

## **Development of prairie environment friendly and value-added pellet products to mitigate ruminant methane: Effect of hydrolysable tannin as phytochemical feed additive on total digestible nutrient and energy values in beef and dairy cattle**

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To date, there were no study on effects of blend pellet co-products from bio-fuel/bio-oil processing with low grade of peas (or pea/lentil screenings in combination with hydrolysable tannins at different levels. This research program aims to develop prairie environment friendly and value-added pellet products to mitigate ruminant methane. The objectives of this study were to study effect of plant extracted hydrolysable tannin (PEHT) as phytochemical feed additive at different dosage levels on total digestible nutrient, energy values in beef and dairy cattle and Feed milk value based on Net energy for lactation (FMV<sub>NEL</sub>). Four levels of PEHT (0% (control), 2%, 4%, 6%) were added to two different feeds with different ratios of canola meal and pea (CP1: 50:50 and CP2: 70:30) which were used to make blend pellet product at Canadian Feed Research Center (CFRC). The total digestible nutrients and energy values were determined using NRC summary approach (NRC, 2001). The experimental design was a CRD with the dosage level and blend pellet product as fixed effects. Polynomial contract was used to determine linear and quadratic relationship between dosage level and nutritional value. The results showed that adding PEHT had quadratically effect on total digestible crude protein (tdCP), but it did not significantly impact tdNDF, tdNFC, tdFA, total digestible nutrient (TDN), NE for lactation, NE for growth, and NE for maintenance as well as FMV<sub>NEL</sub>.

**Take home message:** Compared with two different blend pellet products CP1 vs CP2, it showed that CP1 had significantly higher TDN (77.2 vs 75.2 %DM), tended to be higher in NE for lactation, NE for growth, NE for maintenance and FMV<sub>NEL</sub>.

## **Evaluation of the newly developed value-added blended fat stimulated feed product (bfsfp): Comparison with commercial protein and energy feeds in total digestible nutrients and energy profile**

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The objectives of this study were to compare total digestible nutrients energy values of commercial protein and energy products with newly developed value-added blended fat stimulated feed product (called BFSFP) and Feed Milk Value based on net energy for lactation (FMV<sub>NEL</sub>). Three-batches samples of the newly developed value-added blended fat stimulated feed products BFSFP1, BFSFP2 and BFSFP3 were developed with the Saskatchewan feed industry. Three samples of barley grain (n=3) and canola meal (n=3) were obtained from Canadian Feed Research Center (CFRC). The total digestible nutrients and energy values were determined using NRC summary approach. The treatment design was a one-way structure. The experimental design was a CRD with feed treatments as a fixed effect. The results showed that compared with commercially available energy-rich and protein-rich feeds, the newly developed BFSFP was lower in tdNFC than barley grain (P<0.05), but similar to canola meal, higher in tdCP than barley grain but lower than canola meal (P<0.05), highest in tdNDF and tdFA (P<0.05). The BFSFP had higher (P<0.05) TDN (73.67% DM) than canola meal (66.30 %DM) but lower (P<0.05) than barley grain (84.97%DM). As to energy value, BFSFP had no significant difference in NE for lactation when compared to barley grain and canola meal (1.80 vs 1.93 vs. 1.69 Mcal/kg DM, P>0.05). However, BFSFP had similar in NE for growth (1.29 Mcal/KD DM) when compared to canola meal (1.29 vs. 1.20 Mcal/kg DM, P>0.05) but lower than barley (1.29 vs 1.42 Mcal/kg DM, P<0.05).