

Commentary on “Assessing the Quality of Food Aid Deliveries”

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Introduction

The World Food Programme has commissioned a study on how to measure the quality of food aid. The terms of references for this project are stated in “A proposal to develop a nutritional measure of food aid flows”. The project has been executed by a team lead by Dr. Colleen Doak of the VU University Amsterdam, resulting in the paper “Assessing the Quality of Food Aid Deliveries”. Both documents need to be considered, since the ToR stipulate quite explicitly how the quality index should be constructed and which goals are to be attained. This note provides an evaluation of the quality project in three parts. First, it summarizes the procedure to construct the food quality index (in fact two indexes are being proposed). Second, it assesses to which extent the proposed index can indeed be seen as indicative of food aid quality and third, it ends with some suggestions for further research and improvements. In an Annex the formal definition of the quality indexes is given.

Constructing a quality index for food aid

The ToR document starts with an institutional and historical background of food aid deliveries, and describes how the INTERFAIS service of WFP has been instrumental in reporting food aid flows in terms of quantities shipped and in terms of values (expressed in US-dollars). Increasingly, donors and food aid agencies have been arguing that more specific quality measures are needed, in particular to emphasize the role of micronutrients beyond that of the common measure of per capita dietary energy supply (DES). Deficiencies of micronutrients are claimed to figure among the leading causes of death by diseases in developing countries. Therefore the ToR propose to develop an index of the nutritional value of food aid, as a weighted average of macro- and micronutrients for a standardized food aid commodity, which can be thought of as a mix of food aid commodities used in a typical emergency, scaled to say a ton. The project should determine which nutrients to include in the index, set up a scheme for computations and provide suggestions for data sources to be used.

Specifically it is stated that reporting on quality measures will i) increase the awareness of micronutrient deficiencies, ii) be helpful in achieving food security iii) allow for better allocation and targeting of food aid and iv) improve reporting by donors and allow more detailed analysis.

The paper basically executes the tasks as described in the ToR. It reviews briefly some of the literature on nutrient deficiencies and identifies three macronutrients (calories, fat and proteins) and 15 micronutrients as being most important in the context of emergency food aid. The project collects data on nutrients contents in food commodities and minimum requirements for an adult person. Out of the 15 micronutrients, seven were selected for further analysis, based on data availability. It also reviews quality indexes found in the literature, all of which measure in some way the contribution (or gap) to nutrient requirement recommendations. The paper then proposes to measure the shortfalls of individual nutrients using the DES norm as benchmark (which implies that recipients receive food aid up to a level of 2100 kcal/day). The individual shortfalls are then aggregated into an overall index. Two proposals are in fact made: a count index, which counts those nutrients that meet the nutrient requirements and a score index, which measures the percentage content of the nutrients (capped at 100%) and then computes the index as an average.

The index is indeed a single number, but the deficiencies of individual micronutrients are reported upon in tabular form or as so-called spider diagrams. The method is applied in case of two typical food aid operations, one in Sudan and one in Ethiopia. It appears that food aid shipments originating from the EU and the VS to these countries differ considerably in their nutritional composition, yet for the US the count index is 4 and for the EU it is 5 (out of 10).

Evaluating the quality index

Food aid operations are complex and we can here only attempt to indicate the key steps. This is done best by following food aid from its point of origin to its point of delivery, and list the relevant aspects. The first stage is procurement, storage, handling and transport. Commodities may be shipped in raw form directly to recipients, who do the final processing, or the executing agencies themselves may be involved in food processing, e.g. preparing a balanced mix of commodities or fortified foods. This shows that the (nutritional) composition of food aid may change along the chain. Secondly, a needs assessment is done in order to identify and target the needy and to collect information on their characteristics (by age and by sex, identifying those recipients with specific deficiencies). This shows that nutritional demand differs across recipients and must be matched by adequately composed food aid. Thirdly, the emergency itself has specific characteristics: it may be steep and deep, it may be protracted or it may cover operations in refugee camps, which sometimes last for several years. Again the nutritional needs of the food aid package differ, and become in this case even dependent on the type of crisis.

