PHILIPPINE NATIONAL STANDARD

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Shell Eggs (Chicken and Duck) – Product Standard – Classification and Grading

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Foreword

In 2020, the University of the Philippines Los Baños (UPLB) proposed to amend the Philippine National Standard (PNS) on Table Eggs – Specifications (PNS/BAFS 35:2017) to include the duck eggs in the PNS, update food safety provisions on postharvest handling, promote the duck industry in the country, and support the *ITIK for LIFE* program funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development – Department of Science and Technology (PCAARRD-DOST) in 2017. The Technical Working Group (TWG) tasked to develop the PNS was created through Special Order (SO) No. 442, series of 2020 (Creation of Technical Committees [TCs] and its TWG for the Development of PNS for Agriculture and Fisheries Products, Machinery, and Structures) and SO No. 81, series of 2021 (Creation of TWG for the Development of PNS for Agriculture and Fishery Products, Machinery, Tools, and Equipment). The TWG was composed of representatives from the relevant government agencies, academe, and private sector. The draft PNS underwent a series of TWG meetings and stakeholder consultations conducted via online platforms before its endorsement to the Secretary for approval.

This PNS/BAFS edition includes the following significant changes compared to the previous PNS/BAFS 35:2017:

1. Inclusion of duck egg in the scope;
2. Division of Clause 4 Minimum Requirements into three categories – external qualities, internal qualities, and microbiological requirement;
3. Amendment of Clause 4 Minimum Requirement;
4. Revision of 5.1 Chicken;
5. Inclusion of air cell in Table 4 (Grades of chicken fresh shell eggs);
6. Inclusion of net weight per tray and dozen's tables for chicken and duck;
7. Inclusion of the classification and grading of duck egg in Clause 5 Classification and Grading;
8. Inclusion of paper and pulp as packaging materials in Clause 7 Packing;
9. Amendment of Clause 9 Packaging;
10. Inclusion of storage condition in Clause 10 Marking or Labeling;
11. Revision and inclusion of moisture loss in Clause 11 Hygiene, Storage, and Transport;
12. Inclusion of Clause 12 Shelf-life;
13. Amendment of Clause 13 Tolerances;
14. Revision of Clause 15 Residues of Pesticides and Veterinary Drugs;
15. Inclusion of Clause 16 Methods of Test; and
16. Revision of Annex A Maximum Residue Limits (MRLs) of Veterinary Drugs in Eggs and Annex B List of Banned Veterinary Drugs in the Philippines.

This document cancels PNS/BAFS 35:2017 (Table Eggs – Specifications).
It is drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2.

Contents

1 Scope

This standard covers shell eggs which are the product of the domesticated chicken and duck that are sold by wholesalers and retailers. This standard does not cover hatching and incubated eggs.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their contents constitute the requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

Bureau of Agriculture and Fisheries Standards (BAFS)–Department of Agriculture (DA). (2016). Good Animal Husbandry Practices (GAHP) for chicken (broiler and layer) (PNS/BAFS 184:2016). http://www.bafs.da.gov.ph/bafs_admin/admin_page/pns_file/2021-02-26-PNS%20BAFS%20184.2016.%20GAHP%20Chicken%20Broilers%20Layers.pdf

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BAFS–DA. (2017). Code of Hygienic Practices (COHP) for eggs (PNS/BAFS 209:2017). http://www.bafs.da.gov.ph/bafs_admin/admin_page/pns_file/PNS%20BAFS%20209-2017%20COHP%20Eggs.pdf

Codex Alimentarius Commission (CAC). (2004). General guidelines on sampling (CAC/GL 50-2004). http://www.fao.org/uploads/media/Codex_2004_sampling_CAC_GL_50.pdf

Food and Drug Administration (FDA) - Department of Health (DOH). (2014). Revised rules and regulation governing the labeling of pre-package food products" further amending certain provisions of Administrative Order No.88-B series of 1984 or the "Rules and regulations governing the labeling of pre-package food products distributed in the Philippines", and for other purposes (Administrative Order No.2014-0030). https://www.fda.gov.ph/administrative-order-no-2014-0030-a/

