

# International Hatchery Practice

Volume 32 Number 3 (2018)

Practical information for better breeding and hatching

## EARLY FEEDING

Is it really necessary and beneficial?

## MONITORING

Salmonella, mycoplasma and AI in parent breeder flocks

## BREEDER NESTS

We look at options from around the world

## CHICK DEVELOPMENT

Effect of post-hatch feed deprivation

## INCUBATION & FERTILITY

Papers from the IFRG 2017 Meeting

## EGG STORAGE

Heat treating stored eggs to improve hatchability



# Is the early feeding of chicks really necessary and beneficial?

Development of the avian embryo, or chick, can be categorised into one of two strategies designed to meet two very different physiological and biological needs. The avian embryo will develop as either an altricial or precocial chick, each with their own specific set of needs necessary to survive after hatch.

---

by **Dr Keith Bramwell,**  
**Senior Technical Advisor,**  
**Jamesway Incubator Company.**  
[www.jamesway.com](http://www.jamesway.com)

---



When comparing the two incubation and developmental strategies, the altricial chicks undergo a significant amount of their 'embryo growth and development' after hatch while the parents are feeding the helpless chick and precocial chicks undergo a more significant portion of their 'embryo growth and development' during the incubation period so they can hatch 'ready to go'.

## ● Altricial chicks

Altricial chick development is common in perching type birds that usually nest in trees, birds such as songbirds, pigeons, raptors, etc. The young hatch as helpless naked birds which are unable to open their eyes or even hold up their heads. The young altricial chicks cannot maintain their own body temperature, even for short periods of time, and are thus very reliant on their parents for warmth and brooding.

Additionally, the parents, usually both are involved, are very instrumental in feeding and caring for the newly hatched chicks until they fledge the nest to begin life on their own. These types of birds will lay their clutch of eggs over several days and will usually begin to incubate the eggs before all eggs are laid, resulting in chicks hatching at various intervals over a period of a few days.

The newly hatched chicks will stay in the protected nest away from most predators and are fed individually by their parents. Because the chicks hatch over several days, there is often a great size difference between the chicks; with the last hatched and smallest of the clutch often

succumbing to the increased competition for food and space from their larger siblings. The growing chicks are then fed and cared for until each one has developed enough to leave the nest.

## ● Precocial chicks

Precocial chick development is common with the majority of the ground dwelling and ground nesting birds, such as chickens, turkeys, ducks, pheasants etc. The young precocial chick hatches with a warm covering with the ability to reasonably maintain body temperature, eyes are open with no reliance on the parents to physically bring food back to the newly hatched chicks, as they are able to walk within hours after hatch.

The mother will lay her clutch of eggs over a period of several days to a couple of weeks, depending upon the clutch size. However, she will not begin incubating the eggs until all the eggs are laid to try and maintain a narrow hatch window as the newly hatched chicks will all need to be escorted together by the mother away from the nest site in search of food.

To enable these precocial chicks to hatch together and leave the nest together, there are a couple of biological mechanisms in place to facilitate this function. First, in the hours leading up to the completion of the hatching process, precocial chicks engage in an activity called 'clicking' where the chicks are able to communicate with each other from within the shell in an effort to synchronise the hatch time.

The second is that eggs that produce precocial chicks contain a higher percent yolk (~40% vs 25%) as compared to eggs for altricial chicks. This allows the chicks to remain in the nest after hatch to wait for the other chicks to hatch so they can all leave the nest together. Nature intended for the chicks to use this available yolk to synchronise the post hatch feeding process between all hatchlings.

If the first hatched chicks try to forage for food without the mother or the group they may become subject to predation without the protective instincts of the mother. This is what nature intended; that all chicks are able to begin feeding at the same time with the first hatched chicks utilising the nutrients in the yolk in an effort to synchronise the early feeding process.

## Feeding commercially hatched chicks

Following what nature has designed and intended, is it really necessary and beneficial to feed newly hatched chicks immediately after hatch? In nearly every area of poultry production systems, uniformity is a key and very critical component to success.

When it is not achieved inefficiencies often result in areas including the hatchery, the brooding house, and all the way to the processing plant. It is widely known and accepted that when chicks are not uniform

*Continued on page 9*

Continued from page 7

from the start, problems will ensue whether they be replacement parent stock or broilers destined for the market.

Uniformity in replacement breeders has been shown to result in a better and more productive breeder house. Uniformity of young breeders tends to 'level the playing field' during rearing and allows the birds to more evenly compete with each other for resources such as food, water and space.

Feed consumption and light duration is controlled and limited to encourage the majority of the birds to mature at an even pace, responding to light stimulation together and thereby commencing egg production together.

Uniformity in the breeder house has been shown to improve egg size uniformity, egg production and broiler flock performance.

Uniform egg size results in uniform chicks. When placed chicks are more uniform, productivity of the entire flock is improved. Nearly every hatchery manager desires the most uniform egg size possible, and nearly every broiler manager or grower would greatly prefer chicks that are sourced from similar aged parent flocks to improve the uniformity of chick size at placement.

When chicks are placed that hatched from eggs or from parent flocks of greatly varying ages, dramatic size differences in the chicks is often the result and overall poor flock performance results.

