Egg Handling
Nest to Hatchery

An Aviagen Brand

Zarbal seminar
March 2017

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Outline

- Egg Development
- Hatching Eggs - Care and Environment
- Egg Sanitation
- Egg Transportation
- Egg Storage

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Egg Development

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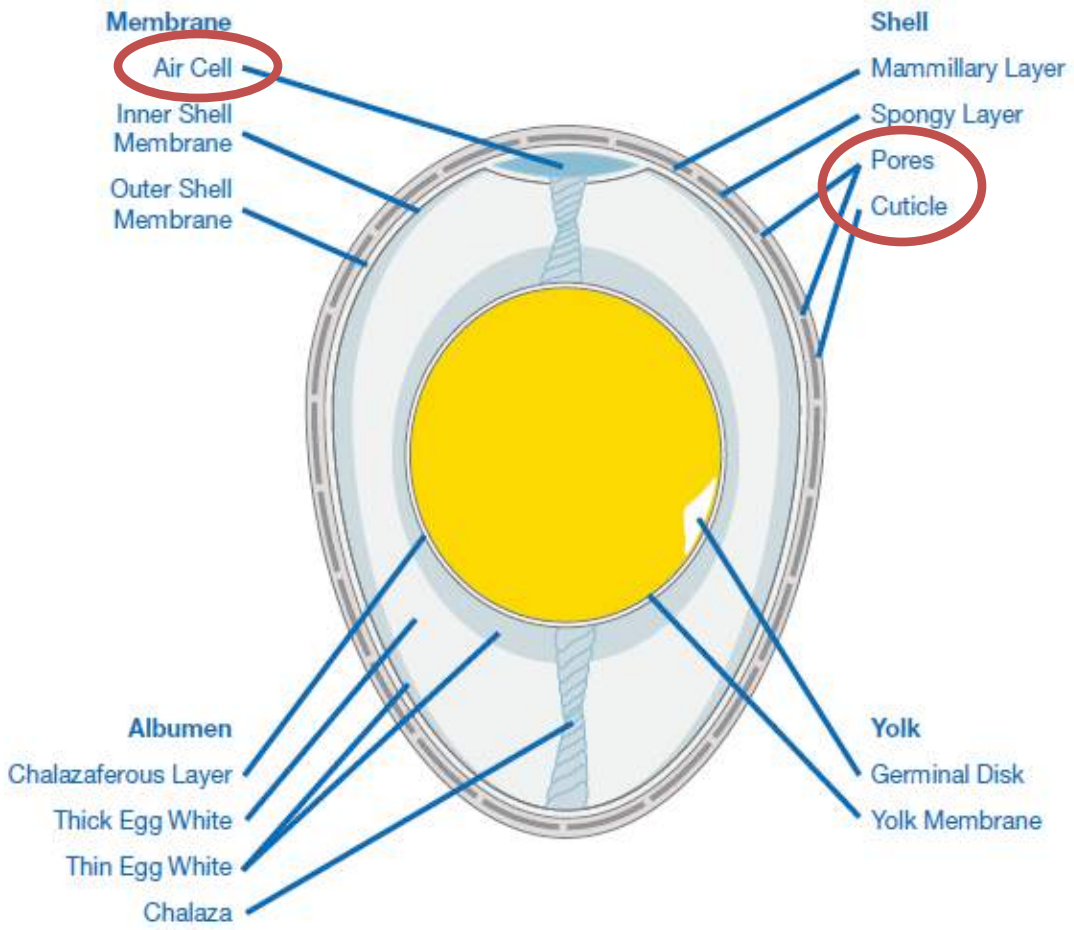
Egg Structure

Figure 93: Internal structure of a fertile egg at the time of lay.



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The Egg Shell Surface Magnified

