

FEDERAZIONE SISVET



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Edizione virtuale

23-26 Giugno 2021

*Con il supporto tecnico-scientifico
di*



**I contributi presenti negli Atti del
74° Convegno SISVet 2021
potranno essere citati utilizzando
il codice ISBN
9788890909290**



POSTER

AIPVET

P237 - Effects of the multistrain probiotic *Slab51*[®] (*SivoMixx*[®]) on the intestinal morphology and microbiota composition of farmed Guinea fowls (*Numida meleagris*)

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Probiotics are beneficial bacteria with positive effects on health and growth efficiency of host animals by influencing gut microbiota or modifying immune status, as well as by stimulating digestive processes [1]. To understand the effectiveness of the probiotic mixture *Slab51*[®] (*SivoMixx*[®], Ormendes SA, Jouxens-Mezery, CH) on intestinal morphology, mucus layer composition and caecal microbiota diversity, forty 10-days old Guinea fowls (*Numida meleagris*) were assigned to two groups: control group (C), receiving drinking water, and treated group (P), receiving water plus the multistrains probiotic (2×10^{11} UFC/L). Both groups were housed in two adjacent sheds (12 m² each), with litter on the bottom, under controlled photoperiod and natural aeration. Through all the trial, both the groups received ad libitum the same commercial pellet feed (Cruciani, Montappone, MC, Italy), as starter followed by growing feed, that changed in proximate composition in relation to the age of the animals. At the end of the normal growth process, animals were slaughtered by electrical stunning and bleeding at 120 days of age, and intestines were collected. Samples from duodenum, ileum and caecum were processed for morphological and morphometric studies, and conventional glycohistochemistry. Caecal samples were also used to assess the microbiota by 16S metataxonomic approach. Group P showed a modification of intestinal morphology characterized by significant increase of villus height, villus width, depth of crypts, and goblet cells per villus in all investigated tracts. Caecal microbiota of birds varied considerably and, comparing the relative abundance of the main Observational Taxonomic Units (OTUs), a positive enrichment of several beneficial taxa like *Oscillospira*, *Eubacterium*, *Prevotella* and members of the *Ruminococcaceae* was observed. High levels of diversity can improve microbiota stability and resilience facing environmental stresses, enhancing its resistance against invading pathogens. *Ruminococcaceae*, which represent the most important taxon in both groups, and *Prevotella* have a key role in the gut physiology due to the production of short-chain fatty acids (SCFAs), that are a vital energy source for enterocytes, improve glucose metabolism and exert an overall anti-inflammatory effect. Probiotic administration enriches presence of *Coprococcus*, *Oscillospira* and *Eubacterium* taxa, that produce butyrate, which exerts a beneficial effect on growth performance, structure of villi and pathogen control and has anti-inflammatory properties too. This study indicates that a probiotic supplementation positively affects the morphology and microbiota diversity of Guinea fowl intestine.

[1] Patterson JA, Burkholder KM. Application of prebiotics and probiotics in poultry production. Poultry Science. 82:627–631, 2003.