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Egg Handling Nest to Hatchery

Zarbal seminar
March 2017

www.aviagen.com



Outline

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



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Egg Development

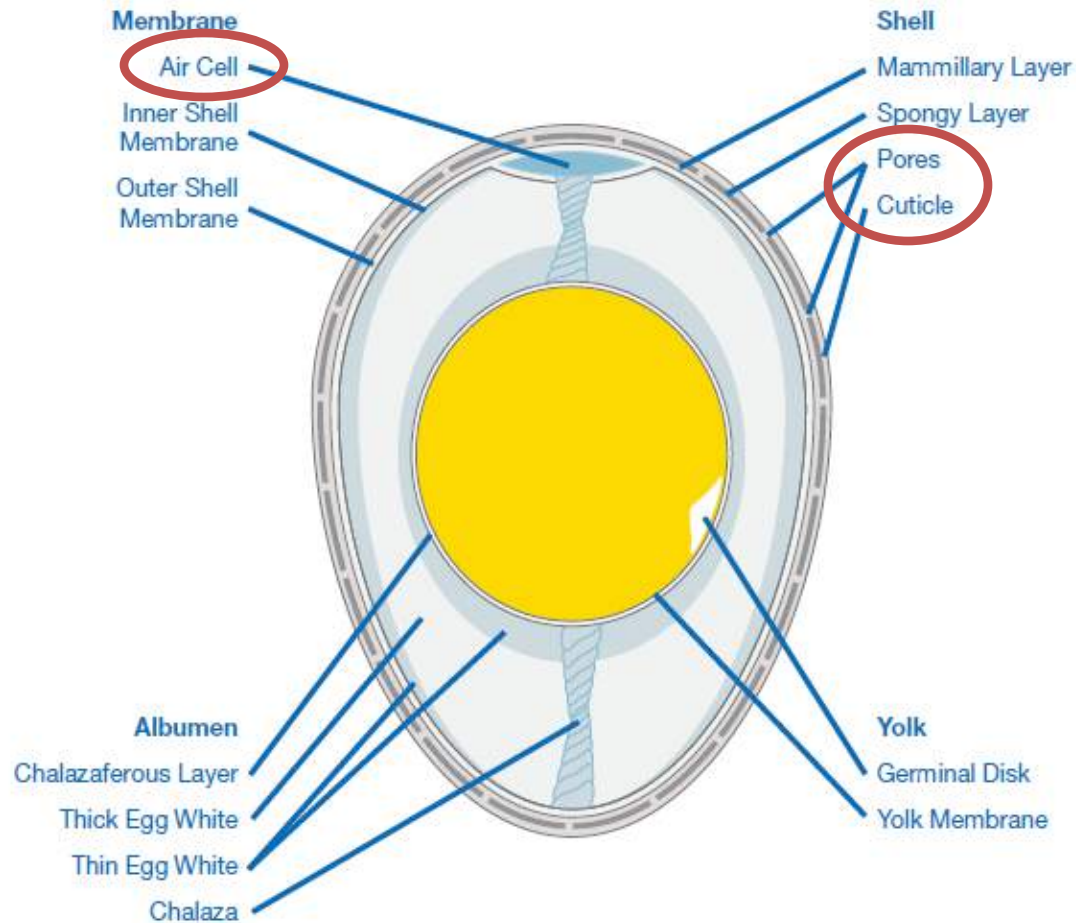


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Egg Structure

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



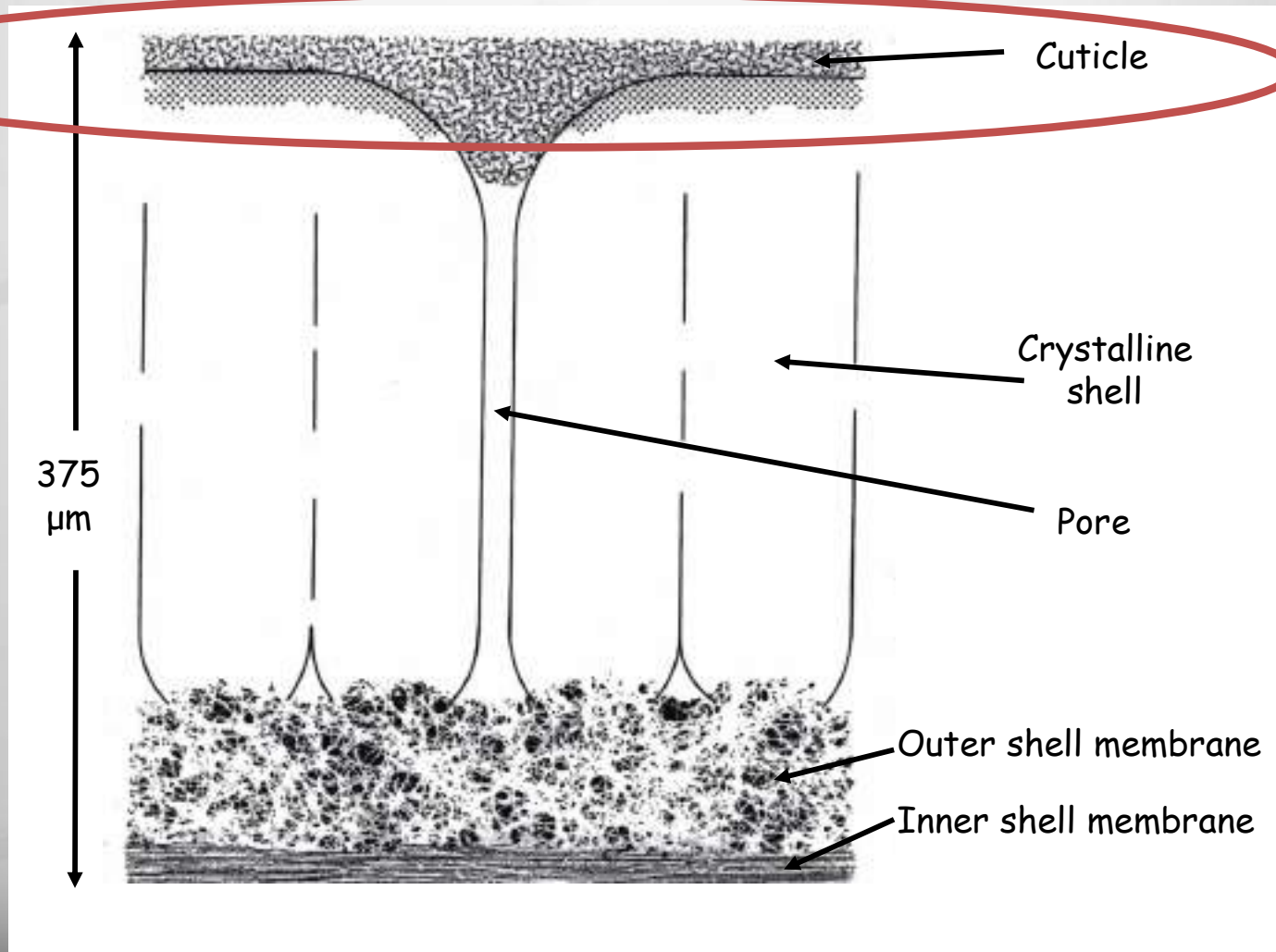
The Egg Shell Surface Magnified



