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Preparation of snack product (Fish kachori) from lesser tiger tooth croaker (*Otolithes cuvieri*) fish

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Abstract

The lesser tigertooth croaker (*Otolithus cuvieri*), which is present in large biomass in the western coast of India. Kachori is a very popular snack item in shaurashtra region (Gujarat) and northern region of our country. Most of the snack items available in the market are based on cereals, which are high in calorie and low in protein content. For this reason, snack like fish kachori with higher protein content was to be developed for nutritional enrichment. The value added product was prepared with maida flour and fish meat in 50:50% ratios. Fish kachori were subjected to analyses for proximate as well as sensory evaluation to determine the nutritive value and its quality attributes for general acceptance. Comparison of kachori with fish meat and without fish meat has done. Kachori without fish meat has 6.4%, whereas 21.38% protein content in fish kachori. Sensory evaluation of this kachori was done on a 5 point hedonic scale and on the basis of the comments from panel members.

Keywords: Fish kachori, lesser tigertooth croaker, protein content, sensory score

Introduction

Snack foods have become an important part of the food habits of the majority of the world's population [1]. Foods which are prepared with fish meat have higher amount of nutritional components. The health conscious consumers always demand nutritious and convenient food item which can be best suited for their busy life. Meat is a highly valued food product for human consumption because it is a good source of essential amino acids and B-complex vitamins and minerals [2]. As a scope of income generation and profit margin it is very essential to utilize fish into value added product such as fish Kachori. Demand for the ready to eat, ready to prepare and shelf stable food increasing with changes in life style and food habits. Kachori is a popular snack product in different states likes Rajasthan, Uttar Pradesh, Madhya Pradesh and other parts of Northern India [2]. It is usually a round flattened ball made up from fine maida flour filled with a stuffing of besan, black pepper, red chili powder, salt and other ingredients. Meat and meat products are important sources of protein, fat, essential amino acids, minerals and vitamin and other nutrients [2]. Croaker fish contain good protein source. We can prepared fish kachori from other than fish. Global great demand for shark and ray derived products [3]. Today it has become local snack dish of several regions of Indian Subcontinent. Kachories can be stored in air tight container for a week. This type of proteinous snacks is best for school going children, working women etc. The natural ingredients used for the preparation of seafood related fish kachori may reduce the heart and lung disease [4, 5, 6]. Ginger in fish kachori is effective for treating nausea caused by seasickness, morning sickness and chemotherapy [7]. Objectives of our study were to prepare the Kachori using fish meat and to evaluate the sensory and physico-chemical parameters.

Materials and Methods

Fish (*Otolithus cuvieri*, lesser tigertooth croaker) were purchased from local market of Veraval. The body scales were removed and completely dressed the fish manually. The meat of the fish was stored into freezer at -18 ± 2 °C until use. Other ingredients such as maida flour, besan flour, refined oil and spices were purchased from market.

Fish kachori preparation

For the preparation of fish Kachori dough, ground nut oil and Luke warm water was added to refined maida flour. The mixture was kneaded for 10 minutes at room temperature, after that it was kept for 5-10 minutes until the further process (Ingredients of fish kachori in Table 1). For

the preparation of fish Kachori mixture, deboned fish meat was minced in meat mincer. The condiments mix, spice mix, refined soybean oil, salt, was added as per formulation given in Table 1. Grind the besan gathiya in the mixture to mix up easily with meat. After mixed of all the spices, added oil and to provide round shape. Kachori were covered with maida flour. The prepared kachori were deep fried in oil at 170 °C temperature, until turn its golden brown color.

Table 1: Formulation of fish kachori mixture

Sr. no.	Name of the ingredients	Percentage (w/w)
1	Maida flour	40
2	Besan gathiya	15
3	Edible fish powder	20
4	Spice mix	10
5	Groundnut oil	10
6	Salt	2
7	Condiment mixture	3
	Total	100

Analytical procedures

Instrumental color profile

Color profile was measured by using Colour Reader CR-10 (Konica Minolta Sensing Inc. Japan). Which has L^* , a^* and b^* values. L^* denotes lightness, a^* (redness) and b^* (yellowness) values were recorded on crushed kachoris kept in a group in the Petri plate. The equipment was standardized with a white color standard.

Determination of oil absorption

The percentage oil absorption was calculated according to the standard method [8] which is given below:

$$\text{Oil absorption (\%)} = \frac{\text{Weight of kachori after frying} - \text{Weight of kachori before frying}}{\text{Weight of kachori before frying}} \times 100$$

The fish kachoris were weighted before and after frying in groundnut oil, using a digital balance. This was done in five replicates and the average weight was taken.

