

Development of dietary fiber-incorporated fish sausage

George Ninan, Aswathy K.S. and Joshy C.G.

ICAR-Central Institute of Fisheries Technology, Cochin

Sausage is a major item of new generation fast food, because of overwhelming young generation craving for its superb taste, fabricated texture, brilliant colour and high nutritional quality. Fish sausage prepared from the mixed mince of under-utilized fishes would be a healthy option for the new generation. The addition of dietary fiber to fishery products is of particular interest as a means of improving the functionality of food products and as a component of new functional foods. The addition of dietary fiber would help to further improve health features of consumer by reducing cholesterolemia, modifying the glycemic response, increasing nutrient availability etc. Therefore, a study was undertaken to develop fiber-enriched tuna sausages by optimizing different combinations of oats and wheat dietary fibers by considering the quality parameters.

The chilled yellowfin tuna (*Thunnus albacares*) blocks were purchased from fresh fish cutlet in Cochin, Kerala. Fish blocks were split into small pieces and washed immediately in potable water and removed all impurities and bones and made into mince by using meat bone separator. Two different types of dietary fibers were used for the preparation of dietary fiber-incorporated tuna sausage samples. The selected VITACEL® brand dietary fibers were oats fiber HF 401-30 and Wheat fiber WF 600R supplied by M/s Rettenmaier India Pvt. Ltd. Sausages were prepared according to the standard recipe by replacing only desired percentage of fish mince with oats and wheat dietary fibers. The common ingredients for the preparation of a standard sausage like salt (2.50%), sugar (1.50%), potassium sorbate (0.10%), polyphosphate (0.20%), guar gum (0.01%), spice mix (0.10%), spice concentrate (1.50%), fat (5%), corn starch

(9%), ice (10%) were used for all these samples in same proportion. Recipe ingredients used in this preparation were of food grade quality.

An experimental design with 13 runs was formulated for the development of dietary fiber-incorporated tuna sausage by substituting tuna mince with fibers. Fish mince ranging from 60 to 70%, wheat and oats fiber ranging from 0 to 5% were used for the formulation of the experimental design with a constraint on sum of mince, wheat and oats fiber to 70%.

The dietary fiber-incorporated tuna sausage was developed by standard procedure. After mixing, all ingredients were stuffed into commercially available polyamide casings (35 mm diameter) to a length of 100 mm by using a hand operated sausage stuffer. Sensory analysis of the sausages was done by a five member expert panel using a 9 point Hedonic Scale prescribed. The score of 9 denoted the quality description “likes extremely” and 1 denoted “dislikes extremely”. A score of 4 was considered as the margin of acceptance. Sausages were cut into uniform pieces and warmed in a microwave oven for 1.5 min. and presented in coded plates. Panelists were asked to score on appearance, colour, odour, flavor, taste, texture and overall acceptability of the samples (Rahman *et al.* 2017).

The best combination was selected based on the sensory and physical parameter evaluation of 13 combinations. The sensory scores of 13 combinations are given in Fig. 1. It was found that sample Number 12 (S12) and sample Number 13 (S13) have highest sensory score compared to the others (Fig. 2). Apart from sensory scores, physical parameters of S12 and S13 were also found to be the best.

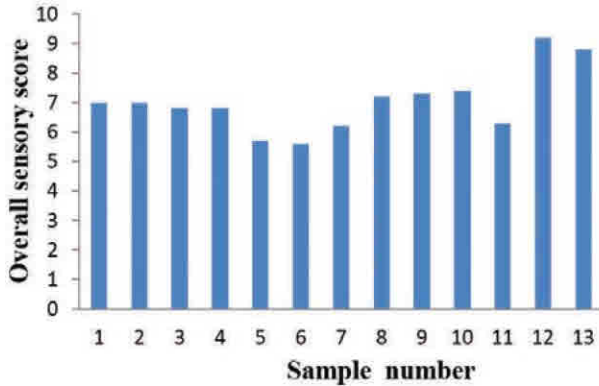


Fig. 1. Overall sensory score of sausage samples

The optimum combination of sausage was found to be 66.8% fish mince with 1.6% each of oats and wheat fibers (S12); and 62.5% fish mince with 2.5% wheat fiber and 5% oats fiber (S13). On the basis of the proximate evaluation of samples,

control and Sample S12 had no significant change in the proximate values. The Sample S12 had 18% carbohydrate, 15% protein, 7% fat, 1% ash and 59% moisture. But Sample S13 had higher amount of carbohydrate, protein and less moisture compared to control. The proximate composition of Sample S13 was 23% carbohydrate, 16% protein, 7% fat, 1% ash and 53% moisture.

References

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- Rahman, M., AL-Waili, H., Guizani, N. and Kasapis S. (2007) - Instrumental sensory evaluation of texture for fish sausage and its storage stability. *Fish. Sci.*, **73**: 1166-1176.



Fig. 2. Dietary fiber incorporated tuna sausage samples (S12 and S13) and control

Quality evaluation studies in ready-to-use squid soup tablets

Femeena Hassan and Bably J. Vijayan

ICAR-Central Institute of Fisheries Technology, Cochin

Development of value added products from seafood is an important need in fish processing

industry. There is an increasing demand for ready to cook or ready to serve type seafood products.