### Early feeding programs

In the case of the various early feeding programs, a number of factors of concern must be considered.

It is well known that research has continually shown that when feed is withheld from chicks after hatch, there is a delayed growth curve in those chicks as compared to chicks from the same hatch that were provided with feed immediately at placement.

The chicks that had feed withheld from them for periods of time after hatch will never catch up with the others of the same age and hatch and therefore would take a



day or so longer to reach the desired market weight. It would be inadvisable for anyone to intentionally place birds in a single house that had hatched and therefore begun food consumption at one or more days apart from each other, as final flock uniformity would be negatively affected and birds would be sent to the processing plant with one or more day's difference in growth rate.

Additionally, the unfed chicks placed in a house that are seeing food for the first time, have to compete with chicks that have had access and have consumed feed and water for various periods of time.

This increased competition would likely be another cause to negatively affect uniformity as the chicks that have had feed for extended periods of time would be much more active and running around the chicks that are still searching for food.

Would a producer want to take a group of hatched chicks and immediately place some on feed and water then intermittently over the next 36 hours, place new groups of newly hatched chicks in that same house and let them compete for food and water with the older chicks?

Nearly all would decline to do this. This would create a less uniform housed group of chicks from the start, resulting with the last chicks placed, never catching up in terms of body weight and food consumption.

Essentially, this is what is happening when chicks are fed as soon as they hatch; they are all starting on feed at different time

intervals in relation to each other. If in replacement breeder farms, birds are fed and light managed in a manner to allow birds to mature at each bird's own pace, the results would be exceedingly poor uniformity and poor overall performance of the breeders and the progeny.

If hatched broilers are each allowed to consume feed as soon as they hatch, the same result is likely, poor uniformity.

### Summary

Nature, and the biology of the precocial chick, is designed for the optimal survival of the group of chicks as a whole with the first chicks hatched utilising their yolk reserves to be ready for all chicks to begin feed consumption at the same time. This is the natural process of precocial chick growth and development.

While it may be beneficial for an individual chick to begin feed consumption immediately after hatch, the growth and development and uniformity of the group of chicks may be hindered.

Currently, research in a controlled setting is underway to more fully investigate this practice of early feeding to compare livability, growth and uniformity of the birds through processing with groups of birds from the same hatch where feeding is initiated at the same time to the entire group of hatched chicks. Once these studies are concluded, the science will support the best procedure. ■

DELIVER BETTER CHICKS

# Heering

ESTABLISHED IN 1865,  
SERVING HATCHERIES WORLDWIDE.

WINNER VIV ASIA 2017 INNOVATION AWARD

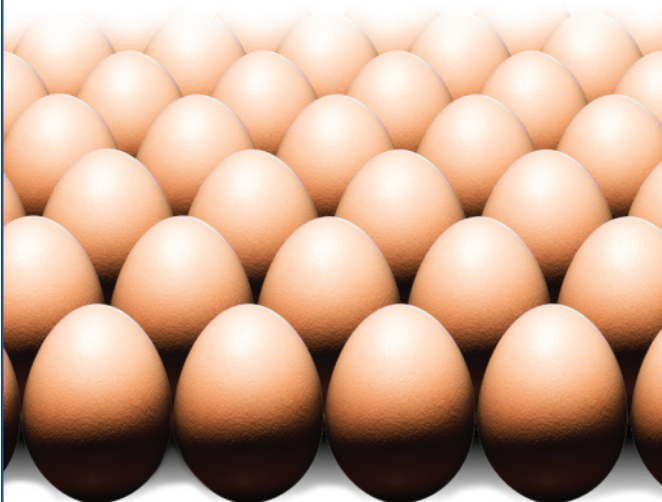
WWW.HEERINGHOLLAND.COM

# WORRY FREE HATCHERY

It is a state of mind.

It's knowing your equipment is solid, that your HVAC is efficient and that your embryos are nestled in the perfect environment.

**Easy to Use**  
**Easy to Install**  
**Easy to Maintain**



**JAMESWAY**   
The Incubator Company  
[www.jamesway.com](http://www.jamesway.com)





## EFFICIENT SYSTEMS



Küçükbakkalköy M. Vedat Günyol C. Ulugöl Plaza  
No.20 K: 7 34750 Ataşehir, İstanbul / TURKEY  
T. +90(216) 444 6 887 | F. +90(216) 364 66 30  
[tavsan@tavsan.com.tr](mailto:tavsan@tavsan.com.tr) | [www.tavsan.com.tr](http://www.tavsan.com.tr)



## PURE WHITE MAGIC!

- Highly productive and excellent feed conversion
- Outstanding livability and good behavior
- Successful in every housing system
- Great persistency
- Superb shell quality

[www.dekalb-poultry.com](http://www.dekalb-poultry.com)

**HENDRIX GENETICS**  
Sporstraat 69, 5831 CK BOXMEER, PO Box 114, 5830 AC BOXMEER, Netherlands-EU  
+31 485 801911 | +31 485 801912 | [info@hendrix-genetics.com](mailto:info@hendrix-genetics.com) | [layers@hendrix-genetics.com](mailto:layers@hendrix-genetics.com)