

# RESEARCHES ON THE CONSERVATION OF CARP FILETS *CYPRINUS CARPIO* VARIETY *PODU ILOAIE* BY THE METHOD OF DEHYDRATION

M.C. Cioran<sup>1\*</sup>, G.E. Nascu<sup>1</sup>, B. Păsărin<sup>1</sup>

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

## Abstract

The present research aimed at the storage time of the *Cyprinus carpio* -carp fish filets, the *Podu Iloaie* variety by the dehydration method at 55°C. For the experiment, 10 kg of carp net filets were used, these being exposed at 55°C for 8 hours. The fish filets were 1 centimeter long and 8.2 centimeters and 10.6 centimeters in length. From the total of 10 kg of carp filets after the dehydration process, about 3.740 kg of dehydrated product was obtained. The deshydrator has a capacity of 2kg and is powered by a 220V power supply with a nominal power of 450w provided with 4 cm deshydration trays with a diameter of 35 cm and a temperature trap. After the dehydration period, the fish filets were placed in vacuum bags and kept at a constant temperature of 14°C for 12 months. The control of the obtained product was verified in the months 1, 3, 6, 9 and 12 by sensory evaluation of fish meat. The results obtained show good preservation by the dehydration method. By this method of preservation new products can be made for marketing.

**Key words:** dehydration, *Cyprinus carpio*, filets

## INTRODUCTION

After slaughter, the water from the fish's muscular tissue is a major factor in the development of enzyme activities and the development of micro-organisms, which is why the elimination of water from fish meat its central conservation element. [3,4,5,].

Thus, by applying conservation methods, fish fills can be stored for a longer period to be marketed. Depending on the period during which the biological material was fished, the water content of carp fillings varies widely from 68.42-77% [6,9,11].

The use of meat preservation methods has been present since the earliest times, preservation being by smoking, salting or dehydration.

The process of dehydrating fish meat should be done immediately after threading because we avoid multiplying microbial populations.

Dehydration of carp fillies and their subsequent insertion into visible bags allow us to keep this product at room temperature

for a long time without significant decreases in its quality.

Hydration of a dehydrated product takes place over a relatively short period of time.

The storage of dehydrated carcass fillse products placed in visible bags has a long shelf life over all preservation methods.

The fish material used for dehydration is suitable for this preservation process, with very good results during the preservation period and organoleptic characteristics [4,8].

## MATERIAL AND METHOD

The study was conducted in the Aquaculture Laboratory of the Faculty of Animal Husbandry in Iasi in October 2016.

The biological material taken into the study was made up of 10 kg of carp skinless fillies, subjected to the dehydration process at a temperature of 55 °C for 8 hours.

After the carp fillings, the *Podu Iloaie* variety, went through the dehydration process, they were individually placed in visible bags and stored at a constant temperature of 14 °C for 12 months.

Sensory analysis is one of the most important methods of assessing the state of freshness, but also the quality of fish and fish

\*Corresponding author: cioran\_cezar@yahoo.com

The manuscript was received: 03.10.2017

Accepted for publication: 18.12.2017

products. Applying sensory evaluation in a clear and precise way is an indispensable way of collecting valuable information about the quality of a foodstuff, which so far can only be obtained through human senses (1.2).

The method used to control the quality of fish fillings, the Podu Iloaie variety, is an objective method of assessing quality by awarding scores. (7.10.)

This method can be adapted for each species, but also for each conservation process (dehydrated, salted, smoked).

Also, through statistical data processing, this sensory evaluation method can provide predictability on the practical storage life of the analyzed product. (12).

The assessment of the quality of carp fillets during dehydrated storage took into account the qualitative dynamics of the sensory attributes in order to establish the maximum period of time when the dehydration fillets retain their characteristic fresh product which may be for consumption

The sensory attributes analyzed were: texture, smell, color, brilliance and consistency.

