Nutritional Evaluation and Processing of Canola Screenings for Ruminants

Dr. John McKinnon,
Department of Animal and Poultry Science
and Vern Racz,
Prairie Feed Resource Centre,
University of Saskatchewan
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As Canada’s total canola crush increased from an average of 1.3 million tonnes in the late 1980s to 2.6 million tonnes in the mid 1990s, so did the opportunities for use of canola by-products such as canola screenings, for the livestock industry. However, studies investigating the use of by-products from the grain cleaning industry and information on their energy, protein and fiber profiles and consistency have been limited. Researchers at the University of Saskatchewan conducted a four-year study from 1995 – 1999 to evaluate the nutritional aspects of canola screenings and the potential for ruminants. From the study, researchers found that canola screenings can have a fit in feeding ruminants. They have developed some recommendations for feeding cattle canola screenings.

As Canada’s total canola crush increased from an average of 1.3 million tonnes in the late 1980s to 2.6 million tonnes in the mid 1990s, so did the opportunities for use of canola by-products such as canola screenings, for the livestock industry. The use of low cost by-product feeds, such as canola screenings, can reduce cash input costs and reduce some of the risk of feeding management. However, studies investigating the use of by-products from the grain cleaning industry and information on their energy, protein and fiber profiles and consistency have been limited. Therefore products such as canola screenings have not been extensively used in backgrounding and feedlot rations to date.

Researchers at the University of Saskatchewan conducted a study from 1995 – 1999 to evaluate the nutritional aspects of canola screenings and the potential for ruminants. There were four objectives to the study, each conducted as separate trials.

**Trial 1. Nutrient and chemical makeup of western Canadian canola screenings.**
The objective of trial 1 was to develop the methodology and investigate the physical and chemical composition of canola screenings from western Canadian crushing plants for one year, from 1995 to 1996. The results showed that canola dockage averaged 48% fines, 27% large particles and 25% aspirations. The study also showed that the nutrient content of canola screenings was primarily influenced by the inclusion level of canola fines, and appears to be related to the cleaning method employed by an individual crushing plants.
Trial 2. Effects of pelleting and dietary fat level on nutrient utilization of canola screenings.
In trial 2, the objective was to study the voluntary intake and nutrient digestibility of growing steers fed unprocessed and processed canola screenings, and the effects of the screenings fat content on these parameters. The study was conducted at the University of Saskatchewan. The results showed that the consumption and utilization of unprocessed canola screenings was similar to that of chopped alfalfa-brome hay/barley diets. Grinding and pelleting of canola screenings depressed dry matter intake, but improved apparent digestibility of dry matter, crude protein and fatty acids. Feeding dietary fat up to 10% (100g/kg of dry matter) processed canola screenings did not result in the commonly negative associative effects on ruminal digestion and feed intake typically seen with this level of fat supplementation.

Trial 3. The effects of canola screening inclusion level on rumen fermentation characteristics and performance and carcass characteristics of feedlot cattle.
The objectives of trial 3 were to determine the effects of feeding canola screenings in combination with barley grain on the rumen environment on performance and carcass characteristics of feedlot steers. The trial was conducted at the AAFC Lethbridge Research Station. Overall, the results showed that cattle performed in a cost efficient manner with acceptable gains when feed 25 or 50% (250 or 500 g/kg) canola screenings in the diet, indicating that canola screenings may serve as a viable feed ingredient in high grain rations.

Trial 4. Nutrient value of high fat canola screening pellets with increasing levels of added calcium.
The final trial examined the potential of adding calcium to canola screening based diets in an effort to minimize the negative effects of fat on rumen fermentation and dry matter intake. The trial was conducted at the University of Saskatchewan. The results showed that increasing the level of added calcium to high fat canola screening diets did not improve dry matter intake, and actually resulted in a negative effect on digestibility.

From the study, researchers have developed recommendations for feeding cattle canola screenings.

- canola screenings are a viable alternative to conventional energy and protein sources for feeding cattle
- canola screenings are a byproduct feed that is characterized by high protein, fat and fiber levels
- the nutritive value of canola screenings is directly related to the content of canola fines
- processing of canola screenings is required to achieve optimal digestion and can be accomplished by grinding and/or pelleting
- based on results of this work, nutritionists and beef producers should ensure that dietary fat levels do not exceed 10% when canola screenings are the primary source of supplemental fat for growing/finishing cattle.
• in background programs, canola screenings are an excellent source of digestible energy and protein
• in finishing diets, the optimal level of inclusion was found to be 25% of the diet, but could be fed at levels of up to 50% of the dry matter in finishing rations without adversely influencing cost of gain or performance
• supplemental calcium will not improve intake or digestibility issues when dietary fat levels are in excess of 10%.
• care should be paid to potential problems with bloat from high inclusion levels of canola screenings
• the use of ionophore is recommended when feeding canola screening based rations
• actual inclusion rates in the diet will vary with the relative pricing of canola screenings to other energy and protein sources available to livestock producers

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