

The effect of dietary phospholipids on neutral lipid digestion by the prawn, *Penaeus monodon*

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Prawns appear to lack dietary emulsificants analogous to bile salts (1). It is suggested that the amphipathic and subsequently, emulsicative properties of dietary phospholipid may alleviate this problem, in this group of animals. The effect of varying dietary phospholipid content on the digestibility of total neutral lipids was examined in the prawn *Penaeus monodon*, which is the dominant prawn species cultured worldwide.

A purified source of the phospholipid, L- α -phosphatidylcholine, was included at 0, 0.5, 1, 2 or 4 % w/w in a purified (casein-based) diet containing 8% w/w olive oil as the neutral lipid source. Diets were labelled with the marker 5 α -cholestane (2). The apparent digestibility of neutral lipid (ADNL) of these diets was determined when fed to \approx 10 g prawns. Six independent determinations were made for each treatment with digestibility being measured by reference to changes in the dietary and faecal concentrations of the α -cholestane. Digestibility (%) increased with increasing dietary phospholipid content (x, %) as described by the equation: $ADNL = 83.53 + 6.16x - 1.15x^2$ ($P < 0.05$; $r^2 = 0.76$); the asymptote of 91.8% was achieved with a phosphatidylcholine value of 2.67% (Figure). These results demonstrate an important role of phospholipids in the digestibility of neutral lipids by penaeid prawns.

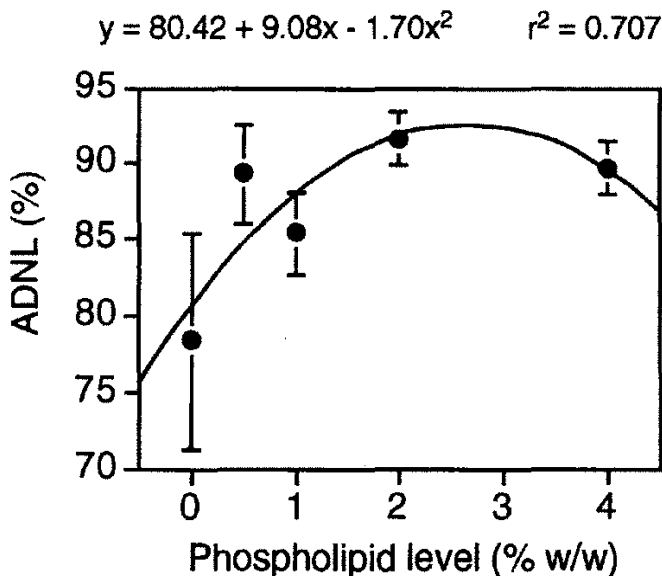


Figure. Effect of dietary phospholipid content on the apparent digestibility of neutral lipid (ADNL)

1. Ishikawa, M., Teshima, S., Kanazawa, A. and Koshio, S. Evacuation of inert markers in digestibility determination, 5 α -cholestane and chromic oxide, in the prawn *Penaeus japonicus*. Fisheries Science 1996; 62(2): 229-234.
2. Van-Weel, PB. Digestion in Crustacea. In: Florkin M and Scheer BT, eds. Chemical Zoology. New York, Academic Press, 1970: 97-115.