

2015-2016 SURVEY OF FOOD DEMAND FOR AGRICULTURAL COMMODITIES

SAMPLING DESIGN AND ESTIMATION PROCEDURE



REPUBLIC OF THE PHILIPPINES
PHILIPPINE STATISTICS AUTHORITY

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I. INTRODUCTION

1.1 Background and Rationale

The Philippine Statistics Authority (PSA) recognizes the importance of data on per capita consumption in measuring the food requirements of the country and its usefulness for buffer stocking activities as well as making decision to import. Likewise, reliable, relevant and timely data on consumption are necessary to improve Food Security planning and policy making in the country.

To date, the former Bureau of Agricultural Statistics (BAS), now part of the **Philippine Statistics Authority (PSA)** had conducted four (4) Food Consumption Surveys (FCS). The first FCS was done in 1995 following the recommendation of the National Food Authority (NFA) Council to conduct food consumption survey covering cereals, cereal-based products, cereal substitutes and other selected non-grain commodities. The second, as a special assignment from the Department of Agriculture (DA), was conducted in four (4) quarterly rounds – from third quarter of 1999 to second quarter of 2000. It examined the extent of rice substitution. In recognition of the need for consumption data, the BAS has included in its plan of statistical activities the conduct of food consumption survey every five (5) years. However, BAS has not been successful in implementing its plan because of resources constraint.

Then in 2008, the BAS implemented its third survey on food consumption. This was in response to Resolution No. 3 passed by the National Agricultural and Fishery Council (NAFC) Sub-Committee on Cereals which recommended the updating of food consumption data. To account for the other data items included in the questionnaire and consider the suggestion of the Technical Committee on Survey Design (TCSD) of the then National Statistics Coordination Board (now part of the PSA), this statistical inquiry was renamed as Survey of Food Demand for Agricultural Commodities (SFD). This was implemented from the third quarter of 2008 to the second quarter of 2009.

Further to the Resolution No. 3 was the recommendation to conduct Food Consumption Survey at least every two (2) years for better monitoring of rice and corn per capita consumption. Thus, the last SFD conducted by the bureau was in 2012.

Following the recommendation of the NAFC Sub-Committee on Cereals, the **PSA** will be implementing this survey on food consumption in four (4) rounds from August 2015 to May 2016.

1.2 Objectives

The general objective of the survey is to generate data on per capita consumption of rice, corn, and other agricultural food commodities. Specifically, the survey aims to determine:

- the present average per capita consumption of rice, corn, and other basic agricultural food items;
- the emerging consumption patterns of Filipino households;
- the substitution of rice with other food commodities; and
- the quantity of rice and corn leftovers, wastage, and consumed by animals/pet.

II. SURVEY DESIGN

2.1 Coverage

The 2015-2016 Survey of Food Demand for Agricultural Commodities covers sample households in urban and rural barangays in 80 provinces and the National Capital Region (NCR). Among the important data elements to be gathered were the following:

- Quantity of household's food consumption, price per unit of food items consumed and number of eaters during the past seven days;
- Quantity of rice / corn leftovers, wastage and consumption by animals;
- Extent of rice substitution; and
- Demographic characteristics of households

The reference period was seven (7) days from the date of interview. The survey will be undertaken in four rounds starting in August 2015. The succeeding surveys will be conducted in November 2015, February 2016 and May 2016.

2.2 Sampling Frame, Sampling Design and Sample Selection

The list of barangays in the Philippine Standard Geographic Classification (PSGC) as of December 2014, with corresponding information on 2010 CPH-based urban-rural classification and number of households serves as the sampling frame for the survey. For purposes of the survey, institutional households, least accessible barangays (LABs) and those with peace and order problems (POPs) are excluded from the survey population.

The survey employs a two stage sampling design with the barangay as primary sampling unit and the household as secondary sampling unit. For the 80 provinces, province is the domain. The sample barangays are stratified based on urban-rural

classification then selected systematically within each stratum based on barangay's total household population with implicit representation of highly urbanized cities (HUCs) and independent component cities (ICCs). For the NCR, region is the domain and two sample barangays are drawn systematically from each city and municipality. For both domains, sample households will be selected using the right coverage procedure.

Selection of sample households in each sample barangay will be done during the first survey round (August 2015). The sample households will be selected and located through the right coverage procedure based on pre-assigned starting point (*sp*), random start (*rs*), and sampling interval (*i*). All successfully enumerated households during that round will be covered in the succeeding rounds.

