



PETERSIME

Critical control points during the exothermic phase of turkey embryos



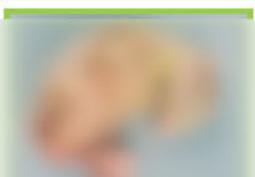
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TSPC 11th of March
2026

The exothermic phase

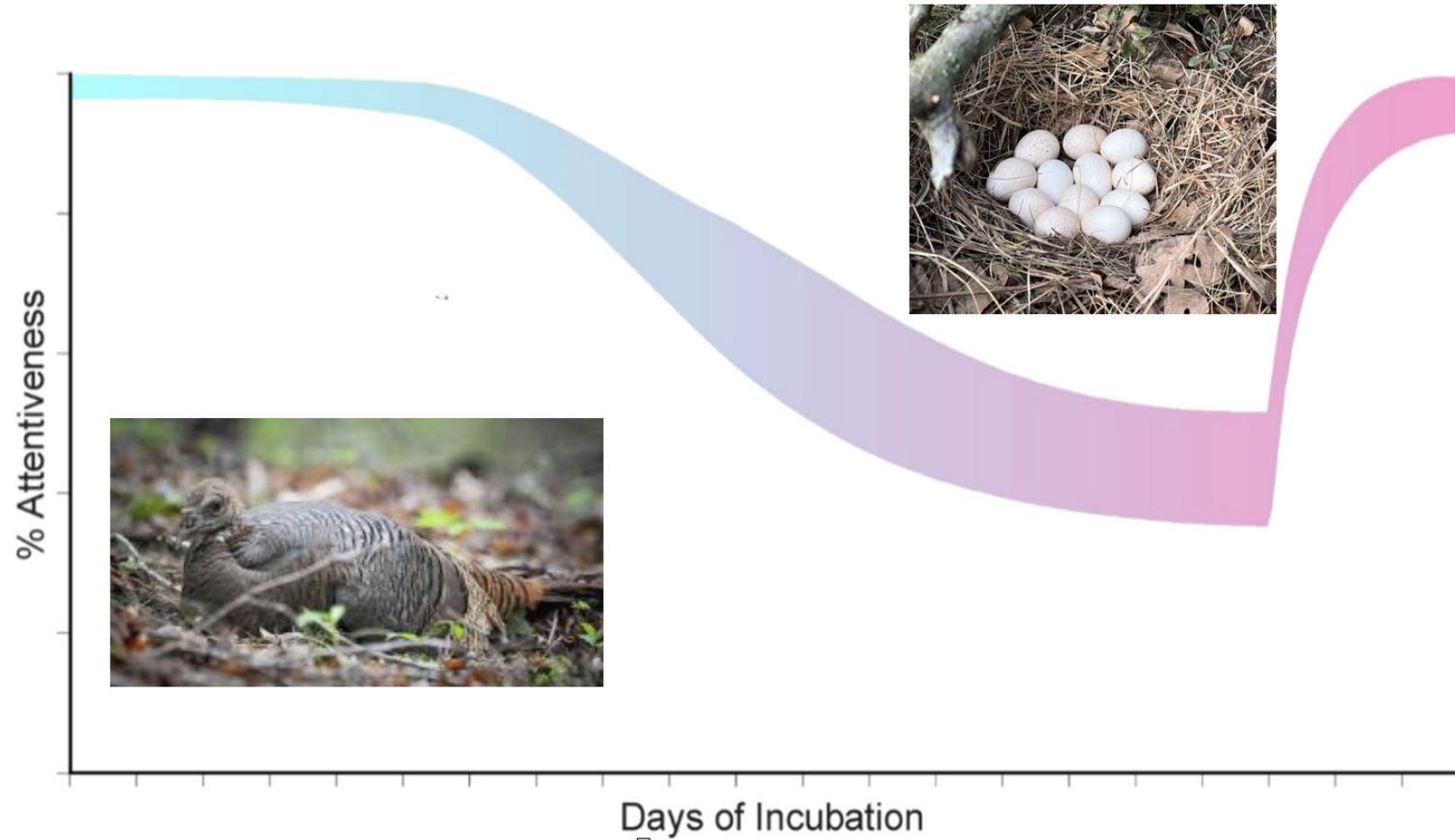


Embryonic Development of the Turkey

Week 1	 Day 1	 Day 2	 Day 3	 Day 4	 Day 5	 Day 6	 Day 7
Week 2	 Day 8	 Day 9	 Day 10	 Day 11	 Day 12	 Day 13	 Day 14
Week 3	 Day 15	 Day 16	 Day 17	 Day 18	 Day 19	 Day 20	 Day 21
Week 4	 Day 22	 Day 23	 Day 24	 Day 25	 Day 26	 Day 27	 Day 28



