

Strategies to increase the Food Supply

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I don't think the woman above can cook for the world so she probably does not represent an effective strategy

Whether food supply can keep pace with an expanding human population is an old question. In 1798, Thomas R. Malthus predicted that population growth would outstrip food supply, causing great human suffering. In the early 1960s, most nations were self-sufficient in food, but alarm about a rapidly growing population (~2% annually) caused many to echo Malthus' prediction. Then, the Green Revolution (high-yield crops and energy intensive agriculture) brought about remarkable increases in crop production. World grain output expanded by a factor of 2.6 from the 1950s to the 1980s. Today, per capita production has now slowed and appears to be declining.

The application of these four strategies can increase the food supply:

Expand the land area used for agriculture
 Increase the productivity of land now used for agriculture
 Identify new food sources
 Increase exports from other countries
 Even with these strategies there are still challenges that face them

Increase food supply by expanding land area for agricultural use

Historically, world food production increased primarily by expanding the amount of land devoted to agriculture.

-The human population has increased faster than the expansion of agricultural land.
 -At first glance, new agricultural land appears to be available because only 11 percent of the world's land area is currently cultivated.
 -Farmland is abandoned for lack of water. Especially in semiarid regions, human actions are causing land to deteriorate to desert like condition, a process called desertification.
 -Excessive crop planting, animal grazing, and tree cutting exhaust the soil's nutrients and prelude agriculture.

-Urbanization can also contribute to reducing agricultural land. -As urban areas grow in population and land area, farms on the periphery are replaced by homes, roads, shops, and other urban land uses.

Increase food supply through higher productivity

-New agricultural practices have permitted farmers worldwide to achieve much greater yields from the same amount of land.
 -The invention and rapid diffusion of more productive agricultural techniques during the 1970s and 1980s is called the green revolution.
 1. It involves two main practices-the introduction of new higher-yield seeds and the expanded use of fertilizers.
 2. The green revolution agricultural productivity at a global scale has increased faster than population growth.
 -Miracle seeds were created and responded better to fertilizers and matured faster.
 -Scientists identified nitrogen, phosphorous, and potassium as the critical elements in these substances that improved fertility.
 -Scientists have continued to create higher-yield hybrids that are adapted to environmental conditions in specific regions.
 -Tools such as herbicides, insecticides, and fungicides reduce crop losses both before and after harvest, and increase crop yields.
 -Selective plant breeding produced high yielding varieties of rice and other crops, particularly maize, sorghum, and wheat.
 -These high yield varieties (HYVs) performed best under high applications of fertilizer, and also required more expenditures for pesticides, irrigation, farm machinery, etc.
 -The Green Revolution's great success with rice explains the former; lack of success with breeding new arid-land crop varieties, combined with a large dose of political instability, explain Africa's worsening condition. Per capita grain production in Africa is down 12% since 1981 and down 22% since 1967. Some 20 years ago, Africa produced food equal to what it consumed; today it produces only 80% of what it consumes.

Increase food supply by identifying new food sources

Development of new food sources

3 strategies being considered are: cultivate the oceans, develop higher-protein cereals, and improve palatability of rarely consumed foods.

1. Cultivate Oceans

Increased fish consumption could meet the needs of a rapidly growing global population. The world's annual fish catch has increased from 22 million tons in 1954 to 100 million tons in 1991.

However the population of some fishes have declined due to being harvested faster than they can reproduce.

2. Develop Higher-Protein? Cereals

People in MDCs obtain protein by consuming meat, but people in LDCs generally rely on wheat, corn, rice, which lack certain proteins.

People can also obtain needed nutrition by consuming foods that are fortified during processing with vitamins, minerals, and protein-carrying amino acids.

However, fortification has limited application in LDCs, where most people grow their own food rather than buy processed food.

3. Improve Palatability of rarely consumed foods

People consume types of food adapted to their community's climate, soil, and other physical characteristics.

People also select foods on the basis of religious values, taboos, and other social customs that are unrelated to nutritional or environmental factors.

To make more effective use of existing global resources is to encourage consumption of foods that are avoided for social reasons.

For example, soybean, which is one of the region's leading crops, most of the output is processed into animal feed, in part because many North Americans avoid consuming tofu, sprouts, and other recognizable soybean products.

In Asia, high protein beverages made from seeds resemble popular soft drinks.

Increase food supply by increasing exports from other countries

Export more food from countries that produce surpluses. Top three export grains are wheat, maize (corn), and rice.

Before WWII, Western Europe was the only major grain-importing region.

In response to the increasing global demand for food imports, the U.S. passed Public Law 480, the Agricultural Trade, and Assistance Act of 1954.

South Asia and Southeast Asia have now become net exporters. Thailand has replaced the U.S. as the leading exporter of rice, accounting for one-third of the world total, followed by India in second place with one-sixth.

USE OF BIOTECHNOLOGY IN SEED PRODUCTION AND PLANTING MATERIAL PROPAGATION

Biotechnological tools have greatly contributed to the production and supply of improved quality seed and planting material to farmers worldwide. Among other uses, biotechnology is employed to:

speed-up the multiplication process for vegetative propagated crops,
 detect diseases transmitted by seed or planting material,
 eradicate diseases transmitted by planting material,
 protect seed with biological control agents, and

test varietal identity and purity.

3. USE OF BIOTECHNOLOGY IN PLANT BREEDING

Crop improvement is the exploitation of genetic variability, followed by several generations of selection. Breeders have always used the most modern technologies available to them. This has permitted them to make considerable progress during the last twenty years, thanks in particular to the development of biotechnology. These tools permit:

an acceleration of the selection process,
new genetic combinations that are not possible through conventional breeding, and
greater precision in the desired modifications of the genome.

Towards Improved Agriculture

Genes from the wild have been used to protect Brazil's coffee plantations; while a Mexican wild maize confers resistance to seven major diseases. According to the American Medical Association, these foods are "substantially equivalent to their conventional counterparts," and no long-term side effects have yet been detected.

Crops and foods can be produced using recombinant DNA techniques which enhance their agronomic potential, nutritional characteristics, or one or more features of pest protection (insect and viruses) and tolerance to herbicides.