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A cross-section of the egg shell



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



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.

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



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



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.



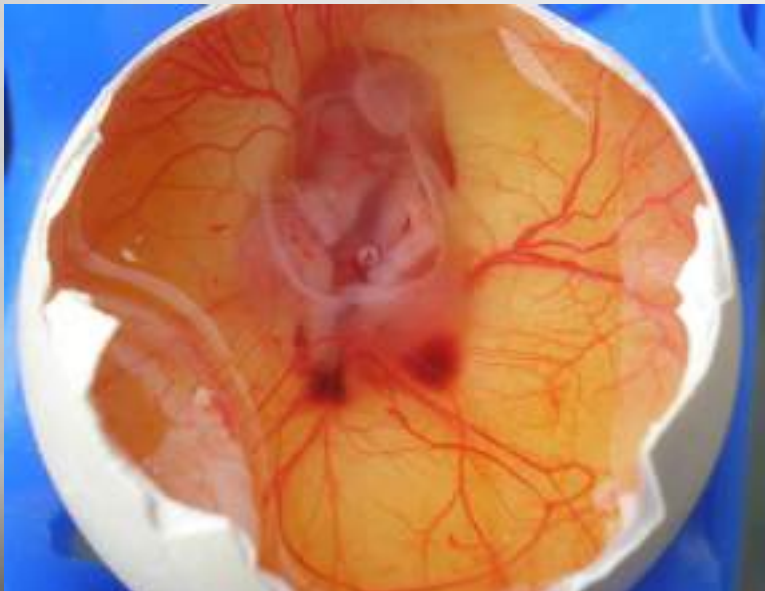
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The effects of Shock and Vibration



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).



