

FOOD INSECURITY and Hunger in the United States

AN ASSESSMENT OF THE MEASURE

Panel to Review the U.S. Department of Agriculture's Measurement of
Food Insecurity and Hunger

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Committee on National Statistics

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PANEL TO REVIEW THE U.S. DEPARTMENT OF AGRICULTURE'S
MEASUREMENT OF FOOD INSECURITY AND HUNGER

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Concepts and Definitions

This chapter discusses the conceptual issues associated with the concepts and definitions of food insecurity and hunger and their applications for measurement in the monitoring of food insecurity in the United States. The chapter also discusses the labeling of the severity levels of food insecurity.

FOOD INSECURITY, HUNGER, MALNUTRITION, AND UNDERNOURISHMENT¹

Food scarcity, with its dangers for survival and serious physical and psychological discomfort, has been part of human experience and human culture from the earliest inception of language and thought. Various concepts have emerged to describe aspects and consequences of food scarcity, although they are often ambiguous in meaning. For example, depending on usage and the user, the concept of hunger covers a spectrum from the short-term physical experience of discomfort to chronic food shortage to severe and life-threatening lack of food.

With the establishment of the modern science of nutrition, the concept of *malnutrition* as a condition brought about by insufficient intake of nutrients to meet biological requirements became a focal construct. Technically the prefix *mal* actually refers to both over- and underintake, but the typical

¹This section is adapted from Habicht et al. (2004).

usage—and until recently the bulk of research on malnutrition—has been directed to understanding inadequate intakes of macro- and micronutrients. The measures of central concern are observed through analysis of biological tissues (e.g., serum), observation of well-established physical (e.g., anthropometric) and clinically observable consequences (e.g., blindness), and by inference from data on intake. For example, anthropometric status is commonly used to assess malnutrition of children under age 5 (de Onis, Blösner, Borghi, Frongillo, and Morris, 2004).

As malnutrition acquired a central role in scientific conceptualization, it was often mentioned jointly with the idea of hunger, to the point at which the two often became virtually synonymous. Nutritional scientists as well as social advocates therefore sought to describe the inequalities of access to adequate food and its consumption. One approach was to compare intakes of a nutrient for a given gender and life stage group with an established reference value, such as the Recommended Dietary Allowances (RDAs).

Some problems with using the RDA approach stem, in part, from its conceptual underpinnings. To cover the needs of nearly all of a group, the reference values were set at very high levels. Consequently, a proportion of the population may consume less than the RDAs but still have adequate nutrient intakes. Another problem is purely technical. It is difficult to use a single interview to assess usual nutrient intake in a biologically meaningful fashion. For instance, vitamin A intake varies considerably over time, and only the mean intake over a period of weeks is meaningful nutritionally, because vitamin A is stored and body reserves buffer the variability of intake. Further technical problems relate to the accuracy of reported intake and of the information used to translate food intake into nutrients. As a consequence of these problems, assessment of nutritional adequacy through interviews and analysis of the record in relation to the RDA is no longer considered appropriate (Institute of Medicine, 2000).

The United Nations Food and Agricultural Organization (FAO) took a different biologically based approach to define *undernourishment* as not ingesting enough food to meet energy needs. Operationally the FAO indicator is calculated from national food energy balance sheets. These balance sheets estimate the total energy available for human consumption nationally by adding total energy produced plus energy imported plus the change in stocks minus energy exported, energy wasted, and energy used for other than human consumption. FAO then creates a synthetic distribution of energy consumption for each country in which the mean is total energy available (from the balance sheets) and the variance is taken from another source, typically an estimate from a nationally representative household expenditure survey that accounts for energy exported and energy used for other than human consumption (Naiken, 2003). The resulting estimated distribution of undernourishment (i.e., food energy consumed) across countries is

highly correlated with the distribution of food energy available for consumption obtained directly from the national food energy balance sheets when national population size is taken into account (Smith, 1998). Thus the two measurements, one from the energy balance sheets and one from the prevalence of undernourishment, are redundant. That is, the FAO method for estimating undernourishment measures only food energy availability, but not consumption of (or access to) food by households.

