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# Barley consumption by lambs during transfer from pasture to barley-based diets

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## ABSTRACT

Lambs that had been reared at pasture till 6 months of age were transferred to barley-based diets fed in outdoor yards. Consumption of barley grain was measured daily during the first 4 weeks that it was fed.

Highest consumption was achieved when grain was processed and introduced to lambs at pasture before they were transferred to the feedlot. Lambs that received these treatments consumed nearly 800 g/hd/d of barley (air dry weight) within 2 weeks and nearly 1200 g/hd/d within 4 weeks of its introduction. They gained live weight at over 150 g/hd/d during the first 7 weeks of barley feeding with minimal health problems.

**Keywords** Lambs; barley; adaptation; intake; liveweight gain.

## INTRODUCTION

Food intake and liveweight gain are commonly low when lambs are first transferred from pasture to diets with a high grain content (McManus *et al.*, 1972; Tomes and Dymond, 1976; Hall and Mulholland, 1982), before rumen microbial populations adapt to the new diet. Unadapted lambs that consume large amounts of grain may die of lactic acidosis.

Lamb performance was monitored in 3 experiments in which lambs reared on pasture were fed barley-based diets for a period before slaughter. One of the aims of these experiments was to identify procedures for rapidly achieving high levels of grain intake while maintaining good growth rates and avoiding health problems.

## MATERIALS AND METHODS

Groups of purebred or Suffolk x Coopworth and Romney lambs aged 6 months with a mean live weight between 36 and 40 kg were used. The lambs had been reared from birth on pasture with no previous experience of hay or grain feeding.

In Experiment 1, ram lambs were removed from pasture, confined in outdoor yards and fed lucerne hay and a barley-mix containing 75% whole barley grain. The daily allowance of lucerne hay was reduced from 900 to 0 g (air dry weight) per lamb over 21 d and the daily allowance of barley-mix increased from 50 to 800 g per lamb over 14 d after which it was maintained.

In Experiment 2, ewe, ram and wether lambs received the same barley mix as in Experiment 1 with a similar feeding regime, except that lucerne hay was removed from the ration over 28 d. Fresh cut pasture was fed instead of lucerne hay to additional wether lambs.

In Experiment 3, ram lambs were introduced to barley-mix when grazing pasture, before being

confined to outdoor yards. The allowance of pasture was progressively reduced over 14 d while that of barley-mix was increased. The lambs were then moved into the yards and fed only barley-mixes for the remainder of the experiment. These mixes contained either 46 or 65% of barley grain in whole, hammer-milled and pelleted or rolled forms.

Barley consumption was determined from the air dry weight of barley offered and refused each day. The data presented are the mean values for between 2 and 8 groups, each containing 8 to 10 lambs.

## RESULTS

Daily consumption of whole barley grain by ram lambs over the first 4 weeks of Experiments 1, 2 and 3 is shown in Fig. 1. In Experiment 1, lambs

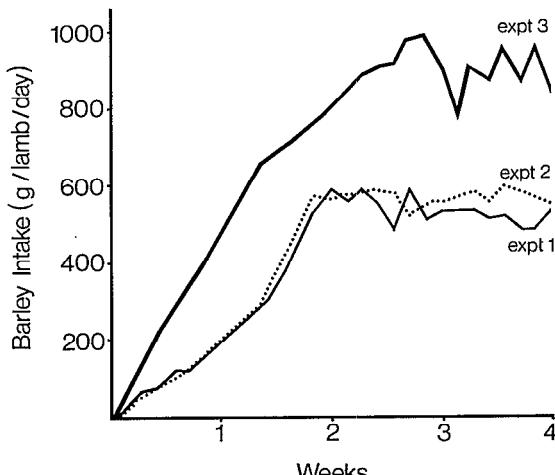


FIG. 1 Daily intake of whole barley grain by ram lambs fed an increasing allowance of barley-mixes.

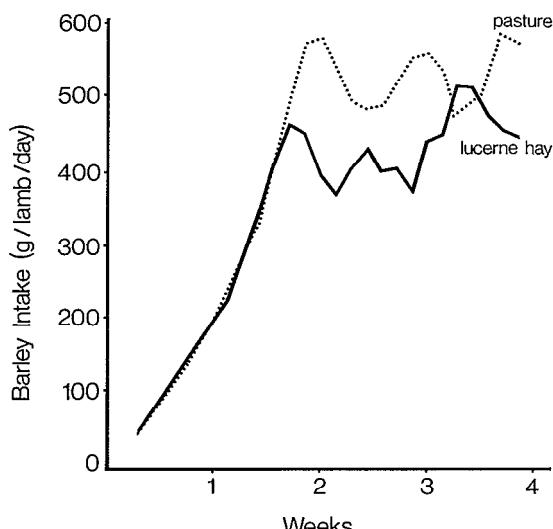
consumed near 600 g/hd/d 2 weeks after introduction to the barley-based diet, but in the third and fourth weeks only 88% of the barley was consumed. Extension of the period of hay feeding to 28 d in Experiment 2 was associated with a small improvement to 94% of the barley allowance being consumed in weeks 3 and 4.

