

# Hatching window and how to improve it



**R Keith Bramwell, MS, PhD**

*Director Hatchery Consultancy, Embryologist  
Jamesway Incubator Company*

History of incubation teaches the **importance of understanding how each incubator system works and can help us to understand how to manage it to obtain optimum hatch windows.**

Understanding basic factors of incubation helps us to understand how to control the incubation process. Temperature controls growth rate of the embryo, humidity controls moisture loss, ventilation helps with gas exchange and to have a uniform environment and turning controls embryo movement and development.

Artificial incubation mimics mother nature to create a complete environment from the beginning to the end.

However, it is not exactly the same due to the size of incubators, number of eggs, and the differences between hen contact and transfer of heat.



However, it is useful to **understand activities of hens during the incubation and right after hatch to learn how artificial incubation can be improved.**



Birds are classified as **altricial** or **precocial** of something in between depending on their stage of development and parental care at time of hatch.



- ▶ **Precocial birds** are hatched in a relatively developed state, have a dense well-developed layer of down, are able to walk, run, and often swim soon after hatching, and can feed themselves or find food with parental guidance.



- ▶ **Altricial birds**, on the other hand, are born in an underdeveloped state, naked with scarce patches of down, are unable to move much and entirely reliant on their parents for food, warmth, and shelter until they grow to a more independent stage.

### **Pre-incubation and egg development varies between altricial and precocial birds.**

These types of birds differ on egg composition. Precocial birds like chickens will need more yolk content, while altricial have more albumen, because they will be fed and needs less energy. Altricial birds have long hatch windows. But precocial tend to hatch in a short period of time to leave the next together to go out and find feed.



Precocial are almost fully developed at hatch, with open eyes and down, are active and mobile, not confined to nests.



**Hatching in poultry is possible because naturally they communicate at hatch time, and it is part of their nature.**

Hatch window of precocial birds like Mallard duck is as short as 2 to 4 hours and 24 hours in Galliformes. In contrast, in altricial birds can take to 2 to 4 days or more.

Egg size and uniformity is important to obtain uniform chicks and flocks. One aspect to improve uniformity is having small hatch windows.



The **hatch window** is the term used to **describe the time from when chicks begin to hatch until the last finish hatching**. In single stage incubators normal hatch windows are 24 hours, but in multi-stage incubators it is at least 30 hours. **Optimum hatch window will be 24 to 26 hours.**





**The humidity curve shows the hatch window.** Humidity starts to increase due to external pipping. Humidity starts to drop as all birds are hatched and begin to dry off.



**If hatch window takes too long, it can cause dehydration of the first chicks. If it is too short not all birds may have hatched by the time the baskets are taken out.**

To dry out completely, chicks need 6 hours after the hatch window has finished.

In a single stage, at peak of hatch, 70 to 75% of the chicks should be hatched. Once the reach peak hatch should be pulled 18 to 20 hours later, 12 hours to finish hatching and 6 hours to dry time. At pulling time 10% of the chicks should be wet or just hatched.

In a multistage hatch window is monitored by spraying. When there is the lowest spraying, they should be at peak.



**The Hatch window should be as short as possible.** Eggs from younger and older hens, eggs stored for a long time will have wider hatch windows.



Factors that can affect hatch window are **breeder age, egg size, egg storage duration, egg gathering and handling** prior to incubation. Proper prewarming can reduce hatch window, but improper prewarming can increase it.

Proper hatch window will contribute to have chicks at the farm with uniform stage of development which will contribute a lot to final flock uniformity.

Long hatch window can be caused by:

- **micro-environments** during egg storage or during incubation with hot or cold spots, **poor ventilation** in setter or hatcher.



