



Effect of different levels of *Tenebrio molitor* larva meal inclusion on chicken meat quality

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Introduction

- The introduction of new ingredients into poultry diets can affect the characteristics of the final product.
- *Tenebrio molitor* larvae have been widely investigated as an ingredient, due to the natural behaviour of birds to feed on insects.

Objective: Evaluate meat quality from broilers fed with soybean meal (SM) as the main protein source and broilers fed with inclusions of *Tenebrio molitor* larvae meal (TMM) as a replacement for SM.



Figure 1. Shed and pens where broilers were raised (San Martin, Peru).

Materials and methods

The study was performed in San Martin, Peru with broilers divided and fed with 4 different treatments:

- **T0:** 100% SM as the main protein ingredient.
- **T1:** inclusion of 5% TMM.
- **T2:** inclusion of 10% TMM
- **T3:** inclusion of 15% TMM

Sensory analysis consisted of a 7-point hedonic scale, where: 1= I dislike it excessively, 7= I like it excessively.

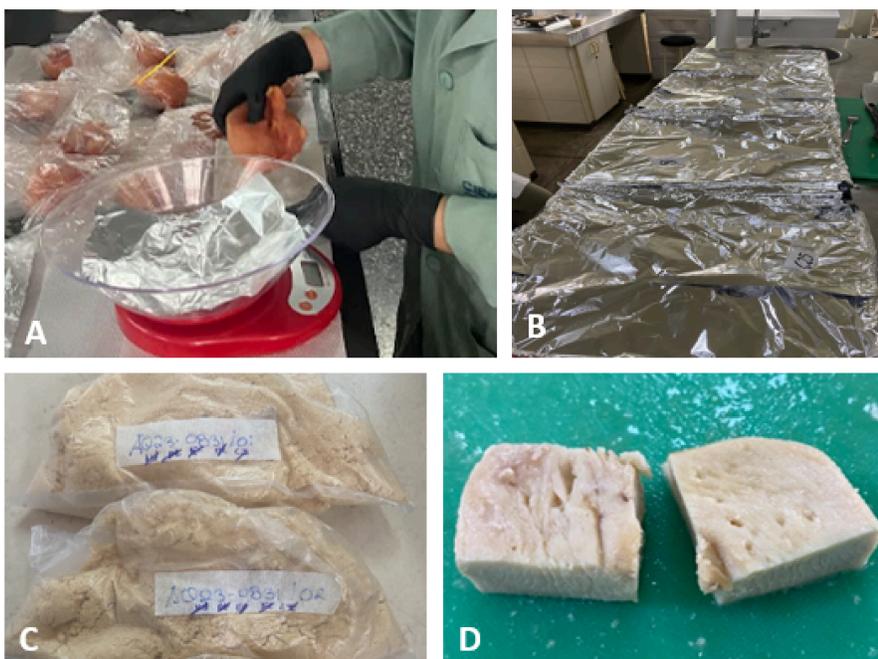


Figure 2. Processing of physicochemical analysis (A) and sensory analysis (B: preservation of chicken meat samples, D: meat samples). Samples ready for nutritional analysis (C).

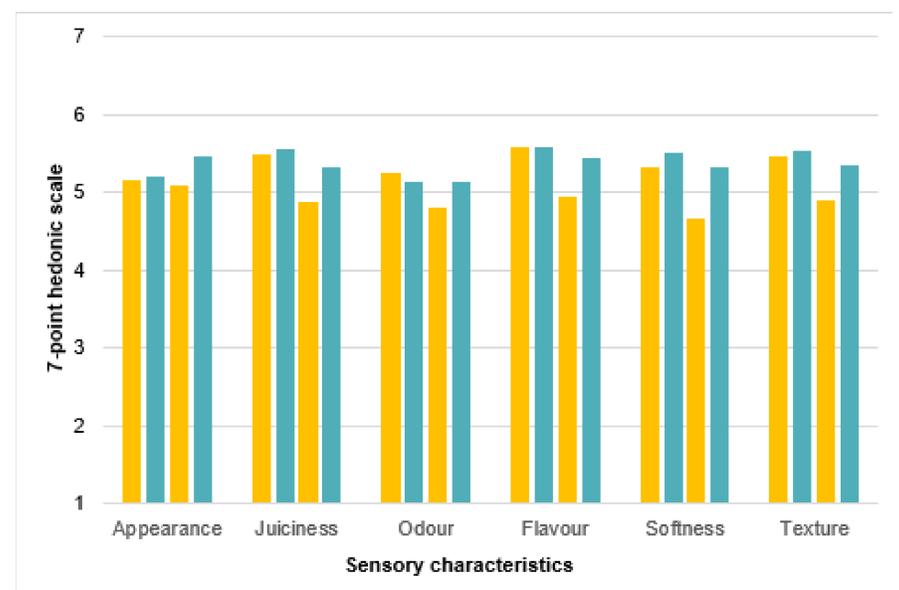
Conclusion

- The use of TMM in the diet of broiler chickens does not negatively affect the characteristics of their meat.
- it is necessary to pay special attention to consumer opinion when including a higher percentage of TMM inclusion.

Results

- The inclusion of TMM in the diets did not influence the sensory characteristics of appearance and odour (Graphic 1).
- Differences were found in attributes of juiciness, flavor, softness and texture, with lower scores obtained in T2 and T3 compared to T0 and T1 (Graphic 1).
- The scores assigned by the panelists were on average between 4 and 5 (neutral scores) (Graphic 1).

Graphic 1. Sensory analysis: averages of 7-point hedonic scale for 94 panelists aged 18-50 years.



- The inclusion of TMM did not influence the physicochemical characteristics (Table 1).

Table 1. Physicochemical characteristics (3 repetitions per treatment).

Parameters	T0	T1	T2	T3	P-value
pH	5.87± 0.11 ^a	5.71± 0.02 ^a	5.70± 0.06 ^a	5.87± 0.10 ^a	0.04
Acidity (%)	0.33± 0.00 ^a	0.38± 0.04 ^a	0.34± 0.03 ^a	0.32± 0.01 ^a	0.09
Water activity (Aw)	0.99± 0.00 ^a	0.99± 0.00 ^a	0.99± 0.00 ^a	0.99± 0.00 ^a	1.00
Thawing loss(%)	2.70± 0.12 ^a	3.02± 1.27 ^a	4.70± 0.65 ^a	3.35± 1.86 ^a	0.25
Cooking loss(%)	2209±3.25 ^a	26.43±4.20 ^a	24.54±1.11 ^a	24.85± 3.02 ^a	0.44

- Protein percentages of chickens fed TMM were numerically higher. Fat was numerically higher in T1 and T2. While minerals were numerically similar among all treatments (Table 2).

Table 2. Proximal composition (1 sample per treatment)

Parameters	T0	T1	T2	T3
Moisture (%)	77.09	74.47	73.82	76.07
Crude protein (%)	20.15	21.72	22.3	21.23
Fat (%)	1.58	2.51	2.68	1.57
Crude fiber (%)	0.01	0.02	0.01	0.02
Minerals (%)	1.09	1.15	1.17	1.09

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