The team evaluating the status of carp fillets in the 12 months of storage was made up of 5 people. They assign ratings from 0 to 5 points depending on the organoleptic quality of dehydrated fillings.

Carp fillets were rated by qualified staff for one year in the months of 1, 3, 6, 9, 12 being scored according to the quality of the sensory attributes studied.

## RESULTS AND DISCUSSIONS

From a quantity of 10 kg of carp fillets, after the dehydration process, results a quantity of fillets of approx. 3,740kg.

The product resulting from the dehydration was introduced into vacuum bags and was kept at a constant temperature of 14°C.

Dehydrated fish stock was analyzed at 1, 3, 6, 9, and 12 months by the 5 specialists and scored according to the quality of the sensory traits studied.

Following the sensory assessment of carp muscle tissue carried out in the first month of storage, the biological material in the form of dehydrated fillets received the highest quality score (Table 1).

The rating steps in the 5-point system are reported in the table below

Rate of appreciation	Nr. points	Overview of the appreciation step
Very good	5	Outstanding quality
Good	4	Appropriate quality
Satisfactorily	3	With slight defects
Unsatisfactory	2	with obvious defects
Bad	1	with pronounced defects
Very bad	0	adulterated

The coefficients of importance for the appreciation system were the following: taste, smell, consistency and appearance.

Table 1 Organoleptic examination of dehydrated fillets (1<sup>st</sup> storage period)

Characteristics analyzed		Joint score	Coefficient of importance	Real point
L1	Taste	5	0.4	2
	Smel	5	0.3	1.5
	Consistency	5	0.2	1.0
	Appearance	5	0.1	0.5
TOTAL				5.0

The sensory evaluation after 3 months of storage from the start of the preservation period indicates that the odor retains its product-related characteristics (Table 2).

Table 2 Organoleptic examination of dehydrated fillets (2<sup>st</sup> storage period)

Characteristics analyzed		Joint score	Coefficient of importance	Real point
L2	Taste	5	0.4	2
	Smel	5	0.3	1.5
	Consistency	5	0.2	1.0
	Appearance	5	0.1	0.5
TOTAL				5.0

We can see that the other sensory attributes remain unchanged after a 3-month storage period. Sensory exam on dehydrated carp fillets proves that the studied fish material is suitable for this preservation process.

Table 3 Organoleptic examination of dehydrated filets (3<sup>rd</sup> storage period)

Characteristics analyzed		Joint score	Coefficient of importance	Real point
L3	Taste	5	0.4	2
	Smel	5	0.3	1.5
	Consistency	5	0.2	1.0
	Appearance	5	0.1	0.5
<b>TOTAL</b>				<b>5.0</b>

Following the sensory assessment of carp fillets, after 6 months of storage, it was found that out of the four organoleptic characteristics, taste, smell, consistency and appearance were unchanged, meeting the highest quality standard.

By obtaining 5 points, at the first storage interval, the sensory analysis indicates the product standard or the maximum freshness of the carp, the Podu Iloaie variety, processed under the skinless fillets, can be offered to the consumer.

The packaging of the product in vacuum bags does not allow the exchange of air and, according to studies, extends the shelf life of products up to 5 times. (6)

Performing the dehydration at 55° C for 8 hours is carried out evenly throughout the mass of the fillets.

Dehydration is a drying process based on reducing the water content, increasing the concentration of soluble substances, to values that allow the storage stability of the food.

Table 4 Organoleptic examination of dehydrated filets (4<sup>th</sup> storage period)

Characteristics analyzed		Joint score	Coefficient of importance	Real point
L4	Taste	5	0.4	2
	Smel	4	0.3	1.2
	Consistency	4	0.2	0.8
	Appearance	5	0.1	0.5
<b>TOTAL</b>				<b>4.5</b>

By reducing product humidity, enzyme activity slows down (until stagnation) and

stops the development of microorganisms (humidity below 15% ceases the growth of yeasts and mildew).