3 Terms and Definitions

For the purpose of this document, the following terms and definitions apply:

3.1
air cell
air space, usually found in the rounder end of an egg, between the outer and the inner shell membranes

3.2
leaker egg
leaker
egg showing breaks of both the shell and the membrane, resulting in the exposure of its contents

3.3
clean egg
free from foreign material, stains or discolorations that are readily visible, and foul-odor. Eggs with only very small specks, cage marks or stains may be considered clean if such specks, cage marks, or stains are not of sufficient number or intensity or cover less than 10% of the shell surface

3.4
cracked egg
egg with a damaged shell, but with an intact membrane

3.5
dirty egg
egg with foreign matter that covers more than 10% of the shell surface such as, manure or soil, including egg yolk

3.6
egg
shell egg
egg-in-shell other than broken, incubated, or thermally processed egg that is produced by domesticated chicken and duck and are fit for direct human consumption or for the preparation of egg products

3.7
egg classification
grading
grouping of egg into lots having similar characteristics as to color, weight, and quality

3.8
egg white
albumen
refers to both the inner and outer jelly-like substance surrounding the yolk

3.9
fresh egg
egg that has not been washed or cleaned, before or after grading, and has not been treated for preservation or chilled in premises or plants where the temperature is artificially maintained at < 5°C

3.10
hatching eggs
eggs intended for incubation

3.11
producer
person or entity engaged in the production of eggs

3.12
retailer
any person or entity who markets eggs directly to consumers

3.13
tray
packaging material which maybe in plastic or pulp form usually containing 30 pcs of eggs

3.14
wholesaler
individual or entity who sells eggs in commercial quantities

3.15
yolk
yellow spheroidal mass of the egg composed of water, protein, and glyceride; contains practically all of the known vitamins except vitamin C

4 Minimum Requirements

In all classes subject to the special provisions for each class and tolerances allowed, the fresh shell egg should meet the following requirements:

4.1 External qualities: fresh shell eggs should be:
a. clean and free from visible cracks;
b. practically ovoid in shape, not long, narrow, of flat sided;
c. not soft-shelled;
d. free from foul odors; and
e. free from visible dirt or mold.

4.2 Internal qualities: fresh shell eggs should:
a. not be cloudy;
b. air cell shall be small and fixed when the egg is twirled;
c. yolk should not be attached to the inner shell (for the broken-out egg); and
d. yolk should be of normal and consistent color, firm, and surrounded by the thick inner albumen

4.3 Microbiological requirements:

Salmonella spp. should not be found in 25g of sample.

4.4 It should not be hatching, incubated or coming from chicken breeder farms[1]. Eggs from chicken breeder farms and incubated eggs (i.e. eggs which have been withdrawn from incubators or as industrial eggs) should not be used as human food.

5 Classification and Grading

5.1 Chicken

5.1.1 Chicken shell eggs should be grouped based on the color of the shell. Each group should be described as follows:

5.1.1.1 Whites - All eggs should be of the standard chalky white tolerating the very light cream tints;

5.1.1.2 Browns - All eggs should be apparently brown including the dark cream tints and any variation in the shade of brown eggshell; and

5.1.1.3 Other colors produced naturally such as blue, green, tint, and cream.

5.1.2 Each group of chicken shell egg should be divided into eight classes based on the weight of each egg in the group as shown in Table 1.