Nature is our reference





Developmental milestones by day 11

- ▶ More bird-like in appearance
- ▶ The allantois reaches its maximum size
- ▶ Legs have developed scales and toes are beginning to curl
- ▶ The aorta is visible along the neck
- ▶ The intestine begins to push into the yolk sack, the stalk is fully formed

The remainder of the incubation period is primary for the growth and maturation of these organs

From day 11 to day 25 of incubation, a turkey embryo's body size increases significantly, with its weight increasing approximately 10-12 times

- Weight at Day 11: 3-4 grams
- Weight at Day 25: 35-45 grams





The main CCP

► In the exothermic phase, the embryos generate a substantial amount of metabolic heat

⚠ The embryos' temperature is the critical factor for healthy development

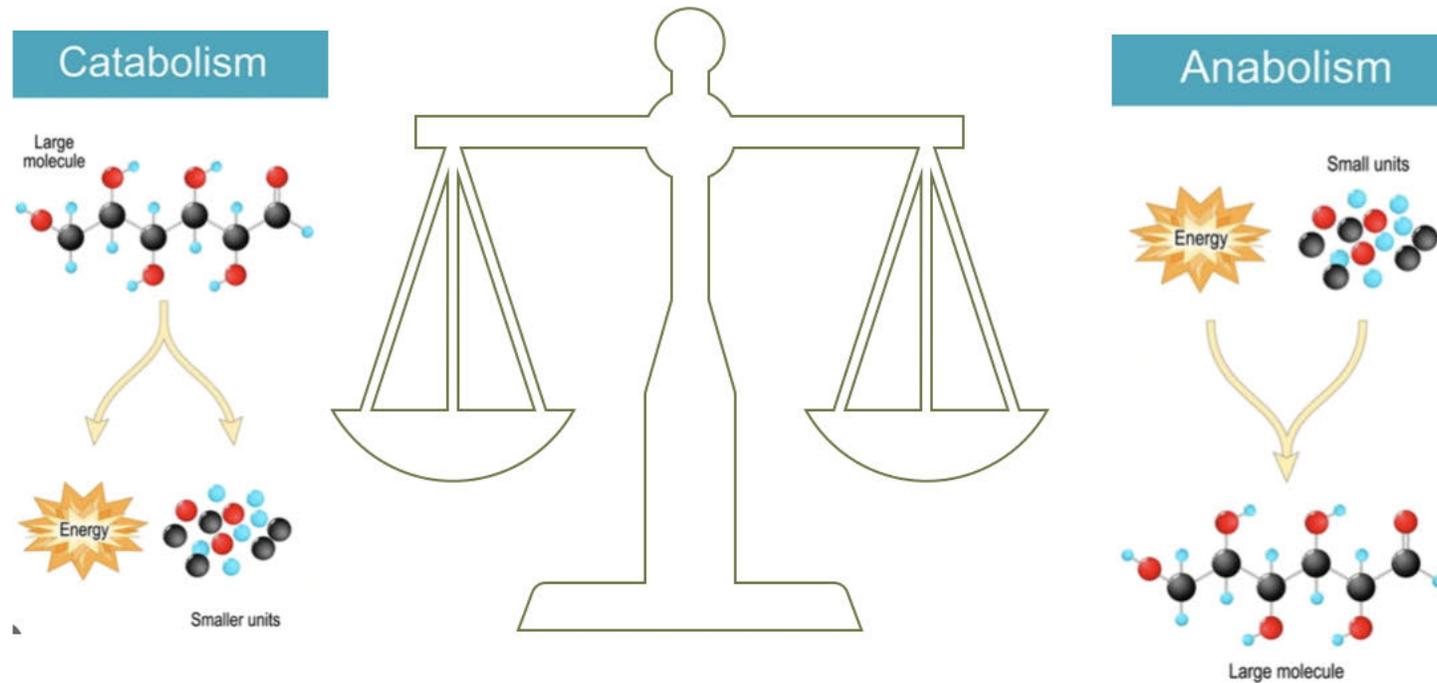
⚠ The embryo's body heat is higher than the surrounding air





