

Chemical Profiles, Energy Values, Protein and Carbohydrate Fractions of New Co-products (Carinata Meal) from Bio-fuel Processing as a New Alternative Feed for Dairy Cattle in Comparison with Canola Meal

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Brassica carinata is a newly developed oil source for bio-fuel or bio-oil production in Canada. Carinata meal is a byproduct of biofuel extraction and could potentially be as a good feed protein source for dairy cattle. However so far no detailed study is available for dairy cattle. The objective of this study was to evaluate nutritive values for dairy cattle in terms of detailed chemical and nutrient profile, truly digestible nutrients and energy values, protein and carbohydrate fractions of raw carinata meal and extruded carinata meal from biofuel processing in comparison with commercial canola meal and provide information for feed registration in Canada. The results showed that there were significant differences among carinata meal, extruded carinata meal and canola meal in crude protein (CP, $P=0.04$), soluble crude protein (SCP, $P=0.001$) and acid detergent insoluble crude protein (ADICP, $P=0.01$). Extruded carinata meal had the highest CP and SCP but the lowest ADICP, while canola meal had the lowest CP, SCP and the highest ADICP. Both carinata meal and extruded carinata meal were significantly higher than canola meal in total digestible nutrient (TDN) and predicted energy values (NE_L) for dairy cattle ($P=0.02$). Results from CNCPS indicated that carinata meal was higher than canola meal in PA2 and true protein fractions, but canola meal was higher in rapidly degradable PB1 fraction, intermediately degradable PB2 fraction and unavailable PC fraction. In addition, sugar in canola meal was higher than carinata meal, but there were no significant differences in other carbohydrate subfractions (CB1, CB2, CB3, CC). The results clearly indicated that carinata meal could be treated as a potential protein supplement for dairy cows, and extrusion had a positive effect on the nutrient availability.

Implications: Carinata meal can be used as a potential new feed protein source for dairy industry to improve the production of lactating cows compared with conventional canola meal. Extrusion improved nutrient availability in dairy cattle.