

**P109****Effect of two sous-vide cooking methods on physicochemical characteristics of *Longissimus thoracis* muscle from pigs fed with or without extruded linseed**

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Meat is recognised as a highly nutritive food. With cooking, the meat enhances its nutritional value and becomes more digestible. However, high cooking temperatures lead to several chemical modifications in meat. Therefore, there is an increasing interest in sous-vide cooking. The aim of this research was to study the influence of two sous-vide cooking methods on physicochemical characteristics of *Longissimus thoracis* (LT) muscle from 24 pigs fed with two different diets: control group (C) had a basal barley/soybean diet; in the linseed group (L), 5% of extruded linseed replaced the same amount of barley. At 24 h *post mortem*, LT muscles were sliced, vacuum sealed and stored at -18°C until analysis. Samples were cooked in water bath at two different combinations of temperature and time: 'A' 80°C of the bath water as long as the core temperature of the pork reached 70°C ; 'B' 60°C for 15 h. After the cooking process, the samples were kept under refrigeration (2°C) for 24 h. The day after, cooking loss, colour, pH, microbial growth and tenderness were determined. Microbial growth was analysed also in the raw meat. Statistical analysis was performed by means of ANOVA, using the GLM procedure of SAS. Dietary treatment (C vs. L) and cooking condition (A vs. B) were used as independent variables. Dietary treatments did not produce significant differences in pH, colour, cooking loss and tenderness. Colour parameters were affected by cooking method: a* values of the internal part of the sample and b* values of the external part were higher for the samples cooked at 60°C (a* 4.74 vs. 3.97 for B and A, respectively, $p < .05$; b* 17.79 vs. 15.84, $p < .01$). The A cooking method led to higher ($p < .01$) shear force values (5.03 vs. 3.30 kg). The microbial load in the raw meat was significantly different ($p < .05$) between dietary treatments: C group showed higher total viable count (4.56 vs. 4.14 \log_{10}) and *Enterobacteriaceae* (2.65 vs. 1.94 \log_{10}) respect to L group. Low microbial growth was detected for both cooking methods. Total viable count was 0.50 \log_{10} for A cooking method and 0.64 \log_{10}

for B, without significant differences among them. No *Enterobacteriaceae* growth was detected. Also, no differences were found for pH and cooking loss between A and B. Both cooking methods generated a meat safe from contamination. The B method: low temperature for long time also, generated tender meat.

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P110**Effect of different rearing system on sensory characteristics of meat in Massese Lamb**

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Meat of lamb has specific flavour and taste, distinct from other popular red meats. The traditional Massese lamb is a suckling lamb and, in this study, they are reared up to two months of age and fed by supplement in order to increase meat production. The feeding system could affect the sensory properties of lamb meat: pasture and associated flavours may be unfamiliar to consumers of meat respect to meat produced from lamb fed with concentrate. Historically, Massese sheep farmers in mountainous environment used different farming systems based on changes in resources availability during the year and on their seasonality. In this research, Massese lambs were reared using two different farming systems: stall (S) including concentrate and hay as supplementary fed, and pasture (P) that includes only pasture as supplementary fed.

The sensory proprieties of roasted unsalted *Longissimus dorsi* samples were evaluated by a team of 11 trained panellists who did not receive any information regarding the lambs. For each sample, the panellist was asked to evaluate in a continuous scale from 1 to 10 the following parameters: tenderness, juiciness, flavour, taste and overall preference. Data were analysed by GLM of SAS using feeding system, panellist and trial day as discrete effects.

The farming system affected meat colour: meat of S lambs is brighter (51.4 vs. 32.1 for S and P groups respectively; $p < .001$) and has a less intense colour (33.6 vs. 45.4; $p < .001$). The taste does not show undesirable aroma except for a slightly metallic sense in both meat types.

The characteristic lamb flavour is not very intense while the characteristic lamb taste is greater in S group (33.2 vs. 27.4; $p < .05$). Effectively, the S lambs showed a greater amount of intramuscular fat that affected the aroma component of meat. The meat of both groups has similar tenderness, juiciness and acceptance level. The results of the present study underline that both groups obtained a high level of liking and acceptance.

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P111

Effects of dietary by-products in mealworm rearing

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Insects represent one of the answers to increasing demand for animal-based protein, related to both the growing world population and also to the increasing demand of protein from developing countries. The lower environmental impact of insects compared to conventional production animals (mostly linked to greenhouse gas production, use of water and use of arable land) and the higher reproductive capacity, higher nutritional quality, and higher feed conversion efficiency lead several researchers to study insects as food and feed.

Furthermore, insects can be reared on sustainable feeds, such as waste or by-products that do not meet the nutritional values needed by other farmed animals. By-products represent a valid source of energy with a marginal cost, and they could be used as feed ingredient in regard to their essential nutrients. Indeed, diet composition could affect insect's development rate and their body nutrient composition.

The objective of this research was to evaluate the influence on the chemical composition of mealworm larvae (*Tenebrio molitor*) of different diets based on food by-products. Five different diets were formulated: brewery spent grains, bread (leftover), cookies (near to the expiration date), 50% brewery spent grain and 50% cookies, and 50% bread and 50% cookies. Mealworms were harvested when the first pupa was observed. Larvae were analysed for the determination of the proximate composition, antioxidant status, fatty acids profile, amino acids profile, microbiological analyses (fasted and un-fasted).

Results of this study highlighted a strong effect of the diet on the final insect products. All the tested parameters were affected by the diet, in relation to the physico-chemical composition of the feeds. Also, microbiological analyses were affected by the diets and the fasting procedure.

Notably, the chemical composition of the larvae followed the chemical composition of the feed stuffs, highlighting that mealworm larvae express a wide rearing plasticity that lead to several possibilities of employment as food and feed.

P112

Effects of different blanching treatments on quality and microbiological profile of mealworms

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Nowadays, acceptability of edible insects is very low to Western consumers, mostly to European ones; nevertheless, in the last years several insect products have been sold online and in supermarkets with also an increasing interest of media.

Safety concern is one of the main factors that reduce the willingness of consumers to eat insects, related to allergic, parasitical, chemical and microbial hazards. Another important concern in consumers is the unwillingness to taste something unknown, this behaviour is also called food neophobia. Grinding is a possible way to include insect as small particles that could be easily mixed in a well-known product without altering its appeal. Anyhow, grinding could induce an enzymatic browning process that does not allow their use as ingredient.

In this study, the effects of different blanching treatments on the microbiological profile, pH and colour of mealworm (*Tenebrio molitor*) larvae were evaluated. The effect of 10 combinations of temperature (50, 60, 70, 80 and 90 °C) and time (2.5 and 5 min) was evaluated in comparison to fresh larvae (not blanched) and oven cooked larvae (10 min at 150 °C). Moreover, effect of 24 h starvation was also evaluated on the microbiological profile. Starvation affected only marginally the microflora, furthermore, in all samples *Escherichia coli*, *Bacillus cereus*, *Listeria monocytogenes* and *Salmonella* spp. were never detected. A blanching treatment at 60 °C for 5 min seems to be the lower time-temperature combination in order to achieve a significant decrease of microbial loads. Blanching treatments played a role also in pH and colour modifications: larvae blanched at least at 60 °C completely stopped browning effect, maybe in relation to an enzymatic inhibition. Among the blanching treatments tested, 60 °C for