

Lupin ingredients in shrimp (*Penaeus monodon*) diets: influence of lupin species and types of meals

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Abstract

The nutritive value of five isonitrogenous practical diets containing different legume meals, whole or dehulled lupin (*Lupinus albus*) seed meal (WAD and DAD, respectively), dehulled lupin (*L. angustifolius*) seed meal (DND), lupin (*L. angustifolius*) protein concentrate (LPCD), and defatted soybean meal (SBD), was evaluated in two laboratory experiments (growout and digestibility studies) using juvenile (4.07 ± 0.05 g, mean \pm SD) shrimp, *Penaeus monodon*. In the 42-day growout study, shrimp fed SBD or DND had significantly higher ($P < 0.05$) growth rates than those fed LPCD, DAD or WAD. Protein conversion efficiency (PCE) and apparent protein utilization (APU) values of DND were significantly higher than those of LPCD, DAD or WAD. SBD and DND had significantly higher feed intake values and better feed conversion ratios (FCRs) than WAD and DAD. LPCD had a similar FCR to other diets but lower feed intake than SBD. Shrimp fed WAD had significantly poorer performance in all the above parameters than shrimp fed other diets except for DAD and LPCD. The diets SBD, DND, LPCD, and DAD had significantly higher ($P < 0.05$) apparent dry matter digestibilities (ADMD) (68.3–71.4%) than WAD (64.4%). All diets had a similar apparent protein digestibility (APD) (87.1–89.1%) with a small, but significant difference being observed for the diets with the highest (DND) and the lowest (WAD) protein digestibility. Pellet water stability was significantly different ($P < 0.05$) among the diets. The most stable pellet was displayed by LPCD, while WAD had the poorest water stability. Dehulling or concentrating lupin seed protein did not improve the nutritive value of lupin diets for juvenile *P. monodon*. The lupin seed meal of *L. angustifolius* was better utilized by *P. monodon* than that of *L. albus* and the nutritive value of *L. angustifolius* diet was equal to that of soybean (control) diet. Results of a feeding preference test also indicated that *L. angustifolius* diet was more attractive for juvenile *P. monodon* than *L. albus* diet.

Author Keywords: Shrimp nutrition; *Penaeus monodon*; Lupin seed; Protein; Digestibility

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