Metabolic balance

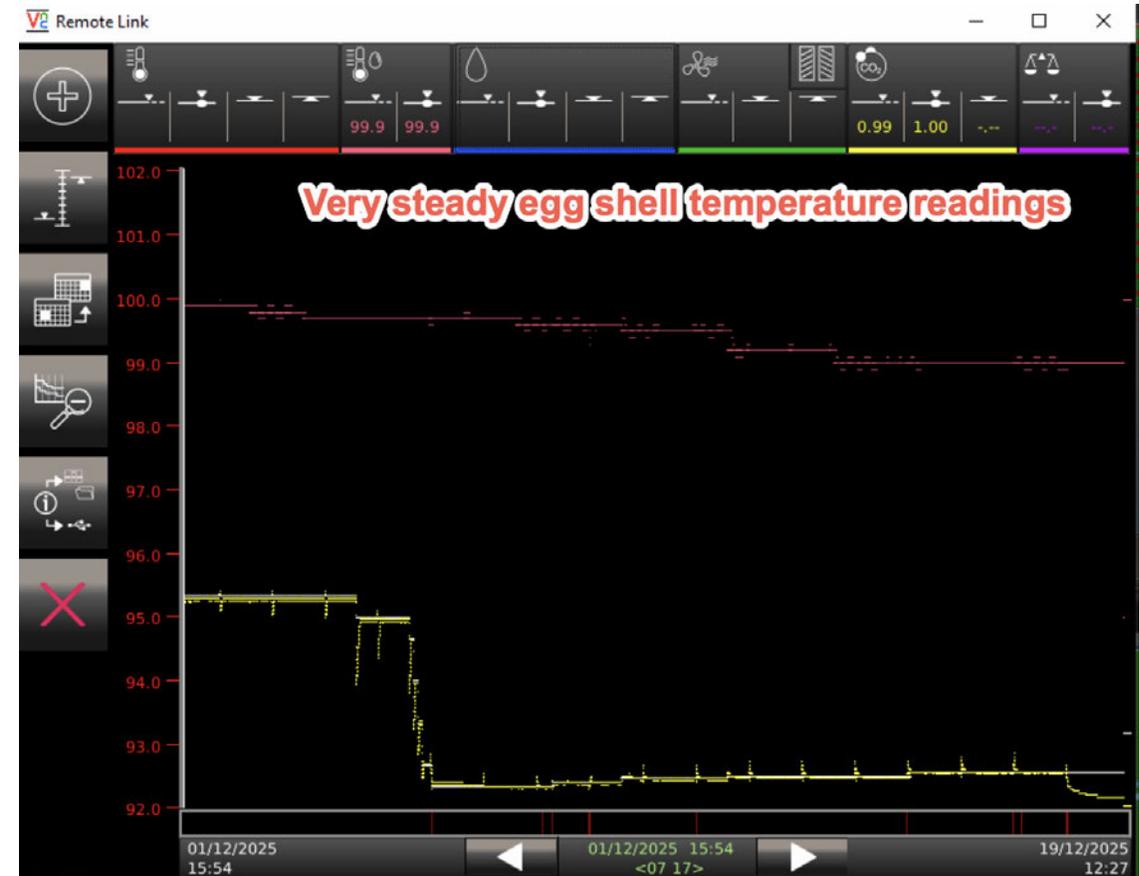
The **eggshell temperature** is one very important detail that we need to account for → it regulates the metabolic rate .





A balanced incubator temperature wise

- ▶ Very small deviations +/- 0.3
- ▶ As many eggs as possible “feel” very similar environment





11-12% WL in day 24-25

- ▶ The air cell is at 1/3 of the longitudinal diameter of the egg
- ▶ Proper size of the yolk sack
- ▶ Proper body size of the embryo





