Prof Jagadish Pai, Executive Director

Protein Foods & Nutrition Development Association of India

PROCESSING OF EGG PRODUCTS

PROCESSED EGG PRODUCTS

- **In the US in 2009, out of over 76 billion eggs consumed only 30% were fresh**
- **Remaining were liquid, frozen and dried egg products used for various other products including scrambled & omelette prepared at home of service industry but many other products like mayonnaise, ice cream, salad dressing, frozen desserts, cream puffs, cakes, & confections etc.**




APPLICATIONS OF EGGS IN INDUSTRY

Properties	Application
Thickening	Eggs thicken foods like custards puddings, sauces, and creamy fillings
Leavening	Souffles, sponge & butter cakes, quick breads, and puffy omelets are leavened by eggs
Coating	Meat dishes, breads, and cookies are some foods with egg components as the base ingredients for coatings
Binding	Eggs bind other ingredients for making meat loaves, casseroles, and croquettes
Emulsifying	Eggs prevent mixture separation in mayonnaise, salad dressing, and cream puff filling
Clarifying	Tiny particles are coagulated in soups and coffee to create a clear solution
Retarding Crystallization	Crystallization of sugar is slowed in cake icings and candies

COMPOSITION OF EGG

Chemical Composition of Egg

	% PERCENTAGE	WATER	PROTEIN	FAT	ASH
WHOLE EGG	100	65.6	**11.8**	**11**	11.7
WHITE	58	88	**11.0**	**0.2**	0.8
YOLK	31	48	**17.5**	32.5	2.0

PRODUCTS

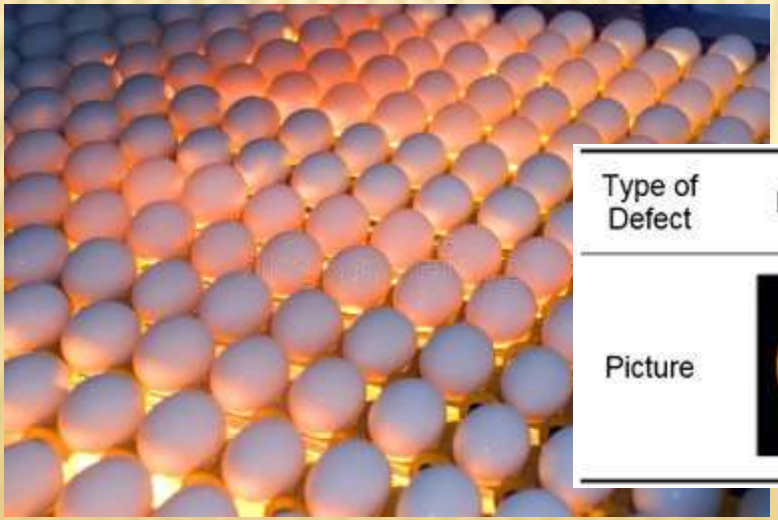
- Liquid Egg (chilled/refrigerated)
- Liquid Egg (frozen)
- Dried Egg powder

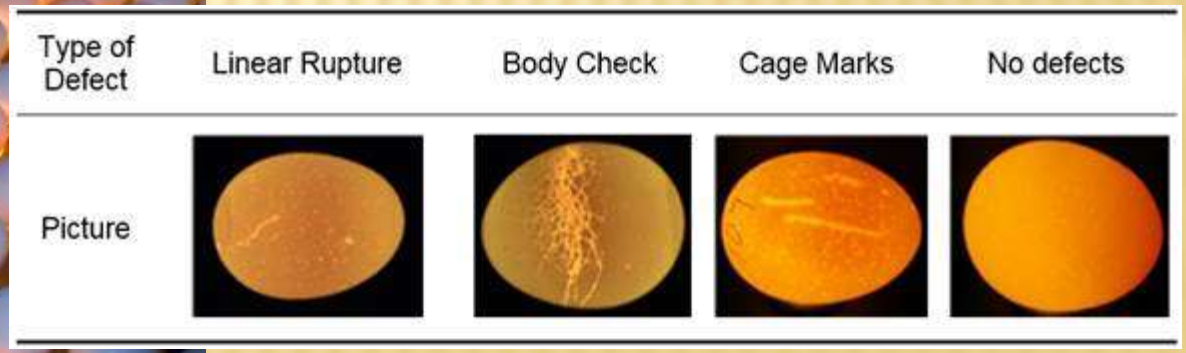
EGG WASHING

- To remove dirt & contamination
- Washing machines with spray jets & brushes with eggs rotating
- Alkaline detergents useful
- Sanitiser like Na-hypochlorite useful
- Eggs may then be airdried
- Spray with mineral oil to seal pores and prevent weight loss by evaporation