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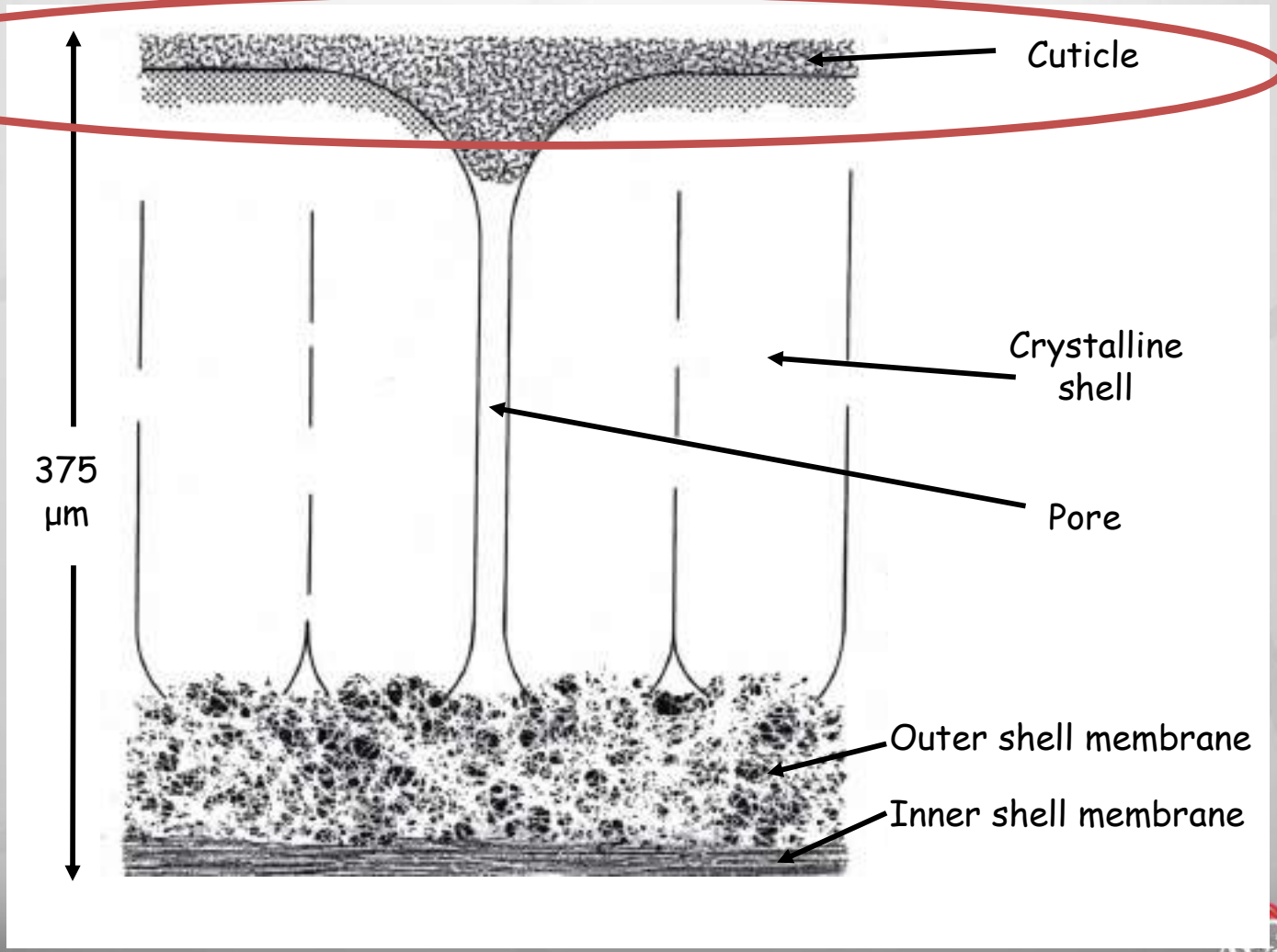
A cross-section of the egg shell



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The importance of the cuticle

- When the egg is laid, the cuticle will remain wet for 2-3 minute

- Until the cuticle is set, it will not protect the pores from bacterial penetration; if the egg is laid onto a dirty surface, then bacteria will penetrate the egg shell

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Pointed End Down!

- At day 18
  - The beak is turned to the air cell and covered by the right wing.
- The chick can break through the inner cell membrane
  - Breathing starts.
- If eggs are placed with the air cell down
  - The embryo turns
  - The head will be positioned in the small end of the egg
  - This is away from the air cell.
- The embryo may die
  - Normal breathing is restricted by fluid.
  - Chick will struggle to get out of the shell

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Pointed End Down!

Provide a small candling flashlight or table candling light as shown in the picture so that staff may check if in doubt.

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Hatching Eggs

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Why is it important to look after hatching eggs properly?

- To keep the embryo and egg contents in the best possible condition
  - Good hatchability
  - Good chick quality.

- Avoid microbial contamination

- Each process must be carried out so that embryonic development is not compromised.

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Clean Nest Hatching Eggs

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Keep Nest Boxes Clean

Keep Nest Boxes Clean

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Keep Nest Boxes in Good Condition

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Sanitizing

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Contamination

When eggs are laid on floor/slats and dirty nests. Some of them will become contaminated and explode later.

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- The best advice is to do nothing to dirty eggs.
  - Do not use wet paper towels or cloths, steel wool and sand paper to clean eggs
- Formaldehyde Fumigation is the best method for disinfecting egg shells

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Egg Fumigation

- Fumigate Eggs on the Farm immediately after collection while still warm
- Do not leave eggs out for long periods of time
- Store eggs in the cooler room within 5 hours after collection

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- Eggs soiled after the cuticle has dried are reasonably well protected, unless the egg then gets wet from;
  - Cold water washing
  - Condensation (sweating)
  - Too high humidity in the egg room

Transportation

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Egg Transport Trucks

Egg Transport Trucks

- Egg transportation trucks should be insulated and have an A/C unit for long distances.
- Check the driver efficiency often for condition of eggs on arrival.
- Air ride suspension is preferred but well maintained springs are essential.

