

# Position of the American Dietetic Association: Addressing world hunger, malnutrition, and food insecurity

## ABSTRACT

It is the position of the American Dietetic Association (ADA) that access to adequate amounts of safe, nutritious, and culturally appropriate food at all times is a fundamental human right. Hunger continues to be a worldwide problem of staggering proportions. The Association supports programs and encourages practices that combat hunger and malnutrition, produce food security, promote self-sufficiency, and are environmentally and economically sustainable. The Association is aware that hunger exists in a world of plenty and that poverty, gender inequity, ethnocentrism, racism, and the lack of political will are key constraints to solving the problems of global hunger and malnutrition. Recognizing that simplistic approaches are inadequate, the ADA identifies sustainable development as the long-term strategy to ending world hunger and achieving food security. Sustainable development requires political, economic, and social changes that include empowering the disenfranchised, widening access to assets and other resources, narrowing the gap between rich and poor, and adjusting consumption patterns so as to foster good stewardship of nature. Additionally, because the health status of future generations is related to the well-being of their mothers, achieving food security will also require increased access for women to education, adequate health care and sanitation, and economic opportunities. This position paper reviews the complex issues of global food insecurity and discusses long-term solutions for achieving world food security. Achieving the end of world hunger has been and is now within our grasp. There is sufficient food to feed everyone, and solutions can be realized now that will benefit all of humanity. As noted in the paper, most people who examine the costs of ending versus not ending world hunger are bewildered by the question of why humanity did not solve the problem a long time ago. The Association supports programs and encourages practices that combat hunger and malnutrition, produce food security, promote self-sufficiency, respect local cultures, and are environmentally and economically sustainable. The ADA recognizes that decisions and actions that dietetics professionals make as practitioners and consumers

can help reduce the extent of poverty and hunger both here and abroad. This paper provides information, resources, and strategies to assist dietetics professionals in improving the public's understanding of key issues, becoming advocates of the poor, and influencing the political will to end world hunger. *J Am Diet Assoc.* 2003;103:1046-1057.

## POSITION STATEMENT

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## ENVIRONMENT DICTATING NEED FOR POSITION

Food security means access at all times by all people to adequate amounts of safe, nutritious, and culturally appropriate food for an active and healthy life (1). Worldwide, a substantial number of people remain food insecure or hungry. (See the glossary for a key to hunger-related terms.) The Food and Agriculture Organization (FAO) indicates that more than 840 million people in the world do not have enough to eat (2).<sup>1</sup> Over half of all child deaths worldwide are associated with malnutrition (3,4). Micronutrient deficiencies are especially widespread. In the developing world, nearly 20% of the population suffers from iodine deficiency, about 25% of children have subclinical vitamin A deficiency,<sup>2</sup> and more than 40% of women are anemic (5).

Famine—the image many people have of hunger—affects relatively few people, and the amount of food needed to prevent it is relatively small. Early warning systems and humani-

<sup>1</sup>For a discussion of food insecurity in the United States, see Position of the American Dietetic Association: Domestic food and nutrition security. *J Am Diet Assoc.* 2002;102:1840-1847.

<sup>2</sup>According to the International Vitamin A Consultative Group (IVACG), the term “vitamin A deficiency disorders” (VADD) is a newer term that is becoming more common. VADD covers what was previously referred to as “subclinical” (eg, impaired iron mobilization, disturbed cellular differentiation, depressed immune response) or “clinical” (increased infectious morbidity and mortality, growth retardation, anemia, xerophthalmia) manifestations.”

**Table**  
Regional summaries<sup>a</sup>

Region	Percentage of children under age 5 (1995 to 2000 <sup>b</sup> )		
	Moderate and severe underweight	Moderate and severe wasting	Moderate and severe stunting
Sub-Saharan Africa	31	10	37
Middle East and North Africa	17	8	24
South Asia	49	17	48
East Asia and the Pacific	19	6	24
Latin America and the Caribbean	9	2	17
CEE/CIS <sup>c</sup> and the Baltic states	7	6	16
Developing countries	29	10	33
Least developed countries	40	12	45

<sup>a</sup>Reprinted from reference 8.

<sup>b</sup>Data refers to most recent year available during period specified in the column heading.

<sup>c</sup>Central and Eastern Europe/Commonwealth of Independent States.

tarian responses have virtually eliminated famine deaths caused by natural disasters. Nevertheless, famines can be caused by changing weather patterns, natural disasters, or by war and civil strife. Whatever the cause, the effects of famine can be devastating. In 1992, some 3% of the world's population lived in countries affected by famine or severe food shortage, although not everyone in these countries actually suffered from hunger (6).

Chronic hunger caused by poverty is much more widespread than acute hunger caused by famine. About 33% of children under 5 years in developing countries are stunted (malnourished based on height for age), indicating long-term, cumulative effects of inadequate nutrition and/or poor health (7). About 27% of children aged 3 to 5 years in developing countries are wasted (malnourished based on weight-for-age) (7). Impairment of growth can have both immediate and long-term negative effects on a child's health, ability to learn, potential for future achievement, and risk for the development of chronic diseases later in life. UNICEF refers to the under-5 mortality rate as the single best indicator of children's overall health—including nutritional health—and well-being. UNICEF states that the under-5 mortality rate is a good measure of many important public health measures, including the nutritional health and the health knowledge of mothers, the level of immunization, the availability of prenatal and other health services, income and food availability in the family, the availability of clean water and safe sanitation, and the overall safety of the child's environment (8).

An overview of the current status of underweight, wasting, and stunting is shown in the Table, and the number of undernourished people is shown in Figure 1.

The situation in most of the developing world is even bleaker than it appears at first glance (2). The marginal global gains are the result of rapid progress in a few large countries. China alone has reduced the number of undernourished people by 74 million since 1990. Indonesia, Viet Nam, Thailand, Nigeria, Ghana, and Peru have all achieved reductions of more than 3 million,

helping to offset an increase of 96 million in 47 countries where progress has stalled.

Sub-Saharan Africa continues to have the highest proportion of undernourishment and also has the largest increase in the number of undernourished people. But the situation in Africa is not uniformly grim. Most of the increase took place in Central Africa, driven by the collapse into chronic warfare of a single country, the Democratic Republic of the Congo, where the number of undernourished people has tripled.

West Africa, along with Southeast Asia and South America, has reduced significantly both the proportion and the number of undernourished people. But prospects are troubling for Central America, the Near East, and East Asia (excluding China), where both of these have increased.

