



## Chemical composition of fish onion rings made from *Luciobarbus esocinus* and *Engraulis encrasicolus*

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**Abstract** In this study, it was aimed to generate of onion rings using *Luciobarbus esocinus* and *Engraulis encrasicolus*. Into the dough the onion rings dough, corn flour, wheat flour, salt, fish meat, cold water and onion were added. Then, stirred with mixer until a homogenous mixture was obtained. By Add different species with fish meat into this mixture, two different groups from onion rings groups were created. After this doughs was used a apparatus to onion ring shape, the fish onion rings for texture was applied in the freezing form for at least 2 days. The chemical composition (moisture, protein, oil, ash, carbohydrate) and sensory quality (of appearance, odor, color, flavor, crispiness and general acceptability) of the samples were obtained. At the end sensory analysis of fish onion rings, experimental samples prepared with *Engraulis encrasicolus* received the highest rating points from the panelists among the different experimental onion rings samples. But, it has been concluded that making the fish onion rings is suitable for both species due to its nutritive properties.

**Keywords** Fish onion rings, *Luciobarbus esocinus*, *Engraulis encrasicolus*, fast food, chemical composition

### Introduction

The snacks known as "Snack Food" in the entire world are broadly consumed. The onion rings are quite a popular of snack food coated [1]. The Onion is a widely used vegetable in all worldwide [2-3]. The onion is generally as raw; however, some of amount a small of onions available at sales points are treated in various ways [4]. Foods as onion rings can be easily and conveniently cooking in boiling oil or in oven heating [5]. The nutritive quality of fish very valuable for our vital activities [6-7]. It is imagined that it would be worth to enrich these inventions added with nutritional fish meat since this products are consumed at high rates today [8]. But, there is very limited to data relevant to evaluation of added with fish nutritional meat of onion rings can be found among studies.

The study aims to determine the effect of fish meat on sensory characteristics and chemical composition of fish onion rings of two fish type containing meat of *Luciobarbus esocinus* and *Engraulis encrasicolus* in Turkey.

### Material and Methods

Within this study, *Luciobarbus esocinus* and *Engraulis encrasicolus* were receipted from fisheries in the Keban Dam Lake in Pertek region. The all fishes were moved to the laboratory in the Pertek Vocational College in ice with polyurethane carriage boxes. Fishes were operated in the same day. Then, fillets were prepared and they were rinsed in cold water with 5% salt-water. Finally, they were ground in blender for 10 minutes.

### Creating of fish onion rings

Fish onion rings were produced according to the method reported by Karaton Kuzgun [9]. It is in down as ordered of fish onion rings process:

1. Supplied fish and the fish were made into fillets.



2. Fish filets were kept in 5% cold salt solution for 10 min, which was made into mince.
3. The mixture was added minced onion (minced fish meat, wheat flour, corn flour, salt, water) (Table 1).
4. The mixture was mixed using a mixer until a homogenous mixture was obtained.
5. After the mixture was formed as the shape of the onion ring by the dough shaping apparatus. The fishy onion rings was applied in the freezing form for at least 2 days.
6. Frozen fish onion rings were covered first flour. Lastly panko or breadcrumbs and followed by egg.
7. Cooking in the hot oil (1-1.5 minutes at 150-190 ° C) (Figure 1.).

**Table 1:** Ingredients of fish onion rings

	<b>Minced Fish meat(g)</b>	<b>Minced Onion(g)</b>	<b>Wheat Flour(g)</b>	<b>Corn Flour(g)</b>	<b>Salt (g)</b>	<b>Water (mL)</b>
<b>Fish Onion Rings</b>	180	350	180	50	20	220



*Figure 1: Fish Onion Rings*

**Chemical Analysis**

Protein% content was measured with AOAC method with protein % analysis [10]. Moisture % was determined with AOAC method by drying the sample at 100 °C until constant weight was obtained [11]. Fat% with Soxhlet method (Extraction) was determined [12]. The ash% content was measured with AOAC method with burning method [10].

**Sensory Analysis**

Five experienced panelists were academic staff trained in sensory descriptors for the samples. were evaluate in terms of appearance, odor, color, flavor, crispiness and general acceptability of the fish onion rings (9-Very Good to 1—Very Bad) [13].