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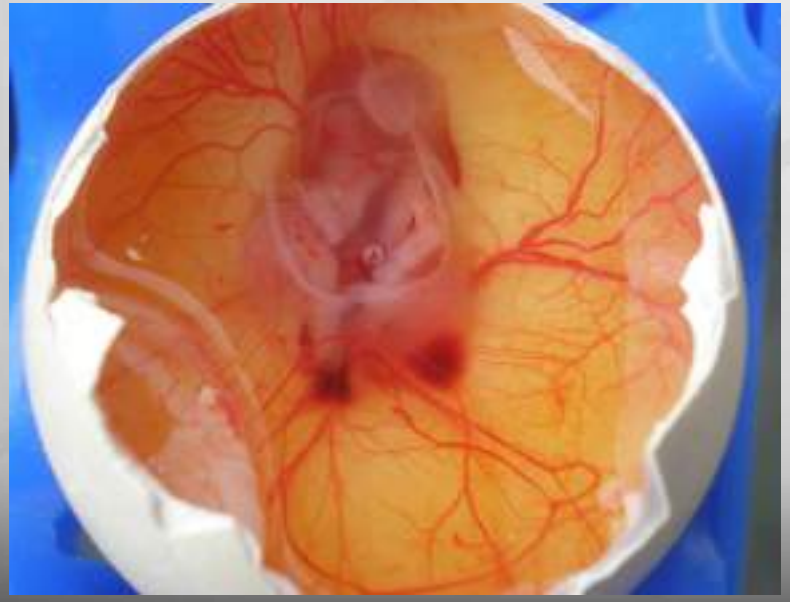
The effects of Shock and Vibration

Extreme Effects of Shock on The Embryo



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Recording Shock and Vibration

- Shock logger
  - Simple
  - Effective
  - Relatively cheap

- G-force – acceleration /deceleration
- Vibration loggers record velocity (mm/s).

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Egg Storage

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Storage Temperature

Storage Period (days)	Temperature of Storage °C (F)
1-3	20-23(68-73)
4-7	15-18(59-64)
>7	12-15(54-59)
>13	12(54)
Humidity between 75%-80%	

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Rules of Egg Storage

- Eggs should be cooled to below physiological zero ($24^{o}C$) soon after collection from the nest boxes within 5 hours of lay
- Longer-stored eggs do not need a sequence of different temperatures
- Eggs set fresh will not be damaged by low storage temperatures – adjust the temperature for the oldest eggs
- Keep the egg store temperature constant

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Egg Room Hygiene

- Do cleaning and disinfect work routinely
- Pay more attention to the air conditioning system , the blind spot.
- Do not put egg trays on the floor directly
- Egg room is the place for egg and empty racks storage only

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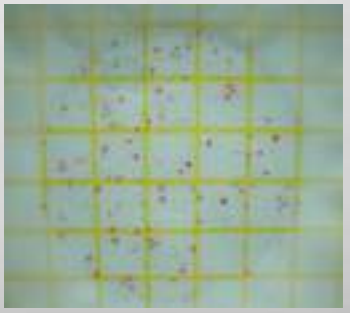
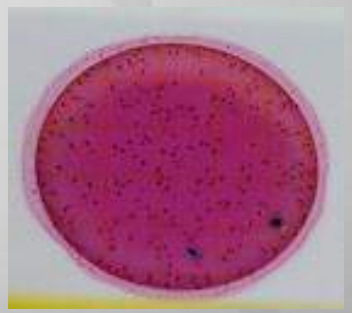
Surface Bacteria Counts

- Petrifilm for TVC and Coliform





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- Good design—drain, turning system, air conditioner and ventilation

Cooling system with plastic sock

Shorter duct easy for cleaning

Ductless Air conditioner

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Check the AC Units Regularly

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Egg room is for HATCHING EGGS ONLY

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Do not put eggs on floor directly

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Keep the floor dry

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Egg should be cool down quickly and evenly

- Cardboard trays will increase the cooling time and egg temperature will not be even

Even Development / Hatch Window

- It is important to provide conditions which give even development of the embryos, to keep the hatch window tight

- Hatch window is the time span from first chick hatched to pulling the chicks from the hatcher

