

thigh meat were quite similar. As expected, breast meat from light free-range chickens presented a lower incidence of growth-related abnormalities and better technological meat characteristics.

**P256**

## **Antioxidant activity of cheese obtained from dairy cow fed tannins**

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The study aimed to assess the effect of dietary supplementation of tannins to grazing dairy cows in two seasons characterized by a good quality pasture (spring) or a poor-quality pasture (summer) on the antioxidant properties of cheese and cheese *in vitro* digestates. Fourteen lactating dairy cows were divided into a control group (CON) and an experimental group (TAN) receiving 150 g/head per day of tannins supplementation. Animals were allowed to graze on spontaneous pasture or on dry stubble, during spring and summer experiment respectively. The experimental trials lasted 23 d. Cheeses were produced the day before the beginning and at the end of each seasonal trial, using individual raw whole milk and ripened for 25 d. Briefly, the cheese was produced using a batch of 7 kg of milk heated at 38 °C, coagulation with commercial liquid veal rennet, cooking at 75 °C in hot water, and brine salting. On cheese samples, the *in vitro* digestion was performed and cheese antioxidant activities before and after simulated digestion were evaluated based on their free radical scavenging ability by 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. Cheese made from TAN milk showed higher ( $p < 0.05$ ) antioxidant activity in both spring and summer season, with 50 and 70% of DPPH inhibition, respectively,

milk and dairy products, thus enhancing the nutritional quality of dairy products.

**P486**

## **Instrumental measurements of juiciness of meat and plant-based burgers**

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Plant-based burgers (PBB) are food products that are designed to have meat-like characteristics, but do not contain any animal-derived ingredients. The sensorial experience of PBB complains about their lack of juiciness of cooked products compared to the meat-based burgers (MBB). As many analytical techniques, established for meat juiciness evaluation, would not seem to be sufficient to characterize PBB the objective of this study is to quantify PBB's juiciness by novel techniques in the burger from the original frozen/fresh *status* to what the consumer could perceive in his/her mouth.

The study was performed on 1 MBB, 1 commercial PBB and 6 self-made prototypes of PBB, for a total of 80 burgers analysed both raw and cooked. The traditional methods employed to quantify meat instrumental juiciness were modified to make them suitable for PBB juiciness evaluation. Physical analyses were performed by two new measuring instruments: Meat Cooking Shrinkage and Water Holding Capacity Trend instruments. These semi-automatic instruments, which measure different parameters on the same sample, provide accurate and fast measurements. Data were analysed by ANOVA GLM procedure (Tukey test,  $p < 0.05$ ). The results were expressed as percentage on the wet basis to provide a correct comparison of the obtained values.

The following parameters were evaluated: total moisture content (TMC), meat cooking shrinkage (MCS), fluid to the mouth (FTM) and cooked specific fluid content per volume (CSFC).

The meat-based burger had a TMC equal to 71%, a significantly higher value (+9.6%) than that from the PBB average. Both MBB and PBB had similar FTM average (48%), but MCS was

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significantly higher (+11%) in MBB (24%) compared to PBB average. It can be concluded that MBB retained more water than PBB with a CSFC of  $0.84 \text{ mg/mm}^3$ , a value significantly higher ( $+0.222 \text{ mg/mm}^3$ ) than that from PBB average. All the means were significantly different at  $p < 0.05$  level. Plant-based burger showed a lower water retention than MBB because plant-based proteins cannot bind together to simulate the interstitial spaces between meat muscle myofilaments. These myofilaments trap and retain water, which is released during chewing to create the juicy sensation.

Further innovations must be explored to reproduce the type of capillary systems of muscle that are crucial to the juiciness of cooked PBB.

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**P575****Effect of intramuscular vitamin E injection on Polycyclic aromatic hydrocarbons formation in**

for the quantification of carcinogenic compounds after grilling. PAHs were detected using a GC-MS analysis. Data were analyzed by one-way ANOVA. Data for concentration of PAHs that did not meet the assumptions for ANOVA were analyzed using the Kruskal Wallis H test. No statistically significant differences between the three groups were found for all the PAHs detected. The mean concentrations ( $\mu\text{g/kg}$ ) of PAHs formed in grilled meat were in the range: 0.30–1.55 for Benzo(a) pyrene (BaP), 0.37–2.54 for Benzo(b) fluoranthene, 0.80–1.19 for Benzo(g,h,i) perylene, 0.89–1.97 for Benzo(k) fluoranthene, 0.94 for Dibenzo(a, h) anthracene and 1.18–1.57 for Indeno (1,2,3-cd) pyrene. In particular, the mean contents of BaP (the marker for the carcinogenic potency of PAHs) found in breast muscle were  $0.3 \mu\text{g/kg}$  for group T1 and  $1.55 \mu\text{g/kg}$  for the control group, with no detection for group T2. The mean concentration of BaP was within the tolerable limit set up by EU regulation ( $5 \mu\text{g/kg}$ ). Even if not significant, an apparent trend of vitamin E treatment towards inhibition of the formation of these carcinogenic compounds appeared to have emerged. In fact, more of the PAHs were detected in the control as opposed to the vitamin E treated groups. The results from the Toxic Equivalent computation also revealed that the concentrations of the compounds detected were within the tolerable limit set by EU Regulation.