

The addition of black soldier fly larvae meal (*Hermetia illucens*) and its influence on the yield and meat sensory parameters of broiler chickens



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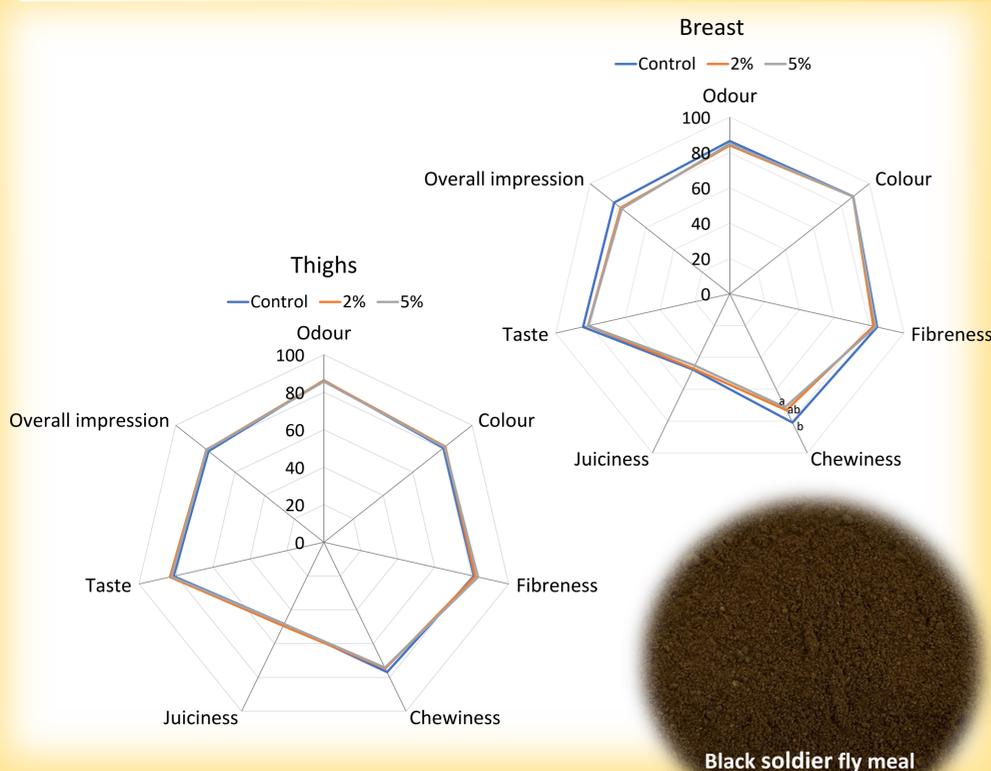
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Nowadays, the demand for alternative protein sources is increasing. Classical animal production will soon not be able to feed the growing world population. Using the nutritional potential of edible insects as a source of food and feed appears to be one of the ways. Insects contain a high protein content, which varies from 13 to 77% depending on the species and developmental stage. The fat content in insects is very variable, from 2 to 50% of dry matter, with different fatty acid content. Recently, most research has focused on insects in the larval stage as a potential source of proteins, amino acids, lipids and specific fatty acids. Among the invertebrate species used worldwide is the black soldier fly, which represents one of the most promising insect species for industrial feed production. The aim of our research was to determine the effect of black soldier fly larve meal in chickens' diet on the yield and sensory parameters of meat.

Table – Composition of used diets (%)

	Control	2%	5%
Rapeseed oil	4.10	3.70	3.50
Limestone milled	0.40	0.39	0.36
Monocalcium phosphatet	0.59	0.56	0.52
DL-Methionine	0.15	0.15	0.15
Soybean meal	39.5	36.2	31.35
Maize	36.64	36.9	36.9
Wheat	15.62	16.96	18.87
Premix BR	3.00	3.00	3.00
Wheat gluten	0.00	0.14	0.35
Damsel fly larve defatted meal	0.00	2.00	5.00

Figures – Sensory evaluation of breast and thighs muscles



^{a,b} mean statistically significant differences (P < 0.05)

Table – Carcass yield and body composition of broilers

	Control	2%	5%	SEM	P
Final live weight (g)	2,373	2,378	2,344	19.01	0.74
Carcass yield (%)	69.62	71.25	69.03	0.49	0.16
Breast (%)	22.40	22.84	21.13	0.32	0.06
Thighs (%)	14.59	15.18	15.37	0.29	0.53

No statistically significant differences (P > 0.05); SEM – standard error of the mean

A total of 249 Ross 308 broiler chickens were included in the study. The experiment lasted from the 1st to the 37th day of chickens' life. Broilers were divided into three groups according to the content of defatted meal from black soldier fly larvae in their feed. The first group was the control, without the inclusion of insect meal in the mixture. The second group had the addition of 2% black soldier fly larvae in the feed mixture and the third group was fed with a mixture with a representation of 5% insect meal.

Chickens had *ad libitum* access to feed and water during the experiment. The housing conditions corresponded to the technological instructions for Ross 308 broilers (Aviagen Group, 2018). At 37th day of age, all chickens were weighed and slaughtered. From each group, 8 individuals were selected, in which the carcass weight without giblets, runners and neck was determined and the percentage of JUT was calculated. In addition, these chickens were deboned and the percentage of breast and thigh muscles to live weight was determined.

Sensory analysis of breast (n=8) and thigh muscles (n=8) was attended by 10 evaluators and performed at the Department of Food Technology of Mendel University in Brno in a laboratory designed for sensory evaluation (ISO 8589). Each sample (breast and thigh muscles) was cooked in a convection oven (200°C, 60% humidity, 1 hour). The evaluators were guided by the established standard ISO 8586-1 (2015). A graphical unstructured scale (100 mm, 0=poor, 100=excellent) was used to compare descriptors (odour, colour, chewiness, fibreness, juiciness, taste, overall impression).



The results of our experiment indicate that the addition of meal from black soldier fly larvae to the feed mixture for broiler chickens in the amount of 2 and 5% had no negative effect on yield parameters (carcass yield, breast and thighs yield). The sensory evaluation showed reduced chewiness acceptability in the breast muscle of chickens fed the diet with the 5% addition of this insect meal.

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