Technical Notes for Livestock and Poultry Quarterly Bulletin, October-December 2023

I. Introduction

The Livestock and Poultry Quarterly Bulletin 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).

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). 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 egg, duck, duck egg, and other animals raised/tended by households and establishments.

The BLPS aims to generate estimates on the supply and disposition of livestock and poultry commodities at the household level. In the fourth quarter of 2023, the number of sample households covered was 21,783 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 sample establishments. There were 58 sample establishments for **carabao**; 213 sample establishments for **cattle**; 138 sample establishments for **goat**; 664 sample establishments for **swine**; 68 sample establishments for **dairy**; 706 sample establishments for **layer chicken**; 919 sample establishments for **broiler chicken**; 140 sample establishments for **native/improved chicken** sample establishments; 155 sample establishments for **gamefowl**, and 169 sample establishments for **duck** covered in the fourth quarter of 2023.

For dairy estimates, the data were sourced from the administrative records of the National Dairy Authority (NDA) and Philippine Carabao Center (PCC). The data on volume of production for dairy cattle and dairy goat were sourced from the administrative records of NDA, while data for dairy carabao was obtained from the PCC-assisted dairy cooperatives. These are supplemented by data generated from the BLPS and CLPS.

II. Data Collection

A. Backyard Livestock and Poultry Survey

1. Data collection procedure

   The field data collection for the fourth quarter of 2023 was conducted from 01 to 08 December 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 personnel 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/Dressed in the household
f. Sold live for slaughter/dressing
g. Sold live for other purposes (breeding, fattening)
h. Average farmgate price
i. Egg production indicators for poultry
j. Milk production indicators for carabao, cattle, and goat
k. Deaths/Losses
l. Average liveweight per head
m. Disposition by areas of destination
n. Assessment of household's production

B. Commercial Livestock and Poultry Survey

1. Data collection procedure

The schedule of field data collection for the fourth quarter of 2023 was during the last 10 days of November 2023. The data collection was undertaken by hired SRs through face-to-face interview with qualified respondents of the 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 Survey Questionnaire aims to gather necessary information on supply and disposition of animals tended/raised in commercial 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/Dressed in the establishment
e. Sold live for slaughter/dressing

f. Sold live for other purposes (breeding, fattening, drafting)
g. Average farmgate price
h. Egg production indicators for poultry
i. Milk production indicators for carabao, cattle, and goat
j. Deaths/Losses
k. Average liveweight per head
l. Disposition by areas of destination
m. Assessment of establishment's production

C. Compilation of Administrative-based Data on Milk Production and Farm Prices from PCC and NDA

1. Data collection procedure

The PCC and NDA monitor and regularly record the monthly data related to dairy. Every quarter, the PSA-Central Office (CO) through the Livestock and Poultry Statistics Division (LPSD) provides a form to PCC and NDA for the consolidation of report. The PCC and NDA accomplish the form and submit to PSA-LPSD through email every 20th day after the reference quarter.

2. Consolidation form

The consolidation form aims to gather information on the performance of dairy in assisted/monitored dairy farms in covered areas of PCC and NDA.

The data items included in the form are as follows:

a. Total inventory of dairy animals
b. Number of breeder animals
c. Number of animals in the milkline
d. Volume of production
e. Average farmgate price

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

a.1.1. 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

a.1.2. SSU Weight

The SSU weight is computed as follows:

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

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

a.1.3. 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:
a. Interview completed;
b. Refused to be interviewed without replacement;
c. Temporarily away/Not at home without replacement; and
d. HH temporarily not accessible without replacement.

Ineligible households are the following:
a. Resides outside the barangay;
b. Unknown in the locality; and
c. 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

b.1.1. 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.1.2. For the average farmgate price, the provincial estimate is computed by summing up the product of farmgate prices and its corresponding final weight. The result is then divided by the sum of the final weight of all sample households with responses in farmgate price. The formula is given as follows:

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

where:

$\hat{F}_p$ =   average farmgate price of the province

w''_{ij} =   final weight of household j with response in average farmgate price

b.2. Estimation of Regional and National Total

b.2.1. 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.2.2. The computation of regional and national farmgate prices is similar with that of the provincial farmgate price.

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 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 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:
a. Operational
b. Refusal
c. Cannot be contacted/Not accessible

Ineligible establishments are the following:
a. Temporarily Stopped Operation
b. Permanently Closed/Stopped Operation
c. Shifted Farm Operation
d. Cannot Be Located
e. Duplicate
f. Out of scope - Recreation
g. Out of scope - Change Sector
h. 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

b.1.1. 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.1.2. For the average farmgate price, the provincial estimate is computed by summing up the product of farmgate prices and its corresponding final weight. The result is then divided by the sum of the final weight of all sample

establishments with responses in farmgate price. The formula is given as follows:

$$\hat{F}_p = \frac{\sum_{i=1}^{a} w_i' y_i}{\sum_{i=1}^{a} w_i''}$$

where:
$\hat{F}_p$ = average farmgate price of the province
w_i'' = final weight of establishment i with response in average farmgate price

b.2. Estimation of Regional and National Total

b.2.1. 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.

b.2.2. The computation of regional and national farmgate prices is similar with that of the provincial farmgate price.

IV. Consolidation of Dairy Estimates

To estimate the dairy production, the data generated from BLPS and CLPS are then aggregated to the administrative data obtained from PCC and NDA. To avoid duplicates in the recording of data, the PSA only includes the milk produced that were not sold to PCC and NDA-assisted cooperatives.

V. 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 animals present in the farm as of a specific reference date.

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

VI. Farm Classification

The following are the new farm classifications and definitions based on the approved PSA Board Resolution No. 04, series of 2022, and PSA Board Resolution No. 11, series of 2023 for swine:

Animal Type	Classification	Definition
Carabao and Cattle	Smallhold	Tending not more than five (5) caracows/cows

Animal Type	Classification	Definition
	Semi-commercial	Tending six (6) to 50 heads of caracows/cows
	Commercial	Tending 51 caracows/cows and above
Goat	Smallhold	Tending not more than 35 does
	Semi-commercial	Tending 36 to 100 does
	Commercial	Tending more than 100 heads of does
Swine	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
Broiler Chicken	Smallhold	Raising 500 birds and below
	Semi-commercial	Raising 501 to 10,000 birds
	Commercial	Raising 10,001 birds and above
Layer Chicken, Native/Improved Chicken, and Duck	Smallhold	Raising 250 birds and below
	Semi-commercial	Raising 251 to 5,000 birds
	Commercial	Raising 5,001 birds and above

The data on the inventory of the following animals based on the definitions indicated above can be accessed in the OpenSTAT website of PSA with their corresponding link:

Animal Type	Link
Carabao, Cattle, and Goat	https://bit.ly/livestock-inventory-classification
Swine	https://bit.ly/swine-inventory-classification
Chicken	https://bit.ly/chicken-inventory-classification
Duck	https://bit.ly/duck-inventory-classification

The data on the inventory of the following animals by farm type (i.e., backyard and commercial) can still be accessed in the OpenSTAT website of PSA with their corresponding link:

Animal Type	Link
Carabao, Cattle, Goat, and Swine	https://bit.ly/livestock-inventory-farm-type
Chicken	https://bit.ly/chicken-inventory-type
Duck	https://bit.ly/duck-inventory-farm-type

VII. Dissemination of Results and Revision

The PSA disseminates the Livestock and Poultry Quarterly Bulletin regularly 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.

VIII. Citation

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