### RATIONALE

Hunger is intolerable in a world of plenty. Still, an estimated 1.3 billion people live in poverty, defined as living on \$1 or less per day, and another 2 billion people are only marginally better off (9,10). It is time for the world to utilize its existing wealth of knowledge and technology to equitably distribute the global abundance that currently exists.

### Effects of Hunger and Malnutrition

In addition to human suffering, hunger and malnutrition have negative effects on cognitive development, growth, and health (11). Additionally, hunger and malnutrition have negative effects on labor productivity and a nation's development. According to The World Bank, the global loss of social productivity in 1 year alone, caused by four overlapping types of malnutrition—nutritional stunting and wasting, iodine deficiency disorders, and deficiencies of iron and vitamin A—is the equivalent of 46 million years of productive, disability-free life (12). Hence, a concentrated effort to eradicate hunger could yield tremendous benefits for individuals and nations, as well as for the world community itself (13). Because hunger causes are typically a combination of individual, household, community, national, and international factors, simplistic solutions such as short-term food aid, limiting population growth, or increasing agricultural productivity are inadequate (Figure 2).

### Food Production

Food insecurity was once viewed as a problem of inadequate food production, and emphasis was placed on increasing national food supplies to deal with hunger. Such an approach is necessary, but insufficient. Hunger persists today, even after a half-century during which world food output nearly tripled (14). National data on food supplies mask regional differences. In China and Thailand, for example, high rates of undernutrition persist in certain regions despite successful national commitments to reducing hunger. Nearly 80% of all malnourished children in the developing world live in countries that report food surpluses (13). In rural areas, pervasive poverty limits people's access to food in the marketplace. The eradication of hunger necessitates a more systemic approach—one that embraces agriculture, but that also integrates the development of human capital and infrastructure.

### Access to Credit

In much of the world, control over land and other assets is highly inequitable. Increasing poor people's access to assets, including credit, is essential to ending hunger. A number of microcredit initiatives, such as the Grameen Bank in Bang-

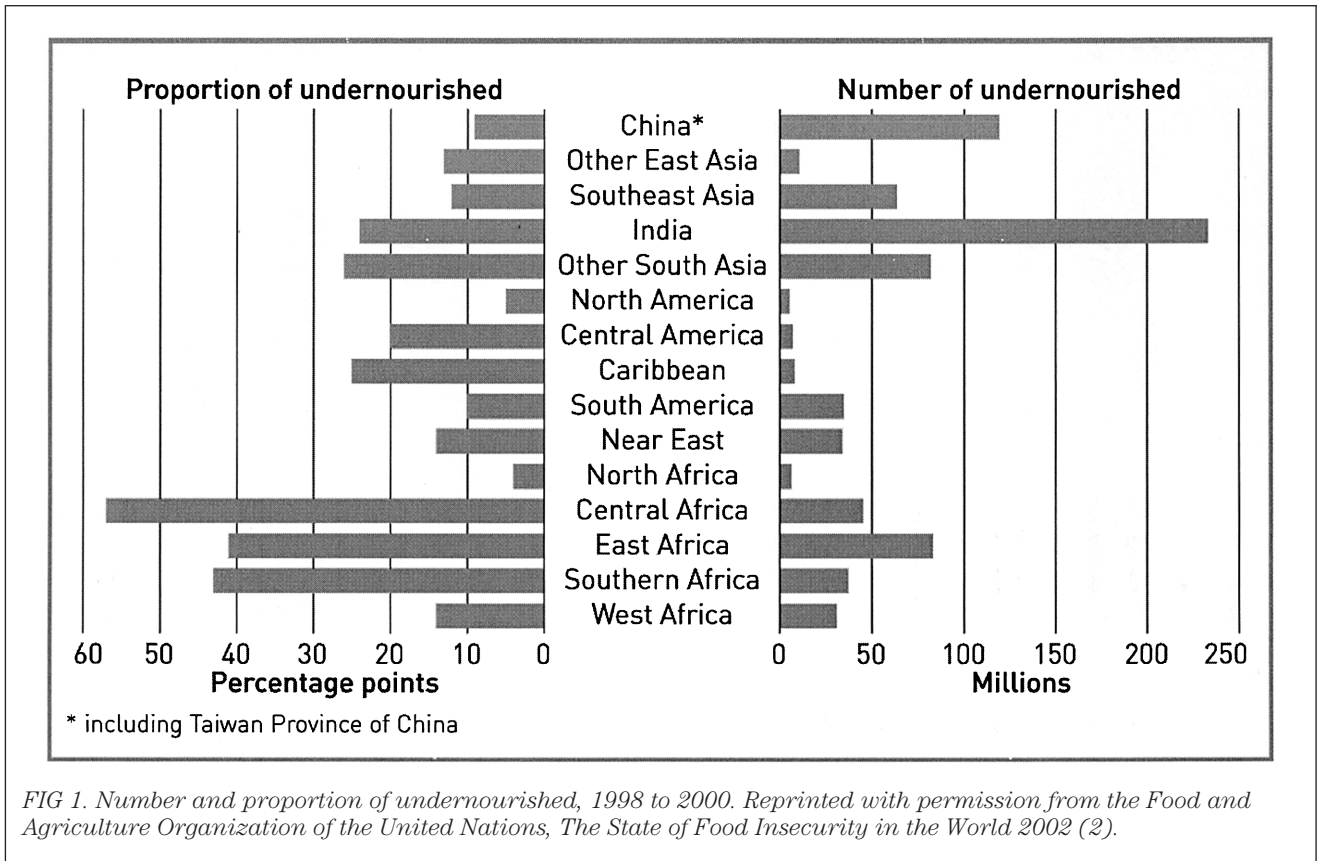


FIG 1. Number and proportion of undernourished, 1998 to 2000. Reprinted with permission from the Food and Agriculture Organization of the United Nations, *The State of Food Insecurity in the World 2002* (2).

ladesh, offer small loans to help very poor women generate income through small-scale projects such as basket weaving or chicken raising. As the microenterprise income raises the women out of poverty, nutritional benefits can be seen. For example, their children have increased arm circumferences and their daughters are more likely to be enrolled in school (13). The unprecedented success of these microcredit programs in achieving high loan repayment rates and increasing the cash reserves of very poor people is resulting in the expansion of similar programs as a highly effective means for reducing global hunger and poverty.

