TECHNICAL NOTES FOR Q2 2023 SWINE SITUATION REPORT

I. Introduction

The Swine Situation Report presents the industry situation in terms of volume of production, inventory by classification, and monthly average farmgate prices. It serves as a ready reference for the various clients and stakeholders of the Philippine Statistics Authority (PSA) in the agriculture sector.

The data for this report were collected by PSA through the two surveys, namely, Backyard Livestock and Poultry Survey (BLPS) and the Commercial Livestock and Poultry Survey (CLPS).

The BLPS aims to generate estimates on the supply and disposition of livestock and poultry commodities at the household level. In the second quarter of 2023, the number of sample households covered was 21,884 from the 1,156 sample barangays nationwide. On the other hand, the CLPS seeks to generate estimates on the supply and disposition of livestock and poultry commodities from the sample establishments. There were 847 sample swine establishments covered in the second quarter of 2023.

Both surveys are conducted quarterly in all provinces, including National Capital Region (NCR). Moreover, the commodities covered in the surveys include: cattle, carabao, swine, goat, chicken, duck, and other animals raised/tended by households and establishments.

II. Data Collection

A. Backyard Livestock and Poultry Survey

1. Data collection procedure

   The field data collection for the second quarter of 2023 was conducted from 01 to 08 July 2023. The data collection was undertaken by hired Statistical Researchers (SRs) through face-to-face interview with qualified respondents of the sample households. Prior to data collection, training of selected staff from Field Offices, including SRs, was conducted to ensure uniform understanding of concepts and proper implementation of survey procedures. Field and manual editing of the accomplished questionnaires was done to ensure completeness, consistency, and reasonableness of the information gathered.

2. Survey Questionnaire

   The BLPS Questionnaire is a 19-page form composed of 16 blocks that aims to gather information on the basic characteristics and operations of the household.

   The data items included in the survey are as follows:
   a. Type of household operation/purpose
   b. Inventory by age
   c. Breeder that gave birth

d. Supply indicator (number of births, received/acquired)
e. Slaughtered in the household
f. Sold live for slaughter
g. Sold live for other purposes (breeding, fattening)
h. Average farmgate price
i. Deaths/Losses
j. Average liveweight per head
k. Disposition by areas of destination
l. Assessment of household's production

B. Commercial Livestock and Poultry Survey

1. Data collection procedure

The schedule of field data collection for the second quarter of 2023 was during the last 10 days of June 2023. The data collection was undertaken by hired SRs through face-to-face interview with qualified respondents of the farms/ establishments. Prior to data collection, training of Field Office personnel, including SRs, was conducted to ensure that the procedures and concepts of the survey are understood and properly implemented. Field and manual editing of the accomplished questionnaires was done to ensure completeness, consistency, and reasonableness of the information gathered.

2. Survey Questionnaire

The CLPS Swine Survey Questionnaire is a five-page questionnaire that aims to gather necessary information on supply and disposition of swine commercial farms/establishments.

The data items included in the survey are as follows:
a. Type of establishment operation
b. Inventory by age
c. Supply indicator (number of births, received/acquired)
d. Slaughtered in the establishment
e. Sold live for slaughter
f. Sold live for other purposes (breeding, fattening)
g. Average farmgate price
h. Deaths/Losses
i. Average liveweight per head
j. Disposition by areas of destination
k. Assessment of establishment's production

III. Sampling Design

A. Backyard Livestock and Poultry Survey

1. Sampling Frame

The BLPS sampling frame is based on the results of the 2017 Listing of Farm Households (LFH) and 2012 Census of Agriculture and Fisheries (CAF). For

barangays not covered in the 2017 LFH, the list of households was taken from the 2012 CAF. The sampling frame is updated quarterly based on the status of the sampled households using structured Frame Maintenance Form (FMF) submitted by the Provincial Statistical Offices every quarter.

2. Sample Selection Procedure

The BLPS uses two-stage sampling design. The first stage is the selection of sample barangays or Primary Sampling Units (PSUs) using probability proportional to size where the measure of size is the total animal inventory.

