

TECHNICAL NOTES

I. Introduction

The Livestock and Poultry Statistics of the Philippines publication presents data series on volume of production, inventory, number of animals slaughtered in slaughterhouses and dressed in poultry dressing plants, and 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 2022, the number of sample households covered was 21,961 from the 1,145 sample barangays nationwide. On the other hand, the CLPS seeks to generate estimates on the supply and disposition of livestock and poultry commodities from sample establishments. There were 67 sample establishments for **carabao**; 176 sample establishments for **cattle**; 133 sample establishments for **goat**; 826 sample establishments for **swine**; 691 sample layer establishments and 892 broiler sample establishments for **chicken**; and 193 sample establishments for **duck** covered in 2022.

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, chicken eggs, duck, duck eggs, and other animals raised/tended by households and establishments.

The data on the number of carabao, cattle, goat, hog, goat slaughtered in slaughterhouses and chicken dressed in poultry dressing plants were sourced from the Compilation of Data from Slaughterhouses and Poultry Dressing Plants (CDSPDP), an administrative-based activity of the PSA. This activity covers 1,281 Licensed to Operate Meat Establishments (LTOMEs) and Locally Registered Meat Establishments (LRMEs) nationwide. This is undertaken in coordination with the National Meat Inspection Service (NMIS) and the Local Government Units (LGUs).

II. Data Collection

A. Backyard Livestock and Poultry Survey

1. Data collection procedure

The schedule of field data collection is every first seven days of the month after the reference quarter. However, the data collection for fourth quarter is done one month earlier to comply with the Philippine System of National Accounts (PSNA)

calendar. 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 13-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 operation/purpose
- b. Inventory
- c. Number of breeders that gave birth
- d. Number of born live
- e. Number of acquired animals
- f. Slaughtered/dressed in the household
- g. Sold live for slaughter and for other purposes
- h. Disposition by areas of destination
- i. Average liveweight
- j. Average farmgate price (live animal, eggs)
- k. Number of deaths/losses and cause/reason
- l. Milk production indicators for carabao, cattle and goat

B. Commercial Livestock and Poultry Survey

1. Data collection procedure

The schedule of field data collection is during the last 10 days of the quarter. However, the data collection for fourth quarter is done one month earlier to comply with the PSNA calendar. The data collection is undertaken by hired SRs through face-to-face interview with qualified respondents of the farm/establishment. Prior to data collection, training of Central Office and Field Office personnel, including SRs, is conducted to ensure that the procedures and concepts of the survey are understood and properly implemented. Field and manual editing of the accomplished questionnaires is done to ensure completeness, consistency, and reasonableness of the information gathered.

2. Survey Questionnaire

The CLPS Survey Questionnaire aims to gather necessary information on supply and disposition of animals tended/raised in farms/establishments.

The data items included in the survey are as follows:

- a. Type of operation/purpose
- b. Inventory
- c. Number of breeders that gave birth
- d. Number of born live/hatched live
- e. Number of acquired animals
- f. Slaughtered/dressed in the farm/establishment
- g. Sold live for slaughter/dressing and for other purposes
- h. Disposition by areas of destination
- i. Average liveweight
- j. Average farmgate price
- k. Number of deaths/losses and cause/reason
- l. Egg production indicators
- m. Milk production indicator for carabao, cattle and goat

C. Compilation of Data from Slaughterhouses and Poultry Dressing Plants

1. Data collection procedure

The schedule of field data collection is during first 10 days of the month and is undertaken by regular Provincial Statistics Office (PSO) personnel. The data is obtained from the administrative records of National Meat Inspection Service (NMIS) and Locally Registered Meat Establishment (LRME) supervised by the Local Government Units (LGUs).

2. Collection Forms

The collection forms used in CDSPDP consists of two (2) forms, namely: CDSPDP Form 1a (Livestock) and CDSPDP Form 1b (Poultry). These forms aim to gather information on the number of livestock and poultry commodities slaughtered/dressed in slaughterhouses/poultry dressing plants.

The data items included are as follows:

- a. Number of Heads/Birds
- b. Total Carcass/Dressed Weight

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 Household (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 the 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

SSU Weight

The SSU weight is computed as follows:

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

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 i

m_{ij} = number of sample operators in household j of barangay i

j = subscript for household

Base Weight

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:

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

Where:

\hat{Y}_{qp} = estimated total for province p at quarter q

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 establishments using the FMF.

2. Sample Selection Procedure

The CLPS uses a stratified sampling design with the maximum farm/housing capacity as stratification variable. Stratum boundaries are obtained using Dalenius-Hodges method. Sample size is determined using Neyman procedure with a target coefficient of variation of five percent (5%). A minimum of five (5) samples are taken when the population for the stratum is greater than or equal to five (5). For stratum with population less than five (5), all farms will be enumerated. The number of strata per province ranges from two (2) to four (4) depending on the homogeneity of the stratification variable.