Determination of diameter

The diameter of kachoris was measured by digital Vernier caliper in mm. This instrument measured more precisely than could be done unaided when reading a uniformly divided circular measurement scale.

Proximate composition

The moisture, fat, protein and ash content of the fish kachori was estimated using automatic moisture meter, Socs plus, Kel plus and Muffle furnace, respectively following the method of AOAC [9].

Sensory evaluation

Five member experienced panel of judges including teachers and post graduate students of Department of Fish Processing Technology evaluated the samples for the sensory attributes *viz.* appearance, flavor, color, texture and overall acceptability using 5-point hedonic scale according to standard procedure [10] where, 5 = like very much and 1 = dislike very much.

Results and Discussion

Table 2: Nutritional quality of veg. Kachori and fish Kachori

Proximate composition	Veg. Kachori	Fish Kachori
Moisture (%)	9.26 ± 0.17	9.92 ± 0.08
Protein (%)	6.40 ± 0.02	21.38 ± 0.87
Fat (%)	29.21 ± 0.19	19.81 ± 0.29
Ash (%)	1.95 ± 0.05	2.95 ± 0.05
Carbohydrate (%)	52.04 ± 0.11	44.92 ± 0.08
Total energy (kCal)	496.65	443.49

(n = 5, mean ± SD).

Table 3: Physical analysis of the product (Fish Kachori)

Oil absorption (%)	8.31 ± 0.57
Diameter (mm)	36.1 ± 0.74
Color (L^*, a^*, b^*)	
L^* (Before frying)	80.68 ± 0.90
a^* (Before frying)	-12.9 ± 0.51
b^* (Before frying)	20.06 ± 0.51
L^* (After frying)	54.4 ± 2.25
a^* (After frying)	8.96 ± 2.30
b^* (After frying)	41.8 ± 2.23

(n = 3, mean ± SD).

Table 4: Sensory analysis Fish Kachori

General appearance	4.5 ± 0.5
Texture	4.0 ± 0.7
Flavor	4.5 ± 0.5
Color	4.7 ± 0.3
Overall acceptability	4.4 ± 0.5

(n = 5, mean ± SD).

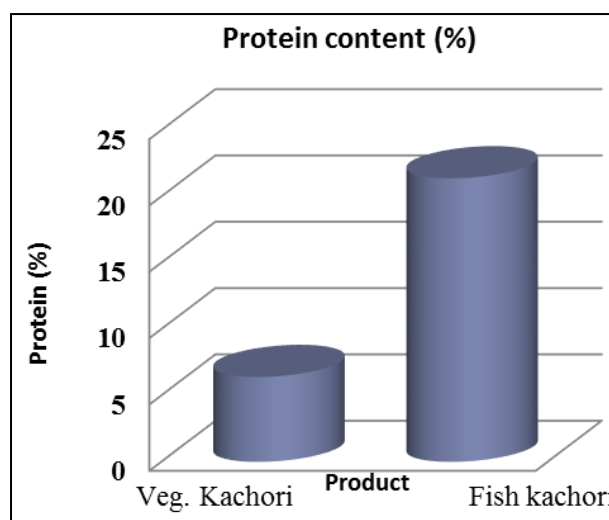


Fig 1: Graphical presentation of protein

The modification of the traditional snack product (fish kachori) was seen as a successful attempt towards the big goal (Comparison of both veg. and fish kachori in Table 2 and Fig 1). Physical analysis of the product (Fish Kachori) in Table 3. The color of any product can be represented in terms of tristimulus L^* , a^* , b^* , or by a combination of them, depending on the nature of the pigment present in the foodstuff [11, 12, 13]. In the literature there is little information available about color changes of fish [14].

Sensory evaluation is the most reliable test for raw material and processed fishery products ^[15]. Sensory analysis of the recipe was found to a large extent by maximum members. Texture and color of the product were admittedly average. The flavor and appearance of the product were mostly found to be at a scale of 5, concluding it was very well accepted in terms of flavor and appearance. Table 4 show the sensory analysis fish kachori. The sensory characteristics of fish are clearly visible to the consumer and are essential for consumer satisfaction ^[16]. As evident in graphical representation, the veg. kachori have much lesser protein value compared to the fish kachori, however typically protein contains high quantity of essential amino acids which is beneficial to the human health. The fish kachori was well accepted in terms of its nutritional benefits and medicinal impact.

Conclusion

Development of shelf-stable kachori incorporated with fish meat was an innovative approach to provide a product which will provide all the appropriate nutrients to the consumers. This product is a much better option than simple veg. kachori in terms of health aspects.

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