GRADING FOR QUALITY

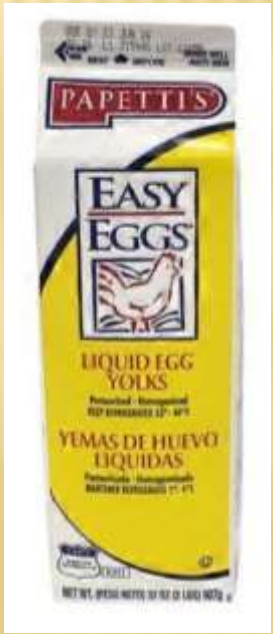
- Candling was done earlier with candles where workers would view inside of egg without breaking it but it is slow
- For larger plants bright lights are used and scanning is done electronically to remove dirty, cracked eggs as well as those with blood spots



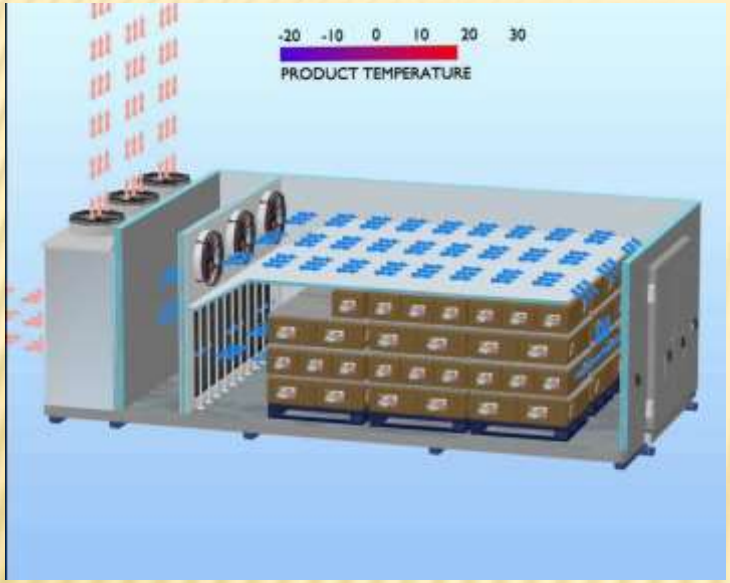


LIQUID EGG

- Convenient to use at home as well as in industry
- Available in whole eggs, egg white and yolk
- Commonly pasteurised because these need to be stored for long at chilled temperature
- Salmonella need to destroyed which is normally done at around 60°C
- Sugar, salt or chemicals like aluminium sulfate added to protect from coagulation



FROZEN EGGS



Shell egg

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Candling

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Removal of egg content

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Inspection of egg meat

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Separation of yolks and whites when desired

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Mixing and churning of Yolks and whites when desired

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Straining to remove chalazas and pieces of shell and membrane

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Addition of sugar, salt and other ingredients

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Pasteurization (60-62°C/3-4 min)

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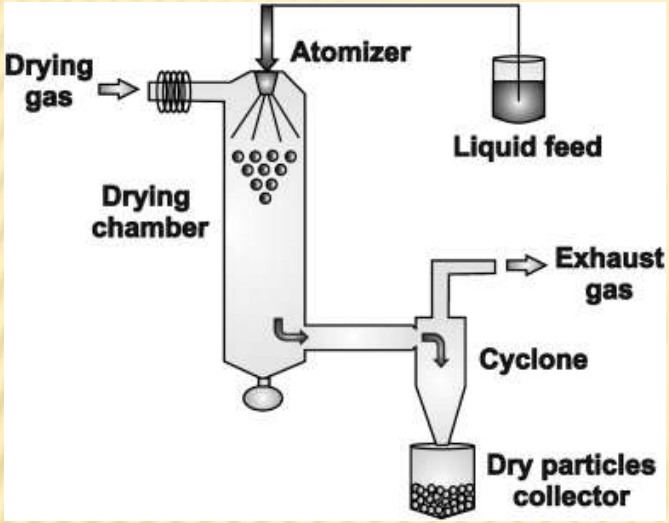
Freezing and drying of the product (-30°C)

FREEZING OF EGGS

- Shells are removed and yolk and white are mixes without air incorporation
- Gelation may be controlled by adding salt or sugar and/or chemicals to the mix
- Citric acid may be added for colour retention
- Prepared egg is pasteurised at 60-62°C for 3-4 min
- Packed in either metal or other container for blast freezing using air at -30°C for 48-72 h

DRYING OF EGG



Fresh eggs

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Cold storage (maintained at 4-5°C)

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Candling and Inspection (Candling room maintained at 15°C)

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Cleaning using Detergent-sanitizer solution (2% sodium hydrochloride solution, at 40°C/7min)

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Removal of egg content

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Churning and Filtration (without beating air into egg mass)

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Pasteurization – 62.5°C/3-5min

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Desugaring (0.5% yeast, fermentation at 30°C for 90min)

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Repasteurization - 62.5°C/3-5min to kill yeast

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Spray drying (inlet air temperature 185°C and outlet air temperature 85°C, moisture content 1.5% in the dried powder)

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Packing (in tin container with inert gas)

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Storage

DRY EGG POWDER

- Eggs are treated with enzyme to remove glucose
- Other ingredients such as silicate (anti-caking agent) may be added
- Eggs may be dried by spray drying for powder
- May be pan or drum dried for flakes


Thank you!