

The nutritional management of future broiler breeder females

The rearing period of future breeding pullets is a key stage in their life and one that will allow them to express their genetic potential. With technical and economic performance aims in production, the quality of pullet management during the first 20 weeks of life must follow certain rules.

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In this article, we would like to give some advice on the nutritional management of pullets during the rearing period.

The growth of future breeding pullets is divided into three very important phases. Each phase is accompanied by a very specific feed formula that meets the different challenges and objectives of the animals' development.

The starting phase

● From day one to five weeks of age:

The objective of this first phase is to secure the growth profile of the chicks to ensure good body development of the future breeding females. We first try to promote the development of all the organs of the immune system (all organs except the reproductive ones), and then to ensure the skeletal and muscular development of the chicks.

It is therefore essential to do everything possible from the moment they arrive to promote the intake of a feed that is rich in protein (organ development), lysine and other complementary amino acids (muscle development, feathering of the animals) and with a balanced calcium/phosphorus ratio (close to two) to promote good bone growth.

A solid skeletal development allows for muscle mass afterwards. A good premix is necessary to ensure the quality of all nutrients without any degradation during the preparation of the feed. In this first phase, we recommend presenting the feed in the form of crumbles (with a

granulometry adapted to the size of the animals, for example between 1.0-2.8mm for a starter) to concentrate the feed and avoid sorting by the chicks.

A presentation in the form of mash during this first phase could lead to feed imbalances and would not stimulate the chicks to consume (it is very rare to observe this in the field).

On arrival of the chicks, we advise offering enough feeding points (and water points) to ensure the interaction of the chicks with the environment and with the feed, and to allow each one to consume the feed (one plate per 50 chicks).

As soon as the starter material is removed (at the end of the eighth day of age), we recommend paying particular attention to the feeding space during the whole rearing period (a dwarf hen of 20 weeks of age requires for example ~11.5cm of feeding space).

Depending on the richness of the feed formula, we can recommend letting the chicks feed ad libitum during the first two weeks of life. This non-restriction must however be accompanied by a daily 1-2 hours of empty feeders to allow all chicks to consume the fine particles.

These fine particles contain mainly amino acids and vitamins essential to the good development of the future chicks, so they should not be thrown away if they are not consumed. An empty feeder also stimulates scratching and pecking behaviour, and favours the ingestion of refusals (improves the feed conversion ratio and therefore reduces production costs).

A high protein diet in the early stages of life can lead to some digestive disorders. This is why we recommend supplementing the drinking water from day one with organic acids (not mineral acids which can demineralise the skeleton) to buffer the pH around 3.5-4.0.

This reduction of the pH of the water will help the digestion of the chicks and will avoid any form of enteritis during the first days/weeks of life. This acidification of the water should be continuous during the first five weeks of life, then by period, at each feed transition or before and after each environmental stress (temperature for example). This helps to avoid the appearance of *E. coli* when the animals are sensitive.

Finally, we advise offering a night of 18 hours on the fifth day of age to allow the chicks to rest and digest. This method can considerably reduce the number of chicks blocked from a digestion point of view (chicks that will not grow anymore).

Finally, it is important to follow the growth of the pullets every week. Depending on the uniformity of the batch, we recommend proceeding to a grading in two or three batches at 3-4 weeks of age to manage the global batch in different weight groups. This method allows a much more uniform batch at 20 weeks of age than a batch managed in only one group and thus allows better synchronisation at the start of laying.

This starting phase is very important and requires managing the comfort and accessibility of the chicks during the first

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five weeks of life. A five week old pullet must be at a breastbone score of about four (sufficiently round). Autopsies should show at this age a very thin layer of fat around the gizzard. The absence or the presence of too much fat reflects a poor body development of the pullet.

The maintenance phase

● From 6-15 weeks of age:

The objective of this second phase is to continue the skeletal and muscular development of the future breeders more slowly, while keeping a good batch uniformity. This phase can be divided into two stages: 6-10 weeks, then 11-15 weeks with even lower nutritional levels.

At these ages, we try to reduce the nutritional levels of the feed formula to keep the animal's development under control. We therefore reduce the levels of protein, lysine and complementary amino acids, while increasing the levels of fibre in the feed. This feed is richer in cellulose, which reduces the energy value of the feed and therefore increases the quantity to be consumed.

