

SINGLE CELL PROTEINS IN THE DIET OF OYSTERS

J. A. NELL

An artificial diet for the fattening of Sydney rock oysters (*Saccostrea commercialis*) was developed by Nell and Wisely (1983, 1984). The particles of this diet were approximately 5 μm in diameter as recommended by Wisely and Reid (1978). The small particle size, together with the requirement for ease of suspension in seawater, restricts suitable protein ingredients for non-encapsulated oyster diets to small single cell proteins. Increased glycogen levels in oyster meats and condition indices in response to bacterial protein "Pruteen" supplementation were obtained by Nell and Wisely (1983). Yeasts were found to support little growth (Kern, 1973; Epifanio, 1979) but had not been compared as a dietary protein supplement against bacterial proteins.

Oysters were either unfed, fed a protein-free control diet or fed one of four diets containing 171 g crude protein per kg dry diet. The single cell proteins used were the bacterial protein "Pruteen" (*Methylophilus methylotrophus*) from I.C.I. Ltd., Billingham, England, "Probion" (*Methylomonas clara*) from Hoechst A.G., Frankfurt am Main, West Germany, food yeast (*Candida utilis*) and baker's yeast (*Saccharomyces cerevisiae*). After mixing all diets had > 80% of their particles < 10 μm in diameter and microscopic examination showed that all cell walls were still intact.

Significant ($p < 0.05$) increases in glycogen content and condition index were obtained with the bacterial protein "Pruteen" (*Methylophilus methylotrophus*) and the food yeast (*Candida utilis*). Both these single cell proteins are therefore suitable for inclusion in oyster fattening diets. Baker's yeast (*Saccharomyces cerevisiae*) was of lesser benefit and the bacterial protein "Probion" (*Methylomonas clara*) was the least useful of the single cell proteins tested. These results could not be explained by differences in dietary composition or the essential amino acid profiles of the ingredients. Therefore it seems that the nutritive value of single cell proteins is largely determined by the digestibility of their cell walls.

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Department of Agriculture N.S.W., Brackish Water Fish Culture Research Station, Salamander Bay, New South Wales 2301