($P<.01$) on the MW treatment (3.20 *vs.* 3.51 lb). Feed efficiency tended to be better for MW treatment, reflecting the greater feed intakes. Steers on DRW had a lower carcass conformation score ($P<.01$), but none of the other carcass characteristics were significantly different ($P>.05$) between treatments.

In both trials, the number of abcessed livers, although high, were similar between treatments. Rumen pH values in both trials were significantly higher ($P<.05$) on the MW.

High Moisture Barley for Beef Cattle

Jerry Aimone and Donald G. Wagner

Story in Brief

Two high moisture barley processing techniques were compared with dry rolled barley in two cattle feeding trials. In the first trial, two treatments were evaluated: 1) dry rolled barley (DRB) and 2) reconstituted barley (RB). The treatments studied in the second trial were: 1) dry rolled barley (DRB), 2) reconstituted barley (RB) and 3) high moisture harvested (HMH). Forty-eight steers averaging 675 lb. were fed for 110 days in trial 1. Trial 2 involved 36 steers averaging 623 lb. fed for 88 days.

In both trials average daily intakes were lower on the DRB treatments, with intake being significantly lower ($P<.01$) on DRB in trial 2. In trial 2, DRB, RB and HMH daily intakes were: 17.9, 20.6 and 20.2 lb. In both trials, steers on DRB gained slower than those on the high moisture treatments (trial 1, 3.16 *vs.* 3.24 lb.; trial 2, 2.92, 3.23 and 3.24 lb.). The feed required/lb. of gain in trial 1 was 5.64 lb. on DRB and 5.62 lb. on RB. In trial 2, the lb. feed required per lb. of gain were: 6.14, 6.40 and 6.22 on DRB, RB and HMH, respectively.

Introduction

With the current cost-price squeeze in feeding cereal grains to feedlot cattle, any benefit which can be derived in utilization is highly advantageous to the cattle feeder.

In recent years there has been quite a bit of interest in different methods of processing feed grains to gain optimum value from them. Most research has been with milo and corn. With milo, reconstitution or high moisture harvesting has been shown to be very beneficial in increasing the nutritive value of the grain.

Little work has been done to study high moisture processing of barley. The objective of this study, therefore, was to evaluate the performance of feedlot cattle fed dry rolled barley, reconstituted barley or high moisture harvested barley.

Materials and Methods

Two feeding trials were conducted to study effect of dry rolled barley (DRB), reconstituted barley (RB) or high moisture harvested barley (HMH) on the performance of feedlot cattle. The rations consisted of 84 percent processed barley on a 100 percent DM basis. In both trials the animals were gradually adapted to the rations.

In trial 1, 48 Angus, Hereford and Angus x Hereford steers were randomly allotted, 24 per treatment, to one of the two treatments, DRB or RB, and were fed for 110 days. Trial 2 was an 88 day feeding trial which involved 36 Angus, Hereford and Angus x Hereford feeder steers. They were randomly allotted, 12 steers per treatment, to one of three treatments: 1) DRB, 2) RB or 3) HMH.

Compositions of the rations fed in both trials are presented in Table 1. The only difference in the rations was the method of processing. The reconstituted barley was reconstituted in the whole form up to about 30 percent moisture. The high moisture harvested grain was harvested containing approximately 27 percent moisture. All rations were formulated to contain the composition indicated on a dry matter basis.

In trial 1, rumen samples were taken once during the trial from each animal. The pH value was determined immediately after sampling, and a small quantity was saved for VFA analysis.

Table 1. Ration Composition[1]

Ingredient	Percent
(Trial 1)	
Barley	84.0
Premix[2]	16.0
(Trial 2)	
Barley	84.0
Premix[2]	16.0

[1] Dry matter basis.
[2] Contained cottonseed hulls, ground alfalfa, cottonseed meal, urea, salt, dicalcium phosphate, calcium carbonate, aurofac-50 and vitamin A; Stilbestrol-2 was also fed in trial 2.

In both trials initial and final weights were taken as shrunk weights, the animals being off feed and water for 12 hours.

Results and Discussion

The moisture contents of the barley and the proximate analysis data are given in Table 2.

The feedlot performance data are presented in Table 3. In trial 1, there was a slight trend for increased performance on the RB ration. However, none of the feedlot characteristics measured in trial 1 were significantly different. The ruminal pH values were also the same for both treatments.

In trial 2, average daily intake (D.M. basis) on the DRB treatment was significantly lower ($P<.01$) than on either RB or HMH barley. Average daily gains and feed efficiencies were: 2.92, 6.14; 3.23, 6.40; and 3.24,

Table 2. Proximate Analysis

Grain	Dry Matter	Crude Protein[1,2]	Ash[1]	Ether Extract[1]	CHO[1,3]
(Trial 1)	%	%	%	%	%
DRB	88.50	13.95	2.99	2.04	81.02
RRB	71.23	13.14	2.75	2.05	82.06
(Trial 2)					
DRB	88.77	13.95	----[4]	----[4]	----[4]
RRB	72.27	14.89	----	----	----
HMH	72.66	14.15	----	----	----

[1] Values expressed on 100% dry matter basis.
[2] 6.25 X percent nitrogen.
[3] 100—(sum of crude protein, ash and ether extract).
[4] Incomplete data.

Table 3. Feedlot Performance

	Trial 1 (110 days)		Trial 2 (88 days)		
	DRB	RRB	DRB	RRB	HMH
No. Steers	24	24	12	12	12
Initial live shrunk wt., lb.	678	672	619	624	625
Final live shrunk wt., lb.	1025	1028	877	908	909
Daily feed, l.[1,2]	17.76	18.16	17.88[a]	20.63[b]	20.02[b]
Daily gain, lb.	3.16	3.24	2.92	3.23	3.24
Feed/lb. gain, lb.[1]	5.64	5.62	6.14	6.40	6.22
Ruminant pH	6.3	6.3	---	---	---

[1] Dry matter basis.
[2] Values with different superscripts within trial differ significantly: 1,2: ($P<.01$).

6.22 on the DRB, RB and HMH treatments, respectively.

Although the steers in trial 2 were fed for only 88 days (due to a shortage of feed) there appeared to be faster gains and greater intakes on the high moisture barley rations.

Formaldehyde Treatment of Full-Fat Soy Flour to Protect the PUFA from Rumen Microbial Hydrogenation

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Story in Brief

Ground soy flour (GSF) was treated with formaldehyde (HCHO) for *in vitro*, tissue and organoleptic studies to determine if the polyunsaturated fatty acids (PUFA) of young, growing lamb's fat tissues can be increased. Excellent protection of linoleic acid, the major PUFA in GSF, from rumen microbial hydrogenation was obtained *in vitro* when the soy flour was treated with HCHO in small quantities (100 gm) and in large quantities (20 lb).

Rump, shoulder, omental and kidney knob fat from lambs fed the HCHO treated GSF supplement had ($P<.05$) more linoleic acid than lambs fed the untreated GSF supplement. There was no difference in linoleic acid content of loin fat between lambs fed the HCHO treated GSF ration and those fed the untreated GSF ration. Lambs fed the GSF rations had ($P<.05$) more linoleic acid in their loin fat than lambs fed SBM. There were no differences ($P>.05$) in daily feed consumption, feed/kg gain or average daily gain among any of the rations. No ($P>.05$) difference in meat flavor could be detected by a taste panel among any of the treatments. In sum, acceptable polyunsaturated meat from lambs was produced.

Introduction

Recently workers in Australia and in the U.S. have produced ruminant meat and milk products high in polyunsaturated fatty acids (PUFA)