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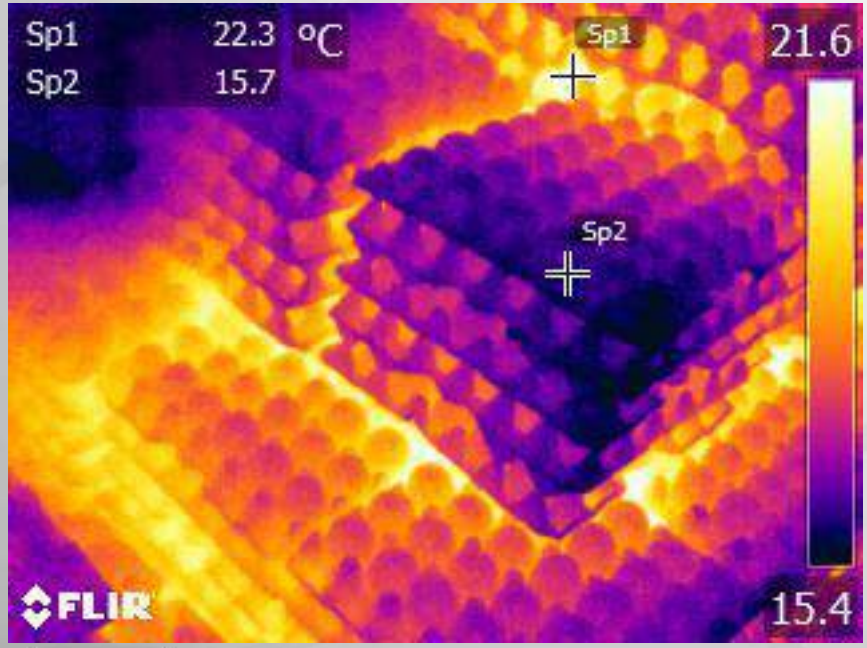
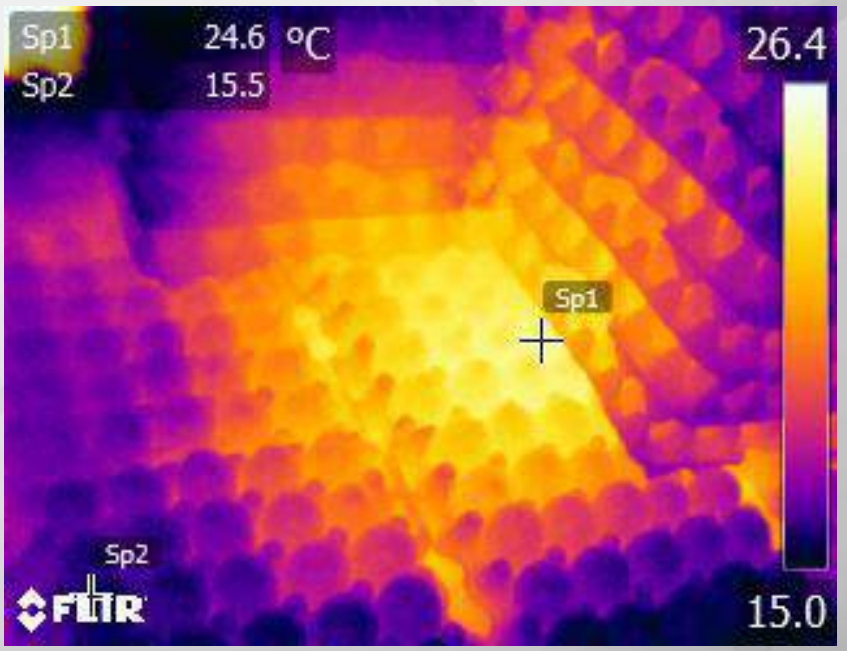
Egg should be cool down quickly and evenly





