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Towards a Simplified Food Balance Sheet

Robert Mayo¹

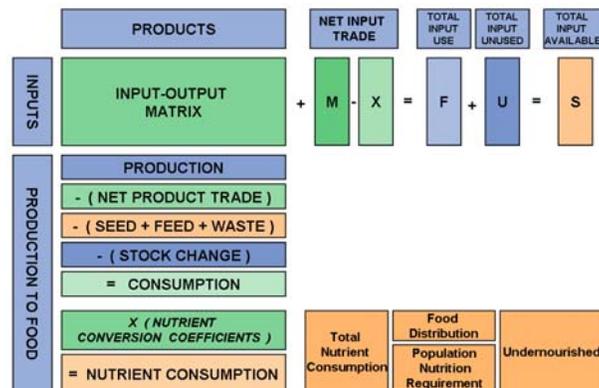
¹ Statistics Division, Food and Agriculture Organization of the United Nations, Rome, Italy

1. Background to Food Balance Sheets

Food Balance Sheets aim to present a comprehensive picture of the pattern of a country's food supply during a specified reference period. The food balance sheet shows national availability for each food item i.e. each primary commodity and a number of processed commodities potentially available for human consumption. It also shows the sources of supply for these commodities and their utilization. The total quantity of foodstuffs produced in a country added to the total quantity imported and adjusted to any change in stocks that may have occurred since the beginning of the reference period gives the supply available during that period. On the utilization side, a distinction is made between the quantities exported, fed to livestock, used for seed, put to manufacture for food use and other uses, losses during storage and transportation, and food supplies available for human consumption. The per capita supply of each such food item available for human consumption is then obtained by dividing the respective quantity by the related data on the population actually partaking of it. Data on per capita food supplies are expressed in terms of quantity and by applying appropriate food composition factors for all primary and processed products also in terms of caloric value and protein and fat content.

FAO has continued to prepare food balance sheets on regular intervals since the 1940's. The overall framework is shown in figure 1. where basic production and trade data is combined in an accounting structure with information on stocks, feed, seed, waste and other utilisation. During the fifty years that separated the first to the sixth World Food Surveys there have been many changes in the geo/political aspects and the statistical capacity and system related to the countries that the surveys were measuring. It is interesting to note that in 1946, data was available for about 20 countries and areas in the Asia/Pacific/Middle-east region, whilst in 1996, data was available for about 129 countries and areas in the Asia/Pacific/Middle-east region. Notably absent was data for many small Pacific Islands.

Figure 1: Food Framework in FAOSTAT



The most common use of the Food Balance Sheets is as a general monitor of the national food supply. It also provided a valuable data set for both intra and inter country comparisons of food consumption. Annual food balance sheets tabulated regularly over a period of years will show the trends in the overall national food supply, disclose changes that may have taken place in the types of food consumed, i.e. the pattern of the diet, and reveal the extent to which the food supply of the country, as a whole, is adequate in relation to nutritional requirements. By bringing together the larger part of the food and agricultural data in each country, food balance sheets also serve in the detailed examination and appraisal of the food and agricultural situation in a country.

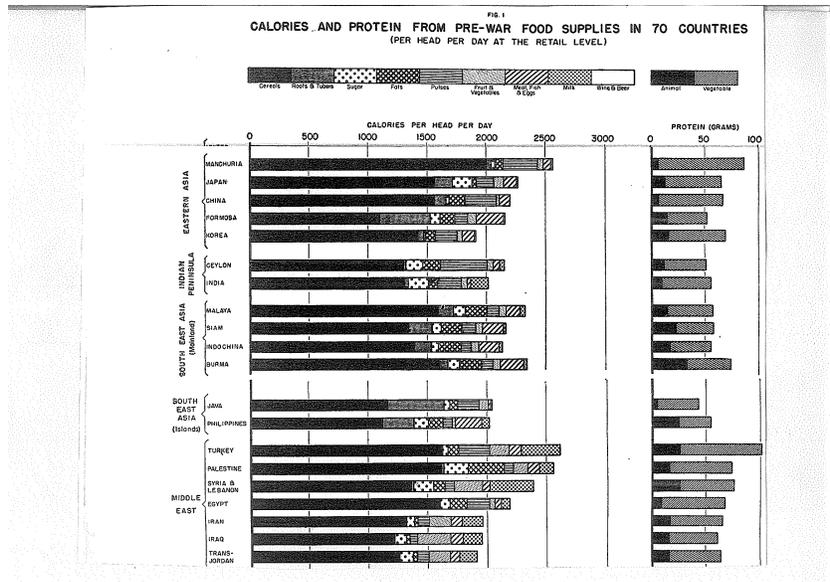
A comparison of the quantities of food available for human consumption with those imported will indicate the extent to which a country depends upon imports (import dependency ratio). Another useful ratio is the Self-Sufficiency Ratio (SSR), which expresses the magnitude of production in relation to domestic utilisation. These ratios can be calculated for individual commodities, groups of commodities of similar nutritional values and after applying some conversion equations for aggregates of commodities.