The second stage is the selection of sample households or Secondary Sampling Units (SSUs) that are engaged in livestock and poultry raising in the sampled barangays using systematic sampling.

The number of sample households per selected barangay is 20 but this could be less if the selected barangay has less than 20 households. The sample households per quarter are independent.

The sample size was determined based on a five percent (5%) target coefficient of variation.

3. Domain

The domain of the survey is the province. In the case of NCR, the region is the domain.

4. Estimation Procedure

   a. Survey Weight

   a.1. Base Weight

   PSU Weight

   The PSU weight is computed as follows:

   $$w_{1i} = \frac{X}{aX_i}$$

   Where:
   w_{1i} = PSU weight
   a = barangay sample size for the province
   X = total animal inventory for the province
   X_i = animal inventory of barangay i
   i = subscript for barangay

<u>SSU Weight</u>

The SSU weight is computed as follows:

$$w_{2ij} = \begin{cases} \dfrac{N_i}{n_i} & ,if\ household\ has\ at\ most\ 3\ operators \\ \dfrac{N_i}{n_i} \times \dfrac{M_{ij}}{m_{ij}} & ,if\ household\ has\ greater\ than\ 3\ operators \end{cases}$$

Where:
w_{2ij} = SSU weight
N_i = total number of households in barangay i
n_i = number of sample households in barangay i
M_{ij} = total number of operators in household j of barangay
m_{ij} = number of sample operators in household j of barangay i
j = subscript for household

<u>Base Weight</u>

The base weight is the product of the PSU and SSU weights. That is,

$$w_{ij} = w_{1i} \times w_{2ij}$$

Where:
w_{ij} = base weight of household j in barangay i
w_{1i} = PSU weight
w_{2ij} = SSU weight

a.2. Adjustment Factor

The adjustment factor to account for non-response is given as follows:

$$A_p = \frac{\sum_{i=1}^{a} \sum_{j=1}^{n_i} w_{ij} X_{1ij}}{\sum_{i=1}^{a} \sum_{j=1}^{n_i} w_{ij} X_{2ij}}$$

Where:
A_p = adjustment factor for province p
X_{1ij} = eligible status of household j in barangay i (1 if eligible, 0 otherwise)
X_{2ij} = responding status of household j in barangay i (1 if responding, 0 otherwise)

Eligible households are the following:
- Interview completed;
- Refused to be interviewed without replacement;
- Temporarily away/Not at home without replacement; and
- HH temporarily not accessible without replacement.

Ineligible households are the following:
- Resides outside the barangay;
- Unknown in the locality; and
- Deceased (No other livestock and poultry operator in the household).

a.3. Final Weight

The final weight formula is given as follows:

$$w'_{ij} = w_{ij} \times A_p$$

Where:
w'_{ij} = final weight for province p
w_{ij} = base weight of household j in barangay i
A_p = adjustment factor for province p

b. Estimation of Total

b.1. Estimation of Provincial Total

Estimation of provincial total is done per animal type and the formula is given as follows:

$$\hat{Y}_p = \sum_{i=1}^{a} \sum_{j=1}^{n_i} w'_{ij} y_{ij}$$

Where:
$\hat{Y}_p$ = estimated total for province p
y_{ij} = survey data (inventory, production, etc.) for household j in barangay i

b.2. Estimation of Regional and National Total

The regional estimates are obtained by aggregating the estimates for the provinces within the region, while the national estimate is derived by adding all the regional estimates obtained in each region.

B. Commercial Livestock and Poultry Survey

1. Sampling Frame

The CLPS frame is based on the results of the 2021 Updating of the List of Establishments (ULE). It is updated quarterly based on the results of visit of the sample farms/establishments using the FMF.