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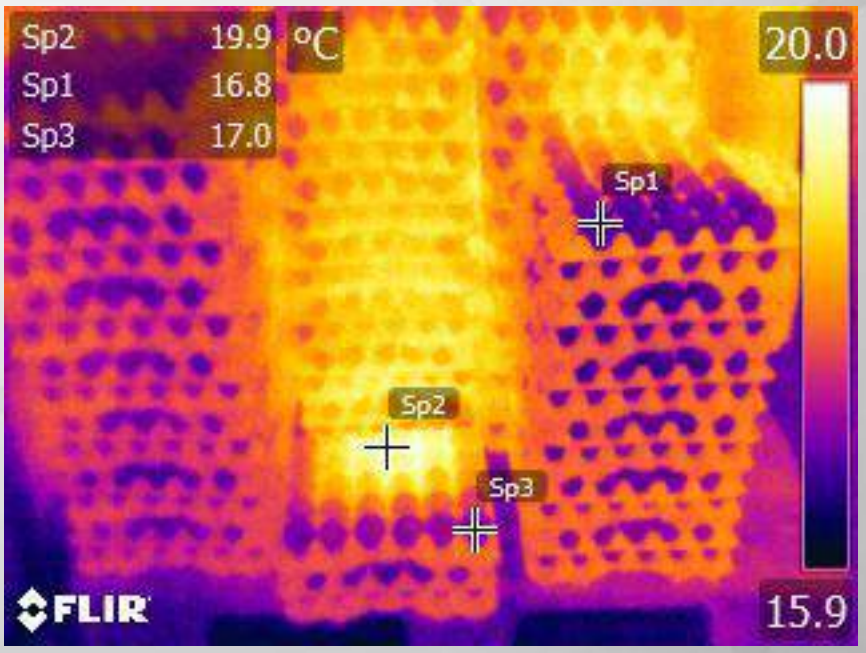
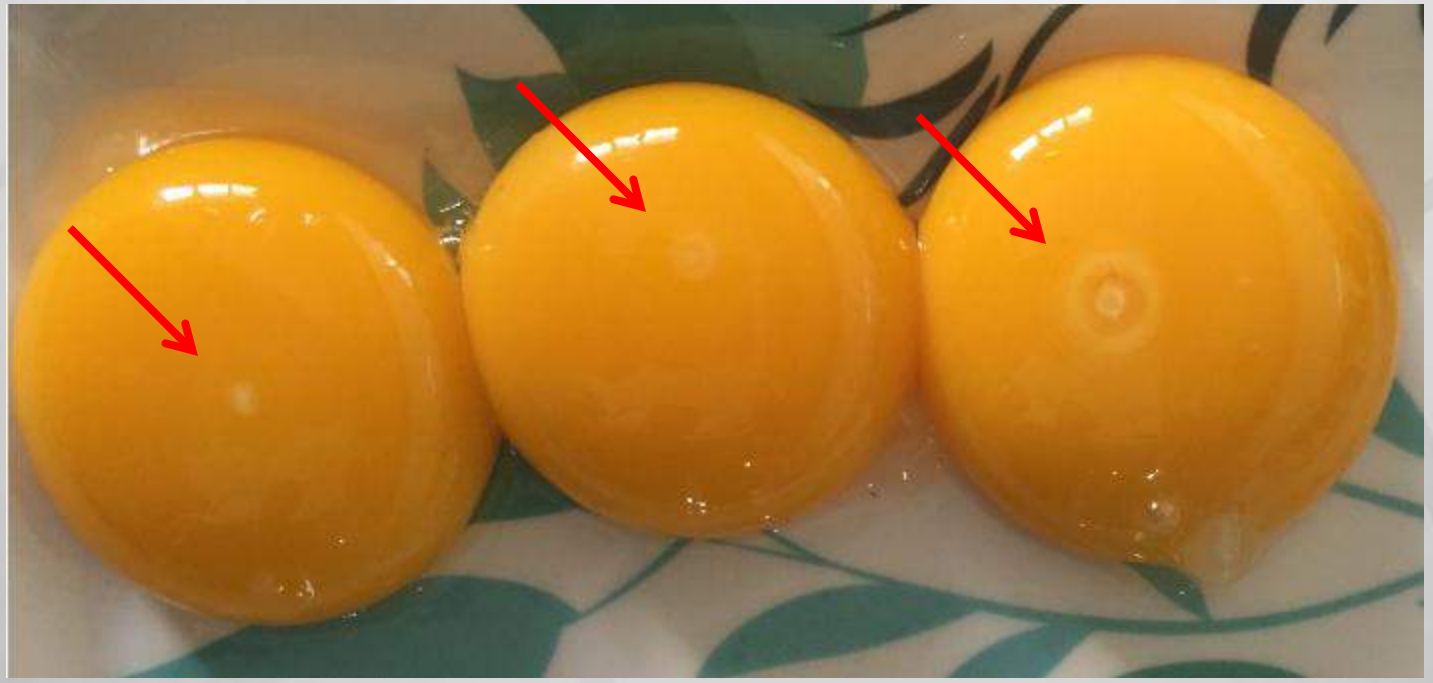
Uneven temperature of egg pack

- 16 hours after arrival to the hatchery



Different size of blastoderm



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Different egg temperature on arrival the hatchery

- Winter time

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Do not stack the eggs too closely

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Leave enough space between eggs

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Stir fan

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24 hours incubated embryos

What happened when eggs are stored longer?

