

^aUniversity of Tuscia, Viterbo, Italy

^bBenaki Phytopathological Institute, Athens, Greece

^cDepartment of Biological Control, Plant Protection Research Institute, Agriculture Research Center, Giza, Egypt

Honey from *Citrus* spp. (CH) is a highly valuable monofloral hive product that as other animal food products, must meet the request of consumers of quality, safety and traceability and the regulatory frame as well. The purpose of this research, as part of the European project Plant-B, funded by PRIMA Foundation (grant number 1812/PLANT-B), is to evaluate the quality and the geographical traceability by measuring some chemical-physical traits of CH samples from three Mediterranean countries. The study was performed on 41 samples of the 2020 beekeeping season of CH from project case studies in Italy (Sicily, Campania and Sardinia) and Greece (Peloponnesus) and from the market, and 40 samples collected during the season 2021 from the same Italian and Greek regions and from and Egypt. The parameters analyzed were moisture (%), free acidity (meq/kg), pH, colour (mm Pfund) and electrical conductivity (mS/cm). A bibliographic search was also carried out which led to the creation of a dataset related to this parameter studied in CH from the Mediterranean basin area. The results showed that the data obtained are similar to what has been found in the literature as regards citrus honeys from the Mediterranean basin. Whenever, significant differences were found between the different geographical origins of the samples. Italian and Greek samples differed as far as the electrical conductivity (0.3 ± 0.1 mS/cm vs. 0.2 ± 0.01 mS/cm, $p < 0.05$) and for moisture (17 ± 1 vs. 16 ± 0.7 %) and colour (32 ± 9 vs. 25 ± 9 mm Pfund) ($p < 0.01$). At the same time, as regards the samples of the 2021 harvesting season only, significant differences were found between the Greek samples and the Egyptian ones for colour (27 ± 10 vs. 41 ± 17 mm Pfund, $p < 0.05$). The Egyptian samples were lower in free acidity (4.1 ± 1.1 meq/kg) with respect to the Greek and Italian samples (5.8 ± 0.9 and 5.6 ± 2 meq/kg, respectively) ($p < 0.05$), but the Italian samples (0.36 ± 0.15) differed from the Egyptian and Greek samples (0.21 ± 0.01 and 0.17 ± 0.05 mS/cm, respectively) as far as the electrical conductivity ($p < 0.05$). Further investigations are in progress on 2022 CH samples, coming from the same areas, to validate the discriminant power of such interesting physico-chemical traits.

O200

Pollen quality: a study on the elemental profile of pollen sampled in a suburban environment

Pier Paolo Danieli, Filippo Lazzari, Eleonora Cresta, Fausto Carbonari, Francesca Petrocchi Jasinski and Federico Manganello

University of Tuscia, Viterbo, Italy

The curbicolar bee pollen (CBP) is a basic feed for good growth and development of honey bees (HB). It is also a food that is increasingly receiving interest from human consumption. However, it can be expected that locally environmental conditions can play a role on the nutrition of HB colonies through the diversity pollen, but, at the same time, environmental conditions can lead to an accumulation of toxic elements in pollen. The aim of this work as part of the European project Plant-B, funded by PRIMA Foundation (grant number 1812/PLANT-B), was to appraise the nutritional quality and safety through the content of some macro and trace elements in CBP collected in the suburban area of Viterbo, Central Italy. From March to August 2021 CBP was collected monthly from the PLANT-B apiary located in the Experimental Farm 'Nello Lupori' (Tuscia University, Viterbo, Italy). One-day bee pollen samplings were performed from 10 HB colonies by means of commercial pollen traps. After each harvest, the pollen samples were combined, packed and stored frozen, and then dried before analysis. Two pollen samples were pooled on the monthly basis, mineralized and analyzed by Atomic Absorption Spectrometry (AAS) with graphite furnace atomization (GFA, for Cd, P, and Pb), or air-acetylene flame atomization (FL, for Ca, Cu, Fe, K, Mg, Na, and Zn). The results obtained from the mineral profiling for Ca 1351.7 ± 123.9 , Cu 5.02 ± 1.12 , Fe 4.35 ± 0.88 , K 11325.2 ± 3041.9 , Mg 1055.8 ± 266.3 , Na 96.1 ± 61.8 , P 1749.8 ± 488.0 , Zn 50.7 ± 15.0 , Cd 0.009 ± 0.002 and Pb 0.071 ± 0.013 mg/kg, showed that during the monitoring period, there were variations in the concentrations of the individual elements based on the month of collection, even though significant differences were recorded only for Na, that showed a decreasing trend from May to June ($p < 0.05$), and for Zn that showed a reduction step between the months of July and August ($p < 0.05$). As far as the content of undesired elements Cd and Pb, it was in line or lower with respect to the values obtained from literature (0.29 ± 0.24 mg Pb/kg, 0.020 ± 0.030 mg Cd/kg). These preliminary results suggest that the value of the CPB from the mineral nutrition standpoint changes according to the period of sampling, but that the surrounding environment does not seem affecting its safety. It is planned to extend the analysis to more elements in order to get insights about a more exhaustive mineral profile of the pollen gathered by the HB in the same apiary.