TGP-0605

High-sensitivity shock logger



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°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

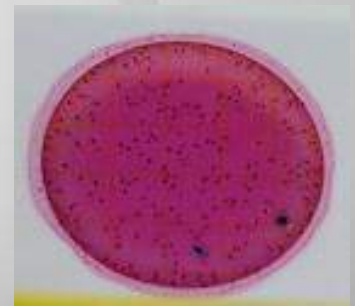
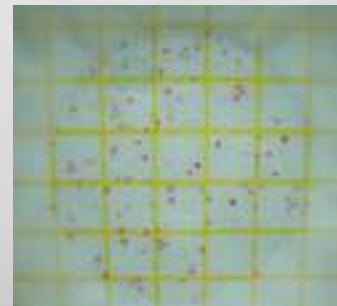


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Surface Bacteria Counts

- Petrifilm for TVC and Coliform



- 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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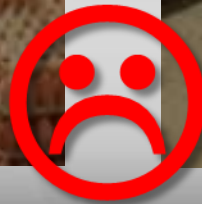


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Check the AC Units Regularly



Egg room is for HATCHING EGGS ONLY



Do not put eggs on floor directly



Keep the floor dry



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

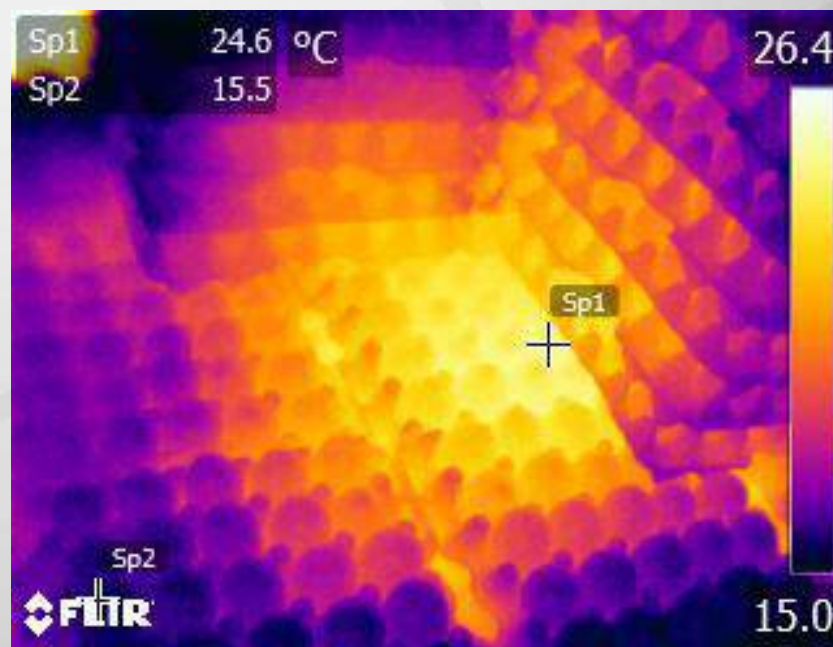
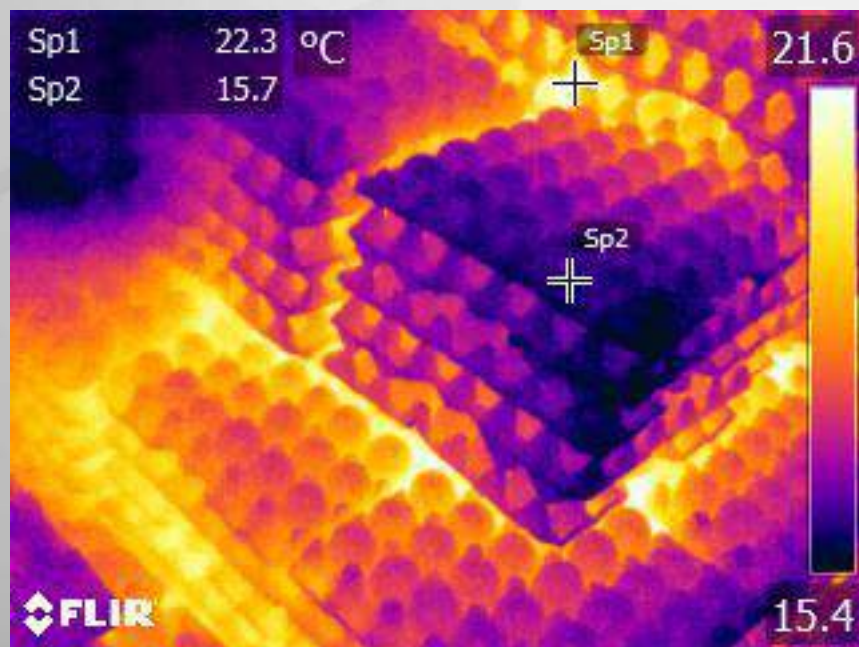
- It is important to provide conditions which give even development of the embryos, to keep the hatch window tight
- Hatch window is the time span from first chick hatched to pulling the chicks from the hatcher



