ChickCare

Unlocking flock productivity

Reducing the gap between genetic potential and current performance of chicks

In current commercial broiler operations, chicks often experience delays in accessing to feed and water. This delay is reflected in reduced productivity. Therefore, feeding during the first days of a chick's life is vital to ensure successful performance. In addition, pre-starter feeds available on the market are generally based on the nutritional needs of chicks varying between seven and ten days. However, the current nutritional needs of those chicks have changed dramatically.

Through scientific studies, Trouw Nutrition has identified nutritional requirements for the development of broiler chicks in their first days of life, specifically analysing the mineral metabolism and functional proteins needed. Based on these studies, Trouw Nutrition is launching **ChickCare 0-4 days**, a completely new early-feeding product intended to optimise broilers' productivity by maximising their genetic potential from the beginning.

By using a micro-pellet as its vehicle, **ChickCare 0-4 days** guarantees a good feed intake, better digestibility and availability of nutrients. The combination of nutrients, minerals and premium class feed additives in this product improves chicks' performance at the beginning of the production cycle –allowing the birds to achieve maximum breast and carcass performance.

Figure 1 shows that this weight gain also manifests both in the final weight and in the improvement in feed efficiency reflected in the feed conversion rate. **ChickCare 0-4 days** technology promotes consistent growth throughout a chick's life, increasing the profit per chick for producers and therefore the economic gain at the end of production.

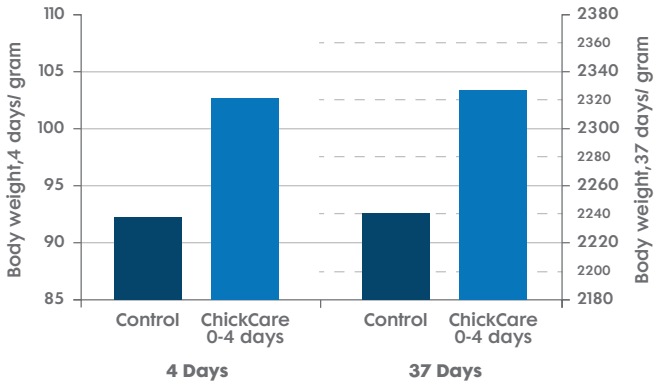

Figure 1. Live weight at 4 and 37 days

Key benefits of ChickCare 0-4 days:

1. Robust chicks
2. Supports early life health
3. Helps to enhance performance throughout life
4. Shortens productive cycles
5. Improves final body weight, carcass weight and meat yield results
6. Increases profitability per bird

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Feeding strategies from day one

This strategy combines the use of low calcium, functional proteins and specific nutritional recommendations in pre-starter diets.

"How old is a day-old chick?" This is a rhetorical question, but a vitally important one. Those responsible for incubators probably consider day-old chicks those that have just hatched. However, from the poultry farmer's perspective, the chick's age is counted from the moment it arrives at the farm. So the question is really, "How many days or hours old is a chick when it arrives at the farm?"

To define "age" correctly, we must remember that the time between hatching and arrival at the farm can vary greatly. Chicks do not all hatch at exactly the same time; there is a hatch window (figure 1), and there can be up to 24 hours between the first and last hatch. Once the chicks have hatched, they must be vaccinated, classified by sex and transported to their respective farms. This pre-settlement period can take over 40 hours.

Feeding after hatching

Traditional incubators or hatchers are known for being dark and having hardly any space to house feeders or drinking troughs, due to the number of chicks and shell remains. It is difficult to feed newly-hatched chicks in these circumstances. Several studies have shown that the longer chicks have to wait to receive their first feed, the lower their growth rate and the higher the mortality rate in the first few days.

To address this situation, a series of early feeding products have been developed in different consistencies (from simple gels to solids). However, none of these products has managed to dominate the traditional incubator market, probably due to limited ability to change conditions in the incubator itself that make consumption difficult.

As part of the search for potential solutions, some alternatives to traditional hatchery systems have been developed, such as equipment that promotes and supports hatching on the farm (where chicks would have access to water and food immediately on hatching) or new systems that provide access to food and water in the incubator itself.

Transportation and placement

During transport, the conditions are similar to traditional incubators. The chicks have no access to water or food and have to depend on reserves from the residual yolk until they receive their first food on the farm.

In the time between hatching and arrival at the farm (up to 48 hours), chicks lose 8% of their initial weight on average. This weight loss is partly due to absorption of the residual yolk, but mainly due to weight reduction in their tissues and organs.

