BIOCHEMISTRY

One Cell Protein from Oil

Tiny, protein-rich micro-plants and animals that can be grown in a garden of petroleum may help solve the world's food problem.

Microscopic organisms can be grown and harvested in large quantities to produce nutritious material called Single Cell Protein or SCP, reported John G. McNab of the Esso Research and Engineering Company, and Louis R. Rey of Nestlé Alimentana of South America. This material can be mixed with other foods to provide valuable protein for human beings, the researchers reported at the annual meeting of the American Association for the Advancement of Science in Washington.

In providing this much-needed food for hungry nations, one large hurdle must be crossed: convincing people to try it, like it and accept it. It is a well known fact that people are very conservative and traditional when it comes to eating.

Even though new foods may be far more convenient and more nutritious than their regular food, people are reluctant to acquire new food habits. Each innovation—canned, frozen, or dehydrated foods—has taken years of advertising, promotion and convincing before it is publicly accepted.

The Single Cell Protein, formed by microorganisms such as yeasts and bacteria, needs to be grown on carbohydrates, one of the basic materials of plants, including sugar and starches. Since most of the world sources of molasses and other carbohydrates are already being consumed by human beings, as well as cattle and poultry, scientists are suggesting that petroleum serve as material on which to grow the cells. The amounts necessary to meet protein shortages in the world today and tomorrow would represent a very small percentage of the world's annual production of crude oil.

Organisms can be grown on the petroleum, maturing in only one to four hours under proper conditions. After fermentation, the cells are separated by centrifugal force, washed, then heated and dried.

Man is already using many microorganisms in his food. The single-celled yeasts have been used for centuries in fermentation processes to produce bread and drinks. Yeasts, such as the saccharomyces of beer fermentation, are now used as a source of protein for animal feed.

BUDGETS

R&D, 1967: $23.8 Billion

This year will see research and development in the United States funded to the tune of about $23.8 billion, an increase of $500 million over 1966.

This lift of 2.2 percent is the lowest percentage increase in the 13 years for which national survey data is available, and is also the smallest dollar increase since 1955.

According to the annual R&D forecast by the Battelle Memorial Institute, 80 percent of the predicted increase will come from the pocketbooks of industry, universities and nonprofit institutions. For the first time in a decade, the federal government (pinched by war in Vietnam) will not be the dominant factor in the R&D growth trend.

Breaking down the total funding estimate for 1967, the Battelle economists predict the federal government will put in about $16.2 billion; industry $6.8 billion; colleges and universities, $480 million; and other nonprofit institutions, $326 million.

Federal R&D spending in 1967, while leveling out, will still be about $100 million more than in 1966—an increase of 0.6 percent.

Back in 1954, the report notes, federal funds accounted for approximately 56 percent of all available R&D money. By 1964, the figure rose to 70 percent. This year, federal funds will total less than 68 percent.

"The longer-term outlook for federal R&D spending will depend upon the final results of basic policy decisions which are currently taking shape with respect to the development of a anti-ballistic system, supersonic air transport, post-Apollo space programs, and in other areas such as oceanography," the report states.

"In addition, a decision to shift national research objectives to the social sector—to problems such as health, air and water pollution, urban transportation and the redevelopment of cities—could lead to increased R&D expenditures in the coming decade. However, for 1967, it is clear that major research efforts will not be instituted in these areas, largely as a result of current inflationary pressures and as a result of the budget pressures of the Vietnam conflict."

MILITARY MEDICINE

Wounds in Vietnam

From the M-16 rifle to the ancient Punji stick used by the Viet Cong, weapons are giving surgeons in the U.S. Army Medical Corps plenty of problems in treating their wounded.

Certain basic principles have been formulated from knowledge gained in World War II and Korea, but on the present battlefields in the Republic of Vietnam a unique situation exists.

Reporting missile wounds and surgical care in the Second Surgical Hospital in South Vietnam, three Army surgeons say in the current Journal of the American Medical Association that hundreds of kinds of wounds had been treated, ranging from the bow and arrow to modern missiles.

"About half the missile wounds were from gunshots and about half were due to fragments from grenades, mortars, artillery, mines and booby traps, utilizing small-arm ammunition," the surgeons said.

"One wooden trap with a simple rubber-band mechanism and a small nail to act as a detonator can fire a .50-caliber bullet or a shotgun shell when someone steps on the wire release," he explained.

"Another simple trap consists of two boards with three .45-caliber bullets inbedded in one of them. Approximately eight pounds of pressure will detonate these bullets when the boards are pushed together by the foot of an unsuspecting soldier."

High velocity weapons such as M-16 rifles are causing tissue damage greater than any previous small arms, however. The M-16 bullet's velocity is 3,250 feet per second, and the bullet has a tumbling effect to add to its injury after it strikes an object.

On the other hand, improved medical care is cutting loss of life on the battlefield. Only 1.3 percent of American soldiers wounded by missiles died after operations at the Surgical Hospital, a markedly lower figure than for similar operations in Korea and World War II.

Infections after the first wound closure operations totaled only two percent. Of men sustaining missile wounds, 58.1 percent were returned to duty after an average stay of 16 days in the hospital.

Major Norman M. Rich, Major Egon V. Johnson and Lt. Col. Francis D. Diamond Jr. of the U.S. Army Medical Corps, reported treating a total of 521 patients with missile wounds.