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THE ROLE OF SORBITOL AND VITAMIN A,D3,E SUPPLEMENTATION IN POULTRY HEALTH

SCIENTIFIC PUBLICATION ADDRESSED TO VETERINARIAN CLASS

In modern poultry farming, despite huge progression made in feeding science field, still vitamin deficiency might occur due to increased requirements.
This can happen under different conditions, through all the production cycle.
Moreover, vitamin deficiency in feeds, supposed to be complete, is quite difficult to evaluate.
Therefore, an adequate supplementation is recommended to face or prevent some difficult stage of poultry breeding, like growth, production peak, heat stress and vaccination.
Egg production, hatchability and embryonic mortality are affected by vitamin A levels (1), furthermore this vitamin can stimulate bird immune system by increasing the production of antibodies and macrophages, and also promoting their phagocytic ability (2) therefore enhancing and sustaining a correct immune response.
Another vitamin which exerts a crucial modulating effect on bird immune system is vitamin D3, that shows robust immune-modulatory properties by favouring Th2 response and promoting cytokines production and release. Moreover, due to its antagonistic action toward vit. A, the balance of these two nutrients must be carefully evaluated (3).
As known, vitamin D plays a key role in regulating skeletal apparatus growth and maintenance, being essential for the normal absorption and metabolism of calcium and phosphorus.
Due to its regulatory action on these two minerals, vit. D also participate in the regulation of eggshell quality in laying hens (1).
The less obvious decline in shell quality with suboptimal, rather than deficient, supplements is more difficult to diagnose, especially because it is very difficult to estimate the real vitamin D3 content in complete feeds.
That enlighten the importance of an adequate supplementation, even more since different vitamins influence each other. Vitamin E can increase the serum concentration of calcium and phosphorus, while exerting a protective effect on the liver and stimulating production of vit. D, thus entering the regulation mechanism of skeletal apparatus growth and influencing eggshell quality.
Furthermore, thanks to its antioxidant properties, can positively influence egg production by improving the Haugh unit score and ameliorating egg quality.
Moreover vit. E is capable of suppressing oxidative damage which affects immune organs, and promoting antibodies production: it has been deeply evidenced how nutritional factors with antioxidant properties can protect bird immune organs thus increasing the likelihood of successful vaccination (4).
It has been recognized that sorbitol can influence birds metabolism, therefore its role has been discussed in scientific literature.
In a field study, the effect of dietary Sorbitol on the performance of broilers was investigated.
Male and female broilers were given a control diet or a sorbitol diet ad libitum from 29 to 57 d of age. Body weight gain, food intake, food efficiency values were not significantly different.

Absolute and relative weights of abdominal fat were significantly reduced in birds given the sorbitol diet. Compared to the control diet, the diet containing sorbitol lowered the serum glucose, total cholesterol and very low density lipoprotein concentrations (5). This suggest how Sorbitol supplementation can positively direct and influence bird metabolism, in order to promote an healthier growth thus lowering likelihood of problems related to intensive farming and feeding which might affect productivity.

Bibliography

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