

# Confronting Famine

Broad-based food reserves and new technological advances are needed to stave off starvation

by John H. Douglas

*Second of a two-part series on the growing threat of worldwide food shortages and famine. Last week's article concentrated on the causes of the crisis; this week's deals with possible solutions.*

The world is about as ready to face a major famine now as when the Biblical Joseph warned Pharaoh to save grain for seven lean years ahead.

Global food reserves have hit their lowest level in two decades, though the number of hungry mouths has grown by half in that time. Spreading droughts and the energy crisis have conspired to negate the food production advances of the Green Revolution. New scientific and technological advances offer much promise of helping feed the world over the long run; but for the time being, only the closest sort of international cooperation and genuine philanthropy on the part of industrialized nations can possibly rebuild reserves enough to buffer shortages that are likely to develop throughout the Third World in the next couple of years. Judging from

citizen reactions to other shortages, these are poor times to implore new sacrifices.

American agricultural wealth still holds the key. Out of some 1.2 billion tons of grain produced each year in the world (1972 figures), only about 90 million tons is free to move in international trade. Of that, 70 million tons comes from the United States. In the past, poorer nations have been able to draw upon American food resources in time of need; but rising affluence in Russia, Western Europe and Japan has steadily eroded this country's reserves of stored grain and now has boosted prices for new harvest surpluses above what developing nations can afford to pay. The energy crisis was the final straw. Faced with a balance-of-payments crisis over imported oil, America has pulled out all the stops—returning soil-bank land to active use, depleting reserves, removing planting restrictions—to increase production of the nation's most lucrative export item, food.

Indeed, the use of agricultural commodities as an instrument of foreign

policy may become America's answer to the Arab "oil weapon." Already the "food weapon" has been wielded to show displeasure, if not open battle. Critical supplies of wheat were denied to the Chilean government under Marxist President Salvador Allende, even when it offered cash. Shipments were restored after Allende was overthrown. Foreign aid to India ended when that country fought the war with Pakistan that helped Bangladesh win independence. Meanwhile, what is left of the "Food for Peace," program, reduced to a fraction of its former levels, mainly benefits such militarily important countries as Vietnam, Cambodia, Korea and Pakistan.

Aside from the political implications, geographic concentration of excess grain production in the midwest regions of Canada and the United States holds another potential threat for Third World nutritional security. These "breadbasket" regions undergo regular cycles of drought—not related to the apparent overall change of global climate—and the next drought period, which might last five or six years, is due just about now. The last such period, during the 50's, wasn't so bad, but the one before that changed the region into the "Dust Bowl." Even a mild failure of the U.S. grain crop could spell disaster for millions of people on the other side of the globe.

Even if adequate international food reserves could be set up, however, evidence from the current famine regions of Africa suggests the present system of delivering emergency food aid is clumsy, at best, and that much more sophisticated understanding of basic human needs during a crisis is also required.

Too often, donating countries do not take into account local diet and tolerances when they send relief packages of food. Favorite items include cans of sweetened, condensed milk and mounds of powdered, skimmed milk. While such provisions might be appropriate for disaster relief involving Caucasians of Northern European descent, the majority of the world's people develop, early in life, an intolerance to the principal sugar in cow's milk, lactose. Not only does it do them no good, it can produce dehydration and diarrhea—the last thing one wants to happen to a person suffering from starvation. In many cultures, the only milk product consumed by adults is yogurt, which has a lower level of lactose, and to send massive shipments of whole milk to a famine-stricken people without first testing for lactose intolerance is a classic example of what one food expert calls "ethnic chauvinism."

As with so many other complex problems, early warning of famine is



Trying to stop the Sahara—moving south 30 miles a year—with palm fronds.

crucial, but governments are often reticent to admit the need for emergency provisions until a crisis can no longer be hidden. In Ethiopia, for example, where 90 percent of the 25 million inhabitants live by subsistence farming, rainfall and harvests have been failing for eight years. The first government call for help did not come until April 1973, with the start of international emergency aid delayed until October. By the beginning of this year relief teams from half a dozen nations were working in refugee camps, but these serve only an estimated one percent of the affected population. Meanwhile, in stricken rural areas, stock losses are estimated at 80 percent, and human deaths have been variously counted at 50,000 to 100,000.

