

Nutritional value of barley malt rootlets in growing lamb rations

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INTRODUCTION

Barley malt rootlets (BMR), a by-product of the brewing industry, are removed from the barley malt after germination but before mashing (1). However, information on the nutritional value of barley malt rootlets for ruminants is limited. Thus, the objective of this study was to evaluate barley malt rootlets as a protein supplement in diets of weaned Florina (Pelagonia) lambs relative to performance and carcass characteristics.

MATERIALS & METHODS

Seventy-two male growing Florina (Pelagonia) lambs (56 ± 6 d of age) were used in an experiment to determine effects of dietary replacing soybean meal, wheat bran, alfalfa meal, and sugar beet pulp with BMR, wheat grain, and corn gluten meal on performance and carcass characteristics. The chemical composition of BMR was 905 g dry matter (DM)/kg (as fed basis), 316 g crude protein/kg DM, 16 g crude fat/kg DM, 418 g neutral detergent fiber/kg DM, 150 g acid detergent fiber/kg DM and 78 g ash/kg DM. All lambs used in the experiment were cared for according to applicable recommendations of the U.S. National Research Council (2). In the 8 week experiment, lambs, after individual weighing, were randomly allocated into four dietary treatments (BMR0, BMR100, BMR200, and BMR300) of 18 each and accommodated in 3 floor pens/treatment of 6 lambs each. Lambs had an initial body weight (BW) of 14.3 ± 1.9 kg, and were fed one of four isonitrogenous (crude protein 187 g/kg, dry matter – DM basis) and isoenergetic (net energy for gain 8.22 MJ/kg, DM basis) concentrate mixtures ad libitum and alfalfa hay (0.18 kg/lamb/day, DM basis). The BMR was added to the concentrate mixture at inclusion levels (as mixed basis) of 0, 100, 200, and 300 kg/t for treatments BMR0, BMR100, BMR200, and BMR300, respectively. Lambs were weighed individually at the end of the experiment, and BW gain was calculated. Feed intake was measured daily on a pen basis, and DM intake and feed conversion ratio (FCR) were calculated. At the end of the experiment, 9 male lambs for each treatment, three randomly selected from each pen, were fasted for 18 h (water was allowed), weighed and slaughtered. After slaughter, pelt, head, liver, heart, lungs, spleen, testicles, major omentum and the small intestine were weighed separately. After dressing and storing refrigerated for 24 h at 3°C, carcasses, kidneys and kidney fat were weighed according to European Union (3) guidelines. A 10-point scale was used to assess lean color, fat color, fat firmness, carcass wetness and overall acceptability (4). The carcasses were then sectioned into two symmetric halves and the right half was divided into the cuts of neck + proximal thoracic limb + steaks + brisket, lumbar + abdominal region and proximal pelvic limb, and weight of each cut was recorded. Performance and carcass characteristics of lambs were analyzed by one-way analysis of variance, and significant differences among treatment means were tested using linear and quadratic contrasts at the 5% probability level (5).

RESULTS

There were very few feed refusals, and DM intake was similar ($P>0.05$) among diets with increasing BMR inclusion levels. The rate of gain for lambs was similar among diets with increasing BMR inclusion levels resulting in similar FCR among treatments (Table).

Table. Body weight (BW), BW gain, dry matter (DM) intake, and feed conversion ratio (FCR) of lambs.

	Treatment ^a					Significance level ^b	
	BMR0	BMR100	BMR200	BMR300	SEM	Linear	Quadratic
Final BW (kg)	26.4	26.8	26.6	25.9	0.305	0.571	0.315
BW gain (g/day)	215	224	220	207	3.80	0.409	0.143
DM intake (kg/day)	0.83	0.85	0.86	0.82	0.010	0.805	0.157
FCR (kg DM intake/kg BW gain)	3.86	3.82	3.91	3.97	0.044	0.354	0.603

^a BMR0 = control treatment, BMR100 = treatment with 100 kg/t BMR, BMR200 = treatment with 200 kg/t BMR, BMR300 = treatment with 300 kg/t BMR.

^b Numbers are probability values.

Moreover, fasted BW, cold carcass weight, carcass yield and other carcass yield traits, as well as lean color, fat color, fat firmness, wetness and overall acceptability of carcasses, were not affected ($P>0.05$) by feeding diets with increasing BMR inclusion. In addition, there was no treatment effect ($P>0.05$) for any response parameter related to carcass commercial cuts.

CONCLUSION: Barley malt rootlet supplementation, at levels up to 300 kg/t, in isonitrogenous and iso (net energy) energetic diets for growing lambs did not affect their performance and carcass characteristics.

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