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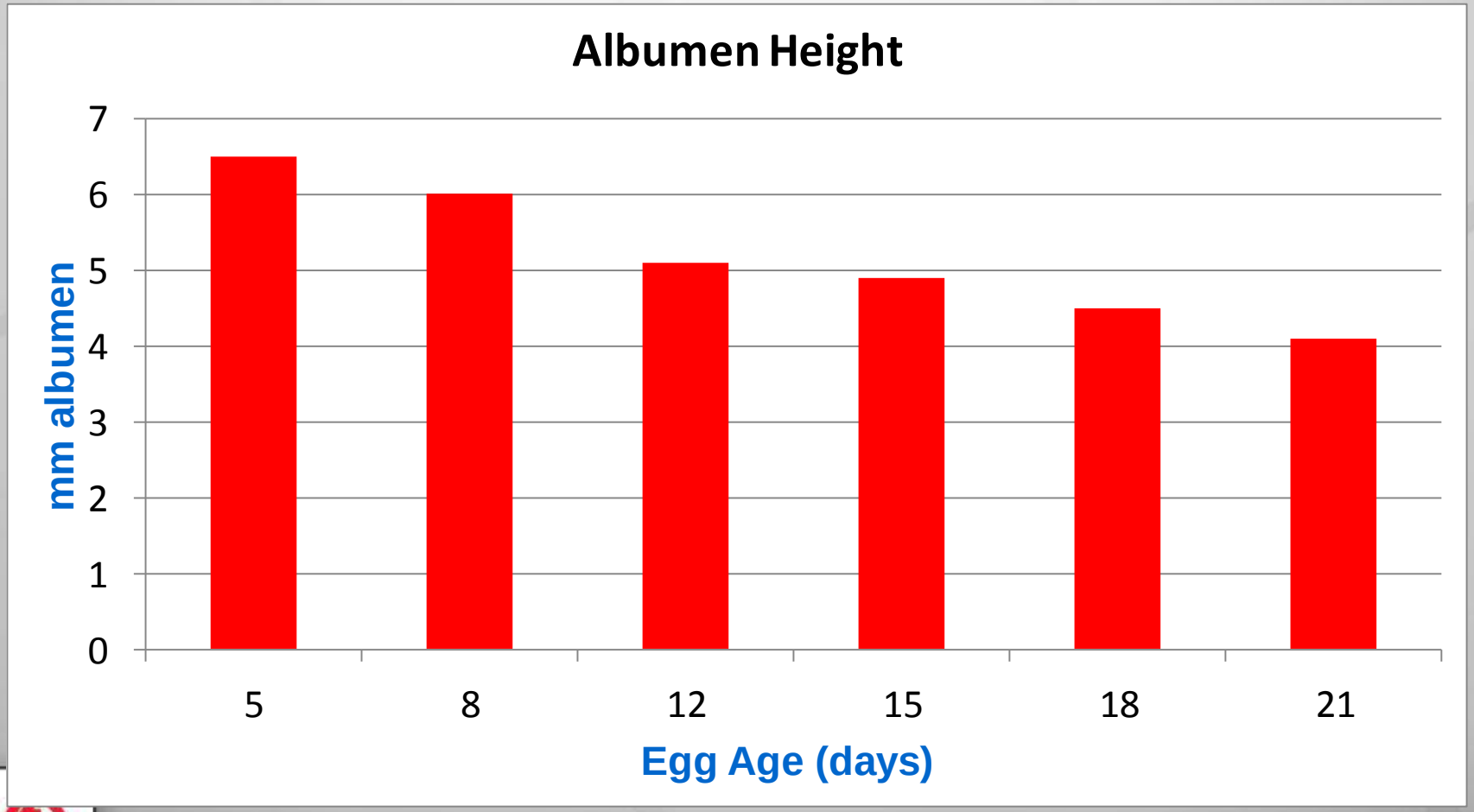
Thick albumen thins and gets more runny



