

Effects of Steam Pressure on the Chemical and Rumen Degradation Characteristics of Faba Bean in Dairy Cattle

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The aim of this study was to identify the effects of processing times on the nutritional value of Faba bean (*Vicia faba*) seeds for dairy cattle. A total of 15 samples were used (1 variety x 3 yrs. harvest x 5 treatments). Seeds were autoclaved at 121 °C for 30, 60, 90, and 120 min, while untreated seeds were used as control treatment. Mixed model procedure and RCBD experimental design ($Y_{ij} = \mu + T_i + \beta_j + e_{ij}$) were used for statistical analyses with SAS 9.4 (SAS Institute, Inc., Cary, NC, US). Significance was declared at $P < 0.05$. The average DM, CP, ST, and NDF content was (90.65 %, 29.16, 36.49, and 36.03 %DM, respectively). Soluble crude protein (%DM) was significantly higher ($P < 0.0001$) in the control than the averaged heat treatments (23.90 vs 5.19 %). The total digestible nutrients (TDN_{1x}) and energy values were significantly different among treatments ($P < 0.001$) by decreasing gradually as heating time increased (TDN: - 2.78, - 3.87, - 6.44, and - 7.71 %DM at 30, 60, 90, and 120 min, respectively). Rumen undegradable crude protein (RUP-NRC, 2001) was significantly different ($P < 0.0001$), increasing its content with increasing heating times (+ 65.33, + 114.80, + 131.24, and + 143.97 g/kg DM at 30, 60, 90, and 120 min, respectively). The effective degradability of NDF in the rumen was significantly different ($P = 0.001$), increasing with increasing heating times (+ 97.44, + 148.73, + 150.93, and + 220.77 g/kg DM at 30, 60, 90, and 120 min, respectively). The potential of steam pressure to decrease protein rumen degradability of Faba bean (*Vicia faba*) for cattle rations has proven effective. Further studies to determine the benefits of an optimal steam pressure time on the metabolism and animal performance of dairy cattle are still needed.