Right coverage is the fashion by which the data collector looks for qualified sample households along the existing path-structure in a barangay. The right coverage requires that at the landmark-starting point, the data collector's standing position is such that his/her right shoulder points to the main entrance of the starting point. He/She then moves on along this path, choosing households along the road or passage-way. A range of alleys or "eskinitas" along or intersecting main roads on the right side shall be penetrated in a serpentine manner. Extensions/Other areas to be covered must be adjacent to the original spot and must be penetrated in likewise manner

A qualified sample household is a household with an available qualified respondent. A qualified respondent is a person who meets the following criteria:

- responsible adult household member
- knowledgeable of the household's food consumption as well as the consumption patterns of the household members
- willing to provide reliable information for the study

The respondent may or may not be the household head.

The following landmark-starting points were used in the application of the right coverage procedure.

A - barangay hall	H - 3 rd councilor's house
B - school	I - 4 th councilor's house
C - barangay chairperson's house	J - 5 th councilor's house
D - church / chapel / mosque	K - 6 th councilor's house
E - barangay secretary's house	L - 7 th councilor's house
F - 1 st councilor's house	
G - 2 nd councilor's house	

A random start (*rs*) is pre-drawn for each sample barangay. Likewise, a sampling interval (*i*) of 10 for urban barangays and 5 for rural barangays will be followed in this survey. The right coverage procedure, along with the *sp*, *rs* and *i* is applied in locating the sample households.

2.3 Estimation Procedure

2.3.1 Household-level Food Consumption

Food consumption will be determined for each food item, by estimation of household-level food consumption within and outside the household comprised of four (4) components as follows:

- (A) - Food prepared at home and consumed at home by household members
- (B) - Delivered / take out food consumed at home by household members
- (C) - Food prepared at home and consumed outside by household members
- (D) - Food prepared in food establishments and consumed outside by household members

Food consumption within and outside the household, denoted by c , is the sum of components A, B, C and D. Thus, c is expressed as:

$$c = A + B + C + D$$

The first three components will be gathered directly from the respondents, while the fourth will be derived based on the assumption that the food consumption pattern of household members within the household is more or less the same as the food consumption pattern of household members when they eat outside or in food establishments. In formula terms, D is computed as:

$$D = \left(\frac{A + B + C}{m + \frac{s}{2}} \right) x \left[m^* + \frac{s^*}{2} \right]$$

where:

- m is the total number of man-meals consumed by household members within the household during the past week
- s is the total number of man-snacks consumed by household members within the household during the past week
- m^* is the total number of man-meals consumed by household members in food establishments during the past week
- s^* is the total number of man-snacks consumed by household members in food establishments during the past week

NOTE: *Man-meal is one meal taken by one man.* Thus, one person taking three meals is three man-meals and three persons taking one meal each is also three man-meals. In relation to man-snacks, *one man-meal is equivalent to two man-snacks.*

2.3.2 Province/Domain-level Estimates

At the province/domain level, the estimated total consumption of a particular food item during the past seven days, denoted by \hat{Y} can be computed by direct expansion of corresponding household-level data across all samples, that is,

$$\hat{Y} = \sum_{h=1}^L \frac{B_h}{b_h} \sum_{i=1}^{b_h} \frac{N_{hi}}{n_{hi}} \sum_{j=1}^{n_{hi}} c_{hij}$$

where:

c_{hij} is the total consumption of a specific commodity of the j^{th} sample household in the i^{th} sample barangay under the h^{th} stratum; the sum of components A, B, C and D.

n_{hi} is the total number of sample households in the i^{th} sample barangay under the h^{th} stratum

N_{hi} is the total number of households in the i^{th} sample barangay under the h^{th} stratum

b_h is the total number of sample barangays under the h^{th} stratum

B_h is the total number of barangays under the h^{th} stratum

L is the total number of strata for the province/domain

Likewise, number of eaters \hat{E} for the past seven days can be estimated as follows:

$$\hat{E} = \sum_{h=1}^L \frac{B_h}{b_h} \sum_{i=1}^{b_h} \frac{N_{hi}}{n_{hi}} \sum_{j=1}^{n_{hi}} e_{hij}$$

where:

e_{hij} is the total number of household members who were served meals/snacks within the j^{th} sample household in the i^{th} sample barangay under the h^{th} stratum

n_{hi} , N_{hi} , b_h , B_h and L are as defined above.

The same procedure, that is, direct expansion of household-level characteristics across all samples in the domain, will be applied to other variables in the survey.

Per capita consumption for the province/domain for the past seven days represents the estimated consumption of each person for one survey round or

quarter. This will be computed as the ratio of the estimated total food consumption and estimated number of eaters, that is,

$$PC = \frac{\hat{Y}}{\hat{E}}$$

Meanwhile, annual per capita consumption for the province/domain will be computed as the ratio of the sum of the estimated total consumption across the four survey rounds to the sum of the estimated number of eaters across these survey rounds, multiplied by 52, the number of weeks in a year, that is,

$$PC_{year} = 52 \left(\frac{\sum_{q=1}^4 \hat{Y}_q}{\sum_{q=1}^4 \hat{E}_q} \right)$$



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