Complete Enumeration (CE) is applied for provinces with less than 25 commercial farms/establishments, otherwise, stratified sampling design 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 is computed by animal type and province. The formula for base weight is given as follows:

$$w_h = w_{hi} = \left(\frac{N_h}{n_h} \right)$$

Where:

w_{hi} = weight of commercial farm/establishment i in stratum h

N_h = total number of establishments in stratum h

n_h = number of sample establishments in stratum h

a.2. Adjustment Factor

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

$$A_h = \frac{\sum_{i=1}^{n_h} w_{hi} X_{1hi}}{\sum_{i=1}^{n_h} w_{hi} X_{2hi}}$$

Where:

A_h = adjustment factor at stratum h

w_{hi} = base weight of establishment i at stratum h

n_h = number of sample establishments in stratum h

X_{1hi} = eligible status of sample establishment i at stratum h (1 if eligible, 0 otherwise)

X_{2hi} = responding status of sample establishment i at stratum h (1 if responding, 0 otherwise)

Eligible establishments are the following:

- Operational
- Refusal
- Cannot be contacted/Not accessible/Temporary away

Ineligible establishments are the following:

- Temporarily Stopped Operation
- Permanently Closed/Stopped Operation
- Shifted Farm Operation
- Cannot Be Located
- Not yet in operation
- 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:

$$w'_{hi} = w_{hi} \times A_h$$

Where:

w'_{hi} = final weight of establishment i at stratum h

w_{hi} = base weight of establishment i at stratum h

A_h = Adjustment factor

b. Estimation by Stratum

b.1. Estimation by Stratum

Each stratum yields an independent estimate. The formula to be used is given as follows:

$$\hat{Y}_h = \sum_{i=1}^{n_h} w'_{hi} y_{hi}$$

Where:

\hat{Y}_h = estimated total for stratum h of the province

w'_{hi} = final weight of establishments i at stratum h

n_h = no. of sample establishments in stratum h

y_{hi} = survey data (inventory, production, etc.) for establishment i in stratum h

b.2. Estimation of Provincial Total

The total estimate for the province is obtained by simply aggregating all the expanded stratum estimates in the province. Hence, the statement of the total for the p^{th} province is given by:

$$\hat{Y} = \sum_{h=1}^L \hat{Y}_h$$

Where:

\hat{Y} = estimated total for the province

\hat{Y}_h = estimated total for stratum h of the province

L = total number of strata

b.3. 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, the 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 animals present in the farm as of a specific reference date.

Licensed to Operate Meat Establishment (LTOME) refers to premises/facilities where food animals are slaughtered for human consumption. These were then referred to as accredited slaughterhouses and poultry dressing plants.

Locally Registered Meat Establishment (LRME) refers to slaughterhouses, meat processing plants, Poultry Dressing Plants, meat cutting plants, and cold storages that are allowed to operate by the city/municipal government but are not accredited by the NMIS.

Poultry Dressing Plant (PDP) refers to premises that are approved and registered by the controlling authority in which poultry are dressed for human consumption.

Slaughterhouses (SH) are premises that are approved and registered by the NMIS and LGUs in which food animals are slaughtered for human consumption.

Slaughtered in slaughterhouses refers to animals slaughtered in accredited (AAA, AA, A) slaughterhouses including number of animals slaughtered in LRMEs.

Volume of production refers to the number of tended/raised animals disposed for slaughter/dressing, including animals shipped-out for slaughter. This is expressed in metric tons, liveweight.

V. Farm Classification

The following are the new classifications and definitions of livestock and poultry animals based on the approved PSA Board Resolution No. 04, series of 2022:

Classification	Animal Type	Definition
Smallhold	Carabao/Cattle	Tending not more than five (5) caracows/cows
	Goat	Tending not more than 35 does
	Swine	Tending 20 heads of sow and below
	Broiler Chicken	Raising 500 birds and below
	Layer Chicken, Native/Improved Chicken, and Duck	Raising 250 birds and below
Semi-commercial	Carabao/Cattle	Tending six (6) to 50 heads of caracows/cows
	Goat	Tending 36 – 100 does
	Swine	Tending 21 – 50 heads of sow
	Broiler Chicken	Raising 501 – 10,000 birds

	Layer Chicken, Native/Improved Chicken, and Duck	Raising 251 – 5,000 birds
Commercial	Carabao/Cattle	Tending 51 caracows/cows and above
	Goat	Tending more than 100 heads of does
	Swine	Tending 51 and above heads of sow
	Broiler Chicken	Raising 10,001 birds and above
	Layer Chicken, Native/Improved Chicken, and Duck	Raising 5,001 birds and above

VI. Dissemination of Results and Revision

The PSA disseminates the Livestock and Poultry Statistics of the Philippines annually with a five-year series. This report 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.

VII. Citation

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