The amount of food crops used for feeding livestock in relation to total crop production indicates the degree to which primary food resources are used to produce animal feed which is useful to know when analysing livestock policies or patterns of agriculture. Data on per capita food supplies serve as a major element for the projection of food demand, together with other elements, such as income elasticity coefficients, projections of private consumption expenditure and of population.

During the late 1930's and early 1940's there was considerable effort put into the study of food consumption levels and the nutritional status and requirements of the populations which were of concern. Up to that period, no regular comprehensive comparisons had been made of total national supplies of food in different countries nor had there been evaluations of their nutrient contents. In 1943 the first food balance sheets were published by a joint committee of experts from Canada, the United States of America and the United Kingdom "*Food Consumption Levels in the United States, Canada and the United Kingdom.*"

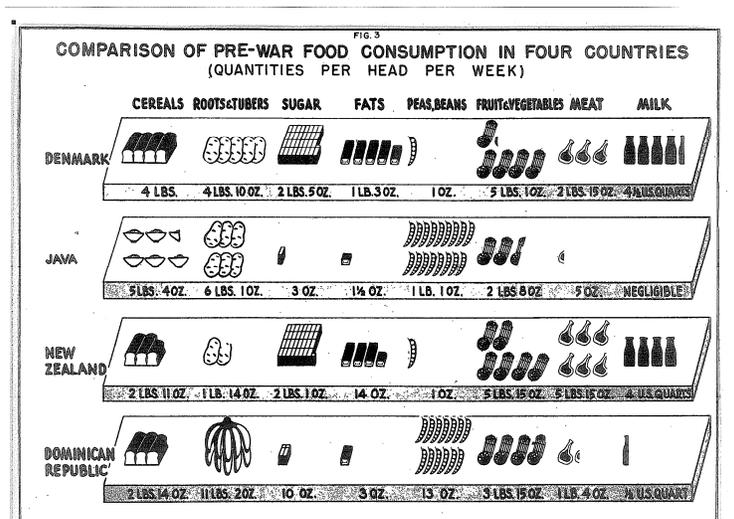
The first FAO *World Food Survey* was published in 1946 and included data for 70 countries. It included: a summary of the pre-war food picture (see figure 2.); the extent of malnutrition; the areas of greatest deficiency, the composition of the food supply by food groups (see figure 3.).

Figure 2: Calories and Protein from Pre-war Food Supplies



The *World Food Survey* (1946) included detailed analysis of the food supply in various countries, areas and regions. Specific food supply and nutritional targets were provided along with strategies provided to reach for those targets.

Figure 3: Comparison of Pre-war Food Consumption in Four Countries



Back in 1946, the FAO noted that “Nevertheless, owing to the lack of adequate data, the food balance sheets prepared by FAO for many countries are still only rough approximations. In fact, for some of the less advanced countries, in which acceptable estimates very seldom exist even for crop production, it has proved impracticable to construct even the most rudimentary balance sheets. Recognizing that the food balance sheet is a useful tool in the analysis of progress in improving the food position in all countries, the Conference of FAO at its Fourth Session in Washington in 1948 recommended:

- (1) that member governments be asked to prepare food balance sheets to a uniform pattern and submit them to FAO...
- (2) that FAO provide direct assistance in this work to those governments which find it difficult to prepare food balance sheets;
- (3) that, in order to promote comparability in the presentation of food consumption data in terms of calories and nutrients, FAO continue work on food composition and make available to governments food composition tables... which may be used in the preparation of food balance sheets;
- (4) that food balance sheets be published as soon as possible...
... It is recognized that food balance sheets will continue to remain an imperfect tool in the examination and improvement of national food programs until range and accuracy of national statistics on food and agriculture have been greatly increased...”

