Egg Preservation, Packaging and Storage

By: Dr. Gargi Mahapatra, Assistant Professor cum Junior Scientist
Department of Livestock Products Technology
Bihar Veterinary College
Bihar Animal Sciences University, Patna-14.

Preservation

Refrigeration/Cold Storage

Immersion Liquids

Thermo-stabilization

Egg shell treatment

Over Wrapping

Radiation

Refrigeration/Cold Storage

- Temperature: 40 ^{0}F/ 4 ^{0}C Relative Humidity: 70-80%.
  30 ^{0}F/ 0 ^{0}C Relative Humidity: 85-90%.
- Ideal storage: 2-3 months.
- Raw yolk and albumen: 2-4 days.
- Hard cooked peeled eggs: 1 week.
- Pickled eggs (without shell): 1 month.

**Frozen whole eggs (blended): 4 months to 1 year.

Refrigeration/Cold Storage

Types

Cold Storage with Normal Atmosphere
Cold Storage with CO_2 Enriched Atmosphere
Cold Storage with Ozone Enriched Atmosphere

Immersion Liquids

Types

Lime Water
Water Glass

Immersion Liquids-I

Lime Water

- For Long term storage (2-3 months).
- 0.5 Kg of lime dissolve in 1 litre of boiling water, the solution is kept over night and the supernatant is poured in a jar. In this solution 2.5 litres of cold water is added and the entire solution is then filtered with a muslin cloth.
- NaCl may be added @ 112 gms/litre of the supernatant solution.
- Eggs are kept dipped in this solution for 24 hrs, they are then dried and packed.

Immersion Liquids-II

Water Glass

- For Long term storage.
- 10% sodium silicate solution prepared in hot water.
- Eggs are then immersed in this cooled solution and stored in areas where temperature does not rise above 70 ^{0}F.
- Eggs preserved by this method are usually punctured before boiling so that the shell does not break while boiling and the shell peels of easily.

Thermo-stabilisation

Eggs are immersed in hot water at different time temperature combination

130 ^{0}F X 15 minutes

142 ^{0}F X 2 minutes

212 ^{0}F X 5 seconds (Flash Heat Treatment)

Advantages: Eggs are pasteurised.

Eggs are defertilised

Eggs have better keeping quality.

Disadvantages: Danger of cooking eggs.

Requires lab instruments to control heat.

Time consuming.

Expensive.

Egg shell treatment

- It involves use of oil which seals the egg shell pores, thus preventing the escape of moisture and CO_2 from the egg content.
- Types: Oil Coating & Oil Water Emulsion
- Technique: Dipping or Spraying.

Disadvantages: Egg surface shows oil shine.
Cloudy albumen, since CO_2 from the egg.
Difficulty in peeling hard cooked eggs.

Over-wrapping

Eggs stored in cartons which are then over wrapped in cellophane

- This technique is effective in maintaining egg albumen quality.
- Reduction in evaporation rate and maintaenace of low albumen pH.
- Over-wrapping cannot replace refrigeration but should be used in conjugation with it.
- Compared to oil coated eggs, eggs stored under plastic overwrap peel easily.

Disadvantage: Mould development may be seen.

Radiation

Shell egg irradiation dose starts at 1.0 kGy upto 5.0 kGy
Radiation destroys the ovomucin protein of the albumin
The gel-like structure of the albumen is lost on irradiation.
Kills microrganisms
Preserves Quality
Not practical
Expensive

**Salmonella destroyed at 448 Gy radiation dose.

Packaging

Contain

Protect

Preserve

Dispense

Containers

Wooden Boxes
Cardboard Boxes
Plastic Boxes
PlasticTrays
Aluminium Trays
Paper Boards
Moulded Pulp Cartons
Boxes made from Straw/Organic fibres.

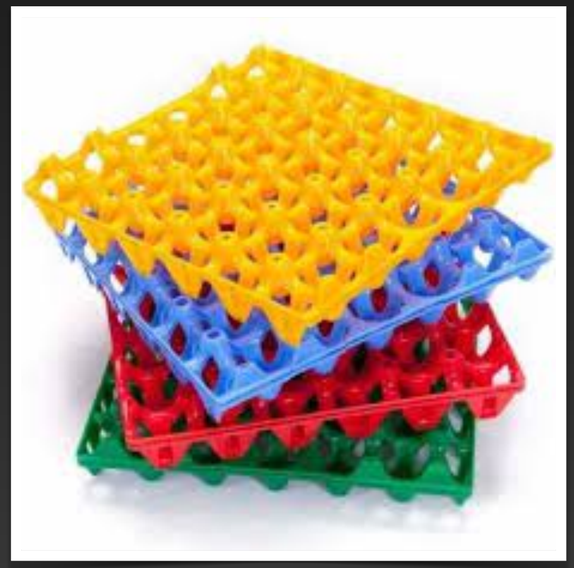
Fillers used in egg packaging

Saw Dust
Rice Husk
Straw
Wood Shaving
Stripped Paper
Moulded Newspaper etc.

*Fillers are used to minimise egg shell damage.
**When eggs are packed along with fillers (during transportation) freezing is not possible since these may get moistened leading to quality degradation of the product in long run or during storage.


6
Happy Eggs
4


cocotte



Filler Trays

Most common form of packaging eggs.

- Filler trays are made up of wood pulp or cardboard or plastic.
- They are moulded/constructed in such a way that they can be stacked one on top of the other and they can also be placed in boxes for transport.
- A convenient way of counting eggs. A standard tray carries 36 eggs. A standard box carries 5 trays hence carrying 180 units of egg.
- Plastic filler trays are washable and reusable but heavier than wood pulp or cardboard filler trays

Storage

**average egg weight loss should not exceed 0.5% per month.

- Egg stored must be clean, not washed or wet.
- Packaging material used should be new, clean and odourless.
- Eggs are usually stored at a temperature of 10-13° C and 75-80% RH but for long term storage, -1.5 to 0°C and 80-85% RH.
- Storage room temperature and humidity must be checked and kept constant.
- Loss of water due to evaporation should be reduced to a minimum.
- Storage room materials and should be cleaned regularly with odourless detergents and sanitizers.
- Air with in the storage room should be circulated.
- Storage room floor should be made of concrete.

Transportation

Transportation Over 2-3 days

Maximum Loading Temperature: 6°C

Recommended for Transportation: -1.0 to 3°C

Acceptable for Transportation: 1.0 to 6°C.

Transportation Over 5-6 days.

Maximum Loading Temperature: 3°C

Recommended for Transportation: -1.0 to 1°C

Acceptable for Transportation: 1.0 to 3°C.

Thank You

Dr. Gargi Mahapatra
Dept. of LPT
BVC, Patna.