Unit 4

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Grading of Eggs

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Haugh Unit

- *The **Haugh unit** is a measure of the internal quality of an egg.*
- *The test was introduced by **Raymond Haugh** in the year 1937.*
- *It is considered to be one of the most significant measures of egg quality, next to other measures such as eggshell thickness and eggshell strength.*
- *When calculating Haugh unit, one should measure the height of the thick albumen that immediately surrounds the yolk.*

Measurement of Haugh Unit

- *An egg is weighed, then broken onto a flat surface.*
- *A micrometer used to determine the height of the thick albumen (egg white).*
- *The height, correlated with the weight, determines the* ***Haugh unit****, or* ***HU****, rating.*
- *The formula is as below:* $HU = 100 \times \log_{10}(h - 1.7w^{0.37} + 7.6)$

Where

HU = *Haugh unit*

h = *observed height of the albumen in millimeters*

w = *weight of egg in grams*

Measurement of Haugh Unit

- *The Haugh unit value ranges from 0 – 130 .*
- *The higher the number, the better the quality of the egg (fresher, higher quality eggs have thicker whites).*
- *Though Haugh unit provides the indication of freshness of the egg, it does not provide other information such as micronutrient or vitamins contained in the egg.*
- *Eggs can be ranked according to their HU rating:*

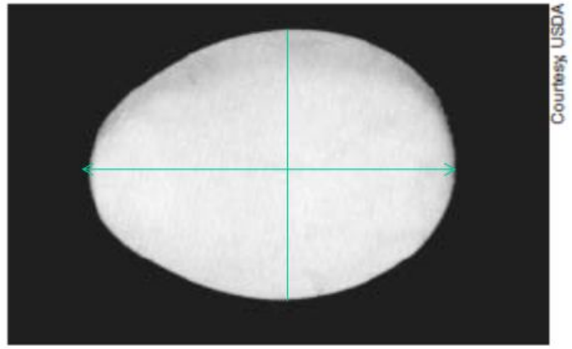
Grade AA: HU rating 72 or more
Grade A: HU rating 72 to 60.
Grade B: HU rating 59 to 31.
Grade C: HU rating 30 0r less.

Shape Index of Egg

Egg length and width are measured using a vernier caliper, and used for the calculation of the egg shape index

(SI = width/length x 100)

Shape Index of Egg



Ideal shape (USDA)

Shape index of egg = A/B x 100
A = the biggest diameter (cm)
B = The longest of length (cm)