Table 1. Weight classification of chicken shell eggs

Weight class	Weight range (in grams/egg)
Super Jumbo	> 75
Jumbo	70-75
Extra Large	65-69.9
Large	60-64.9
Medium	55-59.9
Small	50-54.9
Extra Small	45-49.9
Peewee	<45
Note: assorted eggs should be labeled by the farmers	

5.1.3 Chicken shell eggs should have the minimum net weight per tray (30 pieces) as shown in Table 2.

[1] *– Hatching and incubated egg is unsafe and unsuitable for human consumption due to unsafe levels of veterinary drugs residues.*

Table 2. Net weight of chicken shell eggs per tray (30 pieces)

Weight class	Minimum weight (kg)
Super Jumbo	2.253
Jumbo	2.103
Extra Large	1.953
Large	1.803
Medium	1.653
Small	1.503
Extra Small	1.350
Peewee	Maximum of 1.349

5.1.4 Chicken shell eggs should have the minimum net weight per dozen (12 pieces) as shown in Table 3.

Table 3. Net weight of chicken shell eggs per dozen (12 pieces)

Weight class	Minimum weight (kg)
Super Jumbo	0.9012
Jumbo	0.8412
Extra Large	0.7812
Large	0.7212
Medium	0.6612
Small	0.6012
Extra Small	0.5400
Peewee	Maximum of 0.5399

5.2 Duck

5.2.1 Duck shell eggs color are usually white, off-white, grayish white, pale blue, pale green, tint, and cream.

5.2.2. Each group shall be divided into eight classes based on the weight of each egg in the group as shown in Table 4.

Table 4. Weight classification of duck shell eggs

Weight class	Weight range (in grams/egg)
Jumbo	>76
Extra Large	71-75.9
Large	66-70.9
Medium	61-65.9
Small	56-60.9
Extra Small	51-55.9
Pullet	45-50.9

Weight class	Weight range (in grams/egg)
Peewee	<45
Note: this is based on market preference and assorted eggs should be labeled by the farmers	

5.2.3 Duck shell eggs should have the minimum net weight per tray (30 pieces) as shown in Table 5.

Table 5. Net weight of duck shell eggs per tray (30 pieces)

Weight class	Minimum weight (kg)
Jumbo	2.283
Extra Large	2.133
Large	1.983
Medium	1.833
Small	1.683
Extra Small	1.533
Pullet	1.350
Peewee	Maximum of 1.349

5.2.4 Duck shell eggs should have the minimum net weight per dozen (12 pieces) as shown in Table 6.

Table 6. Net weight of duck shell eggs per dozen (12 pieces)

Weight class	Minimum weight (kg)
Jumbo	0.9132
Extra Large	0.8532
Large	0.7932
Medium	0.7332
Small	0.6732
Extra Small	0.6132
Pullet	0.5400
Peewee	Maximum of 0.5399

5.3 Chicken fresh shell eggs are graded into AA, A and B as shown in Table 7.

Table 7. Grades of chicken fresh shell eggs

Parameters	AA	A	B
Albumen	Thick and firm	Reasonably firm	Thinner and wider
Yolk	High, round, and free from defects	Same as AA	Wider and flatter
Air cell	3mm or less in depth	5mm or less in depth	Over 5mm in depth
Shell	Clean and unbroken	Same as AA	Unbroken but may be stained

Parameters	AA	A	B
Suggested Use	Frying and poaching	Most often sold in stores	For liquid, frozen, and dried egg products

5.4 Duck fresh shell eggs are graded into AA, A, and B as shown in Table 8.

Table 8. Grades of duck fresh shell eggs

Parameters	AA	A	B
Albumen	The thick albumen is viscous and bulging convex. The thin part is not flattering. Blood spots or meat spots are not found.	The same as AA. The thick albumen is less bulged.	The thick and the thin albumen are not firm, weak, watery, and flattening. Blood spots and meat spots may be found.
Yolk	Egg yolk is convex located in the middle of the thick egg white. Blood spots or meat spots are not found. Germinal disk on egg yolk is small and opaque white.	Egg yolk is convex. Blood spots or meat spots are not found. Germinal disk on egg yolk is small and opaque white.	Egg yolk is flattering. Blood spots and meat may be found. Germinal disk on egg yolk may be expanded, surrounded with white border, and has doughnut- like shape.
Shell	Clean without stain, smooth surface free from rough or ridges	Same as Grade AA	Clean or may have slight stain of which total scattered stains shall not be more than 1/16 of the shell surface and localized stain shall be less than 1/32 of the shell surface and shall not be hard coating stain.
Air cell	3mm or less in depth	5mm or less in depth	8mm or less in depth
Suggested Use	Frying and poaching	For processing	For processing

6 Sampling

The sampling method to be used should be in accordance with CAC/GL 50-2004 (Codex general guidelines on sampling).

