oxidative stability of meat based system and deep fat fried products.

AV PO 09

Effect of sodium alginate/carrageenan composites on the oxidative stability of microencapsulated fish oil and its application in noodles

A. JEYAKUMARI[1]*, A.A. ZYNUDHEEN[2], L. NARASIMHA MURTHY[1], U. PARVATHY[1]

[1]Research Centre of ICAR-Central Institute of Fisheries Technology, Vashi, Mumbai, Maharashtra, India; [2]ICAR-Central Institute of Fisheries Technology, Kochi, Kerala, India; **jeya131@gmail.com*

Fish oil has an excellent source of omega-3 fatty acids. However, the use of fish oil as functional ingredients in foods has been limited by its oxidative susceptibility. Hence, fish oil has to be protected against oxidation preferably by microencapsulation. In the present study, the potential of sodium alginate/carrageenan as a wall material along with gelatin and maltodextrin for microencapsulation of fish oil was investigated. Microencapsulation of fish oil was done by spray drying. Fish oil and wall material was used at the ratio of 1:4. Microencapsulated fish oil had moisture content of 2.48-2.52%. Encapsulation efficiency of microencapsulates ranged from 84.22%-87.86. Flow properties of fish oil encapsulate were passable. SEM analysis showed spherical shape of the micro particle with size of 1.76 µm to 19.7 µm. FTIR analysis indicated the formation of polyelectrolyte complex between wall and core material and successful encapsulation of fish oil. Oxidative stability of microencapsulates were tested under accelerated (60°C) and refrigerated temperature (4°C).TBARS values of microencapsulates crossed the acceptable limit of 2 mg MDA/kg on the 4th day (2.2 mg MDA/kg), 28th day (2.5 mg MDA/kg) during accelerated, refrigerated temperature, respectively for the encapsulates contained sodium alginate. Results indicated that micoencapsulates contained sodium alginate was oxidatively stable than carrageenan added one. Microencapsulated fish oil fortified noodles were prepared by hand extrusion. Wheat flour was used as base material. Based on the sensory analysis, incorporation of fish oil encapsulates up to 2% level were acceptable without affecting the taste of noodles.

AV PO 10

Effect of green tea extract on the quality of fish nuggets during chilled storage

A. JEYAKUMARI[1]*, GEORGE NINAN[2], S. VISNUVINAYAGAM[1]

[1]Mumbai Research Centre of ICAR-Central Institute of Fisheries Technology, Navi Mumbai, India; [2]ICAR-Central Institute of Fisheries Technology, Kochi, Kerala, India; **jeya131@gmail.com*

In the present study, fish nuggets were prepared from pink perch (*Nemipterus japonicus*) mince and their qualities were evaluated under chilled (2°C) storage. Pink perch mince had 81.46% moisture, 17.44% protein, 0.85% fat and 1.02% ash. Fish nuggets were prepared in three different formulations by incorporating corn starch (4%), green tea extract (0.1%) and BHT (0.01%). Formulation containing only corn starch (4%) was served as control. Biochemical and microbiological qualities of fish nuggets were evaluated up to 17th day. Results showed an increasing trend in thiobarbituric acid (TBA) values during storage. However, sample contained green tea extract had a lower TBA value (0.34-0.44 mg MDA/kg) than BHT incorporated

sample (0.42-0.80 mg MDA/kg) and control (0.82 – 2.14 mg MDA/kg). Similar trend also observed for free fatty acids, peroxide value (PV), total volatile base nitrogen (TVB-N) and trimethylamine (TMA-N) content. Texture analysis showed an increased trend in hardness during storage. *L** value showed a decreased trend in (59.59 -56.95) green tea extract incorporated sample. Based on the sensory and microbial analysis, control had a shelf life of 12 days whereas, products incorporated with green tea extract and BHT had an extended shelf life up to 17 days.

AV PO 11

Comparative studies on the preparation of nanoparticles from skin-based and scale-based gelatin of blackspotted croaker fish by desolvation method

S. SREEJITH[1]*, MAHESH P. SAMANTH[2], ARVIND R. SINGH[2], DUSHYANT C. KOTHARI[2], G. VENKATESHWARLU[3]

[1]ICAR-Central Institute of Fisheries Technology, Kochi, Kerala, India; [2]Department of Physics, University of Mumbai, Mumbai, India; [3]Indian Council of Agricultural Research, New Delhi, India; *ssreejith1985@gmail.com*

Nanoparticles were prepared using gelatin extracted from the skin and scales of blackspotted croaker (*Protonibea diacanthus*) using one-step desolvation and two-step desolvation methods. Their particle size, stability and morphology were compared. The particle size of nanoparticles prepared by single-step desolvation from scale-based gelatin showed a broader size distribution (697 nm to 2.613 µm) and larger average size (1.047 µm) compared to skin-based gelatin. For skin-based gelatin, the size distribution was 384 nm to 1.326 µm with an average size of 633 nm. The nanoparticles prepared from skin and scales by single- step desolvation had a very low zeta potential of +7.1 mV and +4.6 mV respectively indicating its low dispersion stability. Fish gelatin nanoparticles prepared by two-step desolvation method were having smaller average size and narrow size distribution compared to those prepared by single-step desolvation method. The particle size distribution of nanoparticles prepared by two-step desolvation from scale-based gelatin were marginally broader (128.6 to 302.1 nm) than skin-based gelatin (134.2 to 286.8 nm). There was no significant difference between average particle size of fish skin-based gelatin nanoparticles (189.7 nm) and fish scale-based gelatin nanoparticles (186.4 nm). The nanoparticles prepared from skin and scales by two-step desolvation had a higher zeta potential of +39.6 mV and +34.8 mV respectively indicating its high dispersion stability. The particle size and spherical shape of nanoparticles were confirmed using Atomic Force Microscopy (AFM). The present study demonstrates two-step desolvation method as an efficient method for the preparation of fish gelatin based nanoparticles than one-step desolvation method. Nanoparticles from skin-based gelatin were found to have narrow size distribution than those prepared from scales.

AV PO 12

Structural, functional and antioxidant properties of spray dried clam shuck water

K.R. SREELAKSHMI*, P.K. BINSI, K. SARIKA, A.A. ZYNUDHEEN, K. ASHOK KUMAR

ICAR- Central Institute of Fisheries Technology, Matsyapuri P.O., Willington Island, Kochi, Kerala, India; * *sreecift@gmail.com*

Shuck water from clam is an under-utilized byproduct of clam processing operations. In the present study, shuck water was