



Western Beef Development Centre

Division of PAMI

CDC SO-I

A New Oat Variety for Cattle Feeders

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Introduction

Recently, the Crop Development Center at the University of Saskatchewan developed a new variety of oat CDC SO-I, with a low lignin hull and a high oil groat. This new variety of oat was specially developed for the ruminant feed market. Breeder Seed was released to Super Oats Canada Ltd. in 2006 for Pedigreed seed increase and sales. Limited quantities of Certified seed could be available in 2010.

Background

The main feature of CDC SO-I is a combination of a more digestible, low acid-detergent lignin hull with higher than normal groat fat content resulting in greater energy density and digestibility for cattle than other available oat varieties. It is shorter and stronger strawed than CDC Dancer, with similar yield potential and maturity. It produces large plump grain but is lower in test weight than CDC Dancer and Morgan with % groat greater than Morgan, but less than CDC Dancer. Its grain has a tan/brown-coloured hull with a somewhat persistent awn. At maturity, under normal dry harvest conditions, most of the awns should be lost during threshing. CDC SO-I grain is usually higher in protein than CDC Dancer and Morgan.

CDC SO-I is similar to Ronald in terms of disease resistance being resistant to smut, susceptible to stem rust and susceptible to the newest races of crown rust. Caution should be taken if growing CDC SO-I in the rust-area of south-east Saskatchewan where early seeding is recommended to minimize potential yield loss due to rust.

CDC SO-I is NOT suitable for the milling (food) industry due to its high groat fat content and relatively low milling yield.

Objectives

Previous feeding trials with initial lines of this variety showed promise in both dairy and beef feeding trials, particularly in calf growing programs. In 2004/05 a trial was carried out at the Western Beef Development Centre (Zalinko, M.Sc. Program, unpublished) using 124 crossbred calves (steers and heifers sorted by sex and weight) fed one of two diets containing an early prototype of the new oat fed either whole or dry-rolled. The results of this trial, which was limited in scope due to pen restrictions, showed no difference in how the cattle performed in terms of gain, intake, or feed efficiency. The results suggested that this new variety of oat could be fed whole, without any loss of performance in backgrounding diets.

The results with this prototype of the current CDC SO-I variety were particularly interesting from the point of view of potential savings to producers by their not having to process their grain prior to feeding; costs which can range from \$5 to \$15 per tonne of grain fed. To more clearly define the need to process this new oat variety prior to feeding, a second backgrounding trial was conducted over the winter of 2007/08 at the Termuende Ranch of the WBDC.

The objective of this study was to compare the performance of backgrounding cattle fed hay-based backgrounding diets using dry rolled barley, dry rolled CDC SO-1, or whole CDC SO-I oat as a grain source.

Trial Management

One hundred and five commercial cross-bred calves weighing 600 lbs were assigned to one of 15 pens (seven head/pen) at the WBDC Termuende Ranch. The calves were supplied by Pound-Maker Agventures of Lanigan, SK.

Diets were comprised of alfalfa-brome hay (63%), a commercial mineral supplement (2%) and one of three grain sources: dry-rolled barley, dry rolled CDC SO-I or whole CDC SO-I oat at (35%), all values DM basis. **Table 1** gives the ingredient make up and chemical composition of the experimental diets. Crude protein and mineral requirements were formulated for approximately 2.5 lbs / day weight gain as per NRC (1996). The trial was designed to last for 105 days with a target end of test weight of 880 lbs.

Results

Chemical analysis of the complete diets showed that crude protein levels ranged from 11.3 % for the barley-based diet to 11.6% for the two oat-based diets (**Table 1**). These levels met NRC (1996) requirements for the type of cattle used and rate of gain observed in this study. ADF and NDF levels were lower for the barley diet relative to the two oat-based diets, an observation consistent with the higher fibre levels of oat relative to barley grain.