7 Packing

7.1 Shell eggs should be packed in cartons or suitable containers that will avoid causing any external or internal damage to the produce.

7.2 The packaging material may be standard plastic tray or paper/pulp/cartons molded to suit the size of the shell eggs.

7.3 Shell eggs should be packed either in paper/pulp/carton or plastic trays or crates or cases with their small ends facing down.

8 Uniformity

Shell eggs in each package should be uniform by grade and size.

9 Packaging

9.1 The packaging should meet the quality grades and hygiene requirements and should be free of any foreign matter and foul or rotten odor. They should be durable against handling, transporting, and maintaining the quality of shell eggs.

9.2 The shell egg tray or any packaging made from organic materials should only be used once.

9.3 Any packaging materials made from plastic should be cleaned hygienically before use.

10 Marking or Labeling

The marking or labeling should be in compliance with DOH Administrative Order No. 2014-0030 (Revised rules and regulation governing the labeling of pre-package food products" further amending certain provisions of Administrative Order No.88-B series of 1984 or the "Rules and regulations governing the labeling of pre-package food products distributed in the Philippines", and for other purposes), which are as follows:

10.1.1 Name of the product or the word "eggs";
10.1.2 Weight classification and grade of the eggs;
10.1.3 Name and address of producer, packer and distributor/exporter;
10.1.4 The words "Product of the Philippines";
10.1.5 The words "date produced/production date";

10.1.6 The words “best before” or “consume by”;
10.1.7 Storage conditions; and
10.1.8 Lot identification

11 Hygiene, Storage, and Transport

11.1 The establishment should comply with the provisions stated in PNS/BAFS 209:2017 (COHP for Table eggs).

11.2 The shell eggs should comply with PNS/BAFS 184:2016 (Code of GAHP for chicken), PNS/BAFS 271:2019 (Code of GAHP for duck), and PNS/BAFS 262:2018 (Free-range chicken).

11.3 During storage and transport, 2-3% loss in weight of the shell eggs may occur due to moisture loss.

12 Shelf-life

12.1 It is recommended to store the shell eggs at 10-13°C to reach the shelf-life of up to 30 days. Shell eggs at room temperature may have the shelf-life of up to 15 days.

12.2 When the shell egg is washed, it is recommended to store it immediately at 10-13°C to prolong its shelf-life.

13 Tolerances

Tolerances for each package shall be as follows:

13.1 Quality Tolerances

13.1.1 For grade AA, the minimum number of grade AA shall be 85%.

13.1.2 For grade A, the minimum number of grade A shall be 85%.

13.1.3 For Grade B, only eggs conforming to the requirement for eggs of grade B are allowed.

13.2 Size Tolerances

The package may include the immediate smaller size class so long as it does not exceed more than 3.4% of the total number of shell eggs.

13.3 Defects Tolerances

13.3.1 Crack due to transportation should not exceed 5% of the total number of shell eggs.

13.3.2 There should be no dirty shell eggs.

13.3.3 There should be no leaker shell eggs.

14 Contaminants

Shell eggs shall be free from heavy metals in amounts which may represent a hazard to human health. The products covered by this standard shall comply with those Maximum Levels (MLs) for heavy metals established by the CAC.

15 Residues of Pesticides and Veterinary Drugs

Agricultural and veterinary chemicals should not contain banned veterinary drugs and should not exceed limits established in the latest version of the PNS for Veterinary drug residues in food: Maximum Residue Limits (MRLs) (PNS/BAFS 48:2016) and in the Codex Alimentarius Database for Pesticide residues in food and feeds (CMX 2 – 2018) as shown in Annex A (MRLs of veterinary drugs in eggs) and Annex B (Banned veterinary drugs in the Philippines).

