

ASSESSMENT OF DEGREE OF FRESHNESS AND QUALITY OF PRODUCTS TYPE „FISH ROE "SOLD IN SUPERMARKET CHAIN STORES

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Abstract

This paper study the quality and degree of freshness of fish eggs (salted fish roe of: Carp, Trout and Herring, Caviar and Manchurian Roe), sold by different producers in supermarket chain stores in December 2010 in NW Romania (Oradea City). The following chemical analysis was conducted to assess the product quality: humidity and sodium chloride content, and the quantity of hydrolysable nitrogen compounds and acidity in order to assess the degree of freshness. It was noted that all the analysed sorts correspond as the product quality. In degree of freshness Caviar is not appropriate because exceeded in light terms of hydrolysable nitrogen compounds content and acidity. Regarding the samples of Manchuria fish eggs the freshness corresponds to the limit. Salted fish eggs of: Carp, Trout and Herring are appropriate in terms of freshness. Explanation of the slight overshoot of hydrolysable nitrogen compounds concentration and acidity registered for Caviar and the limit values for Manchurian Roes could be derived from the fact that those products are much higher in prices than comparative to the salted fish eggs, leading to the stagnation of these products on supermarket shelves, probably in less controlled temperature conditions.

Key words: Fish Roes, Caviar, Manchurian Roes, acidity determination, hydrolysable nitrogen compounds determination.

INTRODUCTION

The fish roes are unfertilized egg of fish, which are usually harvested in the last phase of physiological maturation. In general, they named wit the name of the species of fish from coming: from fresh water fish (Carp, Crucian Carp, Pike) fish roes from the ocean (Herring, Mackerel, Cod), Caviar Roes (Beluga, Sturgeon), Red Caviar or Manchuria Roes (Salmon). Salted Sturgeon eggs (Caviar) is the most valuable assortment of fish eggs, and rightly considered a delicacy. They are separate processes and capitalize on the two species (Beluga, Sturgeon) and usually a lot of production must come from a single specimen (Banu C. Et all 2002). The roe's grains must be whole eggs, well individualized, glossy, blackish gray colour (the Cod Roes) or shiny black with a smaller diameter (Sturgeon Roes) (Diaconescu I 1998). The Manchurian fish eggs are the roes obtained from Salmon species, which are process using salting and ripening special technology. The Manchurian Roes have large grain as beans grains and are red orange

colour. The fish eggs are edible and tasty with a high food value because high in vitamin A, folic acid, potassium and especially phosphorus. Caviar contains large quantities of iron, phosphorus, magnesium and vitamin D (Banu C. Et all 2002). The preservation of fish eggs is based on adding of sodium chloride, sterile packaging and freezing storage and transport (Banu, C. Et all 2000, 2005, 5). Disadvantages consumption of fish eggs are few and consist of relatively high cholesterol content, the presence of large amounts of sodium and chlorine if the fish eggs are fresh. The fish eggs are rich in unsaturated fatty acids. This feature gives a high biological quality but also a drawback because it is prone to early oxidation (Banu C. Et all 2002). The fish eggs products which are compromised by chemical distortions caused by early oxidation and other biological processes can induce food poisoning (manifesting by nausea, diarrhea and headaches). Therefore it is very important to determine the freshness of the fish eggs products because the conditions of transport, storage and marketing may produce inappropriate alter biochemical processes leading to the formation of toxic compounds and the development of microorganism dangerous for the consumer's health (Diaconescu I. 1998). Besides fish eggs organoleptic assessment it is necessary to do a sanitation bacteriological and parasitological examinations aiming to detect intolerable germs (pathogens) as well as *Dyphilobotrium latum larvae* (Banu, C. Et all 2005).