The discovery that people frequently did not have enough to eat according to accepted cultural norms created a conceptual crisis. Either the food problems of poor people were imaginary, or other concepts were needed to describe and measure them. An intuitively understandable construct was *hunger* defined as a physical pain. This word has typically and historically been used not only to refer to the physical sensation, but also to a feeling of weakness from not eating. As stated in the previous chapter, beginning in the 1960s, the word hunger began to take on a wider meaning. It was expanded to encompass issues of access to food and socioeconomic deprivation related to food. Perhaps because these expanded referents seemed less compatible with the intuitive meaning of hunger, other constructs were needed. It is in this context that the phrase *food insecurity* came into use in the United States. Internationally, food insecurity was already current. Originally, it was used to describe the instability of national or regional food supplies over time (Pelletier, Olson, and Frongillo, 2001; Rose, Basiotis, and Klein, 1995). It was then expanded to include a lack of secure provisions at the household and individual levels.

Figure 3-1 depicts the core concepts related to nutritional state that were established at the commencement of the U.S. national nutritional monitoring system (Anderson, 1990).

CONCEPT AND DEFINITION OF FOOD INSECURITY

As described in the previous chapter, the broad conceptual definitions of food security and insecurity developed by the expert panel convened in 1989 by the Life Sciences Research Office (LSRO) have served as the basis for the standardized operational definitions used for estimating food security in the United States. *Food security* according to the LSRO definition means access to enough food for an active, healthy life. It includes at a minimum (a) the ready availability of nutritionally adequate and safe foods and (b) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). *Food insecurity* exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain.

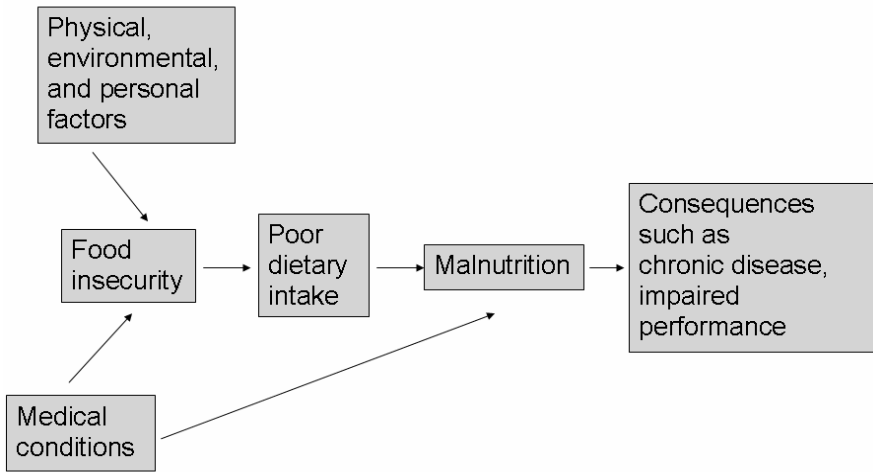


FIGURE 3-1 Core concepts related to nutritional state.

Food insecurity, as measured in the United States, refers to the social and economic problem of lack of food due to resource or other constraints, not voluntary fasting or dieting, or because of illness, or for other reasons. This definition, supported by the ethnographic research conducted by Radimer et al. (1992); Wolfe, Frongillo, and Valois (2003); Hamelin, Habicht, and Beaudry (1999); Hamelin, Beaudry, and Habicht (2002); Quandt and Rao (1999); Quandt, McDonald, Arcury, Bell, and Vitolins (2000); and Quandt, Arcury, McDonald, Bell, and Vitolins (2001), means that food insecurity is experienced when there is (1) uncertainty about future food availability and access, (2) insufficiency in the amount and kind of food required for a healthy lifestyle, or (3) the need to use socially unacceptable ways to acquire food (see Figure 3-2). Although lack of economic resources is the most common constraint, food insecurity can also be experienced when food is available and accessible but cannot be used because of physical or other constraints, such as limited physical functioning by elderly people or those with disabilities (Lee and Frongillo, 2001a, 2001b).

