

BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

अंडे के खोल के लिए शीत भण्डारण — रीति संहिता

(आई एस 6558 का पहला पुनरीक्षण)

Draft Indian Standard

COLD STORAGE OF SHELL EGGS - CODE OF PRACTICE

(First Revision of IS 6558)

ICS 67.120.20

Slaughter House and Meat Industry
Sectional Committee, FAD 18

Last date of comments: **4 September 2023**

FOREWORD

(Formal clause will be added later)

With the recent development of the poultry industry, the production of eggs has registered a significant increase in the country. With a view to preserving the surplus production of eggs during the lean season of consumption for use during the peak season, proper storage assumes paramount importance. Therefore, in order to minimize the loss of eggs due to deterioration in the quality during preservation, and giving due consideration to the Agricultural Produce (Grading and Marking) Rules, regarding grading of shell eggs, this standard was originally published in 1972.

In this first revision of the standard, following modifications have been incorporated keeping in view the latest technological advancements and industrial practices:

- a) Definitions for white defects, air cell defects have been incorporated and a further classification has been given for specific defects in egg.
- b) Conditions for storage of eggs have been incorporated.
- c) The specifications for mineral oil (sprayed on eggs for cold storage) have been incorporated.
- d) The parameters for storage of egg intended for prolonged storage has been updated.
- e) Sampling requirement for period monitoring of stored eggs has been updated.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

1.1 This code covers the guidelines for cold storage of shell eggs from poultry.

2 TERMINOLOGY

2.0 For the purpose of this standard, following definitions shall apply.

2.1 **Grading** — Sorting of eggs, according to quality, size, weight and other factors that determine their relative value.

2.2 **Candling** — Process of holding the egg before a beam of light in such a way that the light rays penetrate and illuminate the interior of the egg for inspection.

2.3 Yolk defects

2.3.1 *Sided* — Yolk displaced to an appreciable extent from its normal central position.

2.3.2 *Stuck* — Yolk stuck to the inner shell membrane.

2.3.3 *Patchy* — *Yolk* uneven in colour including defects sometimes described as ‘heated’ or ‘heat spots’.

2.3.4 *Abnormal Shape* — *Yolk* flattened or irregular, which in extreme cases, may be broken and dispersed in albumen.

2.3.5 *Discoloured* — Yolk of a dark or greyish appearance often with a very distinct outline.

2.3.6 *Embryonic Development* — Thin blood vessels and bright blood ring may be seen in the egg.

2.4 White defects

2.4.1 *Discoloured* — Tinted grey, yellow, green or brown.

2.4.2 *Cloudy, muddy or streaky* — Usually this condition indicates potential rot, but washing an egg in very hot water can cause a similar appearance.

2.5 **Air cell defects** — Air cell exceeding 8 mm depth.

2.6 Specific defects

2.6.1 *Blood spots* — Clots or streaks of blood in the white or adhering to the yolk.

2.6.2 *Blood egg* — Blood is diffused throughout the white or spread around the yolk.

2.6.3 *Meat spot* — Fatty material, fleshy or liver-like that may be found floating freely in the white, embedded in the chalazae or attached to the yolk.

2.6.4 *Staleness* — In most cases the air cell is abnormally large, clearly defined and often ringed. As a rule the yolk is sided and its outline clearly defined.

2.6.5 Mould growth — Usually grey or black in colour, but can occasionally be pinkish, found on the outside and inside of the shell or shell membranes.

2.6.6 Rot — Usually violet, green, red or blue in colour. The early stages of a rot are less easy to detect, but any egg with a streaky, turbid white should be rejected. The egg may have an unpleasant smell even if unbroken.