Table 1: Ingredient make-up and chemical composition of backgrounding diets

Parameter	Dietary Treatment		
	Rolled Barley	Whole Oat	Rolled Oat
<i>Chemical Composition (% DM)</i>			
Alfalfa-grass hay	63.0	63.0	63.0
Cereal grain	35.0	35.0	35.0
Supplement**	2.0	2.0	2.0
<i>Chemical Composition (% DM)</i>			
CP%	11.3	11.6	11.6
ADF%	24.6	27.7	28.6
NDF%	44.2	48.7	47.3
Ca%	0.5	0.5	0.6
P%	0.3	0.3	0.2

** Commercial Mineral Supplement



Table 2: Performance data of Termuende Oat Calves (lb)

Parameter	Dietary Treatment			SEM	P-Value
	Rolled Barley	Whole Oat	Rolled Oat		
Start of Trial wt (lb)	600.4	602.4	600.9	4.44	0.95
End of Trial wt (lb)	852.4	875.4	875.1	7.47	0.08
Average Daily Gain (lb)	2.40	2.60	2.61	0.02	0.16
Dry Matter Intake (lb/day)	18.8 ab	18.5 b	19.2 a	0.15	0.04
Feed Conversion	7.87	7.15	7.35	0.24	0.13
SC fat (mm)	1.17	1.01	1.37	0.15	0.27
Ribeye area (cm ²)	11.8	10.7	13.5	1.05	0.21

Means within the same row with different letters are significantly different (P<0.05).

Table 2 gives the performance of the calves fed the three diets. There were no significant differences in average daily gain between cattle fed the three diets (**Figure 1**). However, feed intake was highest for cattle fed the rolled oat and lowest for those fed the whole oat diet with the barley grain intermediate. While not significant (P=0.13), cattle fed the whole oat diet had the lowest feed to gain ratio (7.15:1), followed by the rolled oat diet (7.32:1) and the barley diet (7.87:1). There were no differences in ultrasound backfat or ribeye area at the end of the 105 day period. Backgrounding programs are designed to promote muscle and frame development yet minimize fat deposition. The minimal amount of backfat at the end of the feeding period indicates that the aim of the backgrounding program was achieved with all diets in this regard.

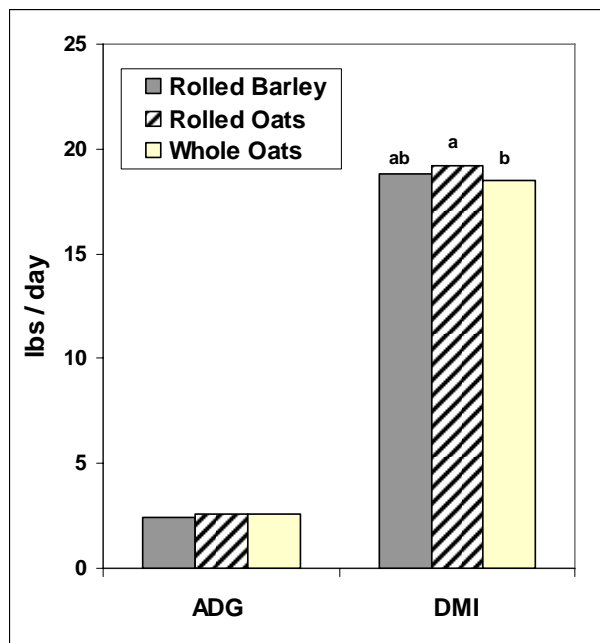


Figure 1. Average daily gain and dry matter intake of calves fed rolled barley, rolled oat or whole oat.



Conclusion

Based on the results of this trial, it is evident that the new variety of oat (CDC SO-I) is an excellent feed oat for backgrounding cattle and does not require processing prior to feeding. Performance of calves fed either whole or rolled CDC SO-I oat was at least equal to that of barley-fed calves and, in fact, feed to gain ratio ($P=0.13$) tended to be superior for calves fed the whole oat diet. These results indicate that processing (i.e. dry rolling) is not necessary when CDC SO-I oat is fed at approximately 35% of the diet dry matter in diets designed to target approximately 2.5 lbs gain in backgrounding programs.

As such, in addition to the agronomic benefits of growing oat for feed, producers will save the processing costs typically required for barley feeding programs, and yet achieve equal performance. These savings typically range from \$5 to \$15 per tonne, depending upon operation size and method of processing employed.

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