The fact that the feed is filled with cellulose naturally increases the consumption time, which helps maintain a good batch uniformity. This is also beneficial for the pullets' behaviour, as they are busy eating for a longer period of time. For better batch uniformity and less nervous behaviour, note that we advise distributing the feed in the dark.

This maintenance phase is also the phase where we start the fasting days. As this can be perceived as a stressful time by the pullets, we prefer to spread this transition from one meal a day every day to one meal a day five or six days a week over 2-3 weeks. These fasting days allow the crop to develop its elasticity and its capacity to ingest large quantities of feed in a short time. A higher fibre feed is again an advantage during this maintenance phase.

Again, it is important to monitor the average body weight gain of the future breeders on a weekly basis. As mentioned before, a five-week-old pullet should have a breastbone score of four. We will try to bring a pullet with a breastbone score (between 10-15 weeks of age) between two and three in this maintenance phase.

At autopsy, the pullet should not have a large layer of fat. A minimum, or ideally no fat layer, is important at this stage. Too much fat would lead to starting the sexual development of the pullets too early.

The pre-laying phase

● From 16 weeks of age to the first eggs:

The objective of this last phase of rearing is to develop the pullets' reproductive system, to start storing calcium in the medullary



bone and finally to allow the future reproductive pullets to develop a small fat reserve.

This phase is therefore accompanied by an increase in protein and amino acid levels to develop the oviduct and ovarian cluster. We try to increase the energy value of the feed at this stage to allow the hens to keep a small fat reserve just before laying. It will be important not to let the hen draw on her reserves to produce an egg, hence the importance of having a minimum reserve.

Therefore, the ADG of pullets for laying should be higher during this period than during the maintenance phase. On inspection of the pelvic bones before laying, they should be covered with a light layer of fat and the abdominal fat should be slightly felt.

At this stage, in order to stimulate the development of the ovarian cluster, we also advise gradually increasing the duration of access to water per day. Two weeks before transferring the hens, we recommend adding 15 minutes of water/day with the objective of arriving at the day of transfer at duration in water = duration in light.

The flock may strongly degrade the litter, which has little impact on the end of the rearing period. However, if the batch remains in the same building during production, we recommend a different water management to avoid this litter degradation.

Finally, this nutritional phase is accompanied by an increase in the calcium level to prepare for egg laying. The aim is to strengthen the medullary bone in calcium to allow the laying hens to have enough calcium reserves in case of need once the laying process has started. Note that organic acid helps in the storage of calcium.

This phase is crucial in preparation for laying. As long as the first eggs are not collected, it is important to keep the day(s) of fasting (at the risk of stimulating egg laying), and to continue to follow the growth curve.

This period is conducive to the important fattening of the hens, with an irreversible impact on the life of the animal (haemorrhagic livers, high mortality, lower performance). It is therefore important to

keep in mind that, at this stage, the hens only have maintenance needs and no production needs yet.

We recommend at this age, before the first eggs are laid, to supplement with a hepato-protector to allow the liver and kidneys to prepare themselves for the future feed stimulation. The feed intake will be significantly increased in a very short period of time, which will be perceived as liver stress. The hepato-protector does not have a curative role, but a preventive one. It will not reduce the fattening rate of your future layers.

Conclusion

The rearing period is just as important as the production period. The right nutritional management will cover the needs of the future breeding pullets during the three different phases of growth: a phase of development of the organs of the immune system, of the skeleton and of the muscular mass, a second phase of maintenance and finally a phase of preparation to lay.

These three phases have different stakes and targets which require observation of the animals, their behaviour, and their fattening state.

Sasso's lines are selected on different traits that may or may not be complementary: we will mention here, for example, the laying and the breast meat yields. The improvement of performance on specific traits leads to changes in skeletal and muscular morphology. This implies needs that change from one generation to the next. Let us take for example a SA51A female. In three generation's time (18 months), we have increased the hatching eggs by one egg between 26-57 weeks of age. We can therefore easily imagine that over several years the production needs change, as do the maintenance needs. It is therefore important to keep in mind that each batch is different. ■

This article was written in collaboration with Ruel Baptiste, MG2MIX Poultry Engineer.