In the fourth storage interval, besides odor, insignificant statistical values and the consistency of carp fillets occur.

After 9 months of storage, the consistency of carp fillets is defined as "hard".

Table 5 Organoleptic examination of dehydrated filets (5<sup>th</sup> storage period)

Characteristics analyzed		Joint score	Coefficient of importance	Real point
L5	Taste	4	0.4	1.6
	Smel	3	0.3	0.9
	Consistency	4	0.2	0.8
	Appearance	4	0.1	0.4
<b>TOTAL</b>				<b>3.7</b>

During the last storage period we can see that all four organoleptic characters are dotted but this score shows that the carp fillets, the Podu Iloaie variety, is a good quality product and can be consumed after 12 months of storage.

The preservation of carp fillets by the dehydration method helps us to keep in good condition but also for a long time the product.

With regard to organoleptic qualities, being a product that can be consumed after a period of 12 months.

## CONCLUSIONS

The study showed that the carp fillings, Podu Iloaie variety, are suitable for this conservation method

The shelf life of dehydrated biological material at 14°C for 12 months shows that this product is consistent from all points of view.

The score obtained at the end of the last storage period shows that this product can be kept in optimal conditions for more than 12 months.

Out of the 10 kg of carp skinless fillets at the end of the dehydration period resulted in a final product weight of 3,740 kg.

Making this product on our market would bring added value among fish consumers.

## REFERENCES

- [1] Ahmed, A., Dodo, A., Bouba, A.M., Saidou, C., 2011 – Influence of traditional drying and smoke drying on three fish species (*Tilapia nilotica*, *Silurus glanis*, *Arius parkii*) from Lagdo Lake, Cameroon, *Journal of Animal and Veterinary Advances* 10(3), p. 301 – 306.
- [2] Arannilewa, S.T., și colab., 2005 – Effect of frozen period on the chemical, microbiological and sensory quality of frozen tilapia fish (*Sarotherodon galiaenus*), *African Journal of Biotechnology*, vol 4(8), p. 852-855..
- [3] Banu, C., și colab., 1997 - Procesarea industrială a cărnii, Editura Tehnică, București.
- [4] Bondoc, I., Șindilar E.V., 2002 - Controlul sanitar veterinar al calității și salubrității alimentelor, vol. I, editura Ion Ionescu de la Brad, Iași.
- [5] Bud I., Vlădău V.V., Réka Șt., Pop S.N., Ladoși Daniela, 2008 - Contributions concerning the species and age influence on qualitative index at fish meat, *Buletin USAMV -CN*, 65 (1-2)/2008 (-) ISSN 1454-2382, p. 288-292.
- [6] Darabă Aura, 2003 - Permeabilitatea la oxigen a ambalajelor din material plastic destinate ambalării sub vid: factori de influență, *Buletin AGIR* nr. 3/2003, p. 38-40.
- [7] Food and Agriculture Organization (FAO), 2004 - Application of risk assessment in the fish industry, FAOFisheries Technical Paper 442. Rome: Corporate Document Repository, Fisheries and Aquaculture Department.
- [8] Ozogul, Y., Balikci, E., 2011 – Effect of various processing methods on quality of Mackerel (*Scomber scombrus*), *Food Bioprocess Technol* DOI 10.1007/s11947-011-0641-4.
- [9] Pășărin, B., 2012 – Principles and methods of preservation in the food industry, Ion Ionescu de la Brad, Iasi
- [10] Pășărin, B., Stan, T., 2003 - Aquaculture - Practical Guide, Karro, Iași.
- [11] Usturoi, M.G., și colab., 2009 - Fish Industrialization, Ion Ionescu from Brad, Iasi
- [12] Vacaru-Opriș, I., Usturoi, M.G., 1994 - Technology of industrialization of products of animal origin. Practical workshop. UAI Multiplication Center, Iași.