2. Sample Selection Procedure

The CLPS uses stratified probability proportional to size sampling design, where the establishment is the primary sampling unit. The animal type serves as a stratification variable and the size measure is the maximum farm/housing capacity of the establishment. Per animal type, the establishments are sorted by maximum farm/housing capacity and sample establishments are selected using systematic sampling. A panel sample establishment is maintained for a year and a new set of samples is selected during the first quarter of the next year.

Complete Enumeration (CE) is applied for provinces with less than 25 commercial farms/establishments, otherwise, sampling is used.

3. Domain

The domain of the survey is the province. In the case of NCR, the region is the domain.

4. Estimation Procedure

a. Survey Weight

a.1. Base Weight

The base weight per animal type is given as follows:

$$w_i = \frac{X}{aX_i}$$

Where:
w_i = base weight of establishment i
a = number of sample establishments in the province
X_i = maximum farm/housing capacity of establishment i
X = total maximum farm/housing capacity of the province

a.2. Adjustment Factor

The adjustment factor to account for non-response is given as follows:

$$A_p = \frac{\sum_{i=1}^{a} w_i X_{1i}}{\sum_{i=1}^{a} w_i X_{2i}}$$

Where:
A_p = adjustment factor for province p
X_{1i} = eligible status of establishment i (1 if eligible, 0 otherwise)
X_{2i} = responding status of establishment i (1 if responding, 0 otherwise)

Eligible establishments are the following:
- Operational
- Refusal
- Cannot be contacted/Not accessible

Ineligible establishments are the following:
- Temporarily Stopped Operation
- Permanently Closed/Stopped Operation
- Shifted Farm Operation
- Cannot Be Located
- Duplicate
- Out-of-scope - Recreation
- Out-of-scope - Change Sector
- Out-of-scope - Main Office/Ancillary Unit

a.3. Final Weight

The final weight formula is given as follows:

$$w'_i = w_i \times A_p$$

Where:
w'_i = final weight of establishment i
w_i = base weight of establishment i
A_p = adjustment factor for province p

b. Estimation

b.1. Estimation for the Province

Estimation of provincial total is done per animal type and the formula is given as follows:

$$\hat{Y}_p = \sum_{i=1}^{a} w'_i y_i$$

Where:
$\hat{Y}_p$ = estimated total for province p
y_i = survey data (inventory, production, etc.) for establishment i

b.2. Estimation of Regional and National Total

The regional estimates are obtained by aggregating the estimates for the provinces within the region, while the national estimates are derived by adding all the regional estimates obtained in each region.

IV. Concepts and Definitions of Terms

Farmgate price refers to the price received by raisers for their produce at the location of farm. Thus, marketing costs, such as the transport and other marketing costs (if any) incurred in selling the produce, are not included in the farmgate prices.

Inventory refers to the actual number of swine present in the farm as of a specific reference date.

Volume of production refers to the number of tended/raised hog disposed for slaughter, including those which were shipped out for slaughter. This is expressed in metric tons, liveweight.

IV. Farm Classification

The following are the new farm classifications and definitions of swine based on the approved PSA Board Resolution No. 11, series of 2023:

Classification	Definition
Smallhold	Tending 1 to 10 sow level or 1 to 100 heads
Semi-commercial	Tending 11 to 50 sow level or 101 to 500 heads
Commercial	Tending 51 sow level and above or 501 heads and above

The data on the inventory of swine based on the definitions indicated above can be accessed in the OpenStat website of PSA with the link: bit.ly/livestock-inventory-by-type-classification

Similarly, data on inventory of swine by farm type (i.e., backyard and commercial) can still be accessed in the OpenStat website of PSA with the link: bit.ly/livestock-inventory-by-type-farm

V. Dissemination of Results and Revision

The PSA disseminates the Swine Situation Report quarterly and is uploaded in the PSA Website.

The livestock and poultry statistics follows the revision policy as stipulated in the PSA Board Resolution No. 1, Series of 2017-119 approving the revision of quarterly estimates on agricultural production, prices, and related statistics to be limited to the immediately preceding quarter and for the past three years with quarterly breakdown to be done only during May of the current year.

VI. Citation

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