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Evaluation of Simple, Effective and Affordable Processing Methods to Reduce Phytates in the Legume Seeds Used for Feed Formulations

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Abstract:

As sources of nutrients, legumes seeds contain abundant quantities of phytates which cannot be digested by the ruminants and cause micronutrient deficit. Furthermore, their removal is too costly. The aim of the study was to investigate cost-effective methods to reduce the inherent phytates in the seeds of *Arachis hypogaea*, *Pisum sativum* and *Vigna radiata* L. The seeds were subjected to single processing methods plus dehulling namely, raw seeds (R+D), soaking (S+D), ordinary cooking (C+D), infusion (I+D), autoclave (A+D), microwave (M+D) and five combined methods (S+I+D; S+A+D; I+M+D; S+C+D; S+M+D). The processed seeds were ground into powder, extracted and analyzed on a microplate reader and Inductively Coupled Plasma to determine the phytate and mineral contents, respectively. One-way ANOVA was used as a statistical tool. The percentage yield ranges of the processing methods were 39.1–96%; 67.4–88.8% and 70.2–93.8% for *V. radiata*; *A. hypogaea* and *P. sativum*, respectively. The lowest percentage yield which was significantly different ($p<0.05$), was determined in S+M+D of *P. sativum*. While all the mineral contents were within the acceptable limits. Since S+M+D method significantly reduced the phytates, it may be recommended to the local farmers and feed producing industries to enhance animal health and production at an affordable cost..

Keywords:

Extracts, phytates, legume seeds, dehulling, processing methods.