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EFFECTS OF DIETARY PROTEIN:ENERGY RATIO ON WEIGHT GAIN, BODY COMPOSITION, SERUM GLUCOSE AND TRIGLYCERIDE LEVELS, AND LIVER FUNCTION OF STRIPED BASS

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ABSTRACT

A 12 week feeding experiment was conducted with juvenile, full sibling striped bass (*Morone saxatilis*) to evaluate three practical diets with protein:energy ratios of 26.9 (diet 1), 31.1 (diet 2), 35.7 (diet 3) g protein/MJ energy. Survival was high in all three diets, however, growth in diet 1 and 2 was significantly less than in diet 3. Proximate composition of whole fish indicated that striped bass fed Diet 1, with the lowest level of metabolizable energy but the lowest protein:energy ratio, had significantly higher lipid content compared to the remaining diets. Conversely, diet 3, with the highest level of metabolizable energy and the highest protein:energy ratio, was the only diet with an increased whole body protein content. Serum levels of triglycerides increased significantly in all treatments when compared with pre-experimental levels, but were lowest in diet 3. Serum glucose levels dropped from pre-experimental levels in all treatments except diet 1. A linear increase in both lipids and carbohydrates stored in the cytoplasm of the liver hepatocytes was observed with increasing metabolizable energy content of the diets. Hepatocellular swelling was observed in fish fed all three diets. However, the two lower protein:energy ratio diets caused significantly greater swelling of hepatocytes than did the highest protein:energy ratio diet. These data indicate that similar practical diets with less than 34 g protein/MJ may be inappropriate for juvenile striped bass.

KEYWORDS

Dietary energy; liver function; serum chemistry; striped bass.

INTRODUCTION

Striped bass (*Morone saxatilis*) have received considerable attention in the United States from economic, research, management and culture perspectives (Norton *et al.*, 1983; Woods *et al.*, 1985; Harrell *et al.*, 1990). The species currently faces severe pressures including: over harvest, pollution, and loss of spawning