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1.78 Metabolic Relationships Between Mineral Composition of Medium and Polyunsaturated Fatty Acid Profile of *Pavlova lutheri*

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Use of specific microalgae as sources of polyunsaturated fatty acids for incorporation as feed additive in aquaculture has received increasing interest, owing to beneficial effects upon the growth rates of zooplankton. However, the fatty acid profile of intracellular fats within a given species can be modulated via manipulation of growth conditions, namely changing nutrient availability; the marine microalga *Pavlova lutheri* is rather interesting in this respect.

Three enriched seawater media (*i.e.* GPM, f/2 and MN) and one synthetic medium (*i.e.* ASW), covering considerable quantitative and qualitative ranges of nutrients, were tested in order to determine the medium composition that best stimulates production of such polyunsaturated fatty acids as EPA and DHA; the biochemical compositions of the algae were monitored accordingly. Metabolic correlations between the mineral components of the media and the resulting biomass yield, as well as the biochemical profile and the polyunsaturated fatty acid productivity, were tentatively put forward in attempts to shed further light on the effects of the processing environment upon microalgae. Statistical analyses of the experimental results have indicated that GPM should be selected because of its capacity to ensure high cell yield (12.1×10^6 cell mL^{-1}) and PUFA productivities (0.502 mg l^{-1} d^{-1} and 0.228 mg l^{-1} d^{-1} in EPA and DHA, respectively). In addition, since it is a simple medium, composed mainly of seawater, nitrogen and phosphorus, it has a low production cost and is easy to prepare in industrial settings, thus making it suitable for general use in marine aquaculture.