In order to face the short-term developing crisis, some international substitute for the lost U.S. grain reserves must be found immediately. Just as the American dollar can no longer single-handedly provide the basis of Western economic development, so can American agricultural surplus no longer remain the "granary of last resort." But new stocks will cost billions of dollars to purchase and hundreds of millions to store. A meeting to discuss these matters is scheduled for Rome in November, with full American support already pledged. But that would come too late to help if the monsoons fail again in Asia and Africa.

Long-term prospects are considerably more promising, assuming the eventual control of population, support for new research and a willingness to adopt somewhat modified life-styles. The necessary goal, according to the United Nations Food and Agricultural Organization, is to increase the rate of food production growth from 2.6 percent a year to 3.7 percent. Otherwise, demand will continue to grow faster than supplies, with the projected "food gap" amounting to \$43 billion (constant 1962 dollars) by 1985. Some new land can be opened—Brazil, for example, has the potential for becoming a major soybean exporter—but for the most part, the world's arable land is already being used for farming, and urbanization is slowly chewing up the available land in many areas. Damming and irrigation, too, have nearly reached their limits, with the accompanying ecological costs mounting in each new project. The sea has shown herself far frailer than originally expected, with many species of commercial fish already overcaught. If greater food productivity is to be found, qualitatively different ways of seeking it must be tried.

Several recent experiments have provided new ideas for increasing the supply of plant food. The almost magical ability of legumes (peas, beans,



*Famine in Ethiopia: Government reluctance, inadequate camps, lingering death.*

and so forth) to create their own fertilizer and enrich the surrounding soil as they grow comes from a symbiotic relationship with nitrogen-fixing bacteria. Now these bacteria have been successfully transferred to some nonlegume plants, and direct nitrogen fixation into soil has also apparently been tried successfully with other bacteria. Certain tropical grasses have been found that use a special type of photosynthesis to produce yields nearly three times greater than their temperate zone counterparts. Totally artificial, "test-tube" photosynthesis is also being tried and a couple of pilot plants to grow high-protein microorganisms on oil are in operation.

Animals are more difficult to manipulate. No way has yet been found to increase cattle yield above one calf per cow, but cloning might someday enable farmers in remote parts of the world to implant embryos of the most productive beef strains into hardy, local cows. Several new animals are being considered for potential meat value. Local varieties of deer in Africa and a huge rodent, the capybara, of South America could supply good tasting meat.

Exploited in new, imaginative ways, the sea could still have vast untapped resources to offer. Fish farming goes back to Greek and Roman times, and Aristotle wrote about raising oysters. In its latest incarnation, harvesting the oceans involves raising nutrients that have settled to the bottom up to shallow lagoons to feed shellfish, while generating electricity using the bottom water's lower temperature (SN: 4/13/74, p. 242). Mussels can be grown on ropes, increasing their yield per acre and make harvesting easier. Inland, trout-ponds are becoming popular in some parts of the western United States, and catfish ponds, in the South.

Both the National Academy of Sciences and the National Science Foundation have launched major programs aimed at studying world food problems and establishing new technologies to meet expanding needs. The Academy is especially interested in finding new data to confirm or dispute the evidence that the global climate is changing. Both studies will investigate the associated problems of economics and population growth, as well as shortages of food and other vital commodities. The desirability of continuing to increase the energy intensity of agriculture must also eventually be considered.

But the issue is finally a moral one: Will the United States and other industrialized countries be willing to cut back on meat consumption to free grain for the world's poor? Famines in some areas, like the Sahel, have little direct effect on daily American life; but one in India would surely lead to some sort of armed confrontation, into which the United States seems always to be drawn. New Arab wealth must also be considered, for a rising standard of living in the Middle East will exert additional pressure on prices of food, particularly rice.

Already the national secretary of the National Farmers Union has told a Senate subcommittee, "Many farmers view permanent scarcity of food as a goal that would be appropriate to their self interest." We may soon find out whether this is also the attitude of the American people as a whole. Will the citizens of the Middle East and of the Western industrial countries accept the necessary sacrifices when they come, or will they, as C. P. Snow predicted long ago, sit and watch on the evening news million of people dying of starvation, somewhere else? □