

BARLEY AND SUNFLOWER RATIONS FOR BACKGROUNDING STEERS

By

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North Dakota cow-calf producers have an opportunity to increase profits by retaining ownership of their calves following weaning, according to a study by Randall Little, David Watt and Timothy Petry of the Department of Agricultural Economics at North Dakota State University. The study, which covered the years 1958-1984, compared several programs of retained ownership, of which backgrounding is commonly used in North Dakota. This is a winter feeding program which emphasizes a higher rate of gain with a high energy and high protein diet. The calves are fed a ration consisting mostly of grain and then sold in the spring.

As of January 1, 1986, North Dakota produced seventy percent of the nations sunflowers, thirty-one percent of the nations barley and ranked twelfth of all states in number of beef cattle on hand. Abundant sunflower production and a depressed market price could result in the use of sunflowers for cattle feed. Producers have experienced problems with ration palatability, bloat, acidosis or founder and liver abscesses when high barley rations are fed. The extra fiber, crude protein and oil in sunflower seeds should compliment high concentrate barley rations, especially when fed to calves with the genetic potential for rapid gain. The addition of feed additives such as the ionophores Rumensin^R or Bovatec^R, sodium bicarbonate and tylosin may help alleviate these feedlot problems.

Park, et al (1981) fed 10, 20 and 30 percent sunflower seeds to growing dairy heifers. There were no differences in daily gain for the treatments. However, there was a decrease in dry matter intake with each increase in seeds, with an increase in efficiency of feed conversion.

Dinusson, et al (1982) reported mixed results. In one trial, steers fed three pounds of sunflower seeds (oil type) as a replacement for rolled barley gained 9.4 percent faster and required 6.9 percent less feed per pound of gain for the 105 day trial. In a second trial, after 63 days on feed, steers consuming sunflowers ate less feed than the controls. The average daily intake of sunflower seeds for the 105 day trial was 4.04 pounds. The steers fed sunflowers gained 7.8 percent less and required 5.7 percent more feed per pound of gain than did the control steers.

EXPERIMENTAL PROCEDURE

On December 29, 1986, forty-five crossbred steers sired by Charolais bulls were weighed and allotted into nine uniform pens of five steers per pen. Prior to allotment, the steers were vaccinated with a seven way vaccine and received a Compudose^Rear implant. The steers had been weaned and fed a fifty percent concentrate ration prior to allotment.

Experimental rations were based on rolled barley and contained 0, 10 or 20 percent oil type sunflower seeds, with the sunflower seeds replacing barley on a pound per pound basis. Initial rations contained sixty percent concentrate and this was increased gradually until eighty-five percent concentrate was fed. Actual rations as fed are shown in Table 1. Mixed hay was included in the ration but was discontinued as the level of barley-sunflower increased. The feed additives, sodium bicarbonate, Rumensin^R and tylosin were added to reduce digestive disturbances and liver abscesses. Limestone and Vitamin A were added to balance the mineral and vitamin shortage of high barley rations.

Steers were self-fed in concrete bunks, with fresh feed added approximately every five days. Bunks were cleaned periodically to remove the fine or otherwise stale feed. The steers were kept on feed for 106 days, with individual weights taken every twenty-eight days. At the conclusion of the trial, the steers were weighed and trucked approximately twenty-five miles where they were sold at auction. One steer in the control lot was removed from trial due to a nervous disorder believed to be caused by a thiamine deficiency. Results of the trial, including overall economics are shown in Table 2.

Table 1. Barley and Sunflower Rations as Fed

Ingredient	Control Lbs.	10% Sunflower Lbs.	20% Sunflower Lbs.
Dry rolled Barley	15.4	12.9	9.22
Oil type whole sunflower	---	1.9	2.74
Wheat straw	2.2	2.1	1.68
Mixed hay	1.05	1.2	0.72
Limestone	0.15	0.14	0.11
Trace mineral salt	0.11	0.11	0.09
Feedgrade sodium bicarbonate	0.11	0.11	0.09
GTA RM 600 <u>1/</u>	0.20	0.20	0.16
Tylan Premix <u>2/</u>	0.05	0.05	0.04
Vitamin A <u>3/</u>	<u>0.0007</u>	<u>0.0007</u>	<u>0.0007</u>
Total	19.2	18.7	14.9

1/ GTA Rm 600 provided monensin sodium at 1200 gm/ton.

2/ GTA Red Pak II provided tylosin at 2 gm/lb.

3/ GTA Quin ADE provided 5,000,000 IU Vit. A., 1,000,000 IU Vit. D, 500 IU Vit. E/lb.

