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Indian Standard METHODS FOR EVALUATION OF QUALITY OF CHICKEN EGGS

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Indian Standard METHODS FOR EVALUATION OF QUALITY OF CHICKEN EGGS

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AMENDMENT NO. 1 JULY 1983

TO

IS:9810-1981 METHODS FOR EVALUATION OF QUALITY OF CHICKEN EGGS

Corrigendum

(Page 7, clause 3.6, equation) - Substitute the following for the existing equation:

'Albumen index = Height of thick albumen in mm.'

Average width of thick albumen in mm.'

(AFDC 18)

Reprography Unit, ISI, New Delhi, India

Indian Standard METHODS FOR EVALUATION OF QUALITY OF CHICKEN EGGS

0. FOREWORD

- 0.1 This Indian Standard was adopted by the Indian Standards Institution on 16 April 1981, after the draft finalized by the Meat Industry Sectional Committee had been approved by the Agricultural and Food Products Division Council.
- **0.2** This Standard has been formulated to prescribe standard methods for estimating the quality of fresh chicken eggs.
- **0.3** While preparing this standard, assistance has been derived from the following publications:

GULICH, (AR) and FITZGERALD, (JC). Egg grading manual. 1964: U.S. Department of Agriculture (USA).

HAUGH (RR) US Poultry Magazine 43; (1937) 552.

ROMANOFF (AL) and ROMANOFF, (AJ). The avian egg. 1949 John Willey and Sons, New York (USA).

0.4 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: 2-1960°. 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 standard prescribes methods of sampling and test necessary to determine quality of fresh eggs. It includes external quality factors as they appear under direct examination and internal quality factors as they appear before candling light or when the egg is broken out and measured by Haugh units plus visual examination of the yolk portions.

2. TERMINOLOGY

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

^{*}Rules for rounding off numerical values (revised).

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2.1 Description of Shell Condition and its Cleanliness:

a) Sound Shell is unbroken

b) Checked Shell having a crack in the shell but shell

membranes intact.

c) Leaker Egg showing leakage through the shell and

shell membranes allowing the contents to come out. Area of shell missing from the

surface is more than 6 mm square.

d) Smashed An egg the shell of which is smashed, crushed

or scattered allowing the contents to come

out.

e) Clean Free from foreign material, stain or other

visual discolouration.

f) Slightly stained A shell surface which is almost free from

adhering dirt, but has slight stains without appreciably detracting its appearance limited

to 1/16th of the shell surface.

g) Moderately
stained

A shell that is free from the stains covering to

A shell that is free from adhering dirt but has stains covering to a moderate degree

and limited to 1/4th of the shell surface.

h) Dirty Egg shell having adhering dirt and stains

covering more than 1/4th of the shell surface.

2.2 Description of Air Cell:

a) Practically regular An air cell which maintains practically a

fixed position inside the egg and presents an even outline with not more than 6 mm movement in any direction when it is turned.

b) Free air cell An air cell that moves freely towards the

uppermost point inside the egg as it is rotated slowly. The shell membranes are intact allowing the air cell to move freely in any

direction between them.

c) Bubbly air cell A ruptured air cell consisting of one or

more small separate air bubbles floating

beneath the main air cell.

2.3 Description of Yolk Shadow Outline:

a) Outline slightly defined

A yolk outline which is distinctly visible and blends into the surrounding white as the egg is rotated in front of the candler.

b) Outline fairly well defined

A yolk outline which is discernible but cannot be outlined clearly when twirled in front of a candler.

c) Outline well defined

Outline of the yolk clearly visible as it casts a dark shadow when twirled in front of a candler.

2.4 Description of Yolk Defects:

a) Practically free from defects

A yolk that shows no germ development, meat or blood spots.

b) Definite but not serious defects

A yolk may show definite meat or blood spots on the surface with slight indications of germ development but without any pronounced or serious defects.

c) Definite and serious defects

Yolk showing development of germ spot on the yolk, visible as a definite area with no blood ring.

2.5 Description of Egg White:

a) Clear

Egg white which is free from discolourations and presence of any free floating foreign bodies on it.

b) Firm

Egg white which is sufficiently thick or viscous and thus makes the outline of yolk slightly or indistinctly visible when twirled in front of a candler.

c) Reasonably firm

Egg white which is reasonably thick or viscous but enough to allow casting of the outline of the yolk when twirled and candled.

d) Weak and watery

Egg white which is thin and lacks in viscosity. It permits the yolk to approach the shell closely on candling, making yolk outline clearly visible on twirling.

3. SAMPLING AND TESTING

- 3.1 Sampling Twenty eggs should be drawn from a lot at random for estimating the breakout quality of eggs.
- 3.2 Testing Carry out the following tests to determine the egg quality.
- 3.2.1 External Quality Determine the external quality of egg for the parameters given in 2.1 and 2.2.