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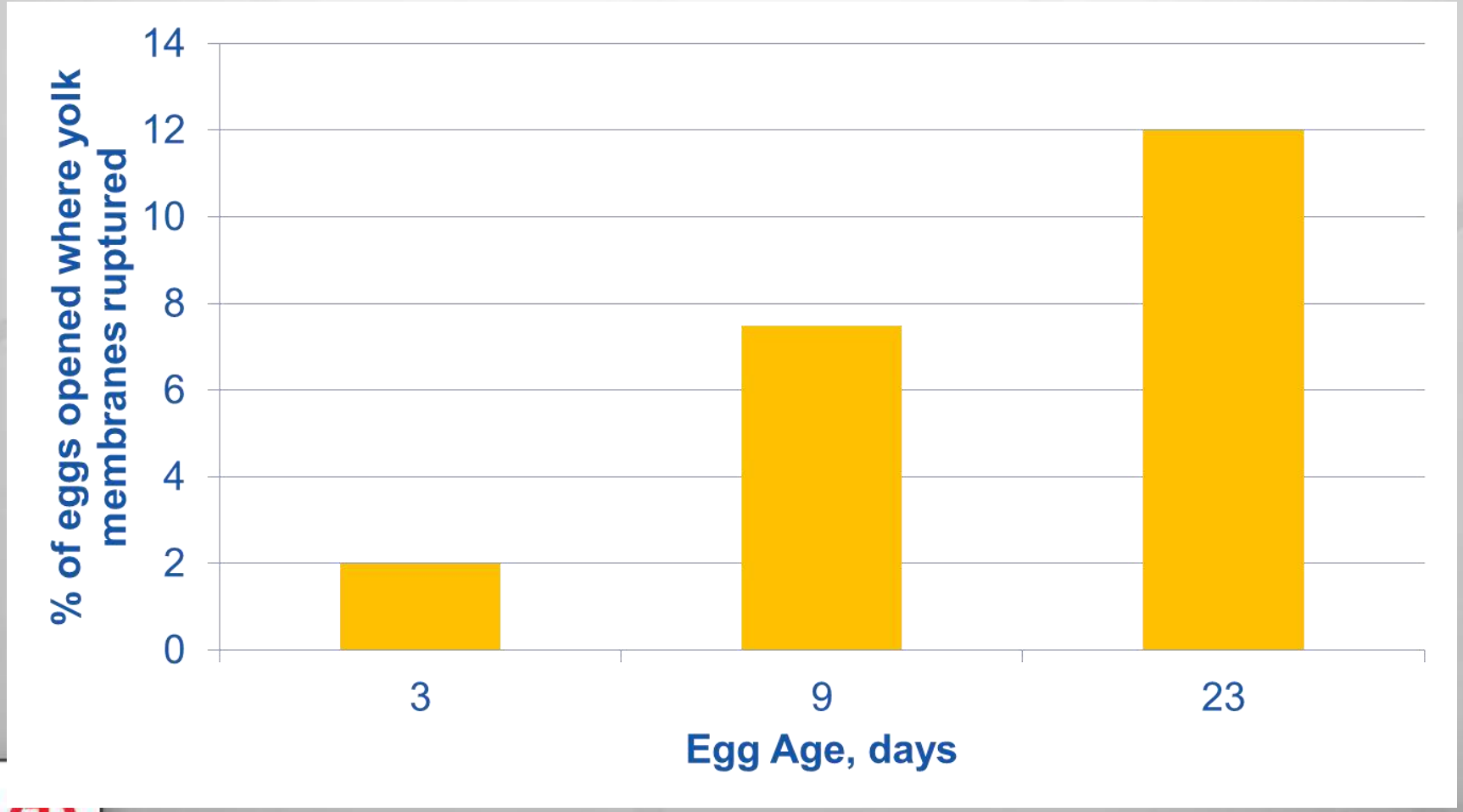
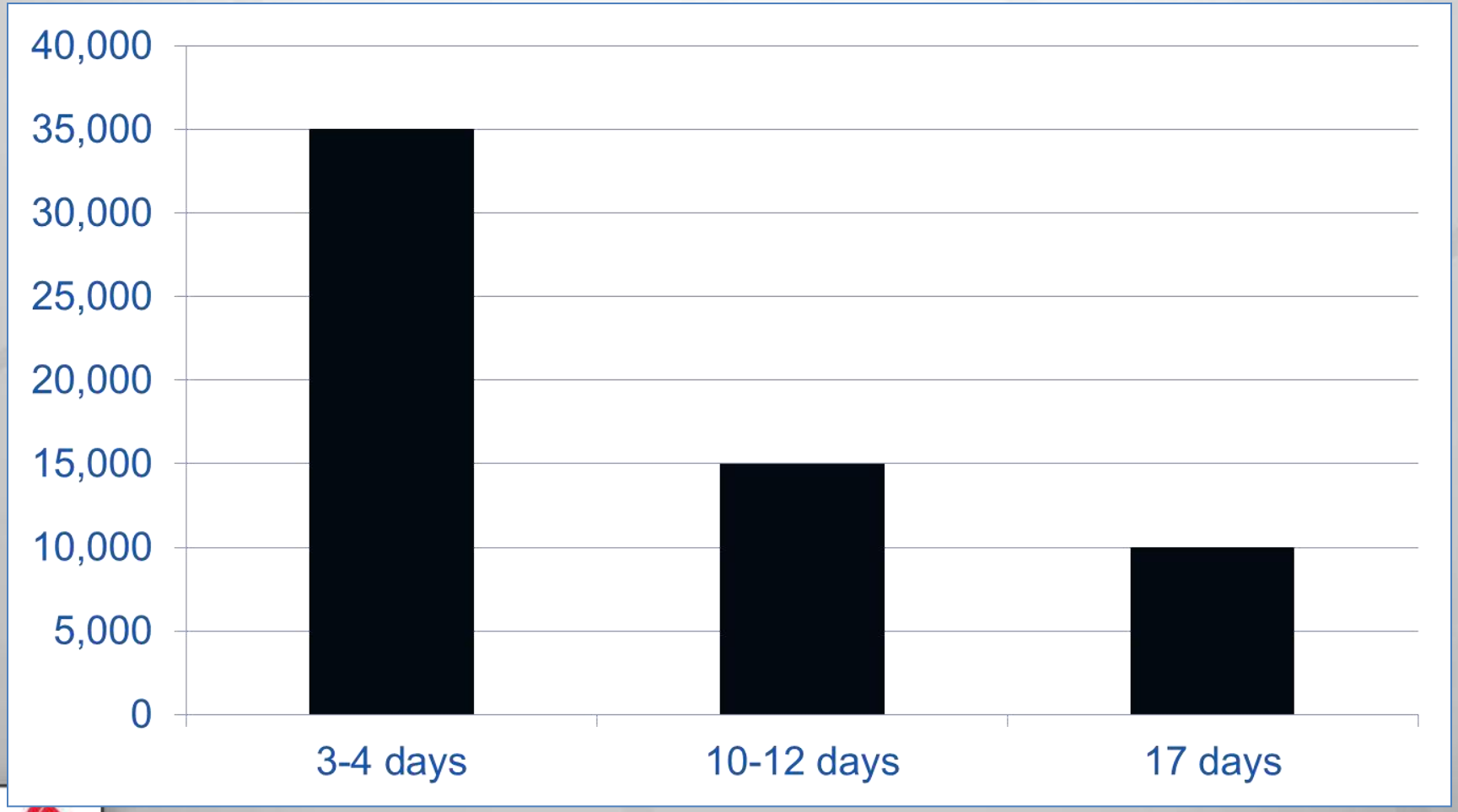
Yolk membranes become more fragile



Data courtesy of Murray Bakst

Cells within the germinal disc die



Data courtesy of Murray Bakst

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What can we do to improve hatch in stored eggs?