2.6.7 Taint — The egg has an abnormal odour.

2.6.8 Specific defects — These include thin-shelled eggs; yolkless eggs; and double-yolked eggs.

3 GRADES

3.1 Eggs, prior to cold storage, shall be sorted out acc. to grades given in Table 1.

TABLE 1 GRADE OF SHELL EGGS

(Clause 3.1)

Sl No.	Grade Designation	Weight of Individual Egg, g	Weight per Dozen, g	Weight per Unit of Test Eggs, g	Shell	Air Cell	White	Yolk
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i.	A-Extra large	60 and above	715 and Above	596 and Above	Clean, unbroken and sound shape and normal	Upto 4mm in depth and Air cell shape to be practically regular and without bubbly appearance	Clear, reasonably firm	Fairly well centered practically free from defects, outline indistinct
ii.	A-Large	53-59	631-714	526-595				
iii.	A-Medium	45-52	535-630	446-525				
iv.	A-Small	38-44	456-534	380-445				

v.	B-Extra large	60 and above	715 and above	596 and above	Clean to moderately stained, sound	8 mm in depth, may be free and slightly bubbly	Clear, may be slightly weak	May be slightly off-centered, outline slightly visible
vi.	B-Large	53-59	631-714	526-595				
vii.	B-Medium	45-52	535-630	446-525				
viii.	B-Small	38-44	456-534	380-445				

4 SORTING AND CLEANING OF EGGS PRIOR TO STORAGE

4.1 Prior to cold storage, clean shell eggs, shall be separated from the soiled ones.

4.2 Cracked and unsound eggs or those with yolk defects and/or specific defects shall be removed through the process of candling. These eggs shall not be stored. Eggs for storage must be clean, of good interior quality and have a sound shell. If they are to be stored for more than a month, they should be equivalent to the Grade A

5 ARRANGEMENTS OF EGGS FOR COLD STORAGE

5.1 Eggs for storage shall be arranged with pointed end down and broad end up, in the filler flats. Each filler flat may contain about 30 eggs.

5.2 It is recommended that collapsible card-board box, 360 eggs (12 filler flats) or 210 eggs (7 filler flats), may be used for arranging eggs.

5.3 While arranging the eggs in the collapsible boxes care shall be taken to place empty filler flat on the top before closing the top sides of the egg boxes.

6 METHOD OF COLD STORAGE

6.1 Eggs meant for cold storage shall be treated before storage by the process given in **6.1.1**, to reduce the weight loss during storage, prevent fungal contamination and maintain proper quality.

6.1.1 The eggs shall be placed in filler flats and sprayed with a suitable mineral oil, such as liquid paraffin which shall be odourless, colourless and non-toxic having a specific gravity of about 0.855 to 0.870 at 15°C; viscosity index should not be more than 70 to 90 and having a high pouring point so that at lower temperature it remains in the liquid form. Oils of vegetable or animal origin shall not be used for spraying as they undergo oxidative rancidity during storage. The oil may be re-used.

6.2 The eggs intended for prolonged storage (up to 3 months) shall be stored at a temperature of 0 to 7°C and relative humidity of 75 to 80 percent.

Shelf-life of fresh eggs at room temperature: 2-3 weeks from the date of laying and depending on production methods, climatic conditions etc.

The time and temperature conditions and humidity for egg storage at the farm should be established taking into account the hygienic condition of the eggs, the hazards that are reasonably likely to occur, the end use of the eggs, and the intended duration of storage.

6.3 The eggs shall be properly graded before storage, and different grades shall be stored separately.

6.4 The boxes containing eggs may be stocked in shelves provided in a cold store.

6.5 The eggs once brought out of the cold store shall not be sent to the cold store again.

7 POST-STORAGE CARE

7.1 Care must be taken in removing eggs from storage to avoid the condensation of moisture on shells. Eggs stored at 0 to 7°C (*see 6.2*) shall be placed in an ante-room having a temperature of 15.5 to 21°C for about 8 to 10 h before release for retail market.

8 STORAGE LIFE

8.1 It is necessary in every case that the storage should not be prolonged beyond 3 months at 0 - 7 °C from the date of laying.

8.2 It is essential to draw samples of the eggs periodically (at least every month) so as to detect spoilage, if any, and to ensure efficient working of the cold store. Usually a sample of about 1 percent of all eggs in storage should be sufficient.

9 ASSESSMENTS OF QUALITY OF EGGS STORED IN COLDSTORAGE

9.1 External

9.1.1 Egg shell shall be free from fungal contamination,

9.1.2 Loss in egg weight shall not be more than 2 percent.

9.2 Candling

9.2.1 Air cell depth should not exceed 8 mm.

9.2.2 Yolk should be at the centre and not stuck to the egg shell.

9.3 On opening

9.3.1 On opening the eggs, the vitelline membrane should not rupture.

9.3.2 Minimum height of the thick albumen shall be 2.5 mm.