During the 1950’s, 1960’s and 1970’s, many countries recognised the value and prepared food balance sheets.

The World Food Survey has been regularly published since then, with the sixth being published in 1996. The focus of the Sixth World Food Survey was to provide the information available on levels and trends of world food supplies and the prevalence of food inadequacy and undernutrition. The methodology used for assessing food inadequacy has progressed a long way since the 1940’s (see Sixth World Food Survey Appendix 3 for details), however it is still based on the underlying food balance sheet data. The fundamental food balance sheet methodology has changed in only minor ways over the years, but as more detailed trade data became available additional information was available for inclusion in the food balance sheets. The number of items expanded to over 200 primary crops and livestock products and over 700 derived commodities in various states of processing now being included. With these additional derived commodities, the linking of primary and processed commodities (commodity trees) has become a very technical aspect of preparation of food balance sheets. In addition, there has been considerable development in the methodology in the analytical indicators derived from the information such as the prevalence and number of undernourished published by FAO have undergone considerable development

2. National Food Balance Sheets in the APCAS Region

National Food Balance sheets are currently prepared by a limited number of APCAS members: Fiji, Indonesia, Japan, Laos, Nepal, New Zealand, Philippines, Sri Lanka, Vietnam (see references to these food balance sheets in the Appendix). The United States of America maintains global commodity balance sheet database similar to the FAO Commodity Balance

database (XCBS). These include the World Agricultural Supply and Demand Estimates (WASDE) report provides USDA's comprehensive forecasts of supply and demand for major U.S. and global crops and U.S. livestock. The report gathers information from a number of statistical reports published by USDA and other government agencies, and provides a framework for additional USDA reports. The Foreign Agricultural Service's Production, Supply and Distribution (PSD) online database contains current and historical data on production, supply and distribution of agricultural commodities for the United States and key producing and consuming countries.

3. Limitations of Food Balance Sheets

It is important to note that the quantities of food available for human consumption, as estimated in the food balance sheet, relate simply to the quantities of food available for the consumer. However, the amount of food actually consumed may be lower than the quantity shown in the food balance sheet depending on the degree of losses of edible food and nutrients in the household, e.g. during storage, in preparation and cooking (which affect vitamins and minerals to a greater extent than they do calories, protein and fat), as plate waste or quantities fed to domestic animals and pets, or thrown away.

Food balance sheets do not give any indication of the differences that may exist in the diet consumed by different population groups, e.g. different socioeconomic groups, ecological zones and geographical areas within a country; neither do they provide information on seasonal variations in the total food supply. To obtain a complete picture, food consumption surveys showing the distribution of the national food supply at various times of the year among different groups of the population should be conducted.

The accuracy of food balance sheets, which are in essence derived statistics, is of course dependent on the reliability of the underlying basic statistics of population, supply and utilization of foods and of their nutritive value. These vary a great deal between countries, both in terms of coverage as well as in accuracy. In fact, there are many gaps particularly in the statistics of utilization for non-food purposes, such as feed, seed and manufacture, as well as in those of farm, commercial and even government stocks. There are very few surveys so far on which to base sound figures for the waste item in food balance sheets, and in some cases also these are subject to significant margins of error. In most cases, the assumptions for waste used in food balance sheets are based on expert opinion obtained in the countries.

4. FAO Commodity Balance Sheets

Commodity balance sheets are the elementary framework for analysis of the food situation of a country or groups of countries. The FAO maintains a Commodity Balance database (XCBS) where balance sheet structured data for the major commodities in the following groups: Cereals, Dairy, Meat, Oil bearing crops, Sugar, Tropical beverages, Bananas and Citrus.

