

Director's Digest



WERNER R. BOEHME
Technical Director

2720 DES PLAINES AVENUE
DES PLAINES, ILLINOIS 60018
AREA CODE 312-827-0139

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PROTEIN SUPPLEMENTATION OF CATFISH DIETS

Investigations by Prof. James Andrews and his co-workers at the Skidaway Institute of Oceanography with fingerling catfish diets containing proteins from animal and vegetable sources have shown the importance of both amino acid balance and amino acid availability for good growth and efficient feed conversion.

With grant support from the Fats and Protein Research Foundation these nutritionists have presented evidence indicating that intact proteins are utilized more effectively than their hydrolysates or the free amino acids. Using nutrients labelled with carbon-14 Dr. Andrews determined absorption rates by measuring the change with time of amino acid concentrations in the blood plasma. The observation that ingested free amino acids appear in the plasma much earlier than those from intact protein led him to suggest that synthetic amino acids are relatively ineffective in catfish diets because of their rapid uptake and dissimilation before other essential nutrients are absorbed and become available.

To compare the effectiveness of an essential amino acid in the free and protein-bound form these investigators replaced the fishmeal (which is rich in bound methionine) in practical 30% protein-containing catfish diets by soybean meal supplemented with 1) l-methionine, 2) the synthetic hydroxy-methionine analog, 3) a protected form of a methionine to delay absorption and 4) inorganic sulfate. None of the

supplemented soybean diets was able to elicit a growth response. However, when fishmeal was replaced by corn gluten meal (another good source of combined methionine) a significant growth response was recorded. Approximately 0.6-0.7% methionine in the protein-bound form is necessary for good growth in catfish.

When 3/4 of the fishmeal was replaced by soybean meal, meat meal, hydrolyzed feather meal, poultry by-product meal or blood meal, while maintaining the same total nitrogen level, weight gains and feed efficiencies were reduced in proportion to the lower methionine contents of these proteins.

These feeding trials point out the importance of providing adequate levels of bound methionine in the protein components of catfish diets.