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- 3.2.2 Internal Quality Determine the internal quality of eggs for the parameters given in clauses 2.3, 2.4 and 2.5 by candling and breaking out tests.
- 3.3 Candling Hold the egg before a beam of 60 watt light in such a way that the light rays penetrate and illuminate the interior of the egg for inspection. Note any internal defects.
- 3.3.1 Measure the aircell height by means of aircell gauge while candling prior to breaking.
- 3.4 Shell Thickness After breaking the egg, boil the shell in 2.5 percent sodium hydroxide solution for 5 minutes. Wash and dry in a thermostatically controlled oven at 100 to 105°C for 24 hours. Determine the thickness of the shell by screw gauge at three different logitudinal points and take the average of the readings.
- 3.5 Haugh Unit (HU) Haugh unit can be measured by using the interior egg quality calculator. The following precautions should be followed while estimating the same:
 - i) The internal temperature of eggs should not be lower than 7°C or higher than 15°C at the time of performing the breakout test.
 - ii) Care should be exercised to see that the thick white is not punctured while breaking.
 - iii) One egg at a time should be broken since it is important to measure the albumen height immediately after breaking.
 - iv) Measurement of height of thick albumen should be made with the help of a spherometer or Haugh meter or micrometer as given in Fig. 1.
 - v) Care should be taken to avoid measuring the albumen height in an area where there is a chalaza for air bubble.
- 3.5.1 Eggs removed from the refrigerator should be kept for three hours at ambient temperature of $23^{\circ} + 2^{\circ}$ C. Determine the Haugh unit reading of the eggs by the following procedure:
 - a) Check the zero reading by placing the instrument on a flat surface and lowering the plung until the point touches the surface. The pointer should be at zero. If not, slacken the clamp and turn the bezol so that the zero mark coincides with the pointer. Retract the point upwards to its full extent.
 - b) Open the egg on to a flat glass plate of sufficient size to contain it, place the instrument over the egg, and lower the point until just touches the albumen The height is then indicated on the dial.

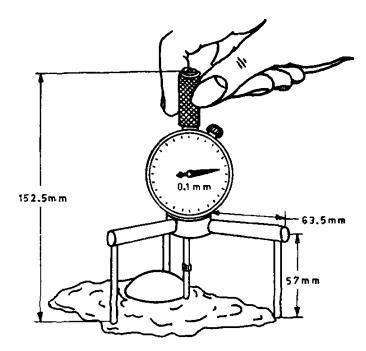


FIG. 1 GAUGE FOR EGG QUALITY

The HU can then be calculated from the following equation:

$$HU = 100 \log_{10} H + 7.57 - 1.7 M$$

where

HU = Haugh units of interior quality whose numerical value equals the quality value of the egg;

H = height, mm, and

M = mass, g

Note — An alignment chart for finding Haugh units without having to make calculation from the above formula is given in Fig. 2

3.6 Albumen Index — Albumen index can be determined by measuring the height of the thick albumen by spherometer or micrometer and average width of the thick albumen by using vernier calipers:

Albumen index = Height of thick albumen in mm Average diameter of yolk in mm

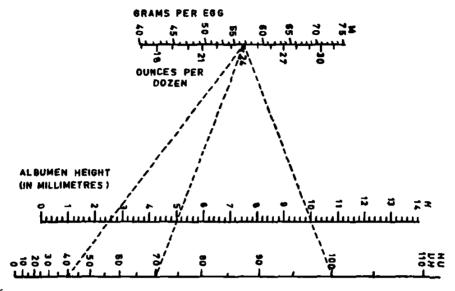


Fig. 2 Alignment Chart

3.7 Yolk Index — Yolk index can be determined by measuring the height or width of the yolk after it has been separated from the albumen or of the yolk in its natural position when the egg is broken out on a flat surface.

Yolk index =
$$\frac{\text{Height of yolk in mm}}{\text{Average diameter of yolk in mm}}$$

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ON

MEAT INDUSTRY

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IS:
1723-1973
             Pork (first revision)
1743-1973
             Mutton and goat meat canned in brine (first revision)
1981-1978
             Animal casings (first revision)
1982-1971
             Gode of practice for ante-mortem and post-mortem inspection of meat animals
             (first revision)
2475-1979
             Smoked bacon (first revision)
2476-1963
             Ham
2536-1963
             Mutton and goat flesh - fresh, chilled and frozen
2537-1963
             Beef and buffalo flesh - fresh, chilled and trozen
3044-1973
             Mutton and goat meat, curried and canned ( first recision )
3060-1979
             Pork sausages canned (first revision)
3061-1979
             Pork sausages, fresh (first revision)
4352-1967
             Pork luncheon meat, canned
4674-1975
             Dressed chicken (first recession)
4723-1978
             Egg powder (first recussion)
4950-1968
             Bacon rashers, canned
4951-1975
             Ham, canned ( first recision )
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             Chicken essence
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             nitrogen content
5960 (Part II)-1970 Methods of test for meat and meat products. Part II Determination
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            of free fat content
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             of moisture content
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6557-1972
             Albumen flakes, non-edible quality
6558-1972
             Code of practice for cold storage of shell eggs
            Code of practice for ante-mortem and post-mortem inspection of poultry Code of handling, processing, quality evaluation and storage of poultry Basic requirements for a stall for sale of meat of small animals
6559-1972
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7053-1973
8539 (Part 1)-1977 Terminology of meat products and meat animals; Part I Poultry
8700-1977
             Basic requirements for a stall for sale of meat of large animals
8895-1978
             Guidelines for handling, storage and transport of slaughter house by-products
9800-1981
             Basic requirements for day-old chicks (lavers broilers)
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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamie temperature	kelvin	К
Luminous intensity	candela	ed
Amount of substance	mole	mol
Supplementary Units		
Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N 1kg m s³
Energy	joule	J	1 J - 1 N m
Power	watt	W	1 W - 1 J s
Flux	weber	WЬ	1 Wb = 1 Vs
Flux density	tesla	Т	1 T = 1 Wb m ^a
Frequency	hertz	Hz	1 Hz = 1 cs(s')
Electric conductance	siemen s	S	1 S=1AV
Electromotive force	volt	٧	1 V = 1 W/A
Pressure, stress	pascal	Pa	I Pa 1 N m⁵

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