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Egg should be cool down quickly and evenly

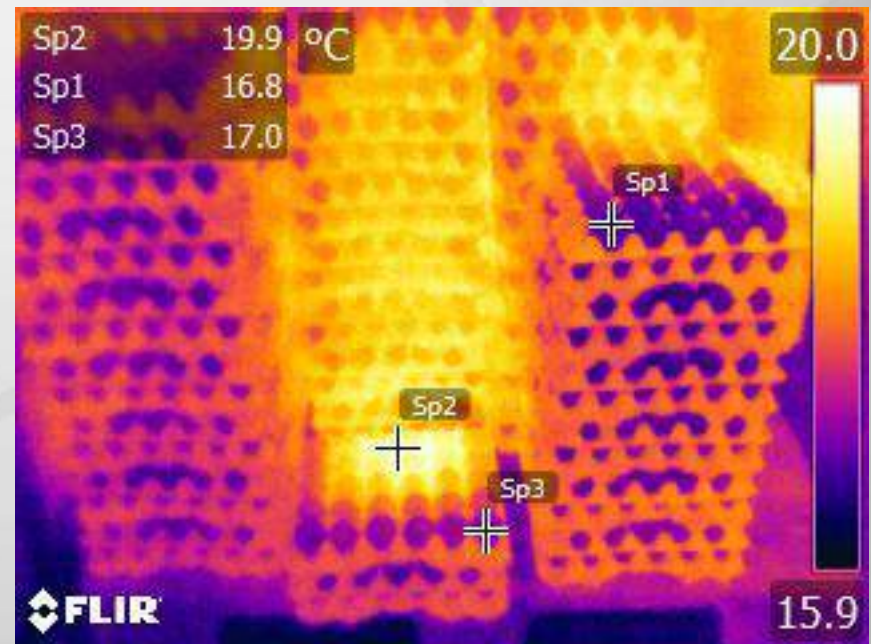


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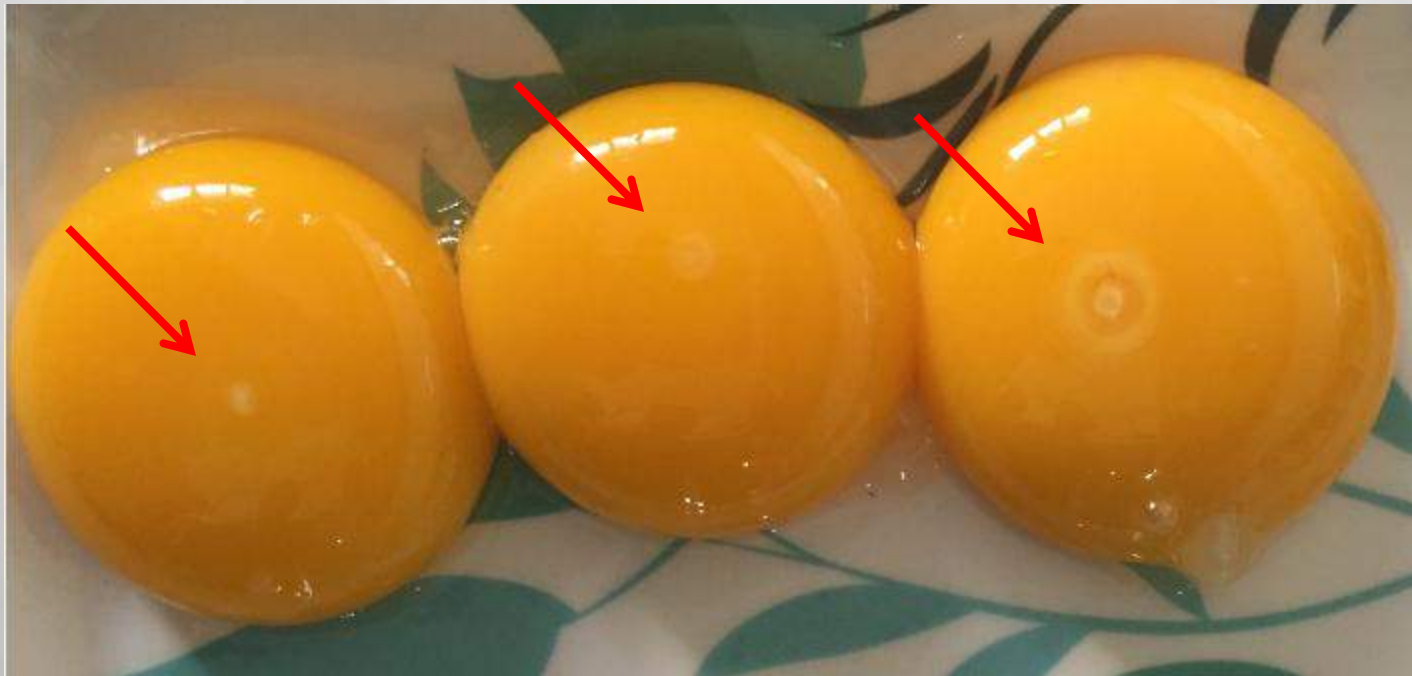
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Uneven temperature of egg pack

