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

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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

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

concentrated and spray dried to obtain a free flowing powder. Prior to spray drying, maltodextrin was added at 5% (w/v) of total solid content and a stable emulsion was formed. Further, the physico-chemical and functional properties of the emulsion and the powder were analyzed. Maltodextrin acted as an anti-caking agent by decreasing the caking strength from 9 Kg to 1.86 Kg and increasing the dispersibility and fat binding capacity. However, addition of maltodextrin resulted in slight reduction in surface active properties such as emulsion activity and foaming capacity, while yielding a stable emulsion. The surface characteristics of the powder were revealed by scanning electron and atomic absorption microscopy. Further, the antioxidant properties of the powders as assessed by standard anti-oxidant assays indicated higher DPPH antiradical scavenging activity for pure shuck water powder.

AV PO 13

FTIR studies on formulation of fish crackers with different proportion of fish with starch

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This study is attempted to examine the molecular interaction that had occurred during the process of gelation and retrogradation of the fish cracker gel and upon frying. Fish crackers prepared by blending lean fish (*Nemipterus japonicus*) along with tapioca, corn and sago in the ratio 40:30:15:15 by standard protocol were examined at different stages of processing. FTIR spectra of individual starch ingredients analysed showed 8 typical major bands in the region of 800-1400 cm^{-1} that are unique to starches but at slightly different frequencies. Two typical peaks of starches were absent in sago. FTIR spectra of fish possessed amide A (3447 cm^{-1}), amide B (2926 cm^{-1}), amide I (1651 cm^{-1}), amide II (1544 cm^{-1}), amide III (1240 cm^{-1}) and amide IV (609 cm^{-1}). Few peaks common to starch and fish were identified at 3400, 2925, 1640-1651 and 1080 cm^{-1}. After gelation and retrogradation, the dried fish crackers showed major change in the intensity of the bands corresponding to starch, as they have narrowed down after gelation. But, the amide B peak of fish at 2926 cm^{-1} was very prominent even after gelation. Frying of dried crackers in vegetable oil had totally changed the spectrum for crackers because of the influence of oil. The FTIR bands unique to vegetable oil viz. 3426, 3009, 1746, 1654, 1378, 1099 and 721 cm^{-1} were very prominent. Some interaction had occurred between the oil and cracker, which was evident through the shifts noticed in the band width of certain peaks between wave numbers 3000-2800 cm^{-1}; as well at 1750 cm^{-1}. Amide B band of fish at 2926 cm^{-1} was very prominent even after gelation, while bands between 800-1400 cm^{-1} of starch corresponding to aldehyde peak of CHO were very sensitive to gelation due to dissolution of starch.

AV PO 14

Heat penetration characteristics of yellowfin tuna processed in different containers using different heating medium

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