

Consumers' food selection is based on a large variety of aspects, such as: appearance, price, convenience or sustainability however, above all, consumers want their food to be tasty. In case of alcoholic beverages the high quality products are appreciated by its flavor which composes of aroma and taste compounds. Therefore careful identification of key aroma compounds formed during preparation of food item with the recognition of technology parameters influencing its formation can provide producers with the knowledge about possibilities to positively influence the overall aroma of the final product.

Mead is a traditional alcoholic beverage made by fermenting honey diluted with water and having a final alcohol content ranging from 8 to 18%. Since 2008 polish mead has been registered in EU as TSG (Traditional Specialty Guaranteed) product which demonstrate its unique quality related to a method of manufacturing based on the tradition. The production of mead, although specified by EU regulations (lit), allows for some variation such as additional step requiring boiling of the honey wort or choice of the type of fermentation: spontaneous vs inoculation with the pure cultures. Therefore it is safe to say that final flavor of mead is affected by heat treatment of the honey wort, diversity of microflora performing the fermentation as well as choice of the raw material (type of honey).

The main objective of this study is to gain basic knowledge on the influence of raw material (type of honey), manufacturing process (honey must heating) and microflora (using spontaneous and inoculated fermentation) on the development of aroma of polish mead using molecular sensory science (sensomic) concept including the identification of aroma active compounds in all production steps (raw honey, heated wort, fermented wort, and matured mead) by gas chromatography olfactometry (GCO), gas chromatography-mass spectrometry (GC/MS) and the quantitation of the most potent odorants by stable isotope dilution assay (SIDA). For assessment of metabolic activity and viability of microbial cells involved in fermentation of mead, the flow cytometry will be used. Isolates will be identified by 16S rRNA/18S rRNA gene sequence amplification analysis.

The final results of this project will give the basic knowledge on the biochemical pathways involved in flavor formation which may be used for the guided bioengineering of the aroma of fermented foods, such as mead. It will demonstrate the influence of raw material, manufacturing process and fermentation conditions on key aroma compounds formation. Additionally, in course of this project, through careful sensomic analysis, a full characterization of polish traditional mead will be achieved.