**Need for Sustainable Agriculture**

Because the economies of many developing countries are based on agriculture, growth in that sector, primarily through appropriate technological changes, is critical for general economic growth, poverty reduction, and elimination of hunger. The agricultural technologies of the 1960s and 1970s that relied heavily on modern seed varieties had dramatic effects on food production, most notably in Asia and some parts of Latin America (15). These technologies led to lower food prices, benefiting urban consumers, landless rural people, and small farmers who were net purchasers of food (16). As production increased, rural incomes increased. For example, in North Arcot, India, households that adopted new rice varieties more than doubled the real value of consumption of food and other goods between 1973 and 1984, and diets became more varied (17). Demand for hired agricultural labor increased, boosting the incomes of rural poor people. However, many poor farmers could not use

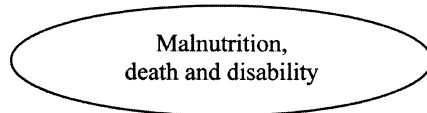
these technologies because they relied on costly patterns of irrigation, fertilizer application, and pesticide use. Such technologies may also contribute to the problem of land degradation, which is already severe in areas where growing poor populations have no choice but to intensively farm marginal land.

Policies that promote long-term sustained increases in knowledge of food production and poor people's incomes provide the most viable strategies for permanently eradicating hunger. In the short term, complementary targeted programs are needed to provide a nutritional safety net for vulnerable households. Targeted feeding programs, most commonly supplementary food programs for children under age 5 years and pregnant women, can be an effective part of the social safety net (18).

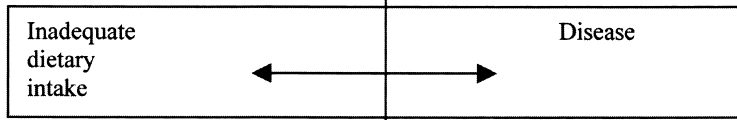
**Ethnic and Political Conflicts**

Racism and ethnocentrism underlie much of the world's hunger (19). In Sudan, for example, competition between racial and ethnic groups for natural resources has led to violent conflict and the world's highest rates of undernutrition. Globally, ethnic and political conflicts contribute to the hunger problem by diverting resources that could be used to meet basic human needs. Since the 1990s, the world has faced an unprecedented explosion of regional conflicts—in Afghanistan, Angola, Ethiopia, Liberia, Mozambique, Rwanda, Somalia, and Sudan, among others—many of them based on long-standing ethnic grievances and struggles over control of resources. This has caused serious increases in short-term hunger and created relief needs that have overwhelmed long-term development efforts. Con-

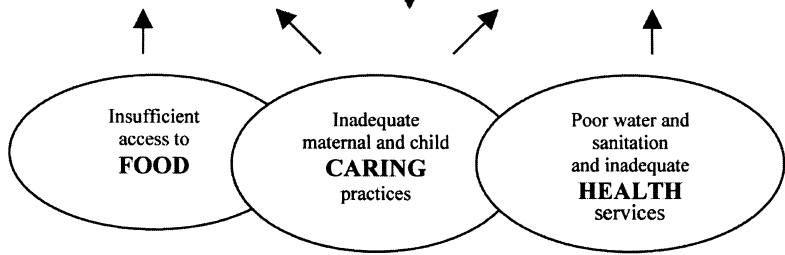
OUTCOMES



IMMEDIATE CAUSES

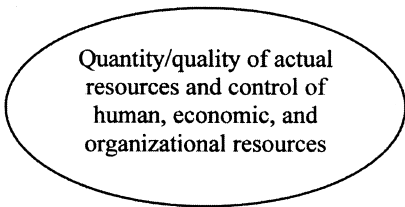


UNDERLYING CAUSES AT HOUSEHOLD/FAMILY LEVEL



BASIC CAUSES IN SOCIETY

*Inadequate and/or inappropriate knowledge and discriminatory attitudes limit household access to actual resources*



*Political, cultural, religious, economic, and social systems, including status of women, limit the use of potential resources*

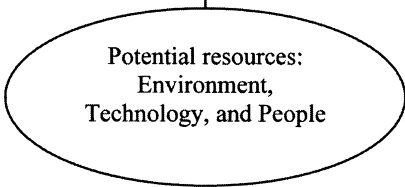


FIG 2. Causes of child malnutrition. (Adapted and reprinted with permission from: United Nations Children's Fund. *The State of the World's Children 1998*. New York, NY: UNICEF/Oxford University Press, 1998.)

licts also disrupt food production, markets, and transportation and displace workers from their homes and livelihoods. Warring parties even use hunger as a weapon. The United Nations faces new challenges, with inadequate support from member states, to make and keep peace, meet humanitarian assistance needs, and uphold the right to food.

### Access to Food

Furthermore, for those without control over land to produce their own food, increased food output does not ensure access to food in the absence of secure and adequate incomes. Local people who are cultivating cash crops for the rich and for export do not share equitably in the profits earned from the marketing of these cash crops. Not only is their time spent growing crops for others, rather than for themselves, but also they cannot afford to purchase the products grown with their labor. To the extent that government policies increase a household's access to food through higher incomes or lower food prices, or direct interventions such as early childhood development programs, household food security improves.

In many countries there are problems of access to food within households. Individual food intake within the household is affected by many factors, including gender, control of income, education, age, and birth order. For example, women and girls may receive less food than men and boys. In some cultures, women are more likely than men to allocate income to food; thus, to the extent that women control income, they are more likely to use it to ensure household members' adequate food consumption. A recent analysis of malnutrition in 63 nations found that improvements in women's education, access to health care, and living environment were responsible for 75% of the total reduction in child malnutrition and underweight that took place from 1970 to 1995 (20).

### Food Insecurity in Rural Areas

Policymakers debate whether to tackle hunger primarily through broad-based economic policies that alleviate poverty or through targeted food and nutrition interventions. No single approach suffices. Particularly troublesome are obstacles to reducing hunger in rural areas, where food insecurity affects the most people.

The World Bank reports that 72% of the world's poor live in rural areas. Most of them live on unproductive, semiarid lands or on steeply sloping lands with high erosion rates (21). Eradicating hunger will depend on rural development strategies that not only encourage the development of infrastructure and agriculture, but also integrate human capital development by encouraging investments by agribusiness and other industries in the rural areas.

