

DOSE EFFECT OF SAVORY (*SATUREJA MONTANA*) FEED SUPPLEMENTATION IN SMALL INTESTINE MORPHOMETRY

Oliveira, J.^{1,2,3}, Vala, H.^{1,3}, Coelho, C.^{1,3,4}, Garcia, C.¹, Perdigão, A.^{1,2,3}, Wessel, D.^{1,3,5}

¹ Agrarian School of Viseu, Polytechnic Institute of Viseu, Viseu, Portugal

² Centre for Natural Resources, Environment and Society (CERNAS-IPV Research Centre), Polytechnic Institute of Viseu, Polytechnic Campus, Repeses, Viseu, Portugal

³ Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB), University of Trás-os-Montes e Alto Douro (UTAD), Vila Real, Portugal

⁴ Veterinary and Animal Research Centre (CECAV), University of Trás-os-Montes e Alto Douro (UTAD), Vila Real, Portugal

⁵ LAQV-REQUIMTE, Department of Chemistry, University of Aveiro, Aveiro, Portugal

Introduction

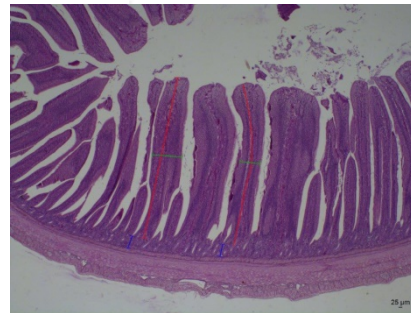
In general, the feed supplementation in broilers pretend achieve better performances in a more efficient way. The utilization of aromatic herbs, namely its by-products after the main agro-industrial use, is a strategy to modulate the gut ecosystem and maintain or reinforce the epithelial integrity. The utilization of raw powder stems by-product of aromatic herbs acts as a prebiotic form of supplementation in broilers. This physical form allows the protection of the cellular contents at the lower gut.

Objective

Evaluate the effect of different levels of savory feed supplementation in the jejunum morphology in broiler chickens, as a way to enhance productive performances.

Material & methods

- 192 Ross 308 (Aviagen) one-day old chicks
- Randomly distributed into 16 pens, with 20 animals each
- Animals were fed *ad libitum*
- **Treatments:** Control [C] and treatments (with savory by-product supplementation: 10 [T1], 20 [T2] and 40 [T4] g/kg)
- Randomized assignment of animals and treatments to each pen
- 2 animals, randomly selected from each pen, were sacrificed by cervical dislocation, slaughtered, plucked and eviscerated (8 animals per treatment)
- Samples collected fixed in 10% neutral buffered formalin and processed for routine histopathological diagnosis with Haematoxylin and Eosin (HE)
- **Morphometric variables (Ten measures in each animal):** Villus height (VH); Villus width (VW); Crypt depth (CD); Villus height to villus width (VH:VW); Villus height to crypt depth (VH:CD) ratio; Villus surface area (VSA) = $\pi \times VW \times VH$
- ANOVA univariate and monofactorial analysis with Tukey post-hoc tests ($\alpha=0.05$)
- IBM SPSS v16.0 software.



Waste2Value
**INTERNATIONAL
CONGRESS**
17th november 2021

Results

	C	T1	T2	T4	Sig.
Villus height [VH] (μm)	922.7±178.9 ^b	775.0±201.0 ^a	868.5±244.6 ^{a,b}	767.0±350.5 ^a	0.000
Villus width [VW] (μm)	112.8±44.0 ^a	123.0±44.3 ^a	122.4±44.7 ^a	143.2±58.8 ^b	0.001
Crypt depth [CD] (μm)	120.4±34.8 ^{a,b}	104.7±48.1 ^a	110.0±34.2 ^a	129.0±56.9 ^b	0.003
VH:VW ratio	9.4±3.7 ^c	7.2±3.5 ^{a,b}	8.0±4.0 ^b	5.8±2.8 ^a	0.000
VH:CD ratio	8.4±3.7	10.3±9.8	8.9±5.7	8.8±10.3	0.454
Villus surface area (mm ²)	334.6±153.7	303.5±143.2	344.9±185.0	356.9±223.5	0.274

The relative differences for specific variables mentioned in table, attenuated the mean values of VSA composite variable for all groups ($p>0.05$), hypothesized that the different doses of supplementation don't influence the morphologic intestinal surface absorption.

Conclusions

In general, the incorporation of savory in feed was beneficial for intestinal morphology, showed by the morphometric values presented, namely the CD and the VH:CD ratio, reflecting higher productive performance, particularly in S1 group (data not shown). The lower dosages of savory inclusion improved the intestinal morphometric parameters, being the worst results obtained from higher supplementary doses of savory.

Acknowledgments

Thanks are due to the Polytechnic Institute of Viseu and to FCT/MEC for the financial support to the research units LAQV-REQUIMTE (UIDB/50006/2020), CITAB (FCT UIDB/04033/2020), CECAV and CERNAS-IPV, through national funds, and the co-funding by the FEDER, within the PT2020 Partnership Agreement and Compete 2020. The authors thank the financial support of the Waste2Value project (PDR2020-101-031828, Partnership n. 94 / Initiative n. 189) through national funds and FEDER, within the PT2020 Partnership Agreement.