Clearly, the provision of food aid is a multifaceted operation, where each separate aspect is important in its own right. This holds in particular for a micronutrient deficiency, which as a rule can be solved by one and only one specific intervention, i.e. adequate provision of the micronutrient at hand. This holds for most if not all micronutrients (nutritional science has to sort out whether there are short cuts here). Averaging is not possible as each essential nutrient causes its own deficiency and needs its own indicator. Similarly, the nutritional needs depend on the length of the intervention, and the needs in a protracted crisis may not be the same as the average needs in a short and enduring crisis. Neither can the nutritional needs of pregnant women and children be averaged. All aspects that reflect quality and are non-additive for an individual must be represented as such. This argument leads to two objections against the proposed index. First, quality should not be captured by a one-dimensional index. It needs to express every single essential element, each of which must be represented by its own index. If the quality changes over the food aid chain, the index needs to represent this as well. Secondly, since nutrient intakes differ across recipients, a quality index needs to be a function of the characteristics of the recipient. It is convenient to include the length of the crisis as one of those characteristics. The proposed indexes do not meet these requirements. Still the paper, while it follows step-by-step the instructions of the ToR to construct a single index, partly meets the first part of the critique by also listing the individual deficiencies for each nutrient, without an assessment which nutrients are essential. The proposed index simplifies the notion of quality and therefore the ToR cannot convincingly claim that the required introduction of such a one-dimensional index will achieve the stated goals. Since the index only counts the nutritional gaps (or averages them), and does not point to the specific risks that may occur, the contribution to increased awareness on nutrient deficiency seems limited. The index is supposed to contribute to improved allocation and targeting. This is unlikely if the characteristics of the recipients are not taken into account. Furthermore it claims to improve food security, which requires a more operational definition of food security than the one based on availability of and accessibility to food, which is rather unspecific.

Maybe a metaphor may help in understanding better why quality aspects cannot be averaged. Nutritional and health status requires the interpretation of many indicators, just like reading off the meters in a control panel of an airplane jet. Measurements on many variables are visible on the display and, dependent on the specific conditions, one or more are essential, but all should be available when the pilot has to cope with volatility or faces a failure somewhere in the operating system. No plane will land safely if all measurements are averaged out in one, say, Boeing index.

Conclusions

We conclude that in setting up the quality index of food aid, it may be considered that the definition of the concept of quality is a research topic in its own right. We mention here two aspects that could be taken into account: the deficiencies of essential nutrients, and in general all non-additive quality aspects, are to be represented separately and the quality index is to be formulated as a function of the recipients' characteristics. Literature review and possibly further research will have to reveal which nutrients are considered essential, whether there are shortcuts possible to reduce the dimensionality of the quality index, and also whether interdependencies between the nutrients within the diets play a role. Characteristics of the recipients differ greatly, not only among children and pregnant women, but may also be location specific,

based on soil deficiencies (as e.g. happens for zinc). Classification techniques may be used to find an appropriate grouping. Clearly, other quality aspects beyond those related to nutritional deficiency may become part of the analysis.

Finally, there seems to be a need for pointing out how information on food aid quality will benefit the delivery process. One of the most important inputs in the effective provision of food aid is professionalism on the ground, and the quality project may want to show in greater detail how the information provided strengthens this vital input, rather than becoming a substitute for it.

Annex: Formal definition of the quality indexes

It is assumed that one person receives a standard food aid commodity with known nutrient contents (this may be thought of as the mix of food aid commodities as delivered in a particular emergency situation).

The nutrients (energy, protein, fat, vitamin A,) are indexed by $i=1, \dots, I$

The analysis is based on two variables

- r_i Minimum requirement of nutrient i for one person (gram/person)
- c_i Content of nutrient i (gram per kg of food aid commodity)

For simplicity we assume all contents can be expressed in gram per kg. The number of persons that can meet their requirements for nutrient i from one kg of food aid is then

$$N_i = c_i / e_i, i = 1, \dots, I$$

As benchmark for the quality index dietary energy intake is taken, defined as

$$\bar{N}_e = c_e / e_e \text{ for } i = \text{energy}$$

Then the proposed quality indexes introduced in the paper are:

$$N^c = \{\#i : N_i \geq \bar{N}_e\}$$
$$N^s = (\sum_i \min_i(1, N_i / \bar{N}_e) * 100) / I$$

The first index, an integer, is a count measure summing the number of nutrients that meet the minimum requirements when energy intake is met. This leaves open which nutrients fall short and whether they need to be supplemented. The second index is a score (as percentage), obtained from averaging over nutrient contents (also in percentages), which states that redundancies (i.e. excess nutrient over the minimum requirement) are discarded and that possible shortfalls of essential nutrients are averaged out. This implies that potential nutrient deficiencies may be underestimated. Similarly, possible harmful effects of oversupply of nutrients remain undetected.