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Edible sensors for meat and fish freshness

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Recent years have seen the development of smart packing, food sensors, amino/pH sensors and other optical or visual sensors of food spoilage to monitor freshness status of food products inline with the EU food quality and safety regulations.

Meat and fish are common sources of proteins in human nutrition, and, they are also rich source of nutrients for microbial growth. Spoilage processes inside these products occur rapidly with microbial growth and creation of amines which is the TVB-N (total volatile basic nitrogen) that caused by microbial metabolisms and known as spoilage indicator that tells about creation of products potentially hazardous to health. Last two decades was developed a lot of methods to control and measure essentially important food safety indicators known as smart packages and spoilage sensors, but still mostly part of them unpractical/difficult for usage at home conditions by costumer or contains components that cannot be in contact with product by healthy consumption reasons. That's why become an interest in real-time sensors for food quality control with the most attention focused on sensors for costumer usage.

To eliminate such barriers here the sensor film itself is made of fully edible components/materials. The matrix of film sensor based on pectin that is a natural polysaccharide (polymer) extracted commercially from citrus fruits and apples, and the color pigment as an indicator of spoilage made of extract from red cabbage.

Sensor films absolutely safe as far as contains natural components and high sensitive to amines. The sensitivity of sensor films begins at point 1ppm of vapor amines and with increasing volume of vapor amines changes visually color of film sensor. This high sensitivity was observed on testing sensor films with meat and fish samples for detection freshness of these products.

Biography

Yulia Dudnyk did her master in process engineering of products for health and preventive nutrition at Odessa National Academy of Food Technologies (ONAFT, Ukraine) by the topic: improvement quality and usefulness of puree for baby nutrition. Then did research at department of water treatment technologies (ONAFT, Ukraine) in developing device for small disperse systems in water/air interfaces for removing Fe2+ and Fe3+ from natural drinking groundwater. After she moved to Ecole Polytechnique Federale de Lausanne (Switzerland) and started research in material science and food sensors. Recently started PhD in Institute of Materials, EPF Lausanne (Switzerland) and doing research in intergrading food and material science

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