- 16 hours after arrival to the hatchery



Different size of blastoderm



Different egg temperature on arrival the hatchery

- Winter time



Do not stack the eggs too closely



Leave enough space between eggs



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Stir fan



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24 hours incubated embryos



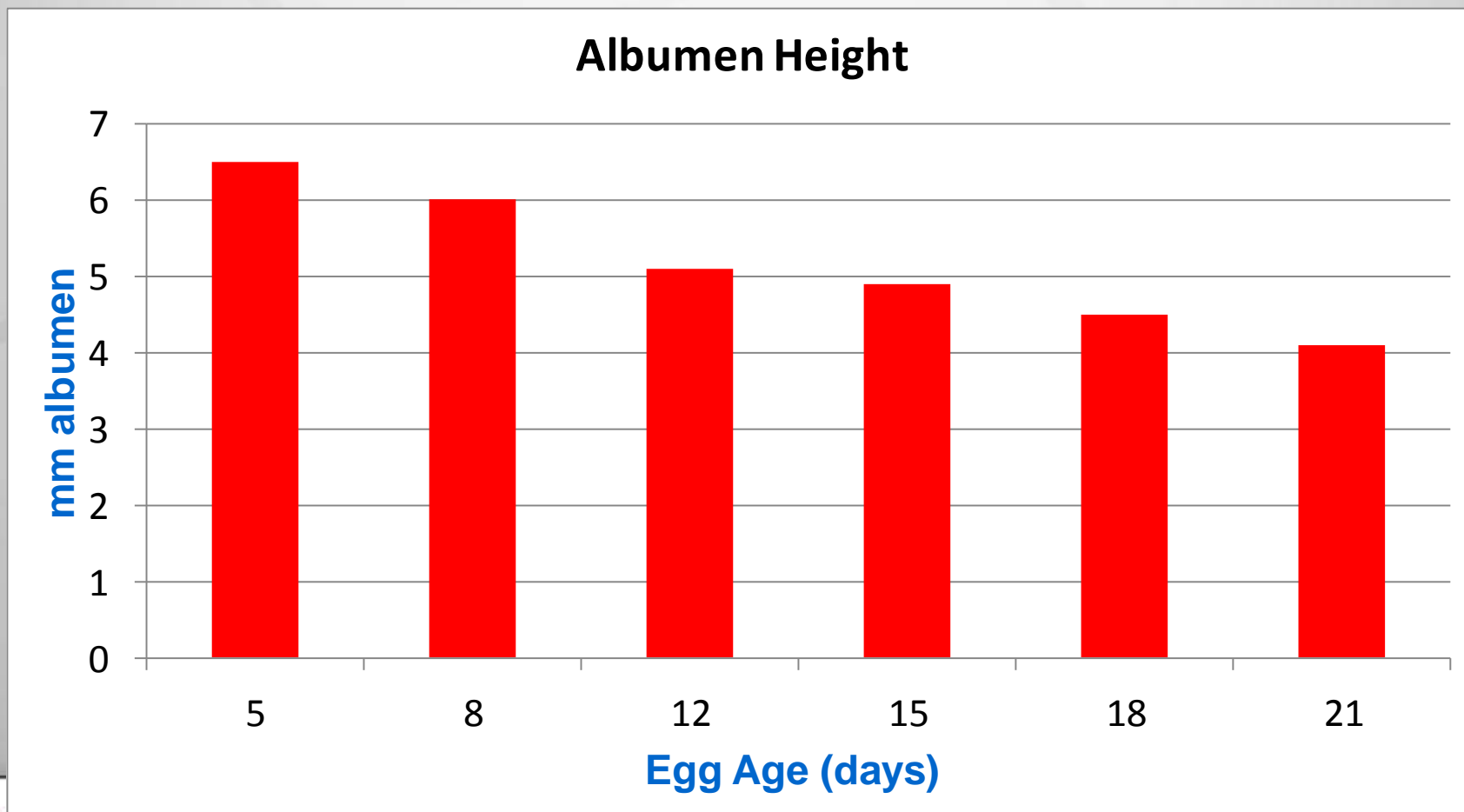
What happened when eggs are stored longer?



