hypothesized that either the wiry growth of ventenata plants or perhaps ventenata hosts a microbial organism that decreases its appeal to cattle.[b]

Interim results from our on-going work on investigating ventenata palatability showed that beef cattle offered a choice between mixed grasses with and without 30-50% ventenata infestation will have a 20% preference towards ventenata hay. These results quantify the poor palatability of ventenata-infested hay. When the ventenata-infested hay was pelleted, beef calves exhibited no preference between ventenata and control hay. Since the principal difference between ventenata hay and pelleting is the texture, it is likely that the wiry structure of ventenata contributes to poor palatability in beef cattle.

HYPOTHESIS or OBJECTIVES:

Together, this study will investigate how early-season grazing of ventenata-invaded pastures affect both pasture productivity and goat productivity. Early-season will be key as ventenata growth is greatest in early season.

Objective: Investigate impact of ventenata on sheep and goat productivity

We hypothesize that goats will be able to maintain productivity on a ventenata-containing diet

PROCEDURES:

For both studies, 20 goats and 20 mature ewes will be housed individually at the University of Idaho Beef Center and assigned 1 of 4 treatments as part of a double-choice feed preference study.[c,d] For 7 days, each animal will be fed 5 lb of a reference diet (mixed grass hay) as well a test diet. The test diets are one of four treatment: negative control (mixed grass hay), pelleted grass hay, pelleted Ventenata-infested hay, and a positive control (grass hay high in ventenata). For all treatments, hay intakes will be measured daily, and intake preferences will be calculated using the formula below:[c]

$$\%\ Preference = \frac{Test\ diet}{Test\ diet + Reference\ diet} \times 100\ \%$$

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ACCOMPLISHMENTS or RESULTS:

To complete these studies, we rented goats from a commercial operator and used sheep from the sheep center. The facilities for the goats were being used by Dr. Laarman for other studies until August 2017, so the animal studies were carried out in August and September 2017. Lab analysis was carried out from October – December. Currently, we are finishing analysis of digestibility of the treatment diets. Animal-to-animal variability in both sheep and goats was considerably higher than in beef calves, so statistical power requirements may need to be higher for future studies. Interim results show the nutrient composition **(Table 1)** of mixed grass hay and ventenata hay are similar in terms of crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF), and total digestible nutrients (TDN). These represent feeds used in both the sheep and goat studies.

Table 1. Nutrient composition of reference and test diets to determine palatability of ventenata-infested hay.

Nutrient (% DM)	Control	Control Pellets	Ventenata Pellets	Ventenata
CP	7.3	9.4	9.1	5.8
NDF	66.3	62.1	57.5	62.5
ADF	43.2	40.1	39.9	40.6
TDN	55.3	0.6	N/A	56.4

Preference was calculated for each treatment as described above. A preference of 50% indicates no preference for either the reference or test diet. A preference below 50% indicates a preference for the reference diet, and against the test diet. In goats, the preference for ventenata (26.5 ± 10.4%) was not different from grass hay (45.6 ± 9.5%; $P = 0.20$; **Fig. 1**). Preference for pelleted feed were the lowest, for both pelleted control hay (15.9 ± 10.4%) and pelleted ventenata hay (13.2 ±10.4%). Pelleting ventenata did not impact palatability to goats ($P = 0.38$).

In sheep, the preference for ventenata-infested hay (27.8 ± 9.2%) was not different from control hay (49.1 ± 8.2%; $P = 0.10$; **Fig. 2**). Like the goat palatability study, pelleting ventenata did not improve palatability of ventenata-infested grass hay (26.6 ± 9.2 vs. 27.8 ± 9.2%, respectively; $P = 0.93$).

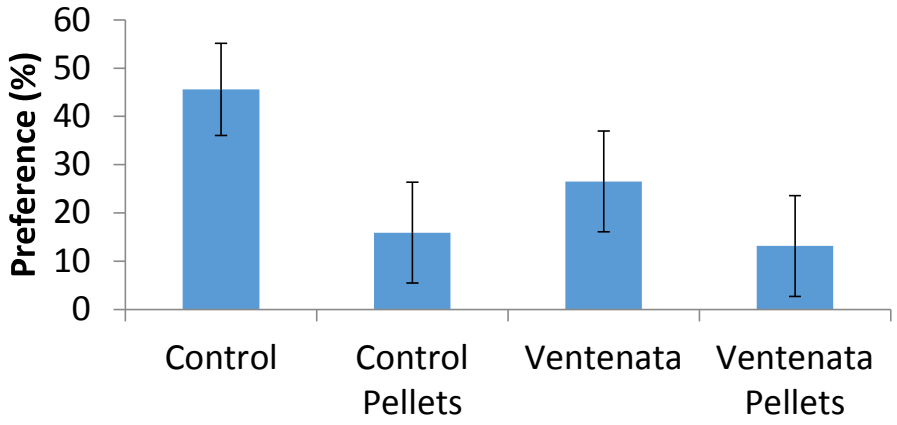

Fig. 1. Preference of mixed grass hay (control) and ventenata-infested hay in unprocessed and pelleted formats to mature goats.

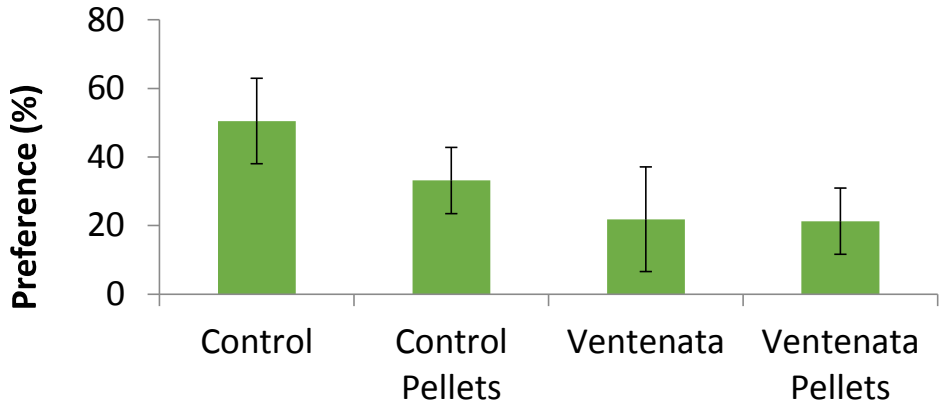

Fig. 1. Preference of mixed grass hay (control) and ventenata-infested hay in unprocessed and pelleted formats to mature non-lactating ewes.

PUBLICATIONS or OUTPUTS:

Work will be presented at the 2018 Pacific Northwest Animal Nutrition Conference, an industry-focused conference with anticipated attendance of 200, including industry and producers. Publication of material, combined with previous beef calf work (FY2016) will begin in early 2018, after completion of analysis.

Watts, C.J., D.E. McCurdy, G.E. Chibisa, F.A. Brummer, A.H. Laarman. Effect of processing *Ventenata dubia* on palatability in ruminants. 2018 Pacific Northwest Animal Nutrition Conference; Boise, ID.

McCurdy, D.E., C.J. Watts, G.E. Chibisa, T.S. Prather, A.H. Laarman. Feed processing affects palatability of ventenata-infested grass hay. 2017 Annual Meeting of the American Society for Animal Science; Baltimore, MD.