Chronic diseases are contemporary one of the biggest health problems, remain in strong connection with usual diet. Diabetes mellitus is one of them, in particular, type 2 diabetes mellitus (T2DM) is the vast majority of cases. The development of effective therapeutic strategies for the prevention and/or treatment based on a selection of ways to restore and maintain blood glucose homeostasis is still in progress. Among the different courses of action, inhibition of dipeptidyl peptidase IV can improve blood glucose control in diabetic patients.

The peptides are inactive in the sequence of the parent protein, until released by the enzyme-catalyzed hydrolysis of the protein. This process occurs during the fermentation and ageing in food processing. However, to call the fragment released bioactive, it must be resistant to the action of digestive enzymes and reach its destination intact to trigger a specific biological effect. It is therefore important to determine the effect of *in vitro* digestion to preserve the activity of peptides released during technological processes.

The project aims to provide information about the basics relationships arising from the degradation of meat proteins treated with proteolytic enzymes (spontaneous proteolysis of endogenous enzymes of meat, the effect of exogenous enzymes of microbial origin in the process of fermentation and maturation and degradation enzymes of the gastrointestinal tract during simulated digestion) into peptides with dipeptidyl peptidase IV inhibiting activity. It is understood that the use of different strains of microorganisms can generate specific sequences comprising peptides with DPP-IV inhibiting properties. Therefore, it is supposed that protein hydrolysis supported by the starter culture during the fermentation and ageing of the meat significantly affects the profile of peptides that are supplied with food to the human body.

The use of probiotic strains as starter cultures may allow the evaluation of their effects on generating the sequence of bioactive peptides of the meat product having properties for the management of type 2 diabetes mellitus. Digestion of the gastrointestinal tract and absorption *in vitro* will be useful to determine whether the released peptide sequences retain biological properties. This will allow to know the factors necessary for a better understanding of the processes, to which meat proteins are subjected during the manufacturing process and the simulated digestion and absorption in the gastrointestinal tract.

General objectives of the project include the analysis of the effect of probiotic bacteria to generate active peptides during fermentation and ageing of pork loins. Resistance of the resulting sequences *in vitro* to hydrolysis in the gastrointestinal tract will also be studied. The study will include, among others, determination of the effect of the ageing time on the content of the peptides in the product and assessment of the dipeptidyl peptidase IV inhibitory activity of meat protein hydrolysates. The innovative investigations *in vitro* will be preceded with *in silico* analysis. Application of chemometric methods help to gain knowledge on the relationship between peptide structure and function.

To achieve the objectives of the project spectrometric and chromatographic techniques will be used. Obtaining information on the role of probiotic strains in the generation of biologically active ingredients and assessment of their activity during digestion in the longer term can be used to design products with desirable nutritional value. They will be important in the prevention of lifestyle diseases. Implementation of the planned research will enable obtaining new knowledge base, which will contribute to the development of the science of functional and nutraceutical food.