



Amino Acid Content of Fish Onion Rings Made from Rainbow Trout (*Oncorhynchus mykiss*)

Nermin KARATON KUZGUN

Fisheries Faculty, Munzur University, Tunceli, Turkey

Abstract In this study, it was aimed to product of fish onion rings with rainbow trout (*Oncorhynchus mykiss*). Based on the onion rings dough, fish meat, onion, corn flour, wheat flour salt, and cold water were added and stirred until a homogenous mixture was obtained. After the mixture was formed as the shape of the onion ring by the dough shaping apparatus, the fish onion rings was applied in the freezing form for at least 2 days. Amino acid and sensory quality of the samples that were acquired in the study were determined. Analysis of amino acids showed that prolin, isoleucine and lysine were found the highest amino acids present respectively. The general acceptability score of fish onion rings was perfectly approved of by panelists.

Keywords Fish onion rings, *Oncorhynchus mykiss*, fast food, amino acid, sensory quality

Introduction

Onion (*Allium cepa* L.) is one of the major most important commercial vegetable vis-a-vis spice crops grown in Turkey. Onion is a commonly used vegetable in all world [1]. A large rate of onion is used as fresh; however, some of the small amount of onion available in the market are processed in various form [2]. Worldwide, several onion ring products have been developed [3]. The emergence of such foods in the world marketplace is linked to their convenient heating by deep-fat frying or oven heating, good taste, and appealing crunchy coating [4, 5].

Prepared foods are consumed by a large part of the society. However, these foods are generally rich in carbohydrates and saturated fats. The production of foods sourced from seafood needs to be increased [6]. The importance of unsaturated fatty acids and essential amino acids in human nutrition has been emphasized in several studies in recent years [7-11]. The most consumed and most delicious parts of fish by humans is muscle tissue. Amino acids are extremely important for human health. It provides healing and growth of tissues [10, 12]. There are compounds that give plenty of flavor in the muscle tissue. The nutritious protein of the fish must be combined with the convenience and pleasure of ready-to-eat foods (Snack Food). This study therefore, is aimed at investigating the amino acid content of fish onion rings made from rainbow trout.

Material and Method

Fish onion rings were produced according to the method reported by Karaton Kuzgun [1]. Within this study, *Oncorhynchus mykiss* fishes were procured from fisheries in Pertek territory in the Keban Dam Lake. Fishes were transferred with polyurethane boxes with ice to the Pertek Vocational College laboratory. Then, they were processed in the very same day. After fish fillets were prepared, they were kept with 5% salt-water (Cold water). Then, they were ground in blender for 10 minutes. Based on the onion rings dough, fish meat (180g), wheat flour (180g), corn flour (50g), salt (20g), onion (350g) and cold water (220mL) were added and stirred until a homogenous mixture was obtained. 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. Frozen fish onion



rings was covered first flour, lastly panko or breadcrumbs and followed by egg. After coating process of fish onion rings, it was cooked in the hot oil (1-1.5 minutes at 150-190°C).

Amino acid analysis: In determining the free amino acid composition of the samples, the HPLC method described by Aristoy and Toldra [13], Antoine et al. [14] was used.

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 (5-Very Good to 1—Very Bad) [15].

Results and Discussions

Amino acids are aromatic components responsible for flavor [16]. One of the most important reasons for the fact that seafood products are biologically valuable foods is the essential amino acids. Vegetable proteins contain very small amounts of important essential amino acids such as lysine and methionine[17], therefore it is necessary to take animal protein for healthy eating. The amino acid content of onion rings are presented in Table 1. The amount of Isoleucine, leucine, arginine, Lysine, phenylalanine, proline and threonine decreased while the amount of the Asparagine, Histidine and Methionine remained in the same level after onion rings process. Berik et al.[6] reported that amino acid analyses showed that the highest amounts of lysine, glutamic acid and leucine the essential amino acids for humans were founding in rainbow trout meat and fingers. The findings of this study show similarity with our study. In our study, the total amount of amino acids was 21.303 g/100g in fish meat, 9.232 g/100g in fish onion ring dough and 15.546 g/100g in fried fish onion rings (Table 1.). The amino acid findings in the fish meat reported in the literature are shows similarity to study [6, 18-22].

Table 1: The amino acid content of onion rings g/100g

Amino acids	F	D	O
Aspartic acid	0.843	0.099	1.616
Glutamic acid	0.592	0.015	0.139
Serine	0.984	0.081	0.622
Asparagine	1.012	0.097	1.202
Glutamine	0.028	0.011	0.021
Threonine*	1.058	0.081	0.537
Glycine	0.110	0.004	0.002
Histidine	0.103	0.004	0.167
Citrulline	0.640	0.167	0.964
Alanine	0.591	0.007	0.009
Arginine	0.951	0.061	0.686
Tyrosine	0.043	0.011	0.002
Cystine	0.001	0.001	0.009
Valine*	0.052	0.002	0.053
Norvaline	0.919	0.323	0.013
Methionine*	0.076	0.024	0.099
Phenylalanine*	0.201	0.001	0.123
Isoleucine*	2.820	1.161	1.037
Leucine*	0.021	0.001	0.016
Lysine*	2.178	0.021	1.040
Proline	8.080	7.060	7.189
Total	21.303	9.232	15.546

F: Fish meat, D: Dough, O: Onion rings

The sensory quality point's experimental sample fish onion rings were presented in Figure 1. In the experimental study determined conducted on onion rings that appearance, odor, color, flavor, texture and general acceptability score of the onion rings as 8.60 ± 0.49 , 8.60 ± 0.50 , 8.20 ± 0.75 , 8.00 ± 1.10 and



7.40±1.20point, respectively. The sensory quality findings related to fish onion rings reported in the literature are consistent with our study [1].

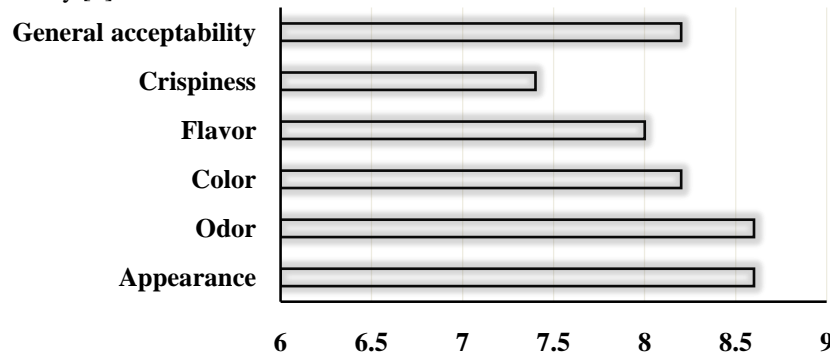


Figure 1: Sensorial changes of the fish onion rings

Conclusion

As a result; It has been determined that rainbow trout can produce acceptable fish onion rings suitable for consumer tastes. When seafood products are turned into snacks, more people can be liked fish consumption and the consumption of processed products can be increased.

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