

EFFECTS OF COMPOUNDS EXTRACTED FROM TAGASASTE ON *IN SACCO* DIGESTIBILITY AND RATE OF PARTICULATE OUTFLOW FROM THE RUMEN

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Tagasaste (*Chamaecytisus profleris*) is a hardy leguminous shrub suited to poor sandy soils in southern Australia. Oldham *et al.* (1994) have shown it to be a suitable feed for cattle production, however recent studies have shown growth to be extremely seasonal (McNeill *et al.* 1996). Steer growth rates of 1.0-1.5 kg/hd.day during the winter-spring period coincide with a low concentration of low molecular weight phenolic compounds in the edible plant material, whereas poor animal performance during the late summer-autumn period coincides with a high level of these compounds (N.J. Edwards, unpublished). The objective of this study was to examine the effects of low molecular weight phenolic compounds extracted from tagasaste on rumen activity in sheep.

A crude phenolic solution was extracted from tagasaste leaf using a 50/50 mixture of ethanol and water. Phenolic concentration was determined using the Folin-Dennis assay, with tannic acid as the standard. Three levels of extract were infused, with artificial saliva (McDougall 1948) as the vehicle, for 48 hours directly into the rumen of four fistulated merino wethers in a complete Latin Square design. The animals received a diet of lupins and oaten-chaff and their feed intake (1200 g/hd.day) was kept constant throughout the experiment by adding any feed refusals to the rumen through the fistula every 3 hours. Retention time was estimated by adding a bolus of Ytterbium impregnated oaten-chaff to the rumen at the start of each infusion period and faecal samples were subsequently collected as they became available. The *in sacco* digestibility of lupins and wheaten-straw were determined by suspending nylon bags containing ground samples of each material in the rumen during each infusion for 12 and 36 hours respectively. *In sacco* digestibility and log transformed retention time data were analysed by the Duncan New Multiple Range test.

Table 1. Mean retention time of particulate matter (\pm SE), and *in sacco* dry matter (DM) disappearance (\pm SE) of lupins and wheaten-straw, in the rumen of sheep infused intra-ruminally with a crude extract from tagasaste

Treatment (g/day total phenolics)	Retention time (hours)	DM disappearance of	
		Lupins (%)	Wheaten-straw (%)
Control (0)	61 \pm 2.1 ^{aA}	82.5 \pm 3.2 ^a	43.6 \pm 4.0 ^a
Low (37.5)	67 \pm 4.6 ^a	79.1 \pm 2.0 ^{ab}	39.1 \pm 2.5 ^a
Medium (75)	79 \pm 13.4 ^a	77.3 \pm 3.9 ^{bc}	39.5 \pm 4.7 ^a
High (150)	128 \pm 24.3 ^b	74.3 \pm 1.8 ^c	29.7 \pm 3.8 ^b

^A Means within columns not sharing common superscripts are significantly different (P<0.05)

Retention time of particulate matter in the rumen increased with increasing levels of crude phenolic extract infused, however the increase reached significance only at the highest level of phenolics (Table 1). *In sacco* digestibility of lupins and wheaten-straw were lowest at the highest level of phenolics. Whilst the extract from tagasaste contained compounds other than low molecular weight phenolics (eg 14% crude protein; 18% water soluble carbohydrates (DM basis)), the major effects reported may be attributed to the presence of 24% total phenolics (DM basis). It is concluded that compounds present in crude extracts from tagasaste reduce some aspects of rumen activity and may therefore contribute to the low growth rates reported for animals grazing tagasaste during the late summer-autumn period.

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