



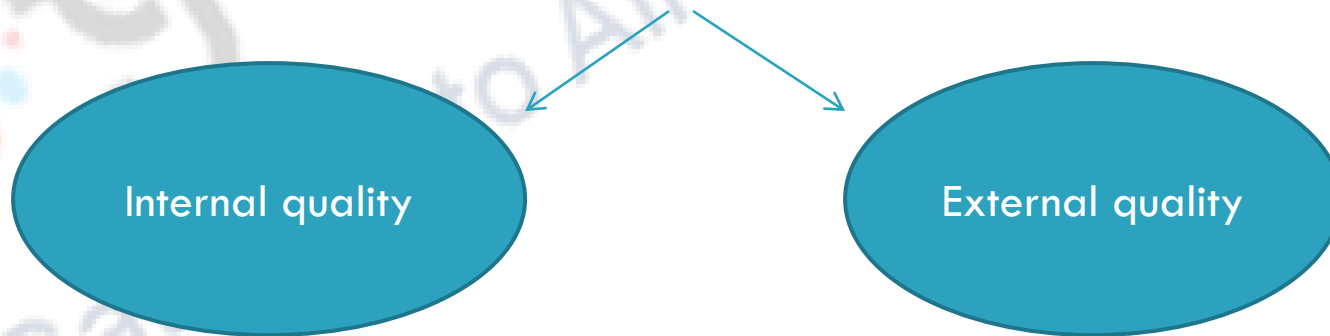
Module Egg

MODULE NO. 25: Internal Quality of Egg



Quality

- Quality : Degree of excellence
- Those conditions and characteristics that consumers want, and are willing to pay for, are, in a broad sense, factors of quality
- Egg is determined by comparing a number of factors
- Quality factors for eggs may be divided into two general groups





Introduction

➤ Interior quality :

- Contents of the egg as they appear before a candling light
- When the eggs are broken out
- Haugh unit method
- visual examination of the yolk

However, internal egg quality is relatively unstable and deteriorates from the time it is laid until it is consumed



The Air Space

- Laid Egg : Warmer than its surroundings
- On cooling : Contracts and a small air space is formed between the inner and the outer shell membrane
- The air space generally forms at the broad end of the egg as there are more pores in this part of the shell
- With age : moisture and carbon dioxide continue to be lost through the pores
- Air moves in and the air space increases in size
- The warmer and drier the air, the quicker the moisture loss from the egg.



- Size of air cell : As an approximate guide to the quality and age of an egg
- Judged objectively : Air-cell gauge
- In candling : Considered a relatively unimportant quality factor for determining internal quality when compared to the broken-out appearance of an egg
- Depth is the only quality factor considered with the air cell.



Descriptive terms for air cell

- **Depth of air cell** : distance from its top to its bottom when the egg is held air cell upward
- **Free air cell** : An air cell that moves freely towards the uppermost part in the egg as the egg is rotated slowly
- **Bubbly air cell** : A ruptured air cell resulting in one or more small, separate air bubbles, usually floating beneath the main air cell



Albumen Quality

- In fresh, good quality : Albumen is jelly-like and may have a cloudy appearance
- With age : Albumen becomes transparent and increasingly watery
- At higher temp : the rate of carbon dioxide loss is higher and the visible signs of ageing occur quicker
- Quality : Measured by the height in millimetres of the outer thick albumen



- During storage : It is the proteins in the thick albumen which begin to break down due to alkalinity
- At the same time, water slowly migrates into the yolk thus the yolk becomes enlarged and flattened on breakout
- The yolk moves away from the centre of the egg and may eventually rest against the shell itself
- Breakdown of the albumen makes the egg extremely vulnerable to microbial invasion



Yolk

- The appearance of the yolk as the egg is twirled in candling is one of the best indicators of the interior quality of shell eggs
- Characteristics : Determined by shadow that it casts upon the shell before the candling light
- Appearance : Dependent on the condition of the white prior to packing
- With age : The rate of carbon dioxide and moisture loss in the white increases and affects the condition of the white
- Three factors : Distinctness of yolk shadow outline, size and shape of yolk, defects and germ development.



Quality Parameters of Yolk

- **The thickness and consistency of the white.** The thicker the white, the less distinct the outline appears, as yolk is prevented from moving close to the shell.
- **Condition of the yolk :** Determined by the presence or absence of blemishes that show up before the candling light as dark shadows on the yolk, or the presence or absence of an off-colored yolk appearance which shows as a greyish or greenish shadow
- **Colour of the yolk :** Difficult to determine the colour of the yolk before the candling light except off-colour. Sometimes yolk colour influences the candler's judgment. An extremely deep-colored yolk, under some conditions, would cast a darker shadow than would a lighter yolk.



Size and shape of yolk.

- Freshly-laid egg : Round and firm
- Aged Egg : Yolk membrane weakens allowing water to be absorbed from the white
- Increase in size results in stretch and weaken the vitelline membrane and to assume a somewhat flattened shape on top and an “out of- round” shape generally, resembling a balloon partially filled with water
- Yolk size and shape are mentioned only in the lowest quality classification for eggs - B quality - where these factors become apparent



Standards of yolk quality

- **Outline slightly defined** — A yolk outline that is indistinctly indicated and appears to blend into the surrounding white as the egg is twirled (AA quality).
- **Outline fairly well defined** — A yolk outline that is discernible but not clearly outlined as the egg is twirled (A quality).
- **Outline plainly visible** — A yolk outline that is clearly visible as a dark shadow when the egg is twirled (B quality).



External quality

- Egg shell : quality is given through the weight and the percentage of shell, thickness and the strength
- The differences in egg shell quality depend on the environmental conditions and the feed quality and also of strain of layers
- Egg weight : Affects egg shell thickness and egg size as well
- Brown egg layers produce higher shell weight in comparison with some other hybrids of white colour, but the egg shell deformation in brown eggs is usually higher
- However, negative correlation on egg shell deformation and the strength as well as thickness is found in brown eggs.



Conclusion

- Egg shell quality and egg internal quality are of major importance to the egg industry worldwide
- Eggs for processing should be visibly clean prior to breaking and separating. Cracked eggs may be processed
- Broken eggs should not be processed and should be disposed of in a safe manner
- Eggs deteriorate rapidly during storage under ambient conditions
- Dirty eggs should be disposed of in a safe manner or may be cleaned, separating of egg contents from the shell should be done in a manner
- Avoid contamination by personnel or from equipment, and that permits examination of egg contents.



Suggested readings

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