### Children and Women Most Vulnerable to Hunger

Despite families' best efforts to protect their young against food insecurity and hunger, when poverty engulfs a household, the youngest are the most affected and most vulnerable (8). If family food is limited, pregnant and lactating women, infants, and children are the first to show the signs of undernutrition because of their high nutrient needs for growth. However, most malnourished children live in homes that have access to adequate quantities of food (22). Malnutrition can result from low birth weight (which may stem from poor nutrition during pregnancy) and formula-feeding in circumstances such as the absence of clean water or the lack of income to purchase appropriate complementary feeding. More than 1 billion people in

developing countries do not have access to safe drinking water, and 2.5 billion lack adequate sanitation (23). Diarrhea and infectious disease thrive in poor communities lacking clean water and sanitation, and both impact negatively on nutrition status.

### Importance of Breastfeeding

Breast milk is total food security for infants up to 6 months of age, and because exclusive breastfeeding may delay subsequent pregnancies, it is doubly advantageous in promoting food security (24). In most of the developing countries until the middle of the 20th century, infants were breastfed for their first year of life—with complementary food added to their diets after the first several months. The global recommendation now is for women to breastfeed their children exclusively for 6 months, and to continue breastfeeding, with complementary food, well into the second year (24). Today, the percentage of infants who are exclusively breastfed to at least the age of 4 months has dropped to approximately 50% (25). A number of factors contributed to this decline, including the aggressive promotion and sale of infant formula to new mothers, the encouragement by health care practitioners for mothers to bottle feed (with free samples given after delivery of the newborn), the large-scale migration of people from rural villages to large cities and accompanying loss of cultural ties supporting breastfeeding, and more women working outside the home.

The finding that human immunodeficiency virus (HIV) can be transmitted through breastmilk has complicated infant feeding recommendations. New guidelines released by the Joint United Nations Programme on HIV/acquired immunodeficiency syndrome (AIDS), World Health Organization (WHO), and UNICEF call for urgent action to educate, counsel, and support HIV-positive women regarding safe infant feeding practices (26). Data supporting these guidelines show that 3-month-old infants of HIV-positive women who were exclusively breastfed have the same risk of contracting HIV as infants who were never breastfed. Shortened duration of breastfeeding is one infant feeding option—especially in areas that lack clean water—suggested in the new guidelines (27). However, confirmation of the protective effect of exclusive breastfeeding on the risk of mother-to-infant transmission of HIV is needed. Nevertheless, in most poor communities, informed choice and accessibility to alternative feeding methods are not realistic options. Therefore, breastfeeding continues to be recommended unless a mother's HIV status is known to be positive.

### Child Survival Strategies

Chronic poor health saps children of nutrients and leaves them with poor appetites, and malnutrition can cause permanent mental and physical damage. At the first World Summit for Children—convened by UNICEF in 1990—nutrition was mentioned for the first time in world history as an internationally recognized human right (28). An immediate result of this summit was an increase in the number of governments actively adopting the child survival strategies of UNICEF—universal immunization, oral rehydration therapy, a massive effort to promote breastfeeding for the first 6 months of an infant's life, an attack on malnutrition involving nutrition surveillance, and nutrition and literacy education (25). The immunization achievements of the last 2 decades are credited with preventing approximately 3 million deaths per year and protecting many millions more from disease, malnutrition, blindness, and polio (28). Environmental sanitation, immunization, and edu-

cation continue to be essential for combating childhood malnutrition.

## KEY POINTS

### A Problem of Poverty

Today, hunger is well recognized as a problem of poverty. Many factors contribute to poverty, including greed, overpopulation, unemployment, political and civil unrest, and the lack of productive resources such as land, tools, and credit (11). People who are poor are often powerless to change their situation because they have less access to such vital resources as education, training, food, health services, credit, and other vehicles of change. It is possible to provide adequate nutrition for all, but this will be achieved only when the economic, political, and social structures that are creating a widening gap between rich and poor—and thereby limiting food production, food access, and food consumption—become the targets of change.

### Major Challenges to Address

The long-term solutions to hunger are more equitable distribution of wealth and resources and more sustainable, people-centered development. This includes meeting basic human needs (basic health, nutrition, and education for all); expanding economic opportunities, thereby empowering poor people; protecting and enhancing the environment so that progress can be sustained; and promoting democratic participation. Such people-centered development extends beyond food aid and emergency relief, reverses the process of impoverishment, enhances democracy, and makes possible a balance between populations and resources. It also improves the well-being and status of women and respects local cultures (18). Successful development highlights the need for ongoing community participation in project development and implementation. As discussed in the following sections, a number of major issues must be addressed to eradicate hunger in this century or reduce hunger by half worldwide by the year 2015 (29).

### The Epidemic of HIV/AIDS

Today, 34.3 million people in the world live with HIV/AIDS, including 1.3 million children less than 15 years of age (30). The majority of these children were born to mothers with HIV, acquiring the virus near the time of birth or during breastfeeding. More than 13 million children worldwide have been orphaned by the epidemic, with 90% of these orphans living in sub-Saharan Africa (30). Children orphaned by the rampant HIV/AIDS epidemic are more likely to be malnourished and unschooled (31). Racism and poverty increase the risk of infection, because the majority of those who are infected are uneducated and illiterate, making it difficult for them to access information on how to prevent infection (32). The loss of adult lives to AIDS not only deprives families of income, but also means the loss of family members to care for their children and elders.

### Increasing Urbanization

Because of increasing rural poverty and scarcity of land to farm, increasing numbers of people are migrating into urban areas in the hope of finding improved economic opportunities. The trend toward increasing urbanization has been a factor in the worldwide decline in breastfeeding, an increased consumption of nutrient-poor foods, and increased contamination of the urban water supply. As nations continue the rural-to-urban

transition, the decline in food sufficiency continues, and the incidence of chronic diarrhea from polluted water and food-borne contamination remains a major public health problem in urban slums (33,34).

### The Burden of International Trade and Debt

International trade and debt are closely related to the progress a nation can make toward achieving adequate health and nutrition status for its people. For many of the heavily indebted poor countries, most of their financial resources must go to paying the interest on development loans or to raising cash crops to pay off international debtors, thus draining their national economy further.

The fluctuating prices in world markets and changing agricultural policies in developed and developing nations affect both access to food and alleviation of poverty through the sale and export of agricultural resources. As of 1999, 70% of the 134 members of the World Trade Organization were developing countries (35). Over the years, developing countries have seen the prices of imported items such as fuel and manufactured goods rise much faster than the prices they receive for their export goods, such as bananas, coffee, flowers, and various raw materials, on the international market. The combination of high import costs with low export profits often forces a developing country into accelerating international debt.

