Food balance sheets

A handbook

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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FOREWORD

Timely and reliable statistical information is one of the most important prerequisites for the formulation of sound development plans and policies aimed at improving the efficiency of production and distribution of food and agricultural products in countries, thereby raising their standards of living.

Ever since its establishment in 1945, FAO has placed great emphasis on the proper development of comprehensive food and agricultural statistics as the only sound basis for the analysis of the food and nutrition situation and for action to improve it. The statistics of food balance sheets play an important role in this task. Food balance sheets provide comprehensive information on patterns, levels and trends of national diets.

The purpose of this Handbook is to provide member countries and interested institutions with the basic methodology regarding the preparation of food balance sheets. It is also intended for use in training activities of nationals from developing countries in the construction of food balance sheets.

After a brief historical background, the document discusses data sources, concepts and definitions regarding various elements of the food balance equation. It also gives numerical illustrations on how to prepare commodity balances. Furthermore, examples regarding applications and use of food balance sheet data in the analysis of national food situations, levels and trends are given.

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I. INTRODUCTION

1. HISTORICAL BACKGROUND OF FOOD BALANCE SHEETS

Food balance sheets present a comprehensive picture of the pattern of a country's food supply during a specified reference period. The first attempts at preparing food balance sheets date back to World War I. Food balance sheets were the major source of data when, in 1936, at the request of the League of Nations Mixed Committee on the Problem of Nutrition and its Sub-Committee on Nutritional Statistics, a systematic international comparison of food consumption data was prepared.

During World War II, the interest in food balance sheets increased considerably. The Inter-Allied Committee on Post-war Requirements used them in 1942/43 in their studies of post-war requirements in European countries and an even more detailed technique was developed and employed by a joint committee of experts from Canada, the United States of America and the United Kingdom in the report "Food Consumption Levels in the United States, Canada and the United Kingdom". During these years, food balance sheets were also constructed in Germany for the country itself as well as for the occupied countries. In the work of the International Emergency Food Council, which dealt with problems of food allocation and distribution in the period of worldwide food shortages after the war, food balance sheets played an important role.

From the outset, the Food and Agriculture Organization of the United Nations (FAO) has given considerable importance to furthering the development of food balance sheets, reflecting their usefulness in analyzing the food situation at the level of individual countries. At its Fourth Session in Washington in 1948, the FAO Conference recommended that governments be encouraged to develop their own food balance sheets and that FAO assist those governments that find it difficult to do so. It was also proposed that in future food balance sheets be published regularly for as many countries as possible.

In 1949, the *Handbook for the Preparation of Food Balance Sheets* was printed. In the same year, food balance sheets were published for 41 countries covering the period 1934-38 and 1947/48, with a supplement in 1950 giving 1948/49 data for 36 countries. In 1955, food balance sheets giving 1950/51 and 1951/52 data were published for 33 countries, together with revised data for the 1934-38 period. Supplements were issued in 1956 giving 1952/53 data for 30 countries, and in 1957 giving 1953/54 and 1954/55 data for 29 countries.

For methodological reasons, it was decided in 1957 to discontinue the publication of annual food balance sheets and to publish instead three-year average food balance sheets. The first set of which, for 30 countries, was issued in 1958, covering the period 1954-56; the second for 43 countries in 1963, covering the period 1957-59; the third for 63 countries in 1966, covering the period 1960-62 and the fourth in 1971 for 132 countries, covering the period 1964-66. In 1960, time series covering the periods 1935-39, 1948-50, 1951-53 and 1954-56 were published showing data for 32 countries on production, available supply, feed and manufacture, as well as *per caput* food supplies available for human consumption in quantity, caloric value and protein and fat content.

In 1977, it was possible to publish provisional 1972-74 average food balance sheets for 162 developed and developing countries. For the first time, tables were included showing for all countries, continents, economic classes and regions and the world, long-term series of *per caput* food supplies in terms of calories, protein and fat by major food groups for the average period 1961-63 and individual years 1964 to 1974. The following issue included 1975-77 average food balance sheets for 164 countries, together with long-term series of *per caput* food supplies and tables showing the conversion ratios applied and the various assumptions made in arriving at the published figures. For the first time in this series, the table of *per caput* food supplies also showed, in addition to calories, protein and fat, the supply by food groups of selected minerals (iron, calcium) and vitamins (retinol, thiamin, riboflavin, niacin, ascorbic acid).

Starting with the 1979-81 issue, three-year average food balance sheets were published in a standardized format; 146 countries were covered. The publication showing standardized food balance sheets for the average 1984-86 included, in addition to the food balance sheets for individual countries, tables showing long-term series of *per caput* supplies, by major food groups, in terms of product weight, calories, protein and fat. These tables were shown also for the world, developed and developing countries. The tables were based on information for more countries than those included in the publication, and covered almost 100 percent of the population in both developed and developing countries. The 1992-94 issue covered 175 countries and the 1994-96 issue about 180 countries.

