



# The impact of exogenous enzymes and sulfur citrate on intestinal microbiocenosis of broiler chicken

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## Introduction

The optimal run of biochemical processes in the organism is preconditioned by the qualitative and quantitative ratio of specific macro and microelements. Among the biologically active substances that positively impact digestion and nutrient availability of animal feed are enzyme mixtures.

## Material & Methods

The test was conducted at the vivarium of the Institute of Animal Biology NAAS of Ukraine in four groups (20 birds in each) of broiler chicken aged ten days. The birds were kept in cages and fed according to technological requirements. The poultry received combined feed with balanced nutrient and biologically active substance content. Test group birds received Natuzyme enzyme mixture and sulfur citrate. Samples of blind gut contents were taken after harvesting and placed in sterile dishes. The samples were studied for quantitative and qualitative contents of microflora using cultivation and inoculation of microorganisms onto select media (Endo, Ploskirev's, Saburo, bismuth sulfite, Baird-Parker, Blaurock, Blood Agar). Identification was conducted under morphological, cultivation, physiological and biochemical properties (Olkenytskyi and Simmons media).

## Results

Levels of microorganisms from the blind gut of the 1<sup>st</sup> test group tended to be lower in comparison with the control group. Types of obligate microflora in blind gut contents of broiler chicken were almost the same as those of the control group and included E.coli, Bifidobacterium, Lactobacterium, and Enterococci. Blind gut chyme of the 2<sup>nd</sup> test group chicken (25% sulfur from its levels in standard premix) showed 0.75 CFU/g less E. coli than in the control group. In addition, strains with different enzyme activity were redistributed. Namely, the number of E.coli Enterobacteriaceae probably increased compared to the control group attesting to unfavorable changes in microbiocenosis. Lacto- and Bifidobacterium, constituting the main part of microbiocenosis, reached the levels of  $10^8 - 10^{10}$  CFU/g in said test group birds along with a higher probable concentration of yeast-like fungus and Proteus cells. As far as mould is concerned, it was the only group where isolated colonies were identified. Birds of the 3<sup>rd</sup> test group (10% sulfur citrate from its levels in standard premix) showed a 97 to 3 ratio of normal fermentation E. coli to weak fermentation E. coli in blind gut contents against the general increase of E. coli cells. Cocci levels in blind gut chyme from the total levels of microorganisms in blind gut chyme of the 3<sup>rd</sup> group broiler chicken matched control group levels. Bifidobacterium and Lactobacterium levels ranged between  $10^9 - 10^{10}$  CFU/g. Facultative microflora contained fewer Candida fungi and Proteus cells which proves positive changes in broiler chicken microbiocenosis.



## Conclusions

Thus, the comprehensive introduction of sulfur citrate (10% from its levels in standard premix) and the Natuzyme enzyme mixture positively impact broiler chicken intestinal microflora.