Figure 4 shows a typical World commodity balance sheet (Source: Food Outlook)

Figure 4. *World wheat market at a glance*

| | 2006/07 | 2007/08 | 2008/09 | Change: 2008/07 over |
|--------------------------|-----------------------|---------------|---------------|----------------------|
| | | <i>estim.</i> | <i>f'cast</i> | 2007/08 |
| | <i>million tonnes</i> | | | <i>%</i> |
| WORLD BALANCE | | | | |
| Production | 596.7 | 605.1 | 658.0 | 8.7 |
| Trade | 113.1 | 110.0 | 110.5 | 0.4 |
| Total utilization | 620.6 | 618.1 | 634.8 | 2.7 |
| Food | 442.3 | 445.5 | 452.8 | 1.7 |
| Feed | 113.0 | 109.2 | 117.8 | 7.8 |
| Other uses | 65.3 | 63.4 | 64.1 | 1.1 |
| Ending stocks | 159.5 | 144.5 | 167.6 | 16.0 |

The data from the XCBS is used in a number of FAO publication and associated databases such as the *Global Information and Early Warning System (GIEWS)*, *Food Outlook* and *Crop Prospects and Food Situation*. GIEWS monitors crop prospects and food security situation at global, regional, national and sub-national levels and is used to warn of impending food difficulties and emergencies. The system regularly provides policy makers and the international community with up-to-date and accurate information so that timely interventions can be made. The monitoring of food and feed markets is undertaken by FAO and published in the *Food Outlook* series sub-title "Global Market Analysis" reflects this focus on developments in international markets, with comprehensive assessments and forecasts on a commodity by commodity basis.

5. The essential ingredients for a simplified food balance sheet

The food balance sheet is the key statistical framework and key analytical tool for countries to put together their food and agricultural data. Currently, only a few of the countries that could benefit greatly from preparation of food balance sheets are actually preparing them on a regular basis. This realisation has led FAO to consider the need for a new approach to preparation of food balance sheets that would make it easier for countries to prepare on a regular basis.

At present, the detailed FAO methodology includes:

- over 200 primary crops and livestock products;
- over 700 derived commodities in various states of processing;
- as data and related coefficients for a large proportion of the above items was not available it would have to be estimated;

- due the complexity of data and coefficients needed to compile a national food balance sheet using the detailed FAO methodology the task had become too burdensome for countries.

This is based on the fact that all potentially edible commodities should, in principle, be taken into account in preparing food balance sheets regardless of whether they are actually eaten or used for non-food purposes. The commodity lists are generally confined to primary commodities except for sugar, oils and fats and beverages. However, by limiting the commodities list to those that account for between 90%-95% of the Daily Energy Supply (DES) then the list of commodities is likely to be between 20-30 items for most developing countries. The drastically reduced list of items to be included in the simplified food balance sheet means that the burden in data compilation is drastically reduced, as is the need for the related coefficients.

There would be major reduction in data required on the utilization of commodities. The seeding rate would only be required for those select items entering the simplified food balance sheet. The utilization of commodities for feed for livestock would also be drastically reduced. Waste estimates or technical losses occurring during the transformation of primary commodities into processed products are taken into account in the assessment of respective extraction/conversion rates. These waste estimates and extraction/conversion rates would also only be need for the limited commodities. Data on stocks would also only be required for the limited number of commodities.

Against this background, FAO proposes that all countries should compile commodity balance sheets for the primary food commodities grouped under the main headings of cereals, root crops, sugars, meats, oils & fats, fish, pulses, vegetables, fruits, milk, beverages, etc.

6. Questions for APCAS to consider?

FAO prepares food balance sheets for over 150 countries from data available in Rome. There are many limitations in this approach with questions on the reliability of the estimates of the Daily Energy Supply (DES). FAO continues to encourage countries to prepare national food balance sheets on a regular basis. Since countries are in the best position to review their own data and prepare food balance sheets would a simplified food balance sheet methodology for compilation at country level be a more feasible approach?

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