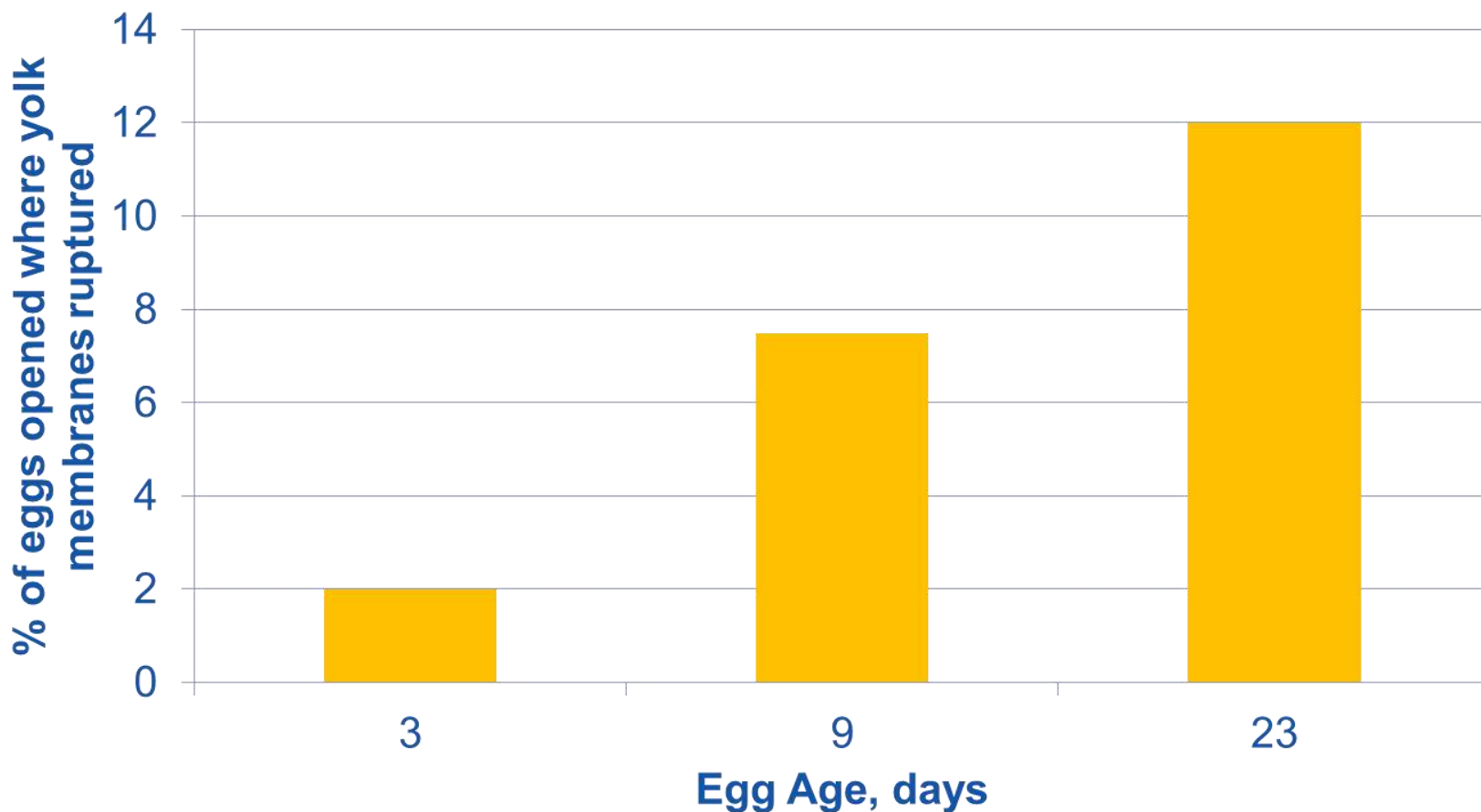
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Thick albumen thins and gets more runny

