WASHINGTON STATE UNIVERSITY EXTENSION

Evaluating Camelina and Canola Meals as Protein Supplements for Beef Heifers

Don Llewellyn, WSU/Benton County Extension, Kennewick, WA
JD Rosman, Rosman Angus, Creston, WA
Gary Rohwer, Bar Diamond, Inc., Parma, ID
Steve Norberg, WSU/Franklin County Extension, Pasco, WA
Shannon Neibergs, WSU Extension Economist, Pullman, WA
Steve Fransen, WSU Extension, IAREC, Prosser, WA

Center for Sustaining Agriculture & Natural Resources

Introduction

As the biofuel industry gains strength and expands production of transportation fuels to meet the Renewable Fuel Standard (RFS2) standards and high value bio-based products, the net result is an oversupply of residual byproduct feedstuffs. In an era characterized by escalating feed costs for beef cattle producers, biofuel byproducts can provide opportunities to the animal feeding industry as a source of low cost protein (i.e., crude protein [CP]).

Forage quality in the Pacific Northwest is dynamic and is in decline as the forage species reach vegetative maturity (Ganskopp and Bohnert, 2001). Likewise, crop residues found in the Pacific Northwest (i.e., grain straws, corn stover, and residues of grass seed production) are lacking in sufficient protein to meet the requirements of beef cattle. Producers have found great utility to the provision of supplemental rumen-degradable protein (RDP) to beef cattle grazing low-quality forages with improvements in performance typically a result of increased intake and/or digestion (Köster et al., 1996; Olson et al., 1999; Mathis et al., 2000). It was also determined that low-level protein supplementation could be employed post-weaning in the fall to increase BW and body condition scores (BCS) prior to cows entering the rigors of the winter grazing season (Llewellyn et al., 2006).

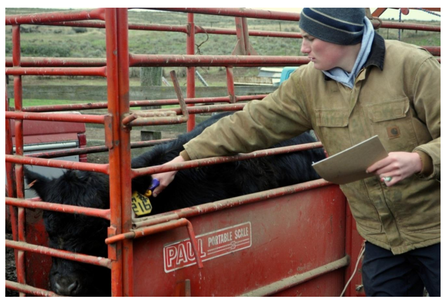
Less well known and researched are meals from the biodiesel refining industry, including Canola (*Brassica napus* or *B. campestris*) and Camelina (*Camelina sativa*), both are members of the Brassicaceae family. Each have unique and different agronomic challenges in stand establishment, weed control, diseases, harvesting, and residual byproduct meals. Canola is a genetically improved rapeseed that plant breeders have significantly reduced the amounts of erucic acid and glucosinolates from the seed making the meal palatable and acceptable for feeding. Camelina has been shown to fit nicely in dryland crop rotations in the Western United States. Only a limited amount of data exists on the usefulness of Camelina meal in ruminant diets.

The objective of our study is to evaluate on-farm processed Canola and Camelina meals as alternative protein supplements for cattle being fed low-quality forages.

Methods

Heifer Feeding Study

In the fall and winter of 2012/2013, crossbred beef replacement heifers (n = 37; age = ~ 9 months at initiation of study; body weight [BW] = 639 lbs ± 48 lbs) were utilized to compare the Canola meal and Camelina meal with soybean meal (a traditional protein supplement).



Treatments:

1. Control (base forage of wheat straw/alfalfa hay)
2. Camelina meal (37.1% CP [Dry matter, DM basis] fed at 0.19% of BW)
3. Canola meal (27.8% CP [DM basis] fed at 0.25% of BW)
4. Soybean meal (51.6% CP [DM basis] fed at 0.14% of BW)

Measurements:

- Oilseed meals fed to provide equal amounts of protein to the heifers diets. Heifers individually fed 3 days/week with the amount fed prorated to deliver the desired daily allotment.
- BW data were collected on day 1 and BW and average daily gain (ADG) data collected at days ~ 45 and 90, and pregnancy data will be recorded at the end of the 2014 calving season.

