

Preface

The term single cell protein (SCP) refers to dead, dry cells of microorganisms such as yeast, bacteria, fungi and algae which serve as food or/and feed supplements. SCP will be an alternative to conventional proteins like casein, soyabean meal, egg protein or meat protein in animal feed. SCP is one of the alternatives that cannot be affected by climate change. SCP has a high content of protein containing all the essential amino acids. Microorganisms are an excellent source of SCP because of their rapid growth rate, their ability to use very inexpensive raw materials as carbon sources, and the uniquely high efficiency, expressed as grams of protein produced per kilogram of raw material, with which they transform these carbon sources to protein. SCP has many benefits. It is a very fast way of producing protein compared to the production of protein through cultivation of agricultural crops or animal farming. The amino acid profile of many SCP is favourable and very similar to that of fishmeal. SCP can be produced from residual streams from different industries giving the possibility of a cheap production. In addition, SCP production can be performed in bioreactors and does not require agricultural land. Production of SCP may very well fit into the request of a sustainable high-quality alternative to fishmeal since the production can be performed using renewable and sustainable feedstocks such as residual streams from second generation bioethanol production. The second generation bioethanol production is predicted to increase in the future, resulting in large volumes of residual and waste streams. These residual streams are commonly considered to be used as substrates for biogas production. SCP production is an interesting alternative to biogas production, possibly with a higher economic value. SCP has been found to meet all the requirements for its inclusion as diet supplement for livestock. SCP can be replaced up to 20–30% of the protein supply by soybean meal without any deleterious effects on growing broiler chicks. Yeast SCP can successfully replace fishmeal up to 50% level with 0.25% dietary methionine supplementation in a 30% protein diet for *O. niloticus* fingerlings with no significant difference in fish performance. SCP from lignocellulose biomass presents upcoming technology aimed at providing protein supplement for both human food and animal feeds. Lignocellulosic biomass presents a readily available feedstock for microbial bioconversion which does not compete with feedstocks

used for human food. Lignocellulose is the major structural component of woody plants and non-woody plants and represents a major source of renewable organic matter—a substrate of enormous biotechnological importance. Microorganisms are involved in bioconversion of low-cost carbon feedstocks such as lignocellulose to produce biomass rich in proteins and amino acids. Production of SCP from lignocelluloses is gaining much attention, with the recovery of valuable by-products and simultaneous reduction of the organic load as the chief economic advantages of such processes. This e-book *focuses on the bioconversion of lignocellulosic residues into single cell protein*.

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