Greatest intakes of whole barley were recorded in Experiment 3 (Fig. 1) where daily consumption reached 800 g/hd/d in the 2 weeks before confinement to yards and averaged 909 g/hd/d in weeks 3 and 4.

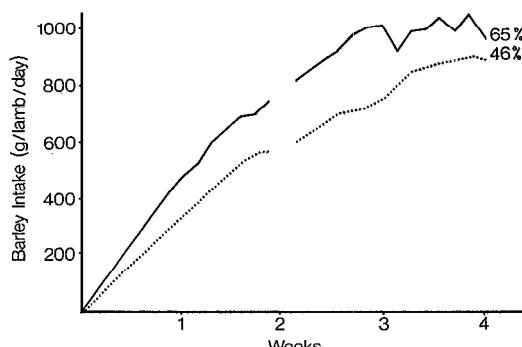
Barley consumption by wether lambs in Experiment 2 was greater when fed cut pasture than when fed lucerne hay during the introduction of barley-mix (Fig. 2). Their intake averaged 524 and 437 g/hd/d respectively over the third and fourth weeks ( $P < 0.01$ ).

In Experiment 3 total intake of mixes containing 65% barley was less than the total intake of mixes containing 46% barley (1045 v 1130 g/hd/d), but because of the higher barley content, barley consumption was greater ( $P < 0.05$ ) throughout the 4 week period (Fig. 3). Intakes of all 3 forms of the 65% barley-mix (Fig. 4) were near 800 g/hd/d after 2 weeks. During weeks 3 and 4 barley consumption averaged 1047 g/hd/d for pelleted and 1054 g/hd/d for rolled forms. Both values were significantly greater than 909 g/hd/d for whole grain ( $P < 0.01$ ). By the end of the fourth week, lambs consumed nearly 1200 g/hd/d of the processed forms (rolled and pelleted).

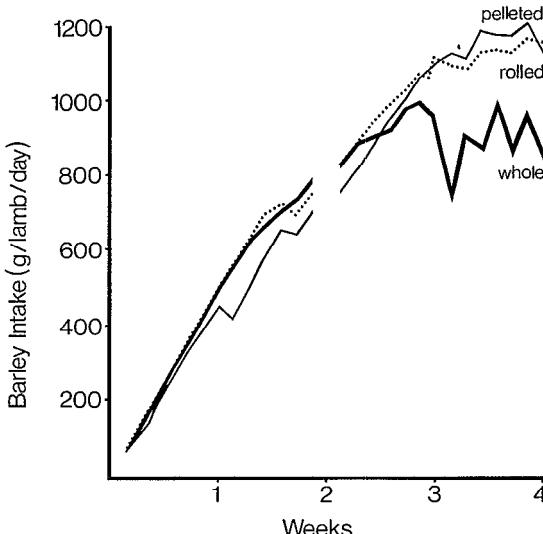
Liveweight gains over the 4 week period averaged 67, 92 and 68 g/hd/d for lambs fed mixes



**FIG. 2** Daily intake of whole barley grain by wether lambs fed an increasing allowance of barley-mix and a reducing allowance of cut pasture or lucerne hay.



**FIG. 3** Daily intake of barley grain by ram lambs fed an increasing allowance of barley-mixes containing 65% or 46% barley.



**FIG. 4** Daily intake of 3 forms of barley grain by ram lambs fed an increasing allowance of barley-mix.

containing 65% barley in pelleted, rolled and whole grain forms, respectively. Corresponding growth rates during the next 3 weeks were 276, 226 and 251 g/hd/d resulting in overall gains for 7 weeks of barley feeding, including the introductory period, of 156, 158 and 149 g/hd/d.

Of the total of 476 lambs in these experiments only 6 were treated for inappetance and, of those, 2 had to be removed. No deaths occurred.

## DISCUSSION

Barley was introduced to lambs in all 3 experiments faster than is normally recommended (Hamilton *et al.*, 1981). Despite this, no lambs died of lactic acidosis and only 1.3% were treated for inappetance.

Under the traditional feedlotting procedure adopted in Experiment 1 and 2, lambs were first exposed to barley when shifted into yards. Barley

consumption was enhanced by feeding cut pasture instead of lucerne hay over the introductory period. It was further enhanced in Experiment 3 when lambs were introduced to barley at pasture, before transfer to the feedlot. Thus it would appear that lambs were better able to adjust to an increasing grain content of their diet when the remainder of their ration was pasture to which their rumen microbial populations were adapted.

The finding that lambs performed better when introduced to processed forms rather than to whole grain is in conflict with evidence that processing will result in more rapid digestion of grain in the rumen, and so is more likely to lead to acidosis and rumenitis (Ørskov, 1979).

The results of these experiments show that lambs can be introduced to grain more rapidly than is commonly practiced. Provided that they are managed appropriately, they can maintain good growth rates during the period of transition from

pasture to grain and reach high levels of grain consumption with minimal health problems.

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