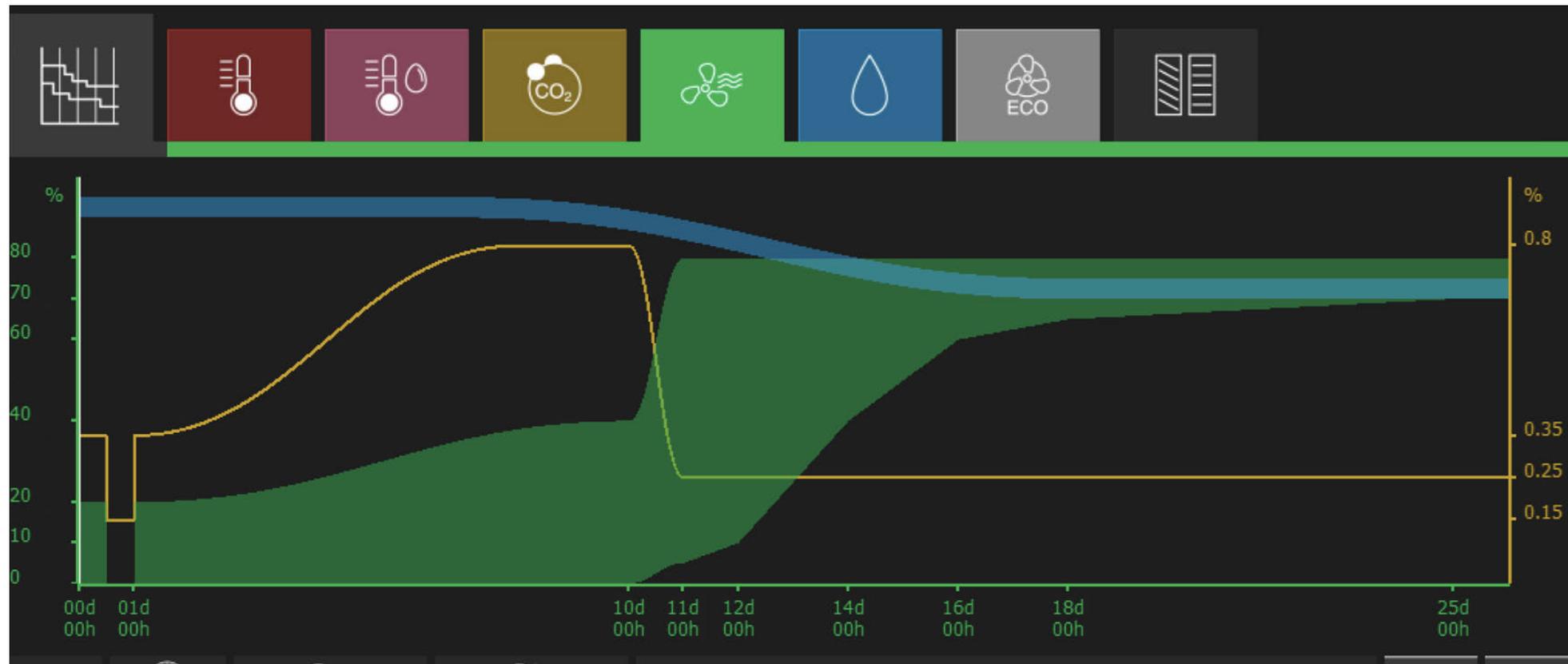
Insufficient %WL at day 24-25

- ▶ Small air cell
- ▶ A layer of fluid between the embryo and the membrane of the air cell

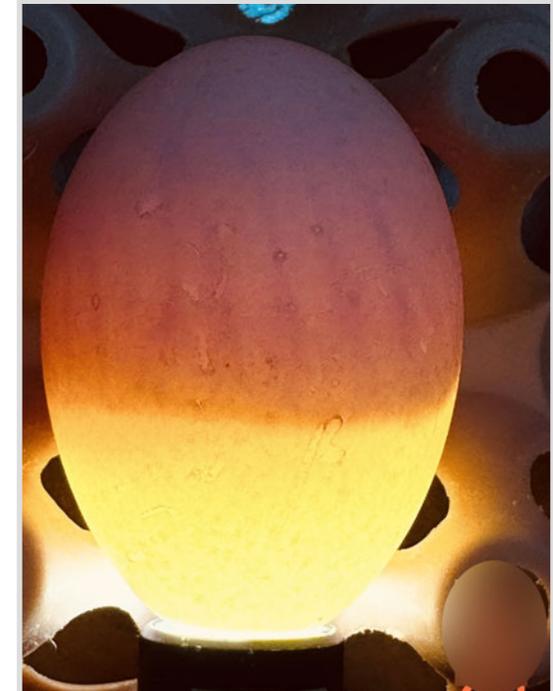




Achieving the right %WL ?



Good %WL \leftrightarrow good ventilation \leftrightarrow good CAM





Poorly developed CAM :

- ▶ Slow growth, weakness and late embryonic mortality
- ▶ Reduced calcium mobilisation
- ▶ Pore waste exchange -> increase of metabolic waste
- ▶ Lower hatchability and weaker poults cause by late dead, high % of pore quality poults



Turning in the exothermic phase

- ▶ Improves *heat distribution* and prevents hot spots
- ▶ maintains *proper CAM function*: CAM thickens, vascularises
- ▶ Prevents the embryo from adhering to the membranes late
- ▶ Improves *yolk utilisation* : no flattening on one side, better absorption



CONCLUSIONS

Optimising the **eggshell temperature** program, the **ventilation** program and the **turning** are essential for every embryo the conditions it needs to reach its full genetic potential.

Consistency in these basics is what separates average results from excellence hatchery performance.



QUESTIONS?



Thank you !

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