Some closely linked consequences of uncertainty, insufficiency, and social unacceptability are assumed to be part of the experience of food insecurity. Worry and anxiety typically result from uncertainty. Feelings of alienation and deprivation, distress, and adverse changes in family and social interactions also occur (Hamelin et al., 1999, 2002; Frongillo and Horan, 2004). As stated in the previous chapter, hunger and malnutrition are also potential, although not necessary, consequences of food insecurity. Management strategies that people use to prevent or respond to

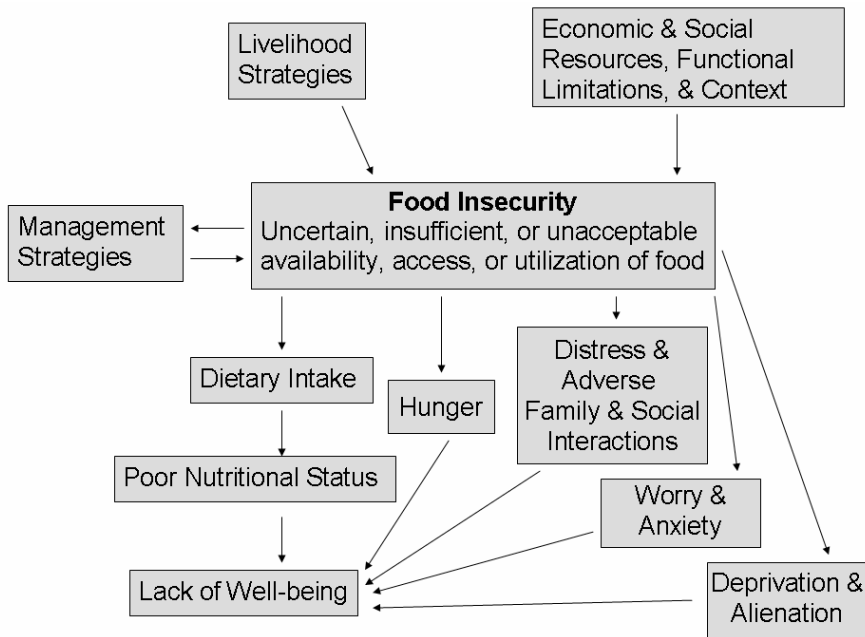


FIGURE 3-2 Food insecurity, and its determinants and consequences (adapted from Habicht et al., 2004).

the experience of food insecurity are conceptually different from food insecurity but are tied to it.

Food insecurity is measured as a household-level concept that refers to uncertain, insufficient, or unacceptable availability, access, or utilization of food. It is experienced along with some closely linked consequences of it. There is a strong rationale for measuring food insecurity at the household level. It is possible for individuals to be food secure in a food-insecure household, just as it is possible for individuals to not be poor in a poor household, depending on the intrahousehold allocation of resources. It means that we can measure and report the number of people who are in food-insecure households (with not all of them necessarily food insecure themselves). When a household contains one or more food-insecure persons, the household is considered food insecure.

Although food is a fundamental need in that each individual must have access to necessary nutrients to survive and to participate actively in society, food is only one of the needs that people must make efforts to meet. Households often make trade-offs among needs to ensure their long-term viability as units. Households manage the stocks and flows of assets and

cash to meet basic needs, offset risk, ease shocks, and meet contingencies (Pelletier et al., 2001; Rose et al., 1995). For example, people in households may consume less food in the present to preserve assets and future ability to make their living, or people may forgo some food to be able to buy medication to treat illness (Wolfe et al., 2003). A full understanding of food insecurity requires incorporation of the time element—both in the sense of the periodicity of occurrence of various needs and events and in the sense of the frequency and duration of episodes (Maxwell and Frankenberger, 1992). *Frequency and duration are therefore important elements for the U.S. Department of Agriculture (USDA) to consider in the operational definition and measurement of household food insecurity and individual hunger.* (This issue is discussed further in Chapter 4.)

