

ENZYME SUPPLEMENTATION OF PRAWNS (*PENAEUS MONODON*) IMPROVES NET ENERGY OF CANOLA BASED DIETS

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Plant protein meals result in poorer growth in prawns than expensive fish or squid meals. This limits their inclusion in prawn diets (Fox *et al.* 1994). It is possible that non-starch polysaccharides (NSP) as with monogastrics (Annison 1992), are poorly utilised by prawns which have a very simple digestive system with a rapid transit time. The net energy value of canola meal at *ad libitum* intakes was determined for prawns. Canola meal, which has a high NSP content, was supplemented with "Porzyme TX" (Finnfeeds International).

The basal diet (B) consisted of (g/kg) squid meal 594, wheat flour 236, wheat gluten 80, vitamins, minerals and cholesterol 60 and binder 30. Into this diet was substituted (g/kg) 200 g canola meal with enzyme (LC+E) or without (LC), 640 g canola meal with enzyme (HC+E) or without (HC), or 540 g canola meal plus 100 g sugar (HC+S). The six diets were fed *ad libitum* to prawns (mean weight 0.7 g) for 5 weeks with 3 animals per tank, 5 tanks per treatment. Net energy was determined by the standard comparative slaughter method using an initial slaughter group and all other groups after 5 weeks of the treatment. Diets B and HC were also fed at restricted rates to calculate net energy for canola. Total body energy content was determined by bomb calorimetry.

The net energy value of canola meal was 6.07 kJ/g. Substitution of canola significantly reduced growth rates ($P < 0.05$) at the higher level of inclusion (Table 1). Enzyme supplement (HC+E) increased live weight gain by 30% ($P < 0.05$) such that it was not significantly different ($P > 0.05$) to the basal diet. Growth on HC+S was similar to B rate suggesting that available energy was the limitation with the use of canola. The net energy of canola meal with enzyme supplementation increased to 9.7 kJ/g. Low level canola addition gave a similar live weight gain to the basal diet.

Table 1 Live weight gain (g/5 weeks) of prawns.

Diet	Live weight gain (g)	Standard error
Basal	2.33 ^{ab}	0.1520
LC	2.29 ^a	0.1043
LC+E	2.39 ^a	0.0101
HC	1.61 ^b	0.1140
HC+E	2.10 ^a	0.1010
HC+S	2.02 ^a	0.1109

^A Means with different superscripts are significantly different ($P < 0.05$).

It may be concluded that canola meal can be successfully included at rates of up to 200 g/kg in prawn diets but will depress live weight gain at higher levels of inclusion. Enzymes or available energy supplements appear to overcome this depression.

ANNISON, G. (1993). *Aust. J. Agric. Res.* 44: 405-22.

FOX, C., BROWN, J. and BRIGGS, M. (1994). In "Recent Advances in Aquaculture V". (Eds J. Muir and R. Roberts) pp. 132-69 (Blackwell Science: Oxford).