

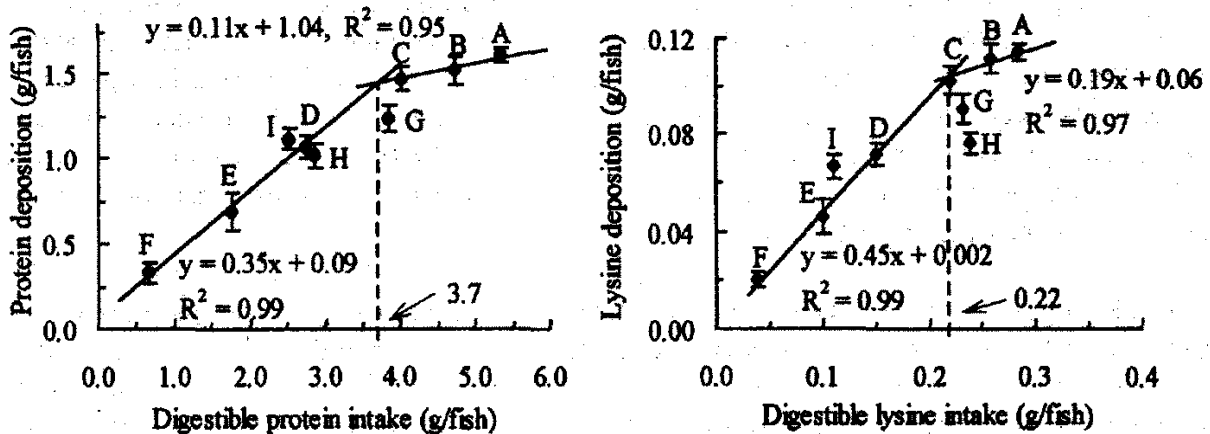
**Estimating optimum lysine requirements of silver perch (*Bidyanus bidyanus*)**

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Lysine is usually the first limiting amino acid in fish diets and may limit fishmeal substitution. In this study, we attempted to estimate requirements for lysine using intact protein sources. Using digestibility data for silver perch for a large number of ingredients, we formulated a "summit" diet to contain 1.8 times the expected requirements for essential amino acids except lysine and 1.4 times the expected requirements of lysine (based on requirements for channel catfish (1)). A "diluent" diet was formulated to contain 0.4-0.5 times the expected requirements of all essential amino acids. Both "summit" and "diluent" diets contained 13 MJ/kg digestible energy. Six diets (A-F) with the following amounts of summit:diluent diets were prepared: 100:0, 80:20, 60:40, 40:60, 20:80, 0:100. Three additional controls were used: a practical control diet (G) (2) and the 40:60 summit:diluent diet with either additional crystalline lysine (H) or a mix of all essential amino acids except lysine (I). Ten fish (2.1-2.6 g) were stocked into each 70 l aerated aquaria (6/diet). Fish were fed restricted rations (0.90% of satiation) for 55 days. Final individual fish weight ranged from 4 g to 15.5 g.



Results were modelled using two-phase linear regression analysis. The minimum digestible protein and digestible lysine intake after which protein and lysine deposition did not increase significantly were 3.7 g/fish and 0.22g/fish respectively. The optimum lysine requirement was not conclusively determined as there was no additional response to the 40:60 summit:diluent diet with added crystalline lysine; therefore lysine was not shown to be the only limiting nutrient. This was either due to a failure of the crystalline form of amino acids to elicit a growth response or a limitation in lysine plus one of the other essential amino acids. This needs to be further investigated. However, these results demonstrate silver perch fed diets with 13 MJ/kg DE diet grew equally well on diets with 27.4% digestible protein and 1.52% digestible lysine, as on diets with up to 40.4% digestible protein and 2.15% digestible lysine.

1. Lovell RT. Nutrition and Feeding of Fish. New York: Van Nostrand Reinhold, 1989.
2. Allan GL, Rowland SJ. Development of an experimental diet for silver perch (*Bidyanus bidyanus*). *Austasia Aquaculture* 1992;6(3):39-40.