16 Methods of Test

Shell eggs should be tested for its quality and safety based on the following methods listed in Table 9.

Table 9. Methods of test for shell eggs

Requirements	Methods	Principles
External Quality	Inspection of general appearance	Visual inspection
Internal Quality	Agricultural Handbook No.75 (Egg Grading Manual), United States Department of Agriculture (USDA), pp 31-32, 34-35 or equivalent methods	Visual inspection and Lighting through the object
Detection of Salmonella	Bacteriological Analytical Manual (BAM), US Food and Drug Administration (US FDA), Chapter 5;	Conventional Method: differential agar media Rapid Test: enrichment medium and then

Requirements	Methods	Principles
	Enzyme-Linked Immunosorbent Assay (ELISA); Molecular Detection Assay (MDA)	subjected to Polymerase Chain Reaction (PCR);
Size	Weighing	Gravimetry
Heavy Metals	AOAC Official Method 2015.01 (Inductively Coupled Plasma–Mass Spectrometry)	Food samples are thoroughly homogenized and then prepared by microwave digestion and the addition of dilute solutions of gold (Au) and lutetium (Lu)
Pesticide residue	Inhibitor test	Liquid chromatography tests
Veterinary drug residue	Inhibitor test and Antibiotic residue test kits	Inhibitor test: Liquid Chromatography Tests Antibiotic residue: rapid qualitative lateral flow assay with indicator

Annex A
(Normative)

Maximum Residue Limits (MRLs) of veterinary drugs in eggs

Table A.1 List of MRLs of veterinary drugs in eggs

Drugs	MRLs (ug/kg)
Chlortetracycline Oxytetracycline Tetracycline	400
Colistin	300
Deltamethrin	30
Erythromycin	50
Flubendazole	400
Neomycin	500
Spectinomycin	2000
Tylosin	300
References: 1. Bureau of Agriculture and Fisheries Standards (BAFS) – Department of Agriculture (DA). (2016). Veterinary drug residues in food: Maximum Residue Limits (MRLs) (PNS/BAFS 48:2016). http://www.bafs.da.gov.ph/bafs_admin/admin_page/pns_file/PNS+BAFS+48.2016+Veterinary+Drug+Residues+in+Food.MRLs.pdf 2. Codex Alimentarius Commission (CAC). (2018). Maximum Residue Limits (MRLs) and Risk Management Recommendations (RMRs) for residues of veterinary drugs in foods (CMX 2- 2018). http://www.fao.org/fao-who-codexalimentarius/codex-texts/maximum-residue-limits/en/	

Note: Non-exceedance in these MRLs does not mean that the egg is antibiotic-free.

Annex B
(Normative)

Banned veterinary drugs in the Philippines

Table B.1 List of banned veterinary drugs in the Philippines

Drug	Administrative Order (AO)	Title
Beta-Agonist • Clenbuterol • Salbutamol • Terbutalin • Pirbuterol	DA AO No. 14, series of 2003	Ban on the Use in Food Animals of Beta-Agonist Drugs Used in Human as Bronchodilators and Tocolytic Agents
Nitrofurans • Furaltadone • Furazolidone • Notrofurazone	DA-DOH AO No. 2, series of 2000	Declaring a Ban/Phase Out of the Use of Nitrofurans in Food Producing Animals
Carbadox Olaquindox	DA AO No. 60, series of 2000 DOH AO No.4-A, series of 2000	Ban and Withdrawal of Olaquindox and Carbadox in the Market
Chloramphenicol	DA AO No. 60, series of 1990 DOH AO No. 91, series of 1990	Declaring a Ban on the Use of Chloramphenicol in Food Producing Animals
Reference: Bureau of Animal Industry (BAI)- Department of Agriculture (DA)		

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United States Department of Agriculture (USDA) – Food Safety and Inspection Service (FSIS). (2019). Shell eggs from farm to table. https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/eggs/shell-eggs-farm-table

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Technical Working Group (TWG) for the Philippine National Standard (PNS) on Shell Egg (Chicken and Duck) – Product Standard – Classification and Grading

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