

Comparison of Carbohydrate Sources for Lambs Fed Alfalfa Silage

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Background:

Alfalfa is the most common forage legume used for stored feed in Ontario. To avoid weather damage after cutting, much of the alfalfa crop is preserved as silage. Alfalfa silage is typically high in both crude protein and soluble protein. Soluble protein is that part of the crude protein which is rapidly degraded in the rumen. To utilize this readily available protein in the rumen, a highly available source of carbohydrate is required. In this study, we compared whole barley and cracked corn as the carbohydrate source to compliment alfalfa silage in the ration for feedlot lambs.

Methods and Materials

Forty-nine lambs were split by sex and allocated to two diets, whole barley or cracked corn. Other ration components included chopped alfalfa silage (crude protein=21.6%, soluble protein=67.2% of crude protein), and soybean meal. The rations were balanced to provide the same amount of crude protein and energy. The rations were designed to provide an average daily gain of about 0.3 kg/hd/day.

The lambs were weaned following their 50 day weighing, then adjusted to the test rations for 18 days. Following the adjustment period, the lambs were weighed every 14 days for 6 weeks. Average daily gains were calculated from the initial and final weights. The lambs were housed indoors in a naturally ventilated barn with constant access to fresh water, salt and mineral.

Results

There were no significant differences in lamb average daily gain between the barley-based and the cracked corn-based rations (Table 1). Absolute gains were slightly below the target of 0.3 kg/hd/day. There was also no significant difference in gain between females and wethers.

Table 1. Weight gain of lambs on two diets.

Group	Wethers		Females	
	Whole Barley	Cracked Corn	Whole Barley	Cracked Corn
# of lambs	13	13	12	11
Start Weight (kg)	25.92	25.11	24.68	24.98
End Weight (kg)	36.91	36.71	36.08	36.85
Ave. Daily Gain (g)	262	276	271	283

Cost of Gain

Using feed costs at New Liskeard (Table 2), feed costs per pound of gain were \$0.39 for the barley ration and \$0.47 for the cracked corn ration. Feed costs in southern Ontario will be different from those shown here, usually with a smaller spread between corn and barley. One possible advantage to the barley ration is that whole grains can be purchased directly from the farm while cracked corn would generally have to be purchased from a feed mill unless a mill was available on-farm to process the whole corn. The value of the silage was set at the equivalent of \$30.00 for a round bale containing about 800 lb of dry matter. The feed costs do not include salt or mineral costs.

Table 2. Cost of ration ingredients (New Liskeard, spring 1998).

Ration Ingredient	Cost/tonne	Cost/lb
Cracked corn	\$230.00	\$0.104
Whole barley	140.00	0.0635
48% Soymeal	380.00	0.172
Round bale silage (\$30 for 800 lb DM bale)	82.69	0.0375

Table 3. Ration formulations, costs, and cost per pound of gain.

Whole barley ration	Cracked Corn Ration
Barley 1.5 lb @ 0.0635 = 0.0953	Cracked corn: 1.2 lb @ 0.104 = 0.125
Soymeal: 0.12 lb @ 0.172 = 0.0206	Soymeal: 0.12 @ 0.172 = 0.0206
Silage: 3 lb @ 0.0375 = 0.113	Silage: 3.69 @ 0.0375 = 0.138
Daily Gain = 0.586 lb	Daily Gain = 0.6095 lb
Feed cost per lb gain = \$0.39	Feed cost per lb gain = \$0.47

Conclusions: Average daily gain of feedlot lambs was similar between whole barley and cracked corn rations when fed with alfalfa silage. The diets fed had a relatively high amount of forage included. Our results should not be extrapolated to a full feed situation where no (or very little) forage is included in the ration. Feed cost per pound of gain was 17% lower on the barley ration. Feed costs vary across Ontario and it is necessary to check local prices to determine the most economical ration ingredients.