A key step in fighting world poverty and hunger is to resolve the tremendous financial drain caused by the international debt of the developing nations. Currently, contributions from the United States and other nations allow the World Bank to make loans totaling \$15 billion each year—with \$6 billion of this money going to poor countries in the form of discounted loans. One suggestion has been that a portion of development aid from the World Bank and similar institutions be given as direct grants rather than loans to increase the countries' investments in education, health services, and other needs (36). Undoubtedly, the outcome of the debate between the developed and developing countries in the United Nations and the World Bank regarding the burden of international debt is critical to solving the problem of global hunger and food insecurity.

### A Vital Role for Women

Solutions to the problems of poverty and hunger will be most effective and long lasting if they address the role of women in developing countries. Women play a vital role in the nutrition of their nations' people, producing much of the world's food. If women are malnourished themselves, or unable to feed their families because of inadequate resources, the consequences affect many other individuals (Figure 3). Key strategies to include in development programs with women in mind include removing barriers to financial credit and land ownership, providing access to time-saving technologies, providing appropriate education and training to promote self-reliance, teaching management and marketing skills, making health and day-care services available, forming women's support groups, and providing information and technology to promote planned pregnancies (7). Recognizing women's needs is a positive step toward the eradication of the world hunger crisis (37).

### A Need to View Nutrition and Health As Tools of Development

The United Nations views good nutrition as a basic human right—and one that the United Nations, especially FAO and WHO, are pledged to secure (38). However, achieving im-

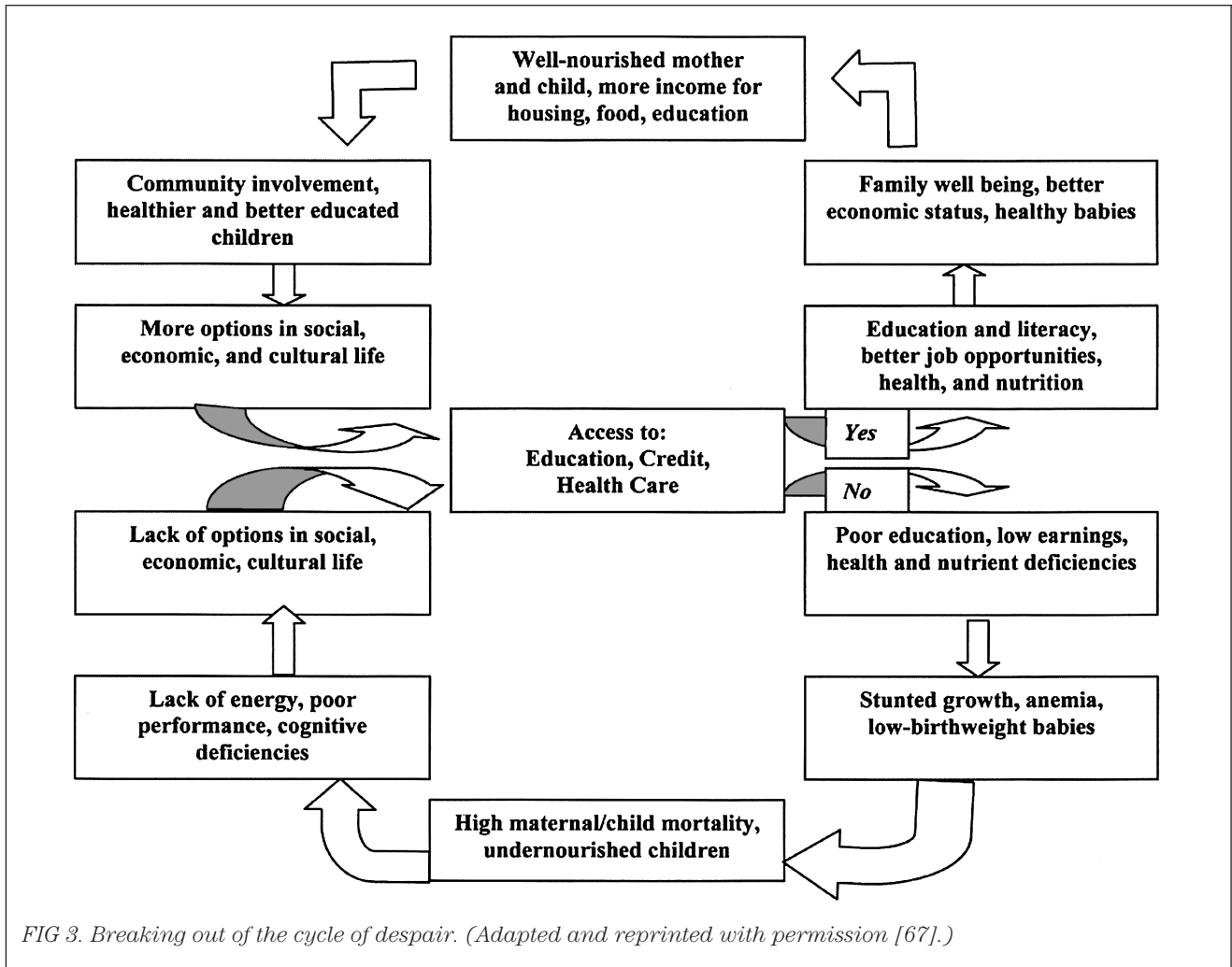


FIG 3. Breaking out of the cycle of despair. (Adapted and reprinted with permission [67].)

proved nutritional well-being worldwide requires broad action on many issues, such as ensuring that the poor and malnourished have adequate access to food; preventing and controlling infectious diseases—providing clean water, basic sanitation, and effective health care; promoting healthy diets and lifestyles; protecting consumers through improved food quality and safety; preventing micronutrient deficiencies; assessing, analyzing, and global monitoring of nutrition status of populations at risk; and incorporating nutrition objectives into development policies and programs. Nutrition and health should be instruments or tools as well as goals of economic development. For example, nutritional adequacy is both an input and an outcome of development. Experts view nutrition as the bedrock on which the present generation secures a future for both itself and the next generation (39). People who are well nourished are more productive, are sick less often, and earn higher incomes (8). Nutritionally compromised people are less productive in their jobs and homes and in furthering their education. For this reason, the inclusion of nutrition objectives in growth and development policies holds the promise of potentially increasing the productivity and earning power of people worldwide.

