

Breeder management to optimise day old chick production

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The objective of any layer hatchery is to produce the highest number of sellable day old chicks. Hatcheries have to pay attention to the management of their breeder flocks to improve productivity and day old chick quality.

Rearing of parent stock

First of all, rearing of parent stock plays an important role in the future performance of the breeders.

Some basic recommendations have to be followed such as availability of feeders and drinkers in order to promote access to feed and water.

As for commercial layers, the first week's bodyweight will influence many production parameters during the production period such as laying persistency and livability (see Fig. 1).

Getting the best possible bodyweight at five weeks of age and a good uniformity in end of rearing should be a priority. To reach this objective, we recommend using a good quality starter feed in crumble form that promotes fast growth. This is particularly important because internal organs and immune system development will develop mainly during the first five weeks of life.

Vaccination program

The rearing period also gives the opportunity to build up immunity against several diseases through vaccination.

Vaccination answers several objectives:

- Protection of the parent flocks and prevention of diseases that would damage productivity in terms of hatching eggs or hatchability.
 - Provide maternal antibodies that would protect the offspring during the first weeks of rearing from a field challenge.
 - Prevent vertical transmission of pathogens to the young chicks.
- The vaccination procedures should

be carefully applied in order to get the best response to vaccinal strain. The vaccination program should be re-evaluated regularly according to field experience. Sometimes vaccination during the laying period may be requested to maintain high protection of the breeder flocks.

Access to a laboratory to follow the hygiene status of breeder flocks is also crucial to regularly test flocks for main pathogens. Frequency of testing should be adapted to national regulations and the internal requirements of the hatchery.

Controlling bodyweight

People do not pay enough attention to parent stock bodyweight during the laying period. Evolution of bodyweight and uniformity is crucial at start of lay when birds have to finish their growth and start egg production.

If daily energy intake is not enough during this period, we can observe a drop of production after a normal start of lay, as birds stop their egg production to finish their growth. We consider that breeders should grow from 300g between 5 and 90% of laying rate to avoid this risk of drop of production.

After peak of production, keeping a good frequency of bodyweight control will help to anticipate technical or sanitary problems in breeder flocks. Any important evolution in the bodyweight or the uniformity of a breeder flock will need special attention to prevent egg production losses. A must is to maintain weekly controls for the whole life of the flock.

Feed for shell quality

Hatchability of breeders is correlated with egg shell quality. The way the birds are fed can influence shell quality and as a consequence hatchability.

It is recommended to feed the birds mainly in the afternoon (for 60% minimum) for several reasons:

- The natural behaviour of birds is to eat in the afternoon.

	Bodyweight (5 weeks)	Bodyweight (10 weeks)	Uniformity (16 weeks)
Sexual maturity between 20-24 weeks (%)	+++ 0.63	+++ 0.59	0
Sexual maturity between 68-72 weeks (%)	+++ 0.82	0	++ 0.46
Egg number at 60 weeks	+++ 0.83	++ 0.30	+++ 0.54
Egg number at 72 weeks	+++ 0.93	0	+++ 0.72
Liveability at 72 weeks	+++ 0.71	0	++ 0.40

+++ = Very good correlation, ++ = Good correlation, 0 = No correlation

Fig. 1. Correlation between bodyweight/uniformity with production parameters.

● Feeding the birds in the afternoon will provide them with calcium at the moment the shell is produced. In this way, calcium from the medullary bone is less mobilised and this reduces the risk of osteoporosis in the long term.

This also reduces the risk of deficiency in phosphorus for the birds, as release of calcium from the bone also releases phosphorus that is eliminated. Therefore, feeding in the afternoon tends to reduce phosphorus losses.

The size of calcium particles also

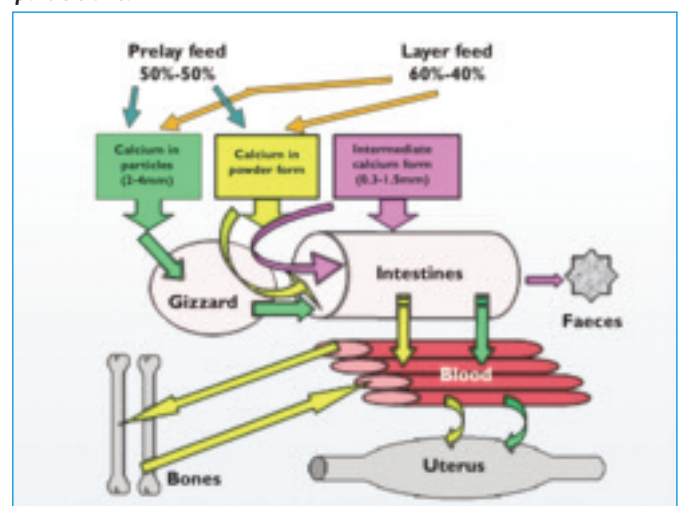
influences its availability. We recommend using a mix of calcium in powder that will be quickly metabolised and calcium in 2-4mm particle size that will be retained in the gizzard and slowly released.

Calcium in an intermediate size will be too big to be metabolised immediately and too small to be retained in the gizzard, so a big part of this calcium will be expelled in the faeces (see Fig. 2).

The use of pre-lay feed (with 2.0-2.5% calcium) for the two weeks

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Fig. 2. Metabolism of calcium in breeders depending on calcium particle size.



