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TIME REFERENCE FOR THE PRESENTATION OF AGRICULTURAL DATA  
(Memorandum prepared by the Food and Agriculture Organization)

1. The object of this paper is to place before the Statistical Commission a description of an important problem facing the FAO on the question of time reference. FAO will be grateful for any suggestions or advice that members of the Commission could offer.

The problem

2. There are three basic time reference problems in agricultural statistics: (a) Combining data for a single crop grown in different countries of the northern and southern hemispheres and harvested at different times; (b) combining data for several crops and for livestock products for one country; (c) combining data for several commodities for several countries.

Single Commodity in Many Countries

3. For most of the important crops there are internationally recognized crop years. These crop years are conventional but generally determined in relation to the harvest periods of the major producers. The principal problem here is to combine the data for harvests occurring during a period of several months in the northern hemisphere with those for harvests occurring during several different months in the southern hemisphere. International

bodies concerned with particular crops adopt these crop years and publish all the data according to these crop years. No major difficulties appear to have been encountered either by those who prepare the data or those who use them. Examples of such crop years are:

Wheat .....	August to July
Cotton .....	" " "
Sugar .....	September to August
Cocoa .....	October to September

#### Many Commodities in One Country

4. Individual countries face the problem of having to aggregate production of all crops with different crop years in order to study agricultural production in relation to population, national income, industrial production, etc. The period of reference has to be chosen as the most suitable for all these purposes. The problem is essentially a domestic one for individual country statisticians and it has been solved in many different ways.

#### Many Commodities in Many Countries

5. The problem that FAO faces is to aggregate the production of all crops for all countries. FAO has to make an estimate of total agricultural production and this happens to be also one of its most important functions. To do this satisfactorily, there must be a uniform time reference for all crops. The solution obviously must be a compromise and the problem is to determine what is the best compromise.

#### History of the Time Reference (Agricultural)

6. The International Institute of Agriculture, in publishing its International Yearbook of Agricultural Statistics, adopted the following definition for the year of reference:

"The year to which the figures for area refer is the year in which the crop was harvested. For certain crops (sugar cane, olives, citrus) harvested in the principal producing countries at the end of one calendar year and the beginning of the next, double years have been indicated. The double year has also been indicated for rice, sugar, cacao, coffee, and cotton. For rice and coffee, the data refer as far as possible to the quantities harvested between 1 July and 30 June: for sugar, to the quantities harvested between 1 September and 31 August; for cacao, to those harvested between 1 October and 30 September and for cotton, to those harvested between 1 August and 31 July."

Generally, two sub-totals were presented, the first for the northern hemisphere and the second for the southern hemisphere. The continents as a whole were allocated to one or the other hemisphere, with the exception of Africa, northern hemisphere, and Africa, southern hemisphere. For the northern hemisphere production, the harvests carried out during a calendar year were generally aggregated, and for the southern hemisphere the harvests covering the end of one year and the beginning of the next. The general total was then arrived at by summing the northern hemisphere sub-totals for the calendar year and the southern hemisphere sub-totals for the split year, the first year of which was that of the northern hemisphere time reference.

7. FAO's first Yearbook of Food and Agricultural Statistics (1947) followed, in general, the same practice as IIA. The division into two hemispheres was kept, but double years were replaced by single years in the table headings. The year indicated referred to the year of harvest in the northern hemisphere. For the southern hemisphere, the figures relate to the crop harvested in the year following that indicated; exceptions were duly footnoted.

8. In the 1948 Yearbook, further simplification was introduced. The classification of countries into two hemispheres was abandoned. For most crops the crop year was considered as the 12 months from 1 July to 30 June, and exceptions to this usage were generally noted. In the table headings, however, the crop year was shown as a single year, e.g. 1947/48 crop year was shown as 1947. In general, for the northern hemisphere, the figure coincided with

the year of harvest; for the southern hemisphere it referred to the harvest period in the following year. The totals appearing under the 1947 column headings, therefore, combined the northern hemisphere crop harvested in 1947 with the southern hemisphere crop harvested in 1948.

9. This formula for the time reference was probably found to be ambiguous and a change in the definition was therefore introduced in 1949, and is still in force. The definition is as follows:

"Area and crop production statistics for the northern hemisphere pertain generally to the harvests of the spring, summer and fall of the year stated, but for the more southernly regions of this hemisphere they represent harvests continuing until the early part of the following year; for the southern hemisphere these data relate to the crops harvested in the later part of the year indicated and the first half of the following year."

#### Defects in the Present System

10. This definition was adopted following a recommendation by the UN Consultative Committee on Statistical Matters. It should be mentioned here that while this definition does not coincide in every case with the definition of the time reference adopted by international bodies with regard to specific commodities, there is in general fair agreement with such years. This definition would appear to have been formulated primarily to meet the needs of those concerned with the marketing, trade and price movements, especially for cereals. It is, however, not certain that it does, in fact, serve the purpose. It seems doubtful whether the aggregation of the harvests of the northern and southern hemispheres, in periods widely separated in time, is of any real statistical importance to the markets. On the other hand, the procedure certainly does not meet the needs of those concerned with the assessment of the volume and value of agricultural output in any calendar year, or in estimating food consumption levels country by country. For the review of the food and agricultural situation of the world, which is done by the FAO annually, this system seems unsatisfactory. It also conflicts frequently with national practices and has given rise to much discrepancy in comparative figures published by other sources.

11. This uniform procedure adopted in the present editions of the Yearbook not only does not allow the aggregation of production of all crops but also results in the use of "statistical crop years" of exceptionally long duration. In the case of wheat, the definition results in a reasonable crop year. Production takes place principally in the northern hemisphere. In that hemisphere the earliest harvest begins in India, proceeding on to Spain, Italy and the colder countries of central and northern Europe. This harvest lasts altogether from March to August, and even into October. In the southern hemisphere, on the contrary, the harvest begins in November and ends in February. The crop year adopted, therefore, amounts to March to February, a period of 12 months.

12. On the other hand, in the case of maize, the earliest harvest begins in January and the last harvest in the southern hemisphere ends in August; this crop year is therefore a period of 20 months. In many similar cases the crop year extends to well over 14 months. Modifications of the definition in such cases, in order to reduce the statistical crop year to a more reasonable duration, would therefore appear to be necessary.

13. A suggestion has therefore been made that the present procedure should be reversed, that is to say, that as far as possible crops in the southern hemisphere should be added to the following crops in the northern hemisphere, rather than to the previous one. This will result, in the case of maize, in a reduction of the statistical crop year from 20 months to 14 months, but in the case of some other crops, like rice, it may not result in any appreciable reduction.

However, neither of these methods will enable the aggregation of production for any calendar year, or even for an agreed period of 12 consecutive months.

#### A Possible Solution

14. In order to overcome these difficulties, a tentative solution was put before the International Statistical Institute last year and met with general approval. The solution is that production statistics should be published by calendar year. That is to say, that harvests of the spring, summer and fall of

any year should be shown against that calendar year. Where, however, a harvest continues into the following year, production should be shown against that year during which the bulk of it is harvested.

15. The Statistics Branch of the FAO is now examining the workability of this solution on the basis of available material regarding harvest periods in various countries. At the same time, it is being examined whether this solution might result in the splitting up of different crops of the same country, belonging primarily to the same crop year, into two different years. In general, it is proposed that this solution should be consistent with the principle that the majority of the crops of a particular country should be assigned to one specific calendar year, and that harvests of adjacent countries should not be allocated to different calendar years. It is hoped that some results of this investigation will be available for presentation to the Statistical Commission when it meets in April.

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