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Applicability of near infrared spectroscopy to detect adulteration of honey

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Honey adulteration is a serious problem nowadays in food industry. Mainly two types of adulteration can be distinguished: direct and indirect. Direct adulteration means the blending of authentic honeys with sugars from different sources (beet, rice, corn). Detection of fraud of honey is a challenging task, therefore several methods are studied, but none of them is completely accurate. In this wise there is a demand for an accurate, rapid and simple technique. Our aim is to check the applicability of electronic tongue and near infrared spectroscopy for detecting adulteration of honey with sugar syrup. In this study linden honey was adulterated with rice and beet syrup at 0.5, 1, 2, 5, and 10%. As quality indicators pH, moisture, and electrical conductivity determined. Electronic tongue measurements were performed with αAstree potentiometric electronic tongue, NIR measurements were performed with handheld NIRScanNano and benchtop MetriNIR instruments. Descriptive statistics, linear discriminant analysis and principal component analysis were used for the statistical evaluation of the data.

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Investigation of the effect of trisodium-citrate on blood coagulation by viscometric approach

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Blood coagulation is a process, which is initiated by certain physico-chemical effects and results in a change in the blood from the sol to gel state. Trisodium-citrate affects clotting factor IV, the calcium and prevents the change in blood texture. The effect of different amounts of trisodium-citrate (0-5g) on the texture of blood is investigated. Porcine blood was collected in 20 cm^3 test tubes in a slaughterhouse directly before trisodium-citrate addition and was stored for one day under refrigerated conditions. The samples without trisodium-citrate coagulated and the samples with high trisodium-citrate (4-5g) became solid as well because of the protein salting-out. The viscosity of measurable samples and the shear stress was measured with a rotational viscometer (Physica MCR 51, Anton-Paar) with concentric cylinders and Couette type method. The flow behaviour of all samples could be described by the Herschel-Bulkley model. The yield point, the consistency index and the power of law index, which are determined by the equation of the model, showed that the samples with lower trisodium-citrate content coagulated “better” and the sample with high trisodium-citrate were most similar to Newtonian fluid. The yield point of the sample, which contained 3g trisodium-citrate, was by 37,3% less than the sample’s containing 0,1 g trisodium-citrate, and the consistency index of the sample with 3g trisodium-citrate was by 20,5% higher than that of the sample with 0,1g trisodium-citrate.