### Balancing People, Food, and Environment

At present, global grain supplies are adequate to provide every person on Earth with his or her minimum energy requirements. Supplies are likely to remain adequate in the short-term future. However, in some parts of the world, per capita food production has declined. If current population growth trends and consumption of westernized types of diets continue, food output is likely to fall short of projected demand in the future.

Globally, growth rates in crop yields are declining, but even optimistic scenarios require a doubling of food production within the next generation to keep up with projected population growth. Efforts to overcome these constraints often degrade the environment and conflict with the longer-term sustainability of agriculture (40). Increased subdivision of land among successive generations and expansion of farms into ecologically fragile areas add to environmental destruction caused by the flight of hungry people from rural areas to cities and deforestation of adjoining lands.

As important as the amount of land available for crop production are the condition of the soil and the availability and quality of the water (41). Some 1.5 to 1.7 million acres of agricultural land in developing countries are lost each year to soil

erosion—a rate that threatens the world's ability to continue feeding itself. Erosion of soil is a natural process, but in the past, processes that conserve soil, such as planting trees, engaging in no-till agriculture, using locally available cover crops and mulches, and rotating crops, have compensated for it. The destruction of natural resources threatens the health of the generations of today and tomorrow. Overconsumption by affluent people also diverts resources that could meet basic human needs and adds considerably to the strain on the environment (42).

Maintaining the balance among people, food, and the environment requires a reversal in the declining trend in global funding for agricultural research. Current research should give priority to environment-friendly technologies and improvements adapted for poor farmers. There is much to be gained from continued work in the area of crop improvement. But concurrent with transplanting industrial technology into the developing countries, small and efficient farms and local structures for marketing, credit, transportation, food storage, and agricultural education should be augmented. For example, marketing might be enhanced by use of satellite broadcast technology and the Internet. Agricultural education in the educational institutions of the developing nations can be improved by having access to information resources through video, radio, and the Internet. Otherwise, access to the latest research information is often quite limited. Small farmers need efficient, reliable, and appropriate transportation methods that include fully functioning vehicles, paved highways, and adequate rail systems to take their crops to larger markets so their crops do not spoil before sale. Food preservation by drying has been improved through the use of solar drying—using locally available materials—which shortens drying time and allows more vitamin retention than traditional methods (43).

International research centers should continue to examine the conditions of tropical countries and orient their research toward appropriate technology. This approach can lead to very successful results. For example, in Bangladesh, Helen Keller International (HKI) has applied research from the Asian Vegetable Research and Development Centre (AVRDC) in Taiwan. In collaboration with FAO and other organizations, HKI developed the largest sustained home gardening intervention in the world with as many as 800,000 households cultivating fruits and vegetables year round for family consumption. The project uses improved technology for seed production such as maintaining the correct distance between plant varieties to prevent cross-fertilization of different varieties of the same vegetable (personal communication, Aminuzzaman Talukder, Country Director, Helen Keller International, Nepal and Regional Agriculture Advisor, Asia-Pacific, November 2, 2001). The project also uses breeder seed to ensure consistent genetic characteristics rather than using seeds from plants grown the previous year.

Promising uses of biotechnology may be in the development of drought-tolerant crop varieties with increased yield and resistance to pests. Plant biotechnology may also help mitigate malnutrition by enhancing the nutritional content of staple foods, such as rice high in beta-carotene and iron (44). However, much more research is needed to determine whether these foods will be culturally acceptable and economically viable, and to understand the long-term environmental and health effects of large-scale use of genetically modified crops (45,46,47).

### Understanding the Problem of Population Growth

The current world population is approximately 6 billion, and for the year 2020 the projected United Nations figure is approximately 7.7 billion (48,49). As the population continues to increase, it challenges the world's capacity to produce adequate food for all. However, reducing population growth is only part of the equation, because poverty contributes to both hunger and overpopulation. Many families in developing countries choose to produce large families because the chances are high that not all of their children will survive, leaving too few hands to help generate family income (50). Conversely, infants who are well nourished in the womb are more likely to survive, thereby reducing this incentive for parents to have larger families (38). Some experts suggest that the most effective way to reduce population growth is to improve the lives of women, especially through education for girls (51,52). Evidence shows that girls who complete at least 6 or 7 years of education tend to marry and become pregnant later in life and have fewer children (53). Likewise, women living in countries with high fertility rates and who have completed some secondary education typically have fewer children than similar women who have never been to school (54).

The world has both the food and the technical expertise to end hunger (6). What is lacking is the political will. The changes needed to overcome hunger will only occur if concerned citizens worldwide seek to change public policies. Past efforts of US anti-hunger activists led, for example, to increased funding for child survival programs, which save the lives of children each day (55).

### PROPOSED SOLUTIONS: FAVORABLE PROGRESS AND PROGRAMS

#### Global Initiatives: Continuing Efforts

Declarations upholding the right to food security, such as those issued at the World Summit for Children in 1990 and revisited by UNICEF in 2001; the Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding in 1990; the International Conference on Nutrition in 1992; the World Food Summit in 1996 and the subsequent release of the US Action Plan on Food Security in 1999; and the Millennium Summit of the United Nations in 2002 helped create the environment for the needed shift in priorities. Such declarations and goal setting inspire optimism and specific action toward resolving complex challenges. On a global scale, they foster both collaborative work and productive competition.

Implementation and review of activities growing out of these initiatives continue. For example, the United Nations General Assembly hosted a Special Session on Children in 2001 that reviewed progress in meeting the commitments made at the World Summit for Children in 1990, considered the obligations entered into with the Convention on the Rights of the Child, and looked ahead to the future (8). Participants at the 2002 global meeting to assess progress on the 1996 World Food Summit goals encouraged accelerated headway in lowering the number of hungry people worldwide (56). Heads of state were also asked to reaffirm their commitment to the World Food Summit goals.

The Baby-Friendly Hospital Initiative and the World Alliance for Breastfeeding both grew out of the Innocenti Declaration and fostered an increased awareness of the importance of breastfeeding worldwide (57). By September 2000, there were more than 15,000 "Baby-Friendly Hospitals" in 140 countries.

Exclusive breastfeeding in the early months of life and the duration of breastfeeding are beginning to increase globally.

