

Chemical and protein quality parameters of heat processed sunflower oilcake for dairy cattle

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Abstract

The effect of heat processing on chemical and protein quality parameters of sunflower oilcake (SFOC) was evaluated. SFOC was processed in a drum roaster at six temperature settings and five time intervals. Chemical analysis included: N-solubility (N-sol.), percent pepsin insoluble nitrogen (% PIN), percent acid detergent insoluble nitrogen (% ADIN). These methods were used as screening tests to select six processed and one control sample for in situ evaluation.

The in situ polyester bag and mobile bag techniques were used to determine the effective rumen protein degradability and undegradable protein (UDP) digestibility, respectively. Heat processing significantly influenced UDP digestibility. The relationship between total tract crude protein (CP) disappearance and % ADIN ($R^2 = 0.88$), and between digestibility of UDP and % ADIN ($R^2 = 0.88$) was linear ($P < 0.05$), indicating the potential of % ADIN to indicate heat damage. Optimum heat processing was assumed to occur at 12 to 15% of total N as ADIN. Heat processing, decreased the concentrations ($P < 0.05$) of the amino acids (AA) Arg, His, Lys and Ser in the unincubated samples. The AA Arg, His, Lys, Met, Ala, Ser and Tyr were ($P < 0.05$) less resistant to microbial degradation compared with the control, whereas Lys, Asp, Gly and Ser were less absorbable ($P < 0.05$). The largest amount of AA from UDP theoretically available in the small intestine (SI) occurred at 150°C/30 min, which agreed with the optimum level of ADIN. Results demonstrated the usefulness of ADIN as an indicator of heat damage for SFOC.

Keywords: [Cattle—dairy](#), [Sunflower oilcake](#), [Heat processing](#)

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