



Role of Single Cell Protein in Healthy Diet

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ABOUT THE STUDY

Eating unicellular bacteria is referred to as single-cell proteins or microbial proteins. In addition to serving as an ingredient or a meal replacement for meals high in protein, the biomass or protein extract from pure or mixed cultures of algae, yeasts, fungi, or bacteria is also ideal for use as animal feed. Production of SCP is not always accompanied by any of these significant problems, but industrial agriculture is characterized by a large water footprint, high land use, biodiversity destruction, general environmental degradation, and a third of all greenhouse gas emissions. Since SCP is currently frequently grown on agricultural waste, it inherits the ecological and water footprints of industrial agriculture. SCP can, however, also be created through autotrophic development completely independently of agricultural waste products. Due to the wide variety of microbial metabolism, autotrophic SCP offers a variety of growth modes, flexible choices for nutrient recycling, and a significantly higher efficiency when compared to crops. According to a 2021 publication, photovoltaic-driven microbial protein synthesis could use 10 times less area than soybean farming to produce the same amount of protein. Processes for making yeast in highly concentrated forms were established in 1781. When Max Delbruck and his associates discovered the great value of excess brewer's yeast as an animal feed addition, research on single-cell protein technology began.

In order to combat the food shortages that occurred during World Wars I and II, yeast-SCP was widely used in Germany. The development of innovations for SCP production frequently marks turning points for biotechnology as a whole. For instance, in 1919, Sak in Denmark and Hayduck in Germany created the "Zulaufverfahren" method, which involved continuously feeding sugar solution to a suspension of yeast rather than adding the yeast to a diluted sugar solution all at once. The Food and Agriculture Organization of the United Nations focused on the global issues of hunger and malnutrition in the post-war era and

created the notion of the protein gap in 1960, demonstrating that 25% of the world's population had inadequate protein consumption in their diets. Additionally, it was believed that agricultural productivity would be unable to keep up with the world's growing food needs. Nearly a quarter of a million tons of food yeast were being produced around the world by the middle of the 1960s, and the Soviet Union alone generated almost 900,000 tonnes of food and fodder yeast by 1970. Researchers at British Petroleum created the "proteins-from-oil technique" in the 1960s, which uses yeast and waxy n-paraffins, a byproduct of oil refineries, to produce single-cell proteins. At BP's Lavera Oil Refinery in France, Alfred Champagnat conducted the initial study; in March 1963, a small pilot plant there began operations. At the same time, development of a second pilot plant at Grange Mouth Oil Refinery in Britain was allowed. Carroll L. Wilson of MIT first used the term SCP in 1966. By the 1970s, the concept of "food from oil" had gained considerable traction to the 1976 UNESCO Science Prize for Champagnat and the construction of paraffin-fed yeast factories in several nations.

CONCLUSION

The product was primarily used as cattle and poultry feed. Carroll L. Wilson of MIT first used the term SCP in 1966. With great enthusiasm, the Soviets established sizable "BVK" facilities near their oil refineries in Kstovo and Kirishi. By 1989, the Soviet Ministry of Microbiological Industry had eight such facilities. However, the government chose to shut them down or switch to alternative microbiological methods due to worries about the toxicity of the alkanes in SCP and pressure from environmentalist organizations. In Europe and North America, Quorn is a brand of vegetarian and vegan meat alternatives manufactured from the mycoprotein of *Fusarium venenatum*. Calysta is another single-cell protein-based beef imitation. Unibio, Circe Biotechnologie, and String Bio are additional producers.

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