Abnormal egg shape

Shape Index of Egg

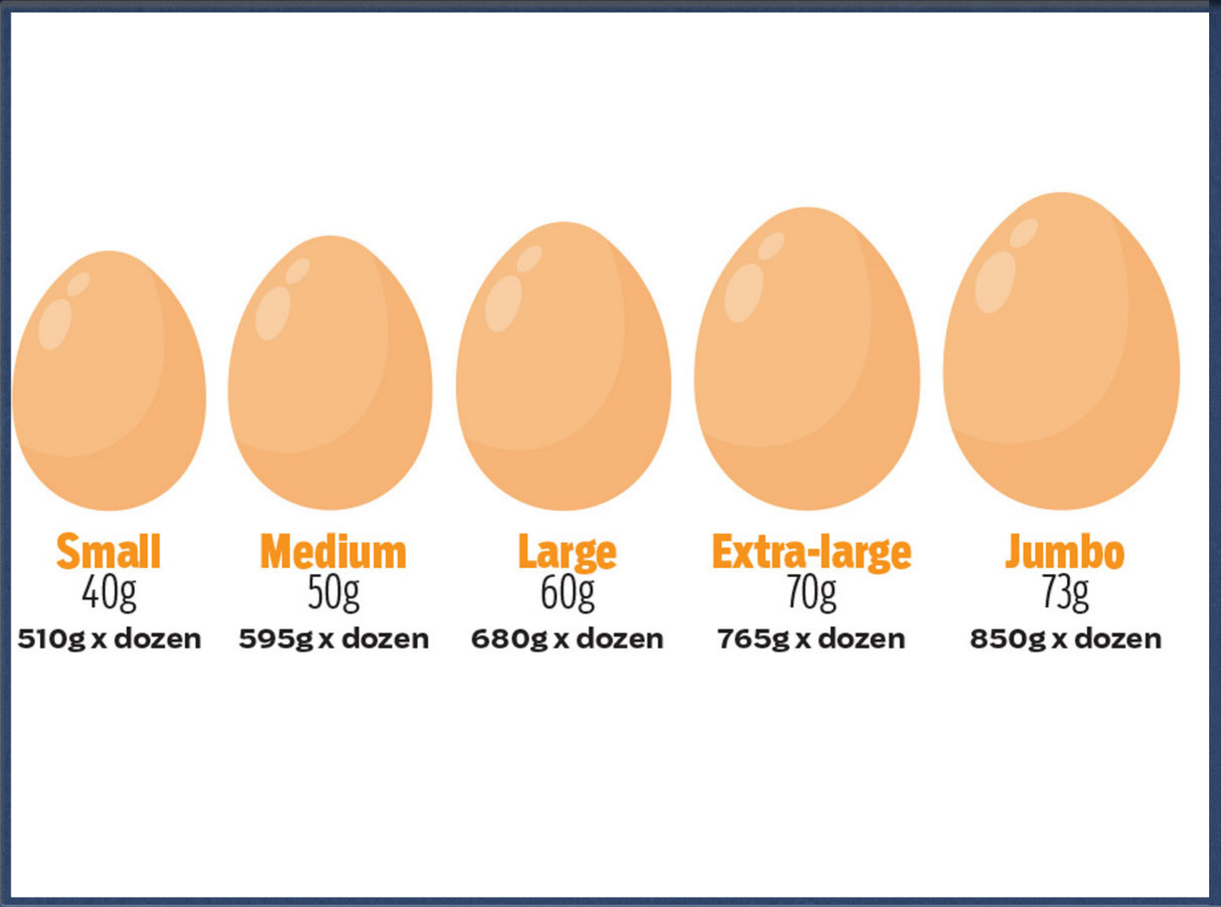
- *Based on the SI value the eggs can be segregated into different shapes.*
- *The shapes most often encountered are sharp, normal (standard), and round eggs.*
- *On the basis of shape index these shapes are enumerated on the SI as*

  Sharp Egg : SI value Less than 72

  Normal Egg: SI value 72–76

  Round Egg: SI value 76

- *It is considered to be one of the most significant measures of egg quality, next to other measures such as eggshell thickness and eggshell strength.*
- *When calculating Haugh unit, one should measure the height of the thick albumen that immediately surrounds the yolk.*



In India eggs are graded according to the weight. There are 5 grades.

Jumbo: more than 70 g,

Extra large-60–70 g,

large- 53-59 g,

medium- 45-52 g,

small- 38-42 g.

Clean eggs with unbroken shell are graded on quality depending upon depth of the air cell. Centering of the yolk and free of defects are given grade A and B in India.

Indian Grading of Eggs

Grades of Egg in India

Grade A

Thick white
Round, well centered yolk
Small air cell (less than 5 mm deep)
Clean, uncracked shell with normal shape

Grade B

Yolk is slightly flattened; white is thinner.
Shell is uncracked and may have a rough texture; and/or be slightly soiled and stained.
These eggs are mostly used for commercial baking or go to hospitals, restaurants, etc.
Very few are sold at retail stores.

Grades of Egg in India

Grade C

The lowest egg grade.
These are used in the production of processed egg products only.
They are not sold in grocery stores
Yolk is flattened and may be oblong in shape; white is thin and watery.
Shell may be cracked and/or stained.

**Clean eggs with unbroken shell are graded on quality depending upon depth of the air cell. Centering of the yolk and free defects are given grade A and B in India.*
*** Air cell depth for GradeA eggs, upto 4mm and for Grade B eggs, upto 8mm.*

Grades According to USDA

Quality Factor	AA	A	B
Air Cell	1/8 inch or less in depth	3/16 inch or less but > 1/8 inch in depth	More than 3/16 inch in depth
White	Clear Firm	Clear May be reasonably firm	Clear May be weak and watery
Yolk	Outline slightly defined	Outline may be fairly well-defined	Outline clearly visible
Blood or meat spot	None	None	Blood or meat spots totaling no more than 1/8 inch in diameter

The grade is determined by the interior quality of the egg and the appearance and condition of the egg shell. Eggs of any quality grade may differ in weight (size). U.S. Grade AA eggs have whites that are thick and firm; yolks that are high, round, and practically free from defects; and clean, unbroken shells. Stained egg shells are acceptable.

Thank You

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