

# Rumen distension and contraction influence feed preference by sheep

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### Abstract :

Distension of the rumen limits feed intake by livestock. Ruminaldysfunctions due to bloat, which causes distension by accumulationof excessive gas within the rumen, also reduce feeding. We hypothesizedthat excessive levels of rumen distension cause feed aversionsand that preference increases for feeds eaten in associationwith recovery from bloat. To test these hypotheses, we determinedwhether 12 commercial crossbred lambs (average initial BW of  $43 \pm 2$  kg) could associate ingestion of specific feedswith the consequences of increased intraruminal pressure andits subsidence. Six of the lambs were fitted with rumen cannulasand offered ground alfalfa for 30 min after a rubber balloonwas inserted into the rumen of each animal and distended withair to volumes of 1.8, 2.5, or 4.5 L. Subsequently, balloonswere deflated and alfalfa was offered again for a second periodof 30 min. Feed intake was not affected when the balloon wasnot distended ( $P = 0.45$  to  $0.93$ ), but distension reduced feedintake ( $P < 0.001$ ) in direct proportion to the magnitudeof distension at all 3 volumes ( $R^2 = 0.70$ ). Relief from distensionpromoted a compensatory increase in feed intake ( $P = 0.006$ ).During conditioning to determine if lambs acquired a preferencefor a feed associated with recovery from distension, fistulatedlambs were offered novel feeds: wheat bran (group 1;  $n = 3$ )and beet pulp (group 2;  $n = 3$ ), and the balloon was distendedfor 30 min. Feeds were then switched and the balloons were deflated(recovery). Control lambs ( $n = 6$ ) received the same feedingprotocol without the balloons. Lambs formed strong aversionsto feeds associated with distension and preferred feeds associatedwith recovery ( $P = 0.001$  to  $P = 0.10$ ). No preferences or avoidanceswere observed in control lambs conditioned without rumen distension( $P = 0.17$  to  $P = 0.87$ ). Thus, rumen distension and recoveryfrom distension induced feed aversions and preferences, respectively,which may be critical in learning avoidance of bloat-inducingplants and preferences for plants and supplements that relievethe incidence of bloat.

### Key Word :

bloat, diet selection, foraging, learning, sheep

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