

SINGLE-CELL PROTEIN: CURRENT STATUS AND FUTURE PROSPECTS**Rashmi Rani Sahoo and Debashish Tripathy**

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ABSTRACT

Malnutrition is a big problem in India and other parts of the world. We can use various microbes for production of single cell protein to solve malnutrition problem. Single cell protein (SCP) has many applications in food and feed industries. The microorganisms which can be used as SCP include a variety of bacteria, microalgae, yeasts and molds. Production of SCP using cheap materials as substrate provides an economically feasible source of protein for use in animal feed or the processing of products for human consumption, as it often meets dietary requirements for protein. Many microorganisms have been used to convert various substrates into biomass. The Protein content vary with different microorganisms used for production of SCP. The maximum percentage was obtained from bacterial source i.e 50-83%. SCP production technologies arose as a promising way to solve the problem of worldwide protein shortage. They evolved as bioconversion processes which turned low-value by-products into products with added nutritional and market value and since SCP belongs to one of the cheapest protein products in the market, its production is profitable.

Keywords:- Single Cell Protein(SCP), Nutritional Supplements, Organic Waste, Protein Deficiency, Biomass

INTRODUCTION

With the world population reaching 9 billion by 2050, there is strong evidence that agriculture will not be able to meet demand and that there is serious risk of food shortage. Autotrophic SCP represents options of fail-safe mass food-production which can produce food reliably even under harsh climate conditions. With the world population reaching 9 billion by 2050, there is strong evidence that agriculture will not be able to meet demand and that there is serious risk of food shortage. Autotrophic SCP (single cell protein) represents options of fail-safe mass food-production which can produce food reliably even under harsh climate conditions.

Microorganisms have an ability to upgrade low protein content and this phenomenon was employed during First World War other bacteria were used to replace the conventional food materials. The production and utilization of microbial biomass as a source of food proteins gained particular interest as an alternative source for proteins of agricultural origin due to its high content of protein. In addition to proteins, scp contents other nutrients such as lipids and vitamins.

Single cell proteins or SCP refers to source of proteins which are extracted from single cell organisms like algae, yeast, bacteria and fungi. SCPs are a good source of proteins to sources like soymeal and fishmeal. Single cell protein can play a major role in alleviating protein deficiency. (Ghasem D. najafpour, 2007)

The single cell protein (scp) concept is applied to the massive growth of microorganisms for human or animal consumption. Single cell protein is a generic term for crude or refined protein whose origin is bacteria, yeasts, molds or algae, microorganisms that usually contain above 40% of crude protein on dry weight bases. Yeasts and bacteria have been particularly important for scp production and easily acceptable as their biomass has been consumed by man since ancient times in the form of fermented foods. The production of scp has important advantages over other sources of proteins, such as its considerably shorter doubling time, the small land requirement.

The determinants of the utility of scp product for application as food for human beings and feed for animals differ. It shows nutritional value of food proteins from different sources. For human beings, protein digestibility and protein efficiency ratio (PER), biological value or net protein utilization (NPU), determined in rats, are the parameters for food application, whereas for animals, metabolizable energy, protein digestibility and feed conversion ratio (weight of ratio consumer/weight gain) are the measures of performance in broiler, chickens, swine and calves (and egg laying in hens).