ADVERSE OUTCOMES OF FOOD INSECURITY

Research has shown that food insecurity is associated with adverse health and developmental outcomes in children and adults that are both nutritional and nonnutritional in nature.² Food insecurity is associated with higher prevalence of inadequate intake of key nutrients (Rose, Habicht, and Devaney, 1998; Casey, Szeto, Lansing, Bogle, and Weber, 2001; Lee and Frongillo, 2001a; Adams, Grummer-Strawn, and Chavez, 2003), risk of overweight in women and some girls (Olson, 1999; Alaimo, Olson, and Frongillo, 2001a; Laitinen, Power, and Javelin, 2001; Townsend, Peerson, Love, Achterberg, and Murphy, 2001), depressive symptoms in adolescents (Alaimo, Olson, and Frongillo, 2002), and academic and social developmental delays in children (Kleinman et al., 1998; Murphy et al., 1998; Alaimo et al., 2001b; Reid, 2001; Stormer and Harrison, 2003; Ashiabi, 2005). Data from a longitudinal study of welfare recipients show that household food insecurity is associated with poor physical and mental health of low-income black and white women (Siefert, Heflin, Corcoran, and Williams, 2004). Food insecurity is also associated with more behavioral problems (Olson, 1999; Shook Slack and Yoo, 2004), poorer school performance (Olson, 1999; Alaimo et al., 2001b; Dunifon and Kowaleski-Jones, 2003), and adverse health outcomes (Alaimo, Olson, Frongillo, and Briefel, 2001c; Cook et al., 2004; Weinreb et al., 2005) in children. Data from the Early Child Longitudinal Study-Kindergarten Class show that reporting at least one indicator of food insecurity was significantly associated with impaired learning in mathematics from fall to spring of the kindergarten year (Winicki and Jemison, 2003) and with impaired learning in reading from kindergarten to third grade (Jyoti, Frongillo, and Jones, 2005).

²The panel does not attempt to present a comprehensive review of all possible literature on the subject.

CONCEPT AND DEFINITION OF HUNGER

The conceptual definition of hunger adopted by the interagency group on the food security is: “The uneasy or painful sensation caused by a lack of food, the recurrent and involuntary lack of food. Hunger may produce malnutrition over time. . . . Hunger . . . is a potential, although not necessary, consequence of food insecurity” (Anderson, 1990, pp. 1575, 1576). This language does not provide a clear conceptual basis for what hunger should mean as part of the measurement of food insecurity. The first phrase “the uneasy or painful sensation caused by a lack of food” refers to a possible consequence of food insecurity, as discussed above. The second phrase “the recurrent and involuntary lack of access to food” refers to the whole problem of food insecurity, the social and economic problem of lack of food as defined above.

Holben (2005)³ has enumerated a large number of definitions of hunger from various sources. Taken together, these definitions fall into four groups regarding the concept of hunger: (1) a motivational drive, need, or craving for food; (2) an uneasy sensation felt when one has not eaten for some time; (3) discomfort, illness, weakness, or pain caused by a prolonged, involuntary lack of food; and (4) the prolonged, involuntary lack of food itself. The first and second of these are not the interest of the household food security survey because they refer to a natural phenomenon that all humans experience on a regular basis. The fourth is also not a useful definition or concept of hunger because it refers to the problem of food insecurity itself. The third provides a starting point for consideration as to what is intended for the Household Food Security Survey Module (HFSSM). It refers to the *consequence* of food insecurity that, because of a prolonged, involuntary lack of food due to lack of economic resources, results in discomfort, illness, weakness, or pain that goes beyond the usual uneasy sensation.