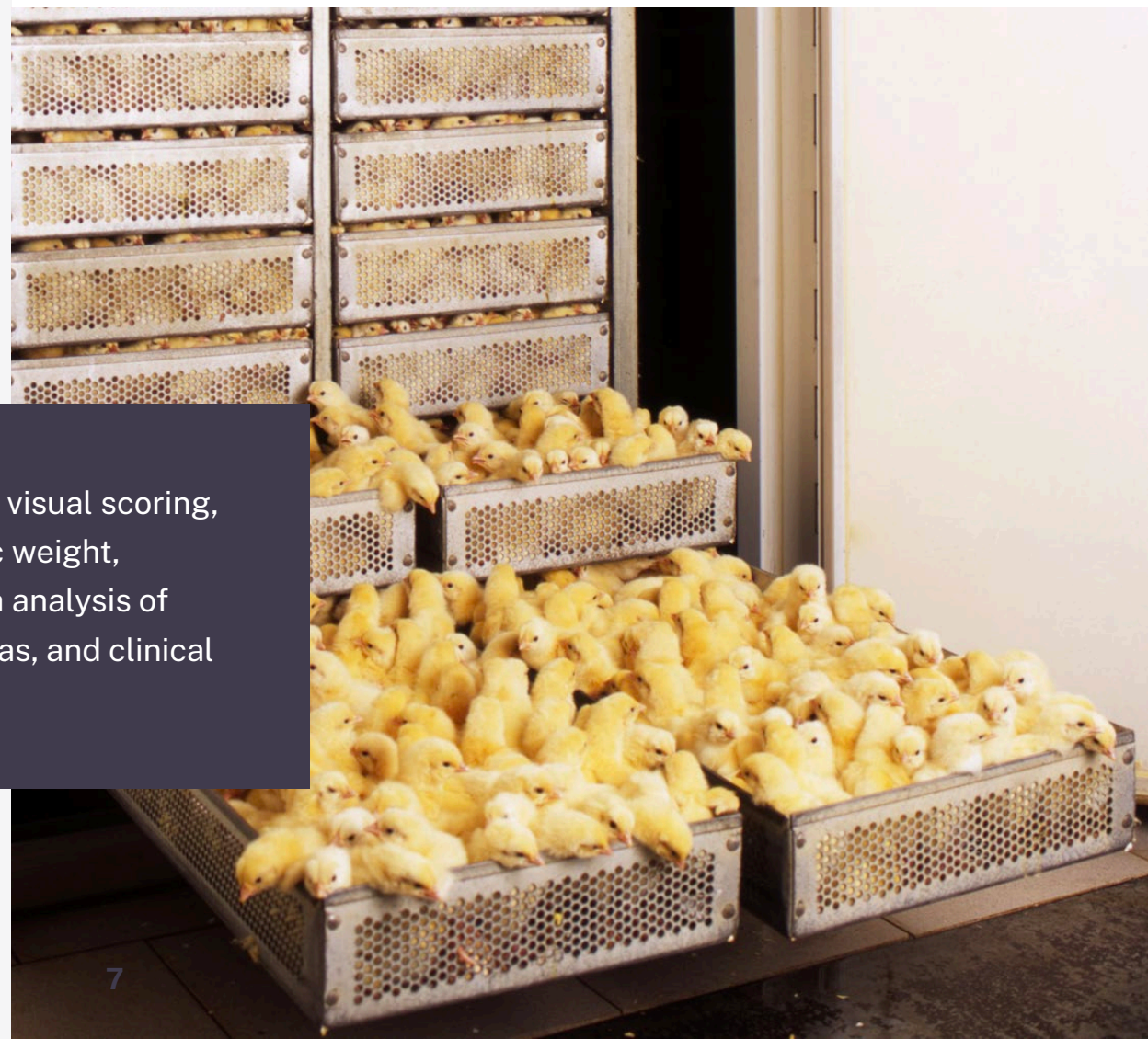
**The hatch residue breakout data can help to detect areas of the machine where more embryo mortality occurs.**

Results of an extreme long hatch window are **poor chick quality, dehydrated chicks, green chicks, unhealed navels, chick size variation, higher 7-day mortality.**

Chick quality can be a good way to evaluate Hatching window.



**Methods to evaluate chick quality:** visual scoring, chick hydration, activity sound, chick weight, moisture loss and chick yield, hatch analysis of residue breakout, yolk-free body mass, and clinical pathology.



# Thank you!

## **Grupo de Comunicación Agrinews S.L.**

*Avinguda de Jaume Recoder, 17, 08301 Mataró,  
Barcelona (España)*

*[info@grupoagrinews.com](mailto:info@grupoagrinews.com)*

*Tel: +34 93 115 44 15*