Table 2. Trial Results from Feeding Trials with Barley-Sunflower in Backgrounding Rations

	Control	10% Sunflower	20% Sunflower
No. of Head	14 <u>1/</u>	15	15
Days fed	106	106	106
Animal days	1484	1590	1590
Avg. initial wt.	671.8	672.0	673.3
Final wt.	952.8	942.7	898.3
Avg. animal gain	281.0	270.3	225.0 <u>2/</u>
Avg. daily gain	2.70	2.55	2.12
Total feed/hd	2034	1982	1574
Feed/day lbs.	19.2	18.7	14.8
Feed/lb. gain	7.24	7.33	7.00

1/ One steer removed from trial on March 9th due to a diagnosed thiamine deficiency. The steer responded to treatment and was sold on May 15th.

Analysis of variance of the randomized block design with one missing value indicated a significant difference in gain (lower) between steers fed the 20% whole sunflower ration and those fed 0 or 10% whole sunflower rations. The calculated F-value with 2 and 27 degrees of freedom was 6.29 (Reg. F₂ and 27 at 5% = 3.3541; the standard error of mean equaled 12.18 and the significant studentized range (SSR) equaled 37.15 pounds.

Economics	Control	10% Sunflower	20% Sunflower
Feed cost/lb. feed	\$.03908	.04217	.0449
Avg. feed cost/hd	\$ 79.48	83.57	70.66
Feed cost cwt. gain	\$ 28.29	30.92	31.40

Projected Return	Control	10% Sunflower	20% Sunflower
Dec. value of steer @ 66¢/lb.	\$ 443.39	\$ 443.52	\$ 444.38
Avg. feed cost	<u>79.48</u>	<u>83.57</u>	<u>70.66</u>
Break even	\$ 522.87	\$ 527.09	\$ 515.04
May 15 th steer @ 69.00/cwt	\$ 657.43	\$ 650.46	\$ 619.83
Added steer value	\$ 134.56	\$ 123.37	\$ 104.79

RESULTS AND DISCUSSION

The addition of 10 or 20 percent whole sunflower seeds as a replacement for barley in “backgrounding” rations reduced feed intake and lowered average daily gains especially at the 20% level. This is in keeping with work reported by Park (1981) and Dinusson (1982). Daily feed intake on all three rations was less than expected, ranging from a low of 14.8 pounds for the 20% sunflower ration to 19.2 pounds for the control ration. The limited feed intake was no doubt responsible for the mediocre average daily gains of 2.70, 2.55 and 2.12 pounds for the 0, 10 and 20% sunflower rations. Calculated values for these rations should have provided enough energy and crude protein to allow gains of over 3.00 pounds/hd/day. Overall feed efficiency was very satisfactory, ranging from 7.0 to 7.33 pounds of feed per pound of gain with the 20% sunflower rations having the best efficiency. Feed costs per hundred weight gain averaged \$28.29 for the control ration; \$30.92 for the 10% sunflower ration and \$31.40 for the 20% sunflower ration. All three rations resulted in a positive return on investment in 1986-87.

None of the steers suffered from acidosis, founder or bloat while on trial. The inclusion of the sodium bicarbonate, monensin sodium and tylosin were thought to have contributed to the low incidence of feedlot problems. However, they could have also been partially responsible for the reduced feed intake. Also, the inclusion of chopped wheat straw did not encourage extra consumption but did provide a “scratch factor” for the high grain rations.

The steers were well accepted by the livestock buyers because they did not carry the extra large middle commonly found on steers fed larger amounts of chopped hay or silage.

SUMMARY

Steers fed 20% whole sunflower seeds consumed less feed and gained slower than control steers fed barley only. All rations (0, 10, or 20% sunflower seed) had very acceptable feed conversion averaging from 7.00 to 7.33 lbs./lb. of gain.

Feed costs per pound of gain averaged \$28.29, \$30.92, and \$31.40 for the 0, 10 or 20% sunflower treatments. It appears from the trial that 10% whole sunflowers may be approaching the upper levels when fed with dry rolled barley in high energy “backgrounding” rations. Retained ownership and “backgrounding” was a profitable alternative to selling off the cow at weaning in 1986-87.

Modern feed additives such as sodium bicarbonate, monensin sodium and tylosin may reduce feedlot problems associated with feeding high barley rations but they may also discourage maximum feed intake.

LITERATURE CITED

Little, Randall; Watt, D.L.; Petry, T.A., 1986. Retained Onership, Production and Marketing Alternatives for Cow-calf Producers. Ag Econ. Bulletin 213, Aug. 1986.

Dinusson, W.E.; Johnson, L.J.; Danielson, R.B., 1982. Sunflower Seeds in Rations for Beef Cattle. Bi-monthly N.D. Farm Research, Vol. 40, No. 2, page 15.