Fasting before arrival at the farm also delays development of the intestinal mucosa, which impairs absorption of nutrients and reduces resistance to bacterial infection, resulting in underperformance and a higher risk of mortality.

Pre-starter diets

To mitigate the effect of low access to food in the initial hours after hatching, there are several start-up or pre-starter diets on the market. However, it is important to recognise that nutritional requirements change rapidly over the first week of a chick's life due to the continuous development of organs like the gastrointestinal tract and the immune system.

The chick's main source of nutrients also changes during this time; immediately after hatching, the residual egg yolk is the main source, a function that is gradually assumed by the food ingested. However, the most common feeding programmes only consider the first 10-14 days of the chick's life as a starter feed, ignoring its needs in the first week, especially the first few days after hatching.

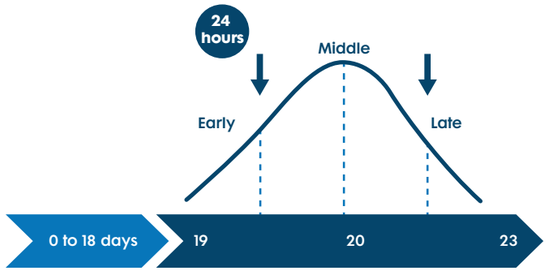

Figure 1. Birth window in the incubator

For this reason, it is crucial to the chick's start in life that the programme and approach to early feeding is focused on three key phases: 1) the period in the incubator, 2) transportation to the farm and 3) the first days on the farm (pre-starter diets). This last phase aims to alleviate the effect of delayed access to feed, taking into account the chick's rapid gastrointestinal development and limited ability to digest of nutrients. With this, it has been observed that pre-starter diets are the best shortterm solution and can be implemented without substantial changes to the current production system.

One of the main objectives of a pre-initiating diet should be to promote bone formation during the post-hatch period to sustain the intense subsequent muscular development. Good skeleton development depends on the proper formation and maintenance of organic and inorganic components, a process that begins during incubation and continues after hatching.

Calcium and phosphorus

During incubation, bone growth begins with mineralisation through the mobilisation of calcium from the yolk reserves (for the first ten days of incubation) and the mobilisation of calcium from the eggshell to the yolk for later use in part of the embryo (after 12 days of incubation). There is therefore a constant supply of calcium for bone growth.

On the other hand, phosphorus, which is important for skeletal development and a fast metabolism, is mainly found in the yolk in the form of phosvitin. As the embryo mobilises phosphorus for skeletal mineralisation and soft tissue development, its concentration in the yolk decreases. Consequently, unlike the calcium content in the yolk, phosphorus reserves decrease during incubation and the chick hatches with a residual yolk deficiency (Figure 2).

Some studies suggest that including calcium in the 10g/kg diet (standard diets) inhibits phosphorus absorption, which limits a chick's performance in the first days of life. Therefore, when choosing a pre-initiating diet for the first days after hatching, it is important to bear in mind that reducing calcium levels increases the availability of phosphorus.

Likewise, as it is well known, in the first four days after hatching chicks are subjected to stressful situations when faced with a sudden change in the type of feeding, transport and low maternal antibody input.

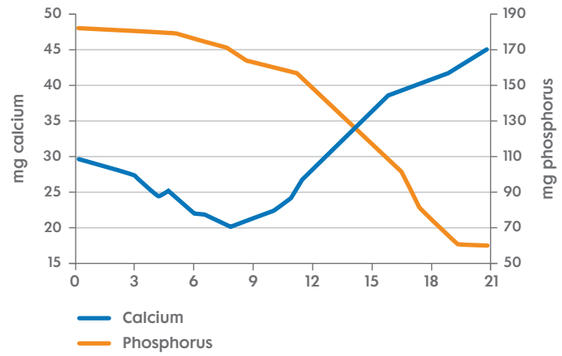

Figure 2. Concentration of calcium and phosphorus in the egg yolk throughout incubation.

ChickCare

Functional proteins

As part of the search for a solution, several studies have demonstrated that the use of functional proteins such as spray dried porcine plasma greatly benefit chicks, since they are highly digestible and strengthen their immune systems. This improves recovery after intestinal illnesses and reduces the risk of early mortality.

Balanced nutrients in a diet specifically designed to address the needs of chicks in their first days of life, as well as access to food immediately after hatching, positively impact chicks' posthatch physiological development and can even improve their performance later in life.

The combined use of low-calcium strategies and functional proteins in pre-initiating diets focused on the first four days results in better feeding efficiency, maximises genetic potential and generates greater production yield, optimising food conversion from the beginning of the chick's life.

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