Prediction of physical and chemical honey parameters trough near infrared spectroscopy (NIRS)

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The present work was made to predict the physical and chemical composition of fresh honey samples. Those samples (n=173). From different locations across the IX and X regions, the samples were scanned in transflectance mode in a NIRSystems 6500 monochromator in both, the visible and near infrared region (400- 2500nm).

Prediction equations were developed using modified partial least squares and cross validation was applied to avoid overfitting. Calibration for moisture (g/kg) was the only one which yielded a determination coefficient (1-VR) and a relation between standard deviation and Standard error of cross validation of 0,930 (S.d/SECV: 3,732) highly enough to validate the equation.

Electrical conductivity and pH showed inferior parameters (1-VR: 0,863); (S.d/SECV: 2,620) and (1-VR: 0,822); (S.d/SECV: 2,297) respectively. Those parameters are not good enough to consider this equation valid.

Ashes, colour(mm Pfund), hidroximetilfurfural (mg/kg), diastase activity, reducing sugars and glucoxidase were poorly predicted by NIRS the parameters were: (1-VR: 0,696) , (S.d/SECV: 1,837); (1-VR: 0,730), (S.d/SECV: 1,826); (1-VR: 0,352), (S.d/SECV: 1,202); (1-VR: 0,376), (S.d/SECV: 1,112); (1-VR: 0,596), (S.d/SECV: 1,550) and (1-VR: 0,703), (S.d/SECV:1,833) respectively.

It is concluded that it will be need more investigation in this area to make NIRS a reliable instrument to predict physical and chemical composition in fresh honey.