Andreotti farmaceutica
Industria Zootecnica

YEAST, VITAMINS AND ORGANIC ACIDS SUPPLEMENTATION IN POULTRY FARMING

It has been widely proven by scientific literature how gut health plays, in birds as well as in all the other animals, a key role in the overall health status and, particularly, in the immune system status and effectiveness.
To keep an healthy and balanced intestinal environment may be a challenge, especially in intensive farming, and even more under certain specific stressful circumstances.
Unfortunately, some breeding cycle steps are for their own nature, stressful events and this might lead to increased needs of essentials nutrients.
Saccharomyces cerevisiae (SC) supplementation can improve hatchability and feed conversion in progeny of supplemented hens (4).
In a field study, SC cells wall supplementation in broiler diet, exacerbated the cellular immune response as measured by the delayed cutaneous hypersensitivity response test, suggesting its capability of a better maintenance of the immune status in response to microbial challenge (5).
Furthermore, SC supplementation can significantly control *Campylobacter* carriage in chickens with some positive effects also on *Salmonella* presence, thus reducing the contamination of carcasses at slaughtering and preventing human foodborne diseases (6).
Vitamins belonging to B group are involved in a broad range of metabolic pathways, and since these are not stored to any significant extent in the body, a continuous supply is required.
The pivotal role played by B2 vitamin supplementation in egg production, hatchability and embryo survival rate was understood since 1930 (7).
Moreover vit. B2 can improve the bioavailability of inorganic copper, zinc and manganese in growing turkeys, while reducing the concentration of these trace elements in bird excreta (5).
Field evidences showed also how vit. B2 deficiency leads to leg paralysis, high mortality and poor growth in broiler chicks (6).
B6 vitamin is extremely important in the metabolic process of essential aminoacids conversion (7) and its deficiency cause retarded growth, dermatitis and anemia, increased nitrogen excretion and disturbance in copper and iron serum levels.
Furthermore, as other vitamins belonging to B group, B6 is essential in maintaining regular appetite, hatchability and egg production (8).
Similarly, B1 vitamin deficiency leads to anorexia and in most severe and prolonged cases, to polyneuritis with lethargy, tremors, weakness and convulsion: it is most commonly observed when poorly processed fish meals are used because they contain thiaminase enzyme (8).
Organic acids have been used in poultry feeding due to their capacity of lowering gut pH therefore promoting an healthier intestinal environment, unfavorable to pathogens (9).
Reductions in bacteria are associated with feeding organic acids, which are particularly effective against acid-intolerant species such as *E. coli, Salmonella* and *Campylobacter* (16).
Citric acid supplementation was proven to bring an improvement of immune status, detected by densely populated immune-competent cells in the lamina propria and submucosa of cecal tonsils and ileum and also in the cortex and medulla of bursa follicles, together with proven positive effects on growth, feed intake, feed efficiency, carcass yield and bone ash (10).
Furthermore, its supplementation was related to an enhanced palatability of feed, leading to increase feed intake and to a significant reduction of serum triglycerides: this is in agreement with other findings, who reported statistically significant improved live body weight of broilers with supplemental citric acid, likely due to decreasing of pH in gastrointestinal tract and growth inhibition of potential pathogen bacteria (11, 12).
As an help against potential pathogens, vitamin C supplementation has also been directly related to a significantly

improved antibodies titre against ND-Virus, IBD-Virus and IB-Virus due to lymphoid organs weight increases (13).
Furthermore, by decreasing synthesis and secretion of corticosteroids, alleviate the adverse effect of stress and lowers mortality (14).
Facilitating calcium absorption and favoring bone formation and its strength, the beneficial effect of vitamin C on skeletal system and egg shell thickness and strength is another proven evidence (13, 14).
In this complex integrative pictures, microelements are not to be forgot: sodium and potassium are among major electrolytes, and their correct balance, essential for multiple fundamental physiological processes, is critical as well for intestinal health and absorption capacity.

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