Available evidence from ethnographic work affirms that this definition of hunger is well understood and is reported in similar terms in the United States (Radimer et al., 1992; Wolfe, Frongillo, and Valois, 2003) and Québec (Hamelin, Beaudry, and Habicht, 2002). There is consensus in U.S. society, supported by this empirical research, that an individual’s report that he or she has experienced hunger because of lack of food provides a straightforward indication that the individual has, indeed, experienced hunger in the sense of the third definition (i.e., discomfort, illness, weakness, or

³This information is drawn from a background paper prepared for the panel by Holben (2005).

pain caused by a prolonged, involuntary lack of food). But unlike food insecurity, which is a household-level concept, hunger is an individual-level concept. For purposes of the HFSSM included in the Food Security Supplement to the CPS, the term “hunger” should refer to a potential consequence of food insecurity that, because of prolonged, involuntary lack of food, results in discomfort, illness, weakness, or pain that goes beyond the usual uneasy sensation. Two questions therefore arise. First, can the experience of severe food insecurity with hunger by households be measured and its prevalence estimated? Second, can the experience of hunger by individuals be measured and its prevalence estimated?

The HFSSM is measuring food insecurity at the level of the household; it is not measuring hunger at the individual level. The scale does not give special weight to the hunger questions. The HFSSM does include items that are related to being hungry among food-insecure households. The ethnographic and quantitative evidence discussed earlier has shown that the HFSSM items on hunger are probably appropriate in the food insecurity scale, but these items contribute to the measurement of household food insecurity and not specifically to the measurement of hunger at the individual level.

For the purposes of measuring and estimating the prevalence of hunger among individuals in the population, something that the HFSSM does not do, some of these same items might be used in a measure of hunger among individuals, but it would require a measurement process that is based on the conceptual definition of the condition, as well as a battery of items designed to measure it and a reoriented sampling design that includes the individual as the unit of analysis. This work could be based on the information from such sources as up-to-date ethnographic studies of low-income populations, results of experiments and analysis of surveys, analysis of public opinion and perspectives of user groups, expert assessment, and other relevant information.

The panel therefore concludes that hunger is a concept distinct from food insecurity, which is an indicator and possible consequence of food insecurity, that can be useful in characterizing severity of food insecurity. Hunger itself is an important concept, but it should be measured at the individual level distinct from, but in the context of, food insecurity.

To summarize, the panel’s conclusion is based on the fact that, although a strong theoretical and research base exists for the conceptualization and measurement of food insecurity, we do not have a correspondingly strong base for either the conceptualization of hunger or its measurement. That is, there is now ample theoretical, conceptual, ethnographic, and quantitative work done to justify the measurement of the experience of food insecurity using a questionnaire. For the measurement of the experience of hunger to be equally credible, there needs to be a stronger base than we currently have

in developing clear concepts for how we should think about hunger and in tested means to accurately elicit information from survey respondents about whether they have experienced hunger.

Recommendation 3-1: USDA should continue to measure and monitor food insecurity regularly in a household survey. Given that hunger is a separate concept from food insecurity, USDA should undertake a program to measure hunger, which is an important potential consequence of food insecurity.

Recommendation 3-2: To measure hunger, which is an individual and not a household construct, USDA should develop measures for individuals on the basis of a structured research program, and develop and implement a modified or new data gathering mechanism. The first step should be to develop an operationally feasible concept and definition of hunger.

Recommendation 3-3: USDA should examine in its research program ways to measure other potential, closely linked consequences of food insecurity, in addition to hunger, such as feelings of deprivation and alienation, distress, and adverse family and social interaction.

It took a lot of discussion and conferences for the Food Security Measurement Project to reach a working agreement on the operational definition of food security and insecurity. Hunger is a complex concept, and it should be well thought through to ensure agreement among the key users and then to develop and test the appropriate questions and to identify the survey mechanism and sample design for collecting the needed data. Such an effort will take time.

APPLICATION OF THE CONCEPTS AND DEFINITIONS FOR MEASUREMENT

The broad conceptual definition of household food insecurity includes more elements than are included in the current USDA measure of food insecurity. The current measure of prevalence of household food insecurity obtained through the HFSSM focuses on the uncertainty and insufficiency of food availability and access that are limited by resource constraints, and the worry or anxiety and hunger that may result from it. It does not include questions on nutritional adequacy, safety, or social unacceptability of food access, concepts that are part of the broad conceptual definition.