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Role of Hydroxyapatite Crystals loaded with an active compound in the shelf life extension of food products

Hydroxyapatite (HA) is considered as one of the most potent bioceramics used in several applications, particularly for dental and orthopedic fields. Due to its structural and chemical composition, till now HA has been widely applied as biomaterial to fabricate artificial bonesubstitute or scaffold for orthopedic and periodontal reconstruction or as a drug vehicle of antibiotics to treat bone-associated disease [1, 2]. Thanks to its interesting properties such as biocompatibility, degradability, and biomimetic dimensions, hydroxyapatite could be used as a potential carrier for active compounds: the use of hydroxyapatite crystals as carriers of an antioxidant or antimicrobial compound in an active packaging could protect the active compound from processing and storage conditions, keeping its properties intact. Based on the above, hydroxyapatite was studied as a suitable carrier for antimicrobial and or antioxidant compounds for food application. In particular, flavonoids as quercetin glycosides were chosen as active substances for their well-known antioxidant properties and their potential antimicrobial activity [3, 4]. Thus a preliminary study on the HA absorption properties versus quercetin glycosides compounds and their antioxidant and antimicrobial properties were carried out. finally, hydroxyapatite crystals complexed with quercetin glycosides were loaded into alginate-based edible coating and its effect on food shelf life extension was evaluated.

Speaker Biography

Francesca Malvano, a Post-doctoral Researcher in the Food Technologies, at the Department of Industrial Engineering of the University of Salerno (Italy). I'm PhD in Industrial Engineering and a Master Graduate in Food Engineering. My studies are related to food technologies, food processing, food quality and safety.

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Aflatoxins, food mutagens and carcinogens, and their recovery in malignant human tumors

Introduction: Aflatoxins (AFs) are secondary metabolites produced by the fungi Aspergillus mainly A. flavus, A. parasiticus and A. nomius with toxic efects on animal and human health. The International Agency for Research on Cancer classify AFs as Group 1 of carcinogens proved for humans. AFs contaminate cereals, oilseeds, spices, dry fruits, animal foods such as meats, eggs and dairy products. AFs are considered unavoidable cancer risks for their frequency and toxicity.

Methodology: For the identification and quantification of AFs in food and feed, the first procedure is to validate the methodology, the chemical extraction purifies and concentrates them with anti-total aflatoxin immunoaffinity columns and the identification and quantification is done with High Performance Liquid Chromatography. For the human malignant tumors the choice is Indirect Inhibitory ELISA that gives an accuracy up to fentograms (1x10-15).

Results and Discussion: The concentration of four different AFs (AFB1, AFB2, AFG1, AFG2) and four hydroxylated metabolites (AFM1, AFM2, AFP1, AFL) will be obtained as well as the AFB1 bounded to the human DNA, AFB1-formamydopyrimidine or AFB1-FAPY adduct (active carcinogen) from the human malignant tumors of liver, cervix colorectal, pancreas, or urine.

Conclusions: The presence of the carcinogen in the DNA of the malignant tumor and its abscence or just traces in the controls testifies the role of this food carcinogen in the development of different cancers.

Keywords: toxins of Aspergillus, cancer, contamination.

Speaker Biography

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