

Early Chick Nutrition – An Approach for Enhanced Poultry Production

The dramatic increase in poultry production and efficiency during the last 50 years is attributed to a number of factors including ongoing development in poultry genetic makeup and its application in nutrition. To continue the same progress in productivity, scientists are focusing on early chick nutrition nowadays.

Early feeding has a great effect in triggering the right momentum of growth in chicks. It not only utilizes the residual yolk faster but also increases body weight gain and enhances the gastrointestinal tract development in chicks.

The post hatch period is critical for the digestive tract because the system is switching itself from 'off' to 'on'. The first day after hatching is critical for the development of body systems in the chicken and certain types of manipulations must occur during the first days in order to achieve long term effects. The GIT which is sterile at the time of birth undergoes exposure to different antigens through the passage of feed. The earlier the food passes through the tract, sooner the proliferating stem cells meet environmental antigens that help create a wider antibody repertoire. Intestine is the primary nutrient supply organ. The sooner it develops its functional capacity, the faster the young chick can utilize dietary nutrients and grow to its genetic potential and resist infectious and metabolic diseases.

Importance of yolk in chick's life

A hatchling depends on yolk for energy and protein till it is housed and fed, which may take between 24 to 36 hours. Although the protein fraction is partly albumen, a large fraction of the egg protein in the hatchling comprises of antibodies. Under normal circumstances, maternal antibody is not digested during the incubation process, leaving these immunoglobulins intact and fully functional at the time of hatch, indicating that the protein in the yolk sac is to be used for the passive immunity of the chicks and not as source of amino acids. Similarly, the residual yolk lipid should be used for growth and not as an energy source for maintenance as some fatty acids in the yolk lipid may influence the pace of development of certain organ systems (Dibner et al, 1998).

Early feeding utilizes the residual yolk faster. The residual yolk is usually absorbed and utilized by the chick within four days of hatching. Recent studies indicate that the residual yolk is absorbed more quickly by chicks that have access to feed immediately after hatching than those fasted for 48 hours. This is because the anti-peristaltic movement that transfers the yolk from yolk stalk to the duodenum appears to be stimulated by the presence of feed in the gut.

Early nutrition and functional developments

After hatch, chicks have an anatomically complete but physiologically incompetent gut resulting in inefficient feed utilization, reduced enzymatic (amylase and trypsin) activity and shorter villi length. Time from hatching to onset of receiving nutrition is critical given the high mortality; approx. 2 to 5% of hatchlings do not survive during post hatch period. Many of those who

survive in this period exhibit stunted growth, poor feed conversion, reduced disease resistance and poor meat yield in the long term.

Post-hatch changes are more pronounced in the intestine of the chicks as compared to other parts. The proportional weight of the intestine compared to the whole body mass steeply increases from 0.02% on day 1 to 0.08% on day 8 (Sklan, 2001). The pace of development of the intestines is in tune with the concept of supply organs developing in advance of demand organs (Brake, 2001). The villi of the small intestine are underdeveloped and the crypts in the inter-villus spaces are not detectable at the time of hatching. New results show an excellent response of early nourishment (neonatal supplement) as soon as possible after hatch. The supplemented nutrition helps to operate the digestive system and stimulates development of all other body systems.

Carbohydrates, lipids and proteins reaching the intestine must be hydrolyzed before uptake. Feed intake triggers secretion of pancreatic enzymes, which are then secreted at relatively constant amounts per feed intake as the chick grows. Supplementation of lipase during early life is very critical for digestion of fat as secretion of lipase during this period is insufficient.

Early nutrition is very important for meat and muscle production. Nutrition is a critical determinant of immune responses which can affect the magnitude as well as the nature of the immune response. There are three ways in which early nutrition can affect the development of the immune system:

1. Nutrients provide substrates for cell proliferation and differentiation.
2. Nutrients can be immune-modulators themselves or can affect their endogenous synthesis.
3. Oral intake provides many of the antigens that drive both the development of isotypes and the generation of immunoglobulin diversity in the bursa.

In modern production systems, birds are inevitably exposed to considerable stress. The GIT of the newly hatched chicks is immature and sterile and only begins to develop its function and its microflora when it begins to ingest feed. Feed inevitably contains microorganisms and other components which may be toxic, and this puts additional stress on the bird either through diseases or activation of the immune system. Minimizing stress through nutritional manipulation at this stage is clearly important.

Chick Boost, a neo-natal supplement, is a breakthrough technology to address early nutrition requirements of Poultry at the Hatchery and Farm. To know more about this neo-natal booster for breeders, broilers and layers, please contact Avitech Nutrition Pvt Ltd at marketing@avitechnutrition.com or call us on +91 124 4011147 / 4278511 / 4278512.

