3.54. Comparison of Extraction Methods and Solvent Composition for Australian Blueberry Anthocyanins

Mamatha Chandra Singh [1], Celine Kelso [2], William Price [3] and Yasmine Probst [1]

[1] School of Medicine, Illawarra Health and Medical Research Institute, Faculty of Science, Medicine and Health, University of Wollongong, Wollongong, Australia
[2] School of Medicine, School of Chemistry and Molecular Bioscience, Illawarra Health and Medical Research Institute, Molecular Horizons Institute, Faculty of Science, Medicine and Health, University of Wollongong, Wollongong, Australia
[3] School of Chemistry and Molecular Bioscience, Faculty of Science, Medicine and Health, University of Wollongong, Wollongong, Australia

Blueberry anthocyanins are known to contribute to various health benefits as protecting against diabetes, cancer and cardiovascular diseases. There are many factors affecting anthocyanin stability, including exposure to heat, light and oxygen, making it difficult to extract anthocyanins without denaturing their properties. The aim of this research was to determine a suitable extraction method and solvent composition for anthocyanin compounds. The method was evaluated for linearity, food matrix effect, instrumental detection and quantification limits. Fresh blueberry anthocyanins were extracted with different solvent compositions: methanol/water (60/40 *v*/*v*), methanol/water (70/30 *v*/*v*), methanol/water (80/20 *v*/*v*), ethanol/water (60/40 *v*/*v*), ethanol/water (70/30 *v*/*v*), ethanol/water (80/20 *v*/*v*) at pH 2.0 and pH 3.0 using ultra-sonication, geno grinder and dounce grinder methods and quantified by liquid chromatography mass spectrometry. All calibration curves showed linearity of 0.999 or higher. The total anthocyanin glucoside content ranged from 55.8 ± 0.7 mg to 84.9 ± 1.2 mg per 100 g of blueberries. Malvidin-3-glucoside was found to be the major anthocyanin extracted from all solvent compositions and extraction methods tested. This study showed that of the methods tested ultrasonication had the greatest effect on extraction yield, producing a reliable anthocyanin quantification method. These extraction procedures will allow potential use of blueberry anthocyanins in future research.

3.55. Sensory, Antioxidant and Physicochemical Influences on the Likeability of a Selection of Commercially Available Australian Honeys

Maddison Hunter [1,2], Jane Kellett [1,2,3], Kellie Toohey [2,4] and Nenad Naumovski [1,3]

[1] Nutrition and Dietetics, University of Canberra, Canberra, Australia
[2] Prehabilitation, Cancer, Exercise and Survivorship Research Group, University of Canberra, Canberra, Australia
[3] Functional Foods and Nutrition Research (FFNR) Laboratory, University of Canberra, Canberra, Australia
[4] Exercise Physiology, University of Canberra, Canberra, Australia

Honey's composition and appearance are largely influenced by floral and geographic origins. Australian honey is frequently sourced from supermarkets; however, properties associated with consumer preference are relatively unknown. A sensory and in-vitro analysis was completed on a selection of commercially available Australian honeys. Samples (n = 32) were analysed for visual, olfactory and taste characteristics, with overall likeability assessed by the trained sensory panel (n = 24; M = 12). In-vitro analysis included colour intensity (mAU), phenolic content, antioxidant characteristics (DPPH, CUPRAC) and physicochemical properties (pH, viscosity, Total Soluble Solids). When compared to the most liked honey sample, 23 samples were liked significantly less ($p < 0.05$). Likeability of honey was positively associated ($p = 0.005$) with perceived sweetness and it was negatively associated (All $p < 0.05$) with crystallisation; odour intensity; waxy, chemical, and fermented smell; mouthfeel; aftertaste; sourness; bitterness and pH. Price (USD/100 g) was not associated with likeability ($p = 0.143$), indicating price value potentially does not influence consumer preference. Conclusively, significant differences between the likeability of honey samples demonstrate that not all sampled honeys are of the same quality to consumers. Additionally, the number of negative associations with

likeability indicate consumer honey selection could occur due to the disapproval of properties, leading to their purchase rejections.

3.56. Molecular Mechanisms Towards Increasing the Nutrition Functionality of White Salted Noodles

Ming Li [1] and Sushil Dhital [2]

[1] Institute of Food Science and Technology, CAAS/ Key Laboratory of Agro-Products Processing, Beijing, China
[2] Department of Chemical Engineering, Monash University, Clayton, Australia

White salted noodles are popular wheat-based food around the globe. Compared to pasta, noodles have a higher glycaemic response. The present work aims to increase the nutritional functionally of noodles by (a) manipulating the starch crystallinity, (b) varying the protein content and (c) optimising cooking and storage conditions. The digestive enzyme susceptivity of noodles was found to be associated with both degrees of gelatinisation of starch (limiting catalytic action of α-amylase) as well as the gluten network encapsulating the starch granules (restricting the access of α-amylase). In terms of cooking, enzyme resistant starch (ERS), as well as the estimated glycaemic index (eGI) of microwaved and stir-fried noodles, were significantly higher (>20%) compared to conventionally cooked noodles through boiling and steaming. On the other hand, the ERS of cooked noodles stored at 25 °C was significantly higher than noodles stored at 4 °C. Supramolecular organisation (helical structure and crystallinity) had a more pronounced effect than the macroscopic structure such as compactness or bulk density in terms of nutritional functionality of noodles. The present study provided the molecular mechanisms as well as the formulation, cooking and storage conditions to decrease the eGI and increase the ERS of noodles important to both consumers and manufacturers.

3.57. Development of Raman Spectroscopy as a Tool to Verify Australian Beef Labelling Claims

Bridgette Logan [1,2], David Hopkins [1,2], Stephen Morris [3], Leigh Schmidtke [2,4] and Stephanie Fowler [1,2]

[1] Centre for Red Meat and Sheep Innovation, NSW Department Primary Industries, Cowra, Australia
[2] Graham Centre for Agricultural Innovation, NSW Department of Primary Industries and Charles Sturt University, Wagga Wagga, Australia
[3] NSW Department of Primary Industries, Wollongbar Primary Industries Institute, Wollongbar, Australia
[4] School of Agricultural and Wine Science, Charles Sturt University, Wagga Wagga, Australia

The current method of verifying the production systems of beef in Australia is dependent on audits and reliant on producers following the requirements set by processors, which vary for individual grain and grass-fed brands. Consequently, there is a need for a non-destructive on-site method to differentiate between production systems. This research tested the viability of Raman Spectroscopy to accurately discriminate between production systems. Subcutaneous fat from 505 beef cattle carcases was collected and scanned using a 785 nm Mira hand-held device (Metrohm) Raman device. Cattle represented 100-day grain-fed, 70-day grain-fed, grass supplemented and grass-fed production systems. Using Partial Least Squares Discriminant Analysis, a model was developed that was able to accurately predict the production systems of origin for 100-day grain-fed (97%), 70-day grain-fed (93%), grass supplemented (95%) and grass-fed (91%) carcases. This study assessed the viability for an objective carcase measurement for the verification of production system labels and found Raman spectroscopy to be a non-destructive and rapid tool with the ability to discriminate between various production systems.