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Turning eggs during Storage

- Scientific evidence shows that Turning eggs during Storage is beneficial
- More beneficial for eggs stored > 14 days
- Start at day 1
- Not more that 4 times per day

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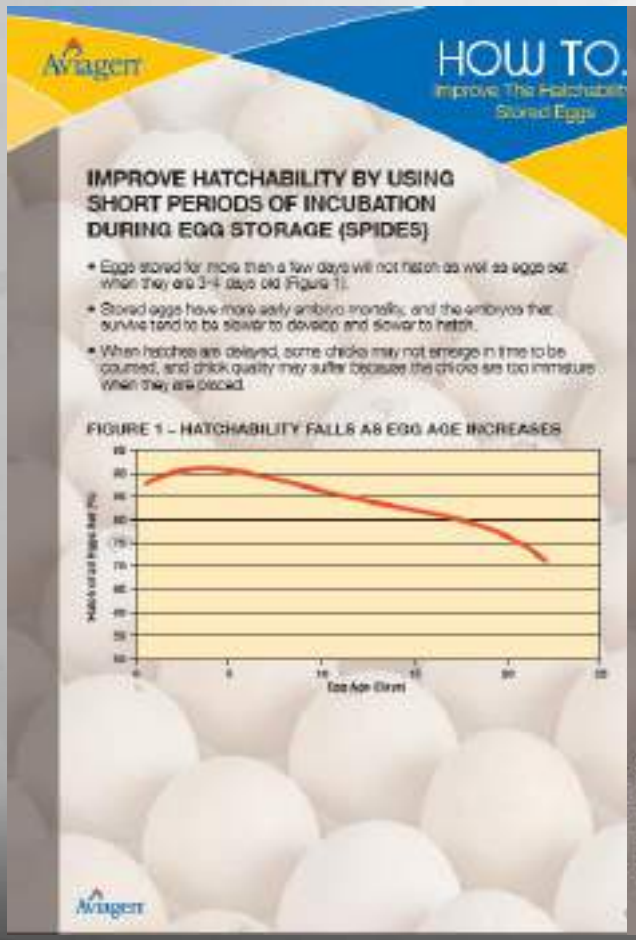
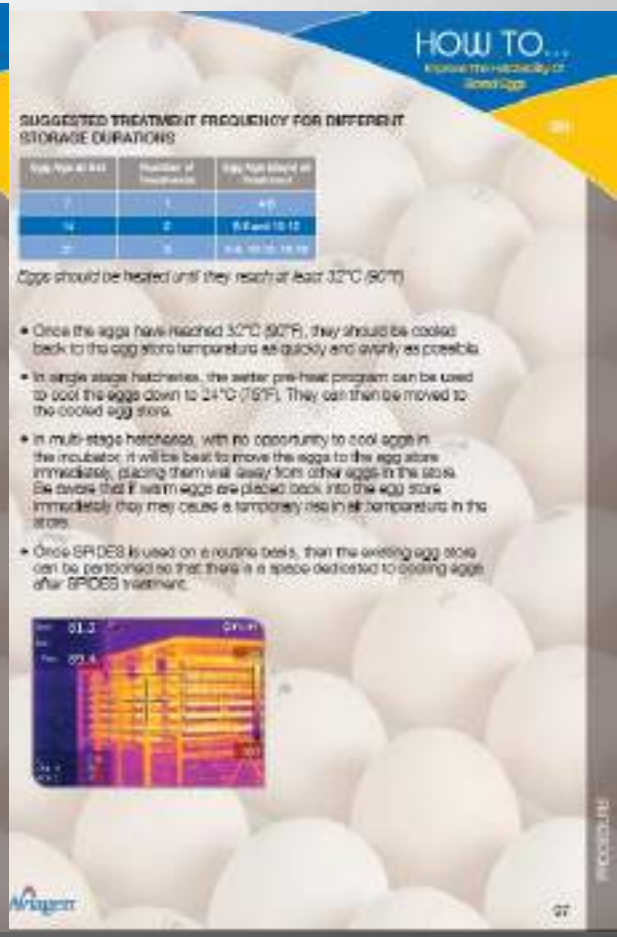
SPIDES
(Short Period Incubation During Egg Storage)
Hatchery How To No.9





Summary

- Good hygiene is requirement
- Do not use floor eggs
- Fumigate of eggs while still warm
- Collect, sanitize and cool eggs often and evenly
- Maintain the cool chain Nest to Hatchery
- Monitor and control transport conditions
- Set eggs within 7 days if possible
- Longer storage will do less harm if egg storage temperatures are reduced and eggs are turned
- Uneven storage conditions will widen the hatch window
  - be very careful of closely packing egg trays in the egg rooms
  - Monitor and record egg room and egg temperature very closely.

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Thank You!

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