Food balance sheets were the main source of data used in the assessment and appraisal of the world food situation which FAO made for the pre-war period in its *First World Food Survey* (1946), for the early post-war period in the *Second World Food Survey* (1952), for the late 1950s in its *Third World Food Survey* (1963), for the early 1970s in its *Fourth World Food Survey* (1977), for the 1970s and 1980s in the *Fifth World Food Survey* (1985) and, covering the two decades from 1969-71 to 1990-92, in the *Sixth World Food Survey* (1996) . Food balance sheets also provided a major source of information for establishing the statistical base of FAO's Indicative World Plan for Agricultural Development, for which purpose 1961-63 average food balance sheets were prepared for all the 64 developing countries included in the study.

In constructing the food balance sheets, both official and unofficial data available in the Statistics Division and other Units concerned in FAO have been used and missing data have been estimated on the basis of surveys and other information as well as technical expertise available in FAO. Comments on the previously published average food balance sheets and suggestions for their improvement received from countries have also been taken into account.

2. *NATURE OF FOOD BALANCE SHEETS*

To restate, food balance sheets present a comprehensive picture of the pattern of a country's food supply during a specified reference period. The food balance sheet shows for each food item - i.e. each primary commodity and a number of processed commodities potentially available for human consumption - the sources of supply and its 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, processed for food use and non-food uses, lost during storage and transportation, and food supplies available for human consumption at the retail level, i.e. as the food leaves the retail shop or otherwise enters the household. The *per caput* 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 caput* 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 energy, protein and fat.

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 are useful in making a detailed examination and appraisal of the food and agricultural situation in a country. As estimates of national aggregates, they are suitable for estimating the overall shortages and surpluses in a country. They are also useful in developing projections of future food supply needs or the future demand for food, in setting targets for agricultural production and trade and for establishing relationships between national food supplies, famine and malnutrition as well as evaluating national food and nutrition policies. The food balance sheets also provide a sound basis for the policy analysis and decision-making needed to ensure food security. For this reason, international organizations, governments, planners and researchers find them invaluable in determining whether a nation as a whole is moving towards meeting national dietary recommendations. 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) to feed itself. 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 information for analyzing livestock policies or patterns of agriculture. Data on *per caput* food supplies are an important element for projecting food demand, together with such other elements as income elasticity coefficients, projections of private consumption expenditure and population.

Conceptually, food balance sheets measure the food supply of the population. In reality, they are often unable to match practice with theory and, as a consequence, the statistics are often criticized for not meeting the expectations of data users. Food balance sheets measure food consumption from a food supply perspective. They do not give any indication of the differences that may exist in the diet consumed by different population groups, e.g. people of different socio-economic groups, ecological zones or 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 and among different groups of the population should be conducted. In fact, the two sets of data are complementary. There are commodities for which a production estimate could best be based on estimated consumption as obtained from food consumption surveys. On the other hand, there are commodities for which production, trade and utilization statistics could give a better nationwide consumption estimate than the data derived from food consumption surveys.

Data obtained through household and food consumption surveys are often the preferred source of food consumption estimates for most analysts because they provide more information on food consumption than food balance sheets do. For example, because the surveys collect data from the people who are purchasing and eating the food, they can obtain information on the consumption characteristics of children, elderly people, males, females and on rural compared with urban populations. This type of information is not available from food balance sheets. In the absence of a comprehensive international data set from household surveys, however, the food balance sheets represent the only source of standardized data that permit international comparisons over time.

3. *SOURCES FOR BASIC INFORMATION*

Food balance sheets are assembled form a variety of sources. The quality of the balance sheets and their coverage vary considerably among countries and commodities. Inaccuracies and errors may be introduced at each stage of a balance sheet's construction. The user of these data must therefore bear in mind their limitations. Ideally, the basic data required for the preparation of food balance sheets should be obtained from the same source. This implies that, firstly, the country should have a comprehensive statistical system which records all current information relating to each component of the food balance sheet (starting from producers to consumers). Secondly, concepts of the information adopted should be those of the food balance sheet concepts. Thirdly, the information available should be consistent, at least with respect to measurement unit and time reference period. In practice, however, such an ideal statistical system does not exist. Even in the few, mainly developed, countries which possess uncommonly sophisticated reporting procedures, the available data do not always meet either the second or third condition. Therefore, in practice, the basic data are necessarily based on a large variety of sources. The main sources commonly used are discussed below.

Production and trade data are part of the ongoing national official statistics. They are based either on direct enquiries or records, or are estimated by Government agencies. Information on stock changes is available from marketing authorities and factories or from farmer stock surveys. Information on industrial uses are obtained from industrial/manufacturing censuses/surveys. Feed and seeding rates are obtained from cost of production surveys or are estimated by the Government agencies concerned. Losses occurring in industrial processing are also obtained from manufacturing surveys.