But reducing hunger also requires other tangible resources. The costs are real, but so are the costs of failing to act. In most cases, micronutrient deficiencies can be ended with low-cost, readily available nutrition interventions (eg, salt iodization, iron fortification, and vitamin A capsules). Sustainable development to overcome chronic undernutrition is more difficult, economically and politically, but the payoff is high: political and social stability and more people contributing to the economic, social, and cultural life of their communities, nations, and the world.

At present, governments of most foreign aid donors and developing countries do not give high priority to reducing poverty and hunger. Additionally, developing country governments may divert donated funds to other activities. The quantity and quality of aid falls short of its hunger-reducing potential (for example, foreign aid amounts to less than 1% of the US federal budget) (58). Fortunately, food aid reaches millions of families worldwide and represents approximately one third of the annual budget of the US Agency for International Development (59).

### Notable Programs Underway

Worldwide, numerous efforts involving partnerships between citizens and a range of public and private organizations are underway to decrease hunger and malnutrition. These efforts include community-led programs to strengthen parents' knowledge and behaviors about the feeding, care, and health of their infants; programs to monitor child growth; the distribution of micronutrient capsules; fortification of foods such as salt and dry milk; initiatives to improve access to clean water; microcredit lending programs; and programs that encourage baby-friendly clinics and hospitals (38,60). Interventions vary according to local conditions and available resources. Several examples are included below:

- The government of Bangladesh, in conjunction with the International Food Policy Research Institute, has designed and evaluated the world's first Food for Schooling program, in which food grains are provided to families whose children attend school (61). Since 1993, student enrollment has increased 44% for girls and 28% for boys in schools with the program. In 2000, about 2 million families and 27% of all primary schools in Bangladesh benefited from the program and significantly increased their calorie and protein consumption (62). Despite the positive results of the program, increased access to food has been insufficient to eradicate malnutrition for the most vulnerable individuals within those households (61).
- Since 1993, the Nepal Technical Assistance Group (a local nongovernmental agency), US Agency for International Development, and collaborating agencies have worked with the Government of Nepal to carry out a cost-effective program of routine vitamin A supplementation using female community health volunteers. By 1995, 23 districts of the country were included in the program and an estimated 18,000 child deaths per year had been avoided. The goal was to cover all 75 districts of Nepal by the end of 2002 (63).
- Salt fortified with iodine is well known for its role in eliminating iodine deficiency disorders (IDD) in industrialized nations, and it has become the standard intervention for IDD worldwide. Despite this fact, only 20 years ago, many people still suffered from goiter and retardation as a result of IDD. Efforts to make salt iodization universal—thus extending its reach to

### GLOSSARY

**Sustainability:** Society's ability to shape its economic and social systems so as to maintain both natural resources and human life. Sustainable development includes the reduction of poverty and hunger in environmentally sound ways. It also embraces the following broader objectives that are interrelated and mutually reinforcing:

- Expanding economic opportunities, especially for poor people, to increase their productivity, earning capacity, and chances to earn income in ways that are environmentally, economically, and socially viable over the long term;
- Meeting basic human needs for food, clean water, shelter, health care, education, and fulfillment of the human spirit;
- Protecting and enhancing the natural environment by managing natural resources in ways that take into account the needs of present and future generations; and
- Promoting pluralism and democratic participation, especially by poor women and men, in economic and political decisions that affect their lives, with full respect for internationally recognized human rights.

**Hunger:** A condition in which people lack the basic food intake to provide them with the energy and nutrients for fully productive, active lives.

**Malnutrition:** Failure to achieve nutrient requirements, which can impair physical and/or mental health. It may result from consuming too little food or a shortage or imbalance of key nutrients (eg, micronutrient deficiencies or excess consumption of refined sugar and fat).

**Food security:** Access at all times by all people to safe, nutritious food that is adequate for an active and healthy life, and that is obtained in a socially acceptable manner.

**Food insecurity:** The inability to acquire or consume an adequate quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so.

many developing nations still affected by IDD—gathered momentum particularly after the 1990 World Summit for Children (64). By 2000, iodized salt was available to 70% of the world's population. Twenty-nine countries used salt that was sufficiently iodized. Half the population in another 36 countries had access to iodized salt. Sadly, less than 50% of the population in 34 more countries used iodized salt. Instrumental partners in the effort for universal salt iodization include UNICEF, WHO, the International Council for Control of Iodine Deficiency Disorders (ICCIDD), The World Bank, The Micronutrient Initiative, government aid agencies (Canada, United States, Belgium, Germany, Netherlands), Kiwanis International, Turner Foundation, The Program Against Micronutrient Malnutrition, and UNICEF National Committees (65). Salt fortified with iodine is an excellent example of cooperation between the public and private sectors.

Bread for the World Institute	<a href="http://www.bread.org">www.bread.org</a>
CARE	<a href="http://www.care.org">www.care.org</a>
Catholic Charities USA	<a href="http://www.catholiccharitiesusa.org">www.catholiccharitiesusa.org</a>
Church World Service/CROP	<a href="http://www.churchworldservice.org">www.churchworldservice.org</a>
Food and Agriculture Organization	<a href="http://www.fao.org/sd">www.fao.org/sd</a>
Freedom from Hunger	<a href="http://www.freefromhunger.org">www.freefromhunger.org</a>
International Council for Control of Iodine Deficiency Disorders	<a href="http://www.people.virginia.edu/jtd/iccidd/mi/idd.htm">www.people.virginia.edu/jtd/iccidd/mi/idd.htm</a>
International Food Policy Research Institute	<a href="http://www.ifpri.org">www.ifpri.org</a>
The International Fund for Agricultural Development (IFAD)	<a href="http://www.ifad.org">www.ifad.org</a>
International Nutritional Anemia Consultative Group (INACG)	<a href="http://inacg.ilsa.org">http://inacg.ilsa.org</a>
International Vitamin A Consultative Group (IVACG)	<a href="http://ivacg.ilsa.org">http://ivacg.ilsa.org</a>
Jubilee 2000—Debt Reduction Campaign	<a href="http://www.jubilee2000uk.org/index.htm">www.jubilee2000uk.org/index.htm</a>
The Micronutrient Initiative	<a href="http://www.mn-net.org">www.mn-net.org</a>
National Council for International Health	<a href="http://www.ncih.org">www.ncih.org</a>
Oxfam America	<a href="http://www.oxfamamerica.org">www.oxfamamerica.org</a>
Pan American Health Organization	<a href="http://www.paho.org">www.paho.org</a>
RESULTS	<a href="http://www.results.org">www.results.org</a>
The Hunger Project	<a href="http://www.thp.org">www.thp.org</a>
UNAIDS	<a href="http://www.unaids.org/hivaidinfo/hiv.html">www.unaids.org/hivaidinfo/hiv.html</a>
UNICEF	<a href="http://www.unicef.org">www.unicef.org</a>
United Nations Development Programme (UNDP)	<a href="http://www.undp.org/hdro/indicators.html">www.undp.org/hdro/indicators.html</a>
United Nations Standing Committee on Nutrition	<a href="http://ceb.unsystem.org/hlcp/scn.htm">http://ceb.unsystem.org/hlcp/scn.htm</a>
United States Agency for International Development	<a href="http://www.usaid.gov/pop_health/nmh/index.html">www.usaid.gov/pop_health/nmh/index.html</a>
U.S. National Committee for World Food Day	<a href="http://www.gsu.edu/~wwwwfd">www.gsu.edu/~wwwwfd</a>
The World Bank	<a href="http://www.worldbank.org/data">www.worldbank.org/data</a>
World Food Programme	<a href="http://www.wfp.org">www.wfp.org</a>
World Health Organization	<a href="http://www.who.org">www.who.org</a>
WHO Global Database on Child Growth and Malnutrition	<a href="http://www.who.int/nutr">www.who.int/nutr</a>
World Hunger Program, Brown University	<a href="http://www.brown.edu/Departments/World_Hunger_Program">www.brown.edu/Departments/World_Hunger_Program</a>
World Vision	<a href="http://www.wvi.org">http://www.wvi.org</a>

