

## Tissue lipid relationships in silver perch fingerlings fed different diets

*BJ Hunter<sup>1</sup>, GL Allan<sup>2</sup> and DCK Roberts<sup>1</sup>*

<sup>1</sup> Discipline of Nutrition and Dietetics, University of Newcastle, NSW, 2308

<sup>2</sup> NSW Fisheries, Port Stephens Research Centre, Taylors Beach, NSW, 2301

The nutritional significance of fish is receiving much attention. Research is being directed into the growth and development of farmed fish. One important aspect of development is the effect dietary lipids have on early growth and development. This study looked at tissue lipid relationships during early growth.

Silver perch fingerlings were fed diets differing in fat content (6.9 %- 11.5 %). After five weeks on the diets, the fingerlings were weighed and harvested. Total lipid was extracted and fatty acids analysed by gas chromatography. Further separation of total lipid into phospholipid and triglyceride fraction was performed by column chromatography and fatty acids analysed by gas chromatography.

Dietary fat influenced the total fat content and type of fat in the fingerlings. As the dietary fat increased there was an increase in fish fat ( $r^2=0.728$ ). Saturated, monounsaturated and n-6 fatty acids increased as the dietary fat increased but n-3 fatty acids were little affected by diet.

As body weight increased the total phospholipid (mg/100 mg lipid) increased, but there was no relationship between body weight and total triglyceride in the young fish.

There was a strong positive correlation ( $P<0.0001$ ,  $r^2=0.96$ ) between phospholipids and the phospholipid:triglyceride ratio in fish tissue (Figure). The strength of this relationship could make it a useful predictor of fat mass based on a measure of phospholipid.

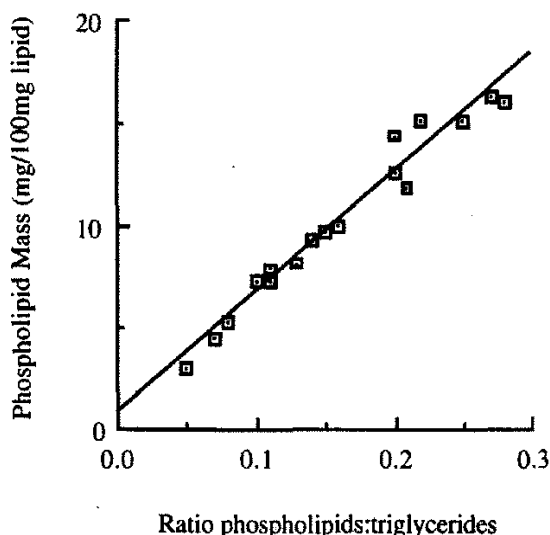


Figure. The phospholipid:triglyceride ratio was positively correlated with the amount of phospholipid in fish tissue.

From these results it is clear that dietary fat intake influences the amount of lipid and the fatty acid profile in fish tissue. The relationship between body weight and phospholipid mass could also be a surrogate measure for the protein:fat ratio in the body of growing fish but this needs to be demonstrated experimentally.