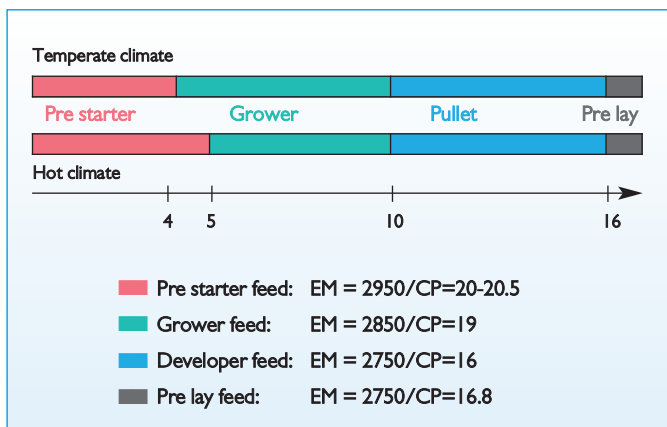


Fig. 3. Feed formulas in the rearing period.

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before start of lay (see Fig. 3) will promote calcium storage in medullary bones before the start of lay and as a consequence reduce the risk of early osteoporosis.

Special attention needs to be paid to feed particle size. If feed is too powdery, birds may reduce their feed intake with reduction in egg size and egg production as a consequence (see Fig. 4).

The way birds are fed is also important. We recommend feeding birds ad libitum for the first six weeks in rearing and then switch to meal feeding (2-3 feed distributions per day). This will promote fast eaters able to ingest quickly the quantity of feed needed to cover the needs of the birds during the laying period.

In hot climates, temperature of the water delivered to the birds may also influence feed consumption: if water is too hot, birds will reduce feed intake with lower egg production and shell quality.

Lighting program

We consider the day old chick weight is two thirds of the hatching egg weight, so egg size will directly influence the chick size.

A strict control of photo-stimulation is recommended to control the egg size that is linked with the age and bodyweight at light stimulation.

Particular attention should be given to the influence of natural light on bird stimulation. A too early photo-stimulation from this natural light will promote early egg production with a lower egg size and possibly generate prolapse problems on the breeders.

We recommend in general to stimulate the layer breeder flocks at start of lay (2% lay) and not before 18 weeks of age.

Addition of artificial light should be done as much as possible in the morning in order to promote feed consumption in the fresh time of the day.

When possible, midnight lighting (give two hours artificial light three

hours after light off) can also help to secure production by:

- Giving additional time for feed intake in a cooler period (important in a hot climate).
- Providing additional calcium in the middle of the night that will be metabolised immediately and improve egg shell quality (see Fig. 5).

Male management

Wrong male management may be responsible for delay in hatching egg production or hatchability problems:

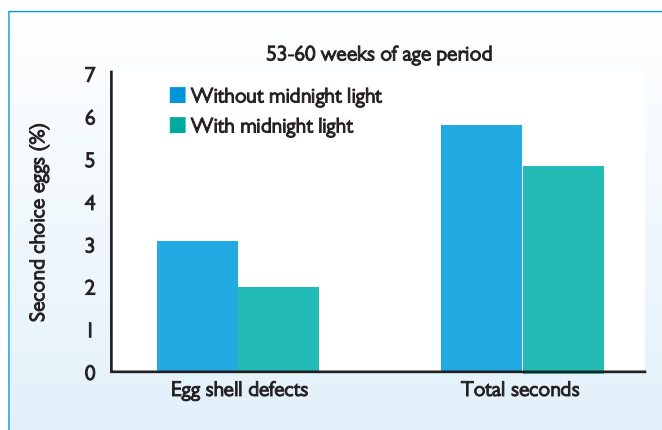
- Males can regroup in some parts of the house (in particular at the end of rearing period) and restrict access of females to nest, water lines and feeders or even beat the females.

As a consequence feed/water consumption may be reduced (lower egg production or egg shell quality) or birds may not go to the nest or be afraid of the males (increase of floor/dirty eggs and lower hatchability).

In case of such regrouping, some of the males should be immediately separated from females and placed in a special pen. They can then be reintroduced progressively at start of lay.

- If males are reared separated from the females, mixing should start not later than 12 weeks of age.
- At transfer time, we recommend

Fig. 5. Effect of midnight light on egg shell quality. Night lighting could reduce graded eggs by 200 (30%). (UCAAB 2001-2002).



Particle size (mm)	Good	Fine	Variation (%)
<0.5	9	31	
>3.2	10	0	
0.5-3.22	81	69	
>1.6	65	21	
Lay (%)	93.9	90.7	-3.4
Egg weight (g)	63.30	62.70	-0.9
Egg mass (g/d)	59.41	56.85	-4.3
Feed consumption (g/day)	118.1	114.2	-3.4
FCR	1.989	2.008	+0.9
Bodyweight (33 weeks)	1.930	1.883	

Fig. 4. Influence of particle size of feed on performance of layers.

keeping only 5% males with females and reintroduce the remaining males progressively.

Hatching eggs management


On top of egg production itself, care provided to the hatching eggs is also important to secure hatchability and day old chick quality:

- Floor eggs should be collected separately from regular hatching eggs. They should not be set to produce chicks as they could be a source of bacterial contamination.
- Hatching egg selection should be done carefully in order to reject cracked eggs, too small or double yolk eggs.
- If eggs are collected on setter trays, they should be placed in the right position (rough end up). Eggs in a wrong position will not hatch correctly.
- Nests should be regularly cleaned and even disinfected to reduce as much as possible contamination of the shell surface.
- Eggs should be disinfected as soon as possible in the farm in order to reduce initial contamination of the egg shell. A second disinfection should also be done in the hatchery


at delivery of the eggs to the hatchery or just before setting.

● The storage room should be cool enough to avoid early development of embryo during storage. In general, the recommended temperature is $16^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

Management of parent stock flocks is crucial to optimise hatching egg or day old chick production and deliver to the market the best quality chicks. A lot of different parameters may influence those technical results and need to be controlled. ■



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