

## **DESCRIPTION FOR THE GENERAL PUBLIC**

Biogenic amines (BAs) are formed in living organisms during decarboxylation reaction of amino acids by bacteria. In food containing proteins or free amino acids (FAAs) BAs are present in natural composition and due to adverse transformations of proteins (such as aging, poor storage conditions, microbiological spoilage and others). BAs are essential for physiological functions at low concentrations, however exceeding amounts of these compounds can cause complications for human health, especially for digestive system. Moreover, BAs are thermostable, and in food with elevated levels of these compounds, there are no signs of spoilage, what can be misleading for consumers choices.

The project research goal focused on the determination of BA in raw meat is important for technology, microbiology, toxicology and food chemistry. Knowledge of BAs content in food is critical due to their potential toxicity and quality assessment. However, determination of BAs in food is still complicated and time-consuming process due to their molecular structure and low content in complex matrices. The existing methods of BAs determination are time consuming and sensitivity limited by the extraction and detection limits of ppm range, for widely used chromatographic methods. Most procedures are based on BAs organic derivatives, what is the main problem in finding sufficiently sensitive derivative compounds. The latter induce the search for new BAs derivatives which will result in selective, sensitive, accurate, low-time consuming and environmentally friendly (according to "green chemistry" rules) methods of BAs determination.

Raw and processed meat is a natural source of the biogenic amines. The most popular method for controlling the BAs level in fresh meat is refrigeration. However, there are some bacteria involved in BAs formation can grow below 5°C. Among various methods used for BAs reduction in meat are: high hydrostatic pressure or modified atmosphere packaging. However, commonly used packaging materials are waste materials, which creates problems with their utilization. Currently, research on the protection of meat against deterioration and an increase of BAs amount through the use of natural and edible biopolymers are carried out. Assessing the quality of these packaging materials requires determination of biogenic amines in products. Hence, the aim of the project is to develop new methods of BAs and their precursors (free amino acids, FAAs) determination in meat raw and wrapped with a natural biopolymer, preferably biodegradable. The level of BAs will be the indicator of meat quality upon storage and used for shelf life assessment.

The project focuses on developing fast and accurate procedures of BAs and their precursors determination in raw meat and protected with an edible film based on popular hydrocolloids. The main goal of the project is to develop analytical method by modification of sample preparation stage using microwave-assisted extraction and synthesis of new BAs and FAAs derivatives followed by HPLC determination with UV and/or fluorescence detection. Raw meat samples and wrapped in edible films, will be examined for changes of the biogenic amines and free amino acids content. Moreover, selected physicochemical parameters and microbiological purity during storage at 4°C (4 days) and room temperature (2 days) will be studied and compared for both matrices. The added value for the application will be a consumer assessment of meat wrapped in edible foil in terms of smell, appearance (colour, texture) made for fresh and heat treated meat.

A measurable result of the project will be innovative procedures for the determination of biogenic amines and their precursors in complex meat matrices. In addition, the result of the project will provide method of protective edible films verification. Proposed in the project consumer sensory analyses will verify the chemical indicators of meat quality.