**Results and Discussions**

Table 2 exhibits moisture 76.55±0.55% (Group E), protein 14.58±0.07% (group L), fat 19.81±0.11% (group EO), ash 2.84±0.39% (group LO) and carbohydrate 20.51±0.43% (group ED) the highest amount of dough mixture created for prepared fish onion ring as they were containing different fish kinds. In another study on dough mixture, protein %, moisture %, ash %, fat %, and carbohydrate% content of mixture were expressed as 16.75±0.75%, 44.5±0.50%, 2.05±0.25%, 19.50±0.50%, and 17.00±1.00%, respectively. These data’s are similar with our data’s. Though, protein and fat quantity were determined to similar values in our found [9]. When other studies available in the literature are examined, moisture % value of onion rings treatment with dehydrated were measured as 48.0 [4]. Similarly, Ling et al. [14], the value fat and moisture of onions were determined as 24.70±1.00, 31.20±1.50, respectively. These data’s displayed similarity with our data’s.



**Table 2:** Chemical Composition of Onion Rings Prepared with Different Fish

	Moisture%	Protein%	Fat%	Ash%	Carbohydrate%
<b>L</b>	69.55±0.45	14.58±0.07	11.93±0.26	1.17±0.15	2.77±0.03
<b>E</b>	76.55±0.55	6.37±0.27	10.56±0.48	1.01±0.02	5.51±0.31
<b>LD</b>	67.55±0.35	5.51±0.41	6.44±0.43	2.45±0.04	18.04±0.29
<b>ED</b>	67.10±1.10	4.39±0.00	5.57±0.54	2.43±0.13	20.51±0.43
<b>LO</b>	54.15±2.05	7.18±0.06	23.82±0.51	2.84±0.39	12.01±3.00
<b>EO</b>	53.70±0.6	6.56±0.05	19.81±0.11	2.71±0.40	17.21±0.04

**L:** *Luciobarbus esocinus*, **E:** *Engraulis encrasicolus*, **LD:** *Luciobarbus esocinus* Dough, **ED:** *Engraulis encrasicolus* Dough, **LO:** *Luciobarbus esocinus* Onion Rings, **EO:** *Engraulis encrasicolus* Onion Rings.

Sample different fish kinds onion rings were also evaluated by participants in terms of crispiness, appearance, color, odour, general acceptability and flavour (Figure 2). When sample of two different fish onion rings cooked were evaluated by panelists in terms of their appearance, the highest score was given to samples from group EO (9.00±0.00), the lowest score was given to the samples from group LO (8.00±0.00) (Figure 2). As it is seen from Figure 2, in sensorial analysis for their odour of samples, in the two groups were given 9.00±0.00 score. When the two different fish onion rings were examined in point of color, they were found to have values of 9.00±0.00-8.00±0.00. When fish onion rings evaluated in terms of flavour, they were the most loved group LO (Onion Rings added *Luciobarbus esocinus*). As it is seen from Figure 2, When fish onion rings evaluated in terms of crispiness of samples, groups EO of experimental samples by participants were had the highest points. The values of Karaton Kuzgun [9] is more low than the ours values determined, and we can attribute this to the different fish species.

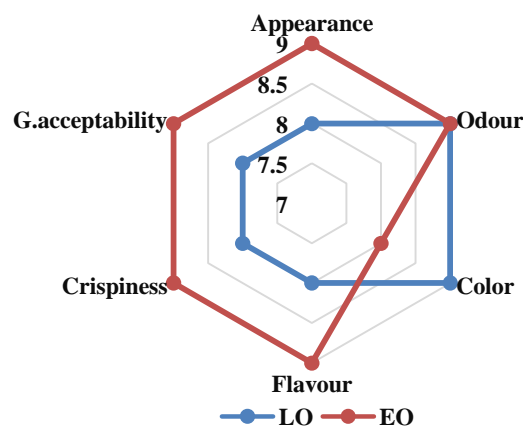


Figure 2: Sensory Change of Onion Rings Prepared with Different Fish

## Conclusion

In the light of all these data; we have come to the conclusion that the onion rings prepared processing with add of fish meat, which can be present and market offered to the consumer as onion rings increasing of nutritional value of prepared with different fish species in our consumer and world. Additionally, it has come to the idea that onion Rings groups prepared with *Engraulis encrasicolus* will be more appropriate to consume in terms of sensory analyzes. However, it has been concluded that making onion rings with fish is suitable for both species due to its nutritive properties and very little fishy odour.

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