FIG 4. Useful Internet resources for further exploration of world hunger, malnutrition, and food insecurity.

■ Women worldwide have an enormous role in both food production and preparation. In Niger, UNICEF helped women improve the production of cereal grains by increasing their access to better tools, donkey carts, and a diesel mill. With the increased output, the women developed a cooperative cereal bank and sold the grain to poor families, particularly in the preharvest season. Children's malnutrition declined when women had both the capacity and resources to address local food shortages and obtain other basic services (66).

### Looking Ahead

Long-term solutions to hunger must address the root causes. Sustainable development requires political, economic, and social changes: empowering the disenfranchised, widening access to assets and other resources, narrowing the gap between rich and poor, and adjusting consumption patterns to foster good stewardship of nature (67). Without these changes, hunger will continue to plague humanity. Ending hunger is not only a moral question, but also a practical concern for all of us and for future generations. It means not only upholding the rights and dignity of all human beings, but also maintaining the security and integrity of the planet on which we all live.

### ROLES AND RESPONSIBILITIES OF DIETETICS PROFESSIONALS

The problems of hunger can appear so great that they sometimes seem approachable only by way of worldwide political decisions (68). Worldwide efforts to overcome hunger, food insecurity, and malnutrition and to foster self-reliant development must be intensified. To this end, many individuals and groups are working to improve the future well being of the

world and its people through a number of national and international organizations (see Figure 4 for a list of Web sites).

Solutions to the problem of food insecurity depend on people being willing to take action and work together, and enabling global political and economic environment. Regardless of the type of involvement a person chooses, each individual can make a difference. Dietetics professionals can educate themselves regarding global hunger issues; visit the Web sites listed below and learn about organizations and programs involved with global hunger and poverty issues; consider how current world issues relate to hunger; think about the ramifications of domestic policy decisions on world hunger (eg, trade, food regulations, import and export tariffs, foreign aid). As individuals, we can raise awareness of hunger issues in our communities or schools by establishing a hunger Web site that demonstrates the plight of the world's hungry and by writing letters to elected officials and the editors of local newspapers to focus attention on hunger and poverty-related issues.

Individuals can also assist as volunteers in both government and nongovernment programs and organizations involved with hunger and poverty issues. Consider working with others who have similar interests, follow current hunger-related legislation, and call for change by writing and calling political representatives and expressing concerns about hunger-related issues. Encourage your church, synagogue, or mosque to support both overseas work and domestic outreach efforts to feed the hungry; support these efforts with monetary contributions (69). Dietetics professionals can network and support each other in this effort by joining the Hunger and Environmental Nutrition dietetic practice group of the American Dietetic Association and other professional organizations such as the

American Public Health Association, and hunger lobbying groups such as Bread for the World and RESULTS (50).

Dietetics professionals are uniquely qualified to develop relationships with elected officials and their staff members and to educate voters about the nutritional impact of policies and programs. There is an urgent need for nutrition professionals to become actively involved in seeing that the food assistance programs that support sustainable development are protected, improved, and expanded. When possible, nutrition professionals should get involved, on a long-term and short-term basis, in relief, development, and education activities in the developing world.

People can also help change the status quo through the personal choices they make each day (70). Individuals in affluent nations can increase their knowledge of how changes in their own eating and purchasing practices may reduce consumption of the world's nonrenewable resources (71-73). Personal and national decisions affect our immediate environment and also people and environments in other parts of the world. We can encourage youth to be respectful of the needs of other cultures.

George McGovern, former US Senator, Presidential Medal of Freedom recipient, and an honorary member of the ADA, calls us all to action and reminds us that malnutrition "is a problem we can resolve at a fraction of the cost of ignoring it. We need to be about that task now. . . . Anyone who looks honestly at world hunger and measures the cost of ending it for all time will conclude that this is a bargain well worth seizing. More often than not, those who look at the problem and the cost of its solution will wonder why humanity didn't resolve it long ago" (69).

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*Authors:*

Marie Boyle Struble, PhD, RD (The College of Saint Elizabeth, Morristown, NJ); Laurie Lindsay Aomari, RD (Nutrition Communications, Alexandria, VA)

*Reviewers:*

Rachel Treveethan, MS, RD (Nutrition Advantage, LLC, Kettering, OH); David Beckmann, (Bread for the World, Silver Spring, MD); Diane Veale Jones, MS, RD (College of Saint Benedict/Saint John's University, St. Joseph, MN); Barbara Scott, MPH, RD (University of Nevada, Reno, NV); Patricia G. Wolman, EdD, RD (Winthrop University, Rock Hill, SC); World Health Organization (Dr Ian Darnton-Hill MBBS, MPH, MSc, FAFPHM, FACN, Columbia University, New York, NY)

*Association Positions Committee Workgroup:*

Ethan Bergman, PhD, RD, FADA (chair); Sonja Connor, MS, RD; Eileen Kennedy, DSc, RD (content advisor); Sondra King, PhD, RD (content advisor)