Tunas are highly sought after seafood commodity across the globe in different forms. Thermal processed tuna is highly preferred by the consumers due to its characteristic taste and flavor. Although thermal processing of tuna is a highly established industry, the process conditions are reviving with advancements in research to reduce process time and improve the nutritional quality. The present study was undertaken to assess the effect of heating medium and containers on the heat penetration characteristics of Yellowfin tuna in water. Equal quantity of tuna and filling medium packed in retortable pouch and TFS can were processed at 121.1^0C to an F_o value of 10 min using different heating medium viz., steam-air, water spray and water immersion. Various process parameters were compared. Come up time varied between 3 to 8 min. Lag factor for heating (J_h) was least for tuna packed in can and processed using water spray, which resulted in least process time. Cook value was least for tuna packed in can and processed in steam-air retort (88.83 min) and highest for tuna packed in retortable pouches and processed in water immersion retort (115.7 min). Among the containers process time was least for metal cans and among heating medium, it was least for steam-air. A reduction of 17.21, 11.07 and 9.36% in process time was observed for metal containers processed in water immersion, steam-air and water spray mediums, respectively.

AV PO 15

An innovative 3D printing technology based mould for shrimp analogue product

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An innovative technology, 3D printing is widely used in many fields widely as it permits layer-by-layer construction of a structure directly from a 3D computer drawing without human intervention. In food, 3D printing is very advantageous as it allows the fabrication of food products using wide variety of ingredients. Analogue products are highly sought after food as they imitate highly priced food commodities with modified texture and taste. The present study aimed to develop a 3D print based shrimp mould for developing shrimp analogue product from low value fish, lizard fish (*Saurida thumbil*). For this Fused Filament Fabrication 3D modelling technique was used for developing shrimp analogue mould using bioplastic, polylactic acid (PLA). The developed mould was used to prepare shrimp analogue product using optimized combination of ingredients. Heating medium (water bath, steam retort, steam autoclave) and temperature (90, 95 and 100^oC for 20 min) was used to optimize the setting conditions. The results indicated that PLA mould prepared using 3D printing technology is a cost effective device for developing shrimp analogue products. Heating in steam retort at 90^oC for 20 min resulted in better product compared to other setting conditions.

AV PO 16

Effect of High Pressure Processing on the quality of protein isolates extracted

from shrimp head waste during refrigerated storage

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Effect of high pressure treatment on physico-chemical and microbiological quality of protein isolates from shrimp head waste was evaluated. Protein isolates were prepared using alkali solubilisation and iso-electric point precipitation. Protein isolates were subjected to high pressure treatment at 200 and 400 MPa with a holding time of 10 min at 30±3°C and the samples were designated as S-200 and S-400. Untreated samples were designated as control. The three groups were stored at 2±1°C for shelf life evaluation. Biochemical analysis such as TVB-N, TBARS and TMA showed increasing trend during storage. The values obtained for biochemical quality indicators were higher than the acceptable limit for control on 21st day of storage, whereas S-200 was unacceptable by 35th day. The S-400 was within the acceptable range even after 35 days of storage as revealed by biochemical analysis. The observed changes in biochemical quality parameters were well related with the APC. The coliforms were detected in control and S-200 samples on 28th day, whereas, the coliforms were not detected in S-400 throughout the storage study period. Enterobacteriaceae count of Control and S-200 increased, whereas, S-400 sample was free from enterobacteriaceae during the storage. Whiteness (L*) values of protein isolates increased with increase in pressure level. However, L* values was decreased as storage period increased in all the samples. The results revealed that the high pressure treatment at 400 MPa (S-400) with a holding time of 10 min extended the shelf life of protein isolates by 14 days under refrigerated storage over the untreated sample.

AV PO 17

Evaluation of viscosity as an index of freshness of rohu, *Labeo rohita* (Hamilton, 1822)

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Freshwater aquaculture is the fastest growing sector in India; . 70-75% of the freshwater fish production is contributed by the India; n major carps. Among the IMCs' Rohu (*Labeo rohita*) alone hold a share of around 35-40% of total IMC production. In this investigation, physic-chemical, microbiological, organoleptical and rheological changes with special reference to viscosity were evaluated during ice storage period. In order to shorten the length of handling protein, quick extraction method was standardized using 1.0 M NaCl extraction buffer (EB) for extracting muscle proteins from grated mince. The extract was later studied for viscosity and protein measurement at selected temperature i.e. 25^{0}C. Initial high viscosity of extract at 0th hour i.e. just after slaughtering live fish, gradually decreased due to low extractability of proteins leading to lowering of viscosity. During ice storage, increment in viscosity and protein was observed during rigor stage followed by a decreasing trend till the end of storage period. On 21st day of storage almost 42.65% and 52.91% reduction was seen in viscosity and protein respectively. The viscosity and protein were found to be highly correlated with each other hence the attempt