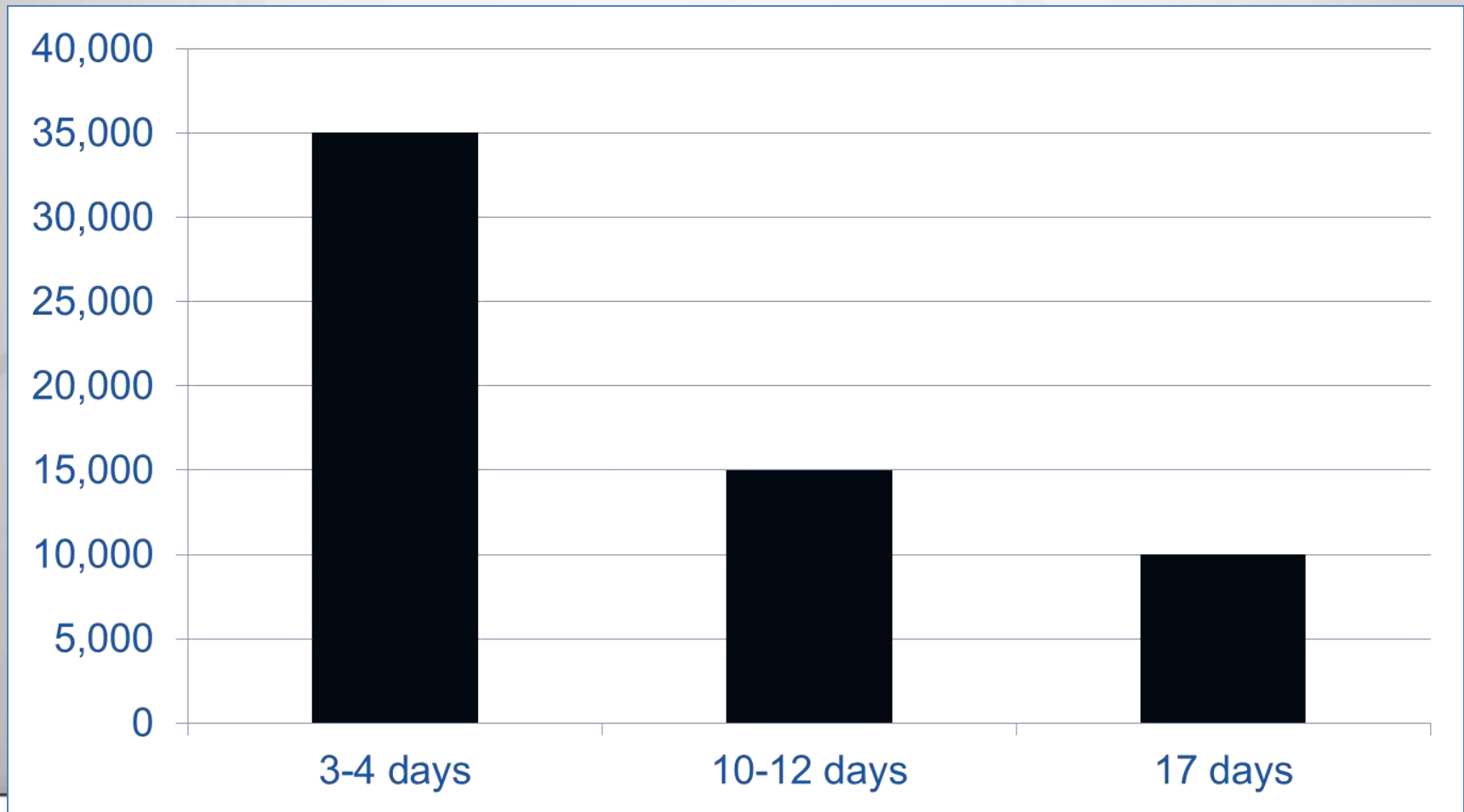


Yolk membranes become more fragile



Data courtesy of Murray Bakst

Cells within the germinal disc die



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Data courtesy of Murray Bakst



