

# Food security: definition and measurement

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**Abstract** The term “food security” has been used over time to mean different things. This brief article discusses the various meanings attached to the concept and suggests that it can be a useful measure of household and individual welfare, particularly if combined with estimates of household food acquisition and allocation behavior. If nutritional security is the goal of interest, estimates of access to food should be combined with estimates of access to clean water and good sanitation. Anthropometric measures are likely to be more appropriate than food security estimates to target policies and programs to improved child nutrition.

**Keywords** Food security · Definition · Measurement · Energy · Nutrient requirements

Recent food price increases have drawn the attention of the world’s policy-makers and news media to food security. But what is “food security” and how can it be measured? Those two questions are addressed in this brief article. In its narrowest definition, food security means that enough food is available, whether at the global, national, community, or household level. But that begs a clarification of what is meant by “enough”. Is it enough to meet economic demand and if so, at what price, or is it enough to meet energy and nutrient requirements?

Originally, the term “food security” was used to describe whether a country had access to enough food to meet dietary energy requirements. National food security was used by some to mean self-sufficiency, i.e. the country produces the food it needs or that which its population demands. Again, it was seldom made clear whether self-sufficiency meant that

all citizens had access to enough food to meet energy and nutritional requirements or whether meeting economic demand from domestic production was enough to claim self-sufficiency. Using the latter definition, all countries could claim self-sufficiency simply by leaving the domestic market to equate demand and supply at whatever price would result. National food sovereignty was and still is used to measure the extent to which a country has the means to make available to its people the food needed or demanded, irrespective of whether the food is domestically produced or imported. A country that does not produce the food it needs or its population is prepared to buy and does not have the hard currency to import what is missing, would not be food sovereign.

The use of the term food security at the national and global level tends to focus on the supply side of the food equation. The question raised is: is there enough food available, where food is usually interpreted to mean dietary energy? But availability does not assure access, and enough calories do not assure a healthy and nutritional diet. The distribution of the available food is critical. If food security is to be a measure of household or individual welfare, it has to address access. This was widely recognized by scholars and practitioners in the mid-1970s, and food security was defined as access by all people to enough food to live a healthy and productive life. This definition was subsequently amplified by FAO to include the nutritional value and food preferences. Thus the definition agreed upon at the World Food Summit in 1996 is that food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life.<sup>1</sup> The addition of “safe and nutritious” emphasize food safety and nutritional composition while the addition of

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<sup>1</sup> FAO (1996) Declaration on world food security. World Food Summit, FAO, Rome.

“food preferences” changes the concept of food security from mere access to enough food, to access to the food preferred. This implies that people with equal access to food, but different food preferences, could show different levels of food security. As long as the term “preferences” is interpreted to mean foods that are socially and culturally acceptable and consistent with religious and ethical values, rather than a broader interpretation to mean a household or individual preference for caviar instead of sorghum, there may not be a problem with the addition of “preferences.”

### Household food security

The concept of food security has been used extensively at the household level as a measure of welfare and attempts have been made to make the concept operationally useful in the design, implementation, and evaluation of programs, projects and policies. A household is considered food secure if it has the ability to acquire the food needed by its members to be food secure. A distinction is frequently made between transitory and permanent food insecurity, where the former describes periodic food insecurity as for example seasonal food insecurity, while the latter describes a long-term lack of access to sufficient food. There are two reasons why household food security may not assure food security for all its members. First, the ability to acquire enough food may not be converted into actual food acquisition. Household preferences may not prioritize food acquisition over the acquisition of other goods and services such as school fees and housing. Second, the intra-household allocation of the food may not be based on the needs of each individual member. The existence of a large number of households with both undernourished and obese members is a case in point. Furthermore, the extent to which individual food security results in good nutrition depends on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care. Thus, food security does not assure nutritional security.

### Estimation of food security

How should household or individual food security be estimated? Consumption surveys would tell us what was consumed. But that is an outcome of not only access to food, but the household food acquisition and allocation behavior. Estimates of total household incomes and food prices could provide an estimate of household food security, but only if assumptions are made about the income share that the household spends on food. That would depend on household behavior and the costs of other goods

and services demanded by the household. For example, two households with the same total incomes and facing the same food prices might have different food security if one had to pay school fees, but the other did not. Least-cost diets that would meet energy and nutrient requirements could be used as guidelines for household food security but that would ignore household preferences and inter-household variations in expenses to meet other basic needs.

Experimental measures of food insecurity, like the one used by the United States Department of Agriculture (USDA),<sup>2</sup> attempt to address the issue of varying household needs and behavior. A set of questions addressed to potentially food insecure households is used to estimate household food insecurity scores. The questions attempt to capture perceptions as well as past experience by the households. A moral hazard risk would be expected from such an approach if the respondents expect that the answers will influence whether the household gets access to government support.

### Magnitude of food insecurity

If the above FAO definition is interpreted to mean that the nutritional needs of each individual have to be met for the person to be food secure, the FAO estimate of 800–900 million undernourished people would be a gross underestimate of the prevalence of food insecurity. If the estimate of two billion iron deficient people is correct, that number would be the lower bound for the number of food insecure people in the world.

But should households that are able to acquire the food they prefer and need to meet the energy and nutritional requirements for all its members whether from own production, barter or purchase, really be classified as food insecure if one of the household members suffer from micronutrient deficiency? In such a case, the problem is inappropriate intra-household allocation of the household food acquisition power. Dietary changes rather than enhanced ability of the household to obtain more food may be the solution. At issue is whether the FAO definition of food security, that is now widely accepted, can be used to guide policies and programs or whether there is a need to disaggregate the concept into different kinds of food insecurity depending on the nature and severity of the problem and the type of solution required.

The USDA food security measure which, as mentioned above, is based on household self-declarations, differentiates between low and very low food security. It is focused

<sup>2</sup> Nord M, Andrews M, Carlson S (2004) Household food security in the United States, 2003. ERS Food Assistance and Nutrition Research Report No. 42, USDA, Washington, DC.

on the household-level resource constraints, i.e. does the household have the resources to acquire the food needed? But if food security, as defined by FAO, is to be achieved, assuring sufficient household resources is necessary, but not sufficient. Household behavior must be considered. Does the household acquire the food needed and is it allocated according to needs of the household members? What becomes important is whether all members are food secure. Policy interventions to assure that each household has access to enough food are likely to be very different from interventions needed to change food acquisition and allocation behavior. But what about those individuals who are food secure but exposed to unclean water and poor sanitation? Is food security a goal in itself or a means to achieve good health and nutrition? If the latter, policy interventions should be guided towards nutritional security and the monitoring of food security should be complemented by anthropometric measurements.

### Conclusion

Food security, as defined by FAO, provides a useful goal towards which the world should strive. It can also be useful for monitoring an important aspect of the well-being of households and for the design, implementation, and evaluation of policies, programs and projects. However, the interaction between household food access (usually referred to as household food security), and household food acquisition and allocation behavior means that household food security is of only limited value as an indicator of individual food security. Because of a high prevalence of poor sanitation and unclean water in many developing countries, its value as an indicator of individual health and

nutrition is even less. Food security is a valuable concept if used with a clear understanding of what it means, its limitations, and how it interacts with behavior and non-food factors. Estimates of household food security, combined with individual anthropometric estimates for children and a thorough understanding of household behavior provide a powerful input into the design and implementation of policies and programs to improve nutrition.



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