Potassium Nitrite Delivery in Meat and Meat Products by Encapsulation in Edible Tubular Cellulose

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Meat and its products are foods of high nutritional value. The ingredient responsible for their preservation and the extension of their self-life along with salt, is nitrite salts. Nitrite salts are proved to be very effective against the growth of many pathogenic microorganisms, but mainly against the microorganism *Clostridium botulinum*. They are used to enhance the color of meat products and also to prevent lipid oxidation. However, nitrite salts have several side-effects. They can cause methemoglobinemia, and they are considered responsible for the creation of carcinogenic nitrosamine compounds such as N-nitroso-dimethylamine, N-nitroso- diethylamine, N-nitroso-dibutylamine and others. Thus, one of the most important issues that the food industry must face is the production of healthier but also safe for consumption meat products without the negative effects of chemical preservatives. A way to achieve this, is the encapsulation of nitrite salts in a carrier which can be excreted from the human body after it has released the necessary preservative amount. In that way food safety is ensured but at the same time the majority of the preservative is excreted by the human body thus reducing the negative side- effects. Our team has already made attempts on this, by encapsulating chemical preservatives in tubular cellulose from leaf celery and from orange pulp. Potassium nitrite gradual release has been studied in pork meat, and sodium benzoate has been studied in orange juices. In continuation of these studies, the purpose of the present work was the encapsulation of potassium nitrite in tubular cellulose from leaf celery and its controlled release in veal meat and pork sausages, studying at the same time different microbiological and physicochemical characteristics. The encapsulation showed a slow delivery of the preservative in both veal meat and pork sausages, showing its potential for future controlled delivery applications. Finally, this way of preservation proved capable of inhibiting the growth and reducing the numbers of spoilage microorganisms in both products. (We acknowledge support of this work by the project “Research Infrastructure on Food Bioprocessing Development and Innovation Exploitation – Food Innovation RI” (MIS 5027222), which is implemented under the Action “Reinforcement of the Research and Innovation Infrastructure”, funded by the Operational Programme "Competitiveness, Entrepreneurship and Innovation" (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund)).

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