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 Aviagen HOW TO... Improve The Hatchability Of Stored Eggs IMPROVE HATCHABILITY BY USING SHORT PERIODS OF INCUBATION DURING EGG STORAGE (SPIDES) - Eggs stored for more than a few days will not hatch as well as eggs set when they are 3-4 days old (Figure 1). - Stored eggs have more early embryo mortality, and the embryos that survive tend to be slower to develop and slower to hatch. - When hatchlings are delayed, some chicks may not emerge in time to be counted, and chick quality may suffer because the chicks are too immature when they are placed. FIGURE 1 - HATCHABILITY FALLS AS EGG AGE INCREASES | Egg Age (Days) | Hatchability (%) | |----------------|------------------| | 0 | 85 | | 3-4 | 88 | | 5 | 87 | | 7 | 85 | | 9 | 82 | | 10 | 70 | TROUBLE SHOOTING - The table below gives possible causes to consider when SPIDES either doesn't improve hatch at all, or does not restore 80-90% of the loss. | Observations | Possible Causes | Action | |---|--|---| | Stored eggs hatch at a lower than expected rate | Egg age over 10 days
Incubation started at 24°C (75°F) instead of 32°C (90°F) | Use 32°C (90°F) to cook the eggs before moving to 37°C (99°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | | Too few chicks hatch | The time from SPIDES to hatch is longer than 24 hours | Use a cooler and lower heat than when the eggs were cooked. SPIDES should be 12 hours or less, followed by the eggs being cooled to 20°C (68°F) | | Too many chicks hatch | Incubation started at 37°C (99°F) instead of 32°C (90°F) | Use 32°C (90°F) to cook the eggs before moving to 37°C (99°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | | Too few chicks hatch | Incubation started at 32°C (90°F) instead of 37°C (99°F) | Use 37°C (99°F) to cook the eggs before moving to 32°C (90°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | | Too many chicks hatch | Incubation started at 32°C (90°F) instead of 37°C (99°F) | Use 37°C (99°F) to cook the eggs before moving to 32°C (90°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | | Too few chicks hatch | Incubation started at 37°C (99°F) instead of 32°C (90°F) | Use 32°C (90°F) to cook the eggs before moving to 37°C (99°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | | Too many chicks hatch | Incubation started at 37°C (99°F) instead of 32°C (90°F) | Use 32°C (90°F) to cook the eggs before moving to 37°C (99°F) for 12 hours or less, then cool the eggs to 20°C (68°F) | MORE INFORMATION - Avian Adm. Brief, Indian River Information or Rose Tech - Investigating Hatchery Problems - AVATECH-Hatchery Maintenance - Others in the Hatchery How To series - 01 Measure Egg Water Loss - 02 Measure Chick Yield - 03 Measure Eggshell Temperature - 04 Identify Infertile Eggs & Early Deaths - 05 Break Out and Analyze Hatch Debris - 06 Monitor Bunker Temperature Variation - 07 Check Your Chicks Are Comfortable - 08 Monitor Egg Turning HOW TO... Improve The Hatchability Of Stored Eggs HOW TO... Improve The Hatchability Of Stored Eggs SUGGESTED TREATMENT FREQUENCY FOR DIFFERENT STORAGE DURATIONS | Egg Age at Set | Number of Treatments | Egg Age Stored at Treatment | |----------------|----------------------|-----------------------------| | 7 | 1 | 4-5 | | 14 | 2 | 8-9 and 10-12 | | 21 | 3 | 14-15, 16-17, 18-19 | Eggs should be heated until they reach at least 32°C (90°F) - Once the eggs have reached 32°C (90°F), they should be cooled back to the egg store temperature as quickly and safely as possible. - In single stage hatcheries, the water pre-heat program can be used to cool the eggs down to 24°C (75°F). They can then be moved to the cooled egg store. - In multi-stage hatcheries, with no opportunity to cool eggs in the incubator, it will be best to move the eggs to the egg store immediately, placing them well away from other eggs in the store. Be aware that if warm eggs are placed back into the egg store immediately they may cause a temporary rise in temperature in the store. - Once SPIDES is used on a routine basis, then the existing egg store can be performed so that there is a space dedicated to cooling eggs after SPIDES treatment. TROUBLE SHOOTING 04 Aviagen Aviagen 07

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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