O191

A comparison of the nutritional quality and sensory properties of commercial milk with different labeled production systems

Annalaura Lopez^a, Vittorio Maria Moretti^a, Sabrina Ratti^b, Raffaella Rossi^a and Federica Bellagamba^a

^aDepartment of Veterinary Medicine and Animal Science, University of Milan, Lodi, Italy

^bFood Technologist Freelance, Milano, Italy

In the current marketplace, different quality seals exist for commercial milk to support producers in (a) sustaining the additional costs related to the practice of unconventional and less intensive production systems and (b) endorsing consumers requirements and expectations toward superior milk quality, including inner (healthiness, taste) and external (sustainability, origin, production method, animal welfare) quality features. The aim of this research was to verify the nutritional and sensorial properties of commercial milk collected on the retail chain in the plain area of Lombardia (Italy). Four different types of retail milk were considered, including conventional 'High Quality' fresh milk (HQ), fresh milk labelled as 'Mountain Product' (MM), conventional milk with 'Extended Shelf Life' (ESL), and STG-certified Haymilk (HM). One sample for each type of whole milk was collected weekly during March, May, July, and September 2022, for a total of 80 samples (20 per type). Fatty acids (FAs) were quantified by gas chromatography. Milk sensory profile was assessed according to ISO 13299:2010 recommendation. Comparisons among groups were performed by means of parametric and non-parametric statistics. Results showed significant differences among the different labels for the content of many FAs that are biomarkers of origin and/or functional compounds. Particularly, HM was evidenced as the quality seal associated with the most favourable FAs profile, represented by the highest content of branched chain fatty acids (BCFA, 79.11 mg/100 mL), ruminic acid (RA, 35.83 mg/100 mL) and the lowest n-6/n-3 ratio (3.46), followed by MM (69.98 mg BCFA/100 mL milk; 16.92 mg RA/100 mL milk; n-6/n-3 ratio equal to 5.46) and the two conventional types of milk, HQ and ESL (52.71–59.23 mg BCFA/100 mL milk; 14.36–15.07 mg RA/100 mL milk; n-6/n3 ratio equal to 7.31–7.56) ($p < 0.001$). No significant association with the quality mark was evidenced for the sensory attributes, with the exception of aroma intensity, which showed a lower score for MM (5.03) if compared to HM, HQ, and ESL milk (6.32, 6.94, and 7.47, respectively) ($p < 0.001$). The outcomes obtained in this research provided useful knowledge for all the stakeholders involved in the milk supply chain, from producers to consumers, supporting the existence of a relationship between the claims on milk label and its nutritional quality and indicating a superior quality of commercial milk obtained by certified production systems.

O569

Effect of different doses of Vitamin E added to beef patties on the formation of polycyclic aromatic hydrocarbons

Siria Tavaniello^a, Sanije Zejnelhoxha^a, Olgas Viegas^b, Edgar Pinto^b, Isabel M.I.p.v.o Ferreira^b and Giuseppe Maiorano^a

^aDepartment of Agricultural, Environmental and Food Sciences, University of Molise, Campobasso, Italy

^bDepartamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Porto, Portugal

The increasing concern of consumers regarding the impact of red meat on human health, has brought to the attention of the scientific community the study of polycyclic aromatic hydrocarbons (PAHs), toxicants generated in grilled meat undergoing high temperatures. Considered potential carcinogenic agents to humans, the European Union has established PAH4 (sum of benz[*a*]anthracene, chrysene, benzo[*b*]fluoranthene and benzo[*a*]pyrene) as the most appropriate indicator for the occurrence and carcinogenic potency of PAHs in food. In the light of this, the emerging issue of health risk from exposure to PAHs has led to mitigation strategies consisting in the use of antioxidants, such as vitamin E. This research work aimed to evaluate the effect of different added concentrations of DL- α -tocopheryl acetate (2, 3, 4.5 and 6 μ g/g) in ground meat, on the formation of PAHs in grilled beef hamburgers. Raw meat samples presented a total lipid content of 1.36 g/100 g and an endogenous vitamin E content of 1.32 μ g/g. Hamburgers of 80 g (two for each experimental group) were directly cooked in disposable barbecue obtaining well-done level of doneness. An acetonitrile based-extraction and high-performance liquid chromatography with fluorescence detection were used to assay 14 PAHs. The PAHs concentrations were evaluated averaging three measurements for each sample meat. Data were analysed by one-way ANOVA. In relation to the total content of PAHs, no effect ($p > 0.05$) was observed in hamburgers added with 2 μ g/g of vitamin E, while a marked reduction ($p \leq 0.0001$) was found in those added with 3 and 4.5 μ g/g (59 and 46 ng/g respectively) compared to control samples (76 ng/g). A similar trend was observed for heavy and light PAHs: vitamin E at the lowest concentration did not reduce ($p > 0.05$) their formation, while their content decreased ($p \leq 0.05$) with the other vitamin E levels. Despite low values of PAH4 were observed in control samples, far from the maximum established by the European Union (30 ng/g), the addition of vitamin E reduced PAH4 ($p \leq 0.01$) in all experimental groups, especially ($p \leq 0.0001$) in those added with 3 and 4.5 μ g/g. Although grilled hamburgers did not generate high PAHs amount, the effectiveness of vitamin E in inhibiting PAHs formation in grilled beef hamburger depends on the concentration used.

O406

Effect of the inclusion of *Opuntia ficus-indica* cladodes in the feeding of Cinisara cows on Caciocavallo Palermitano cheese produced in summer

Giuseppe Maniaci^a, Marialetizia Ponte^a, Riccardo Gannuscio^a, Cristina Giosuè^b, Antonino Di Grigoli^a, Adriana Bonanno^a, Marco Alabiso^a and Marianna Pipi^a