

THE PROTEIN SPARING EFFECTS OF HIGH LIPID LEVELS IN DIETS FOR RAINBOW TROUT (*ONCORHYNCHUS MYKISS*, W. 1792) WITH SPECIAL REFERENCE TO REDUCTION OF TOTAL NITROGEN EXCRETION

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Abstract

This research sought to develop low-protein, high-energy (less-polluting) diets for rainbow trout to properly utilize protein and reduce total nitrogen excretion. Duplicate groups of rainbow trout were fed one of four experimental diets with a protein to energy (P:E) ratio of 25, 24, 22 or 19 mg/kJ and a lipid content of 12, 13, 17 or 26%, respectively. The diets were given to fish with a mean initial weight of 181 g for 70 days. At the conclusion of the trial, mean weights ranged from 353.17 g (94% weight gain) to 394.75 g (118% weight gain) with 100% survival in all treatments. Weight gain, feed efficiency and protein retention increased as the dietary lipid content increased and as the P:E ratio decreased. Fish fed the 22 mg protein/kJ energy diet (17% lipid, 44% protein, 20.34 kJ/g gross energy) performed best. This indicates that the protein content in practical trout feeds can be reduced from the currently used 47% to around 44% without reducing the growth rate and feed efficiency, if high quality protein is used and the gross energy is increased by lipid to about 20.34 kJ/g diet. The low-protein, high-energy diets reduced the total nitrogen excretion from the rainbow trout by 27%.

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