Results

Figure 1:

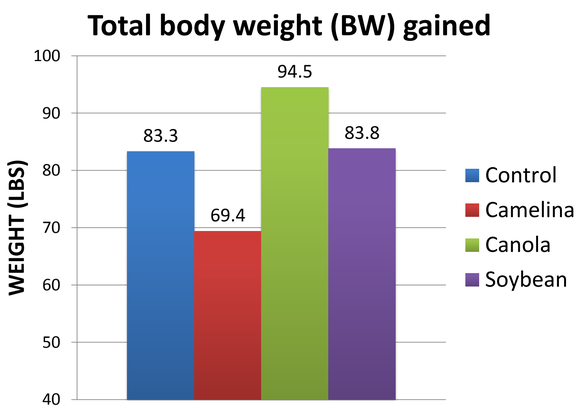
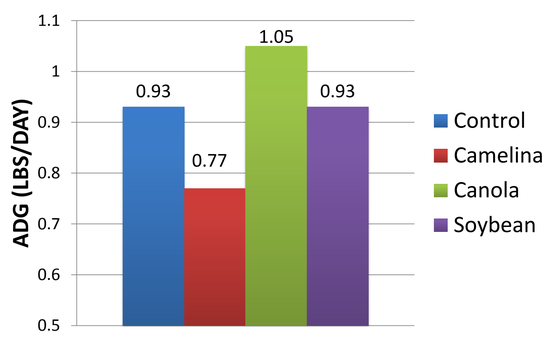


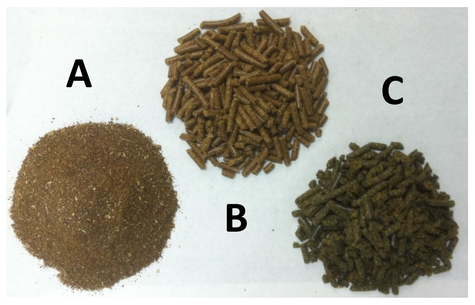
Figure 2:



For cumulative BW change (Figure 1), no differences *(P = 0.89)* were noted between the all forage control (CTRL; alfalfa hay and wheat straw) and the on-farm processed products (on-farm processed Canola and Camelina meal grouped together). The feeding of Canola meal resulted in a 36% greater *(P = 0.04)* cumulative BW change when compared with Camelina meal. The same trends were apparent when comparing the oilseed meals based on the heifers responses in ADG (Figure 2). No significant differences were observed between the CTRL and the oilseed meals. However, as ADG was again 36% greater *(P = 0.04)* for Canola meal compared to Camelina meal. Results also indicate some palatability issues with Camelina meal. This, as far as we know, has not been previously reported in the scientific literature. Previous research utilized Camelina meal in a mixed ration and therefore was not easy for the cattle to sort the feed. In our study, the protein supplements were fed separately, giving clear evidence of palatability differences among the oilseed meals.

Conclusions

In total, the results indicate that good performance can be obtained by using Canola meal as a protein supplement in beef heifer diets. There was no difference between Canola meal and soybean meal. However, Canola meal has a definite advantage over Camelina meal, which may be due in part to some palatability issues observed with Camelina meal.



A. Canola meal—commercial
B. Camelina meal—on-farm processed
C. Canola meal—on-farm processed

This project was supported by a BIOAg Grant from the WSU Center for Sustaining Agriculture & Natural Resources.

References

Ganskopp and Bohnert (2001), J. Range Manage. 54(6):640-647.
Köster et al. (1996), J. Anim. Sci. 74:2473-2481.
Llewellyn et al. (2006), Anim. Feed Sci. Tech. 127:234-250.
Mathis et al. (2000), J. Anim. Sci. 78:224-232.
Olson et al. (1999), J. Anim. Sci. 77:1016-1025.