MATERIAL AND METHOD

Laboratory tests of fish eggs are done to assess the quality of the product (water and sodium chloride content) and the state in terms of freshness (acidity and hydrolysable nitrogen compounds) (Banu C. Et all 2002). The acidity determination is based on the titration method with KOH 0,1 N solution in the presence of phenolphthalein as indicator. The sample is homogenised in a porcelain cup. A quantity of 10 g of sample is washed out with 100 ml distillate water in a 250 ml flask and then boiled on a water bath with a reflux condenser system for 5 minutes. After the cooling the sample is filtrated and then titrated. The fish eggs acidity is expressed in mg KOH required for the neutralisation of acid for a gram of fish eggs. The determination for easily hydrolysable nitrogen is the same used for meat products. The ammonia is released by treating the sample with magnesium sulphate. The resulted ammonium is release by distillation and caught in a sulphuric acid solution. The sulphuric acid excess is determined using titration method with sodium hydroxide. The sodium chloride was measure using titration method with sodium hydroxide in the presence of phenolphthalein and potassium chromate. The humidity determination was made by drying in oven at 110°C and weighing repeated.

RESULTS AND DISSCUSION

We have analysed some samples of fish eggs preserved by addition of sodium chloride (Carp, Trout and Herring), Manchurian Roes and Caviar, sole in supermarket stores in NW Romania (Oradea Town), by different manufacturers, purchased in December 2010.

Were analysed for each product three samples from three different packages and then the arithmetic average was calculated and interrelated. All the analysed products had validity commercial term. The samples were fist organoleptic analysed regarding their aspect smell and taste. It is to consider as inappropriate the fish eggs which are matte finish, soft grain, crinkled or crushed grains, with the connective tissue aqueous, modified odour, taste fermented, rancid, bitter, spicy or sour, with impurities. Only on the samples that were appropriate as aspect, taste and smell, were performed the chemical analysis.

The results obtained processing 20 samples (4 for every 5 studied assortments) after the mathematical average calculus are presented in table 1 with the maximum permissible values.

Table I

Result of chemical analysis for the samples of fish eggs/maximum permissible values

ANALYSED FISH EGGS PRODUCT	FRESHNESS ASSESSMENT	FRESHNESSASSESSMENT
	Determined easy hydrolysable nitrogen compounds/maximum permissible value mg NH ₃ %	Determined acidity/ maximum permissible value mg KOH/g of sample
Carp Salted Roes	45/65	3,5/4
Trout Salted Roes	50/65	3,7/4
Herring Salted Roes	55/65	3,8/4
Manchuria Roes	45/45	4,0/4
Caviar	37/30	3/2,5
ANALYSED FISH EGGS PRODUCT	QUALITY ASSESSMENT	
	Determinate Humidity/ maximum permissible value %	Determinate sodium chloride/maximum permissible value %
Carp Salted Roes	50/60	8/8
Trout Salted Roes	45/60	7,5/8
Herring Salted Roes	50/60	8/8
Manchuria Roes	-	7/8
Caviar	-	4/4,5

The obtained results for the chemical analysis done to the fish eggs samples compared to the maximum permissible values reveal that:

- The content of easy hydrolysable nitrogen compounds is above the limits for the Caviar products, near the limits for the Manchurian Roes and below limits for the salted fish eggs (Carp, Trout and Herring).
- The acidity values for the Caviar exceed the limits, for the Manchurian Roes was at the limit value and below limits for the salted fish eggs (Carp, Trout and Herring).
- The humidity for all the fish eggs samples was below the limits.
- The sodium chloride content was at the limit for the salted fish eggs of carp and Herring and below the limit for the salted Trout egg fish and Caviar.

CONCLUSIONS

After chemical analysis conducted to assess the freshness of salted eggs of Carp, Trout and Herring, Manchuria eggs and Caviar, sold in supermarket in NW Romania (Oradea Town) in December 2010, from different manufacturers, it was noted that:

- All varieties can be considered appropriate in terms of water content and sodium chloride (salted eggs of Carp, Trout and Herring being at the maximum allowable levels of sodium chloride).
- For the analysed Caviar samples the degree of freshness is not quite appropriate because it was determined slow overcome of the hydrolysable nitrogen compounds and acidity.
- Regarding the Manchurian Roes the freshness correspond to the limits.
- Salted fish eggs (Carp Trout and Herring) are appropriate in terms of freshness.

We may explain the slightly overshoot for the hydrolysable nitrogen compounds and acidity registered for Caviar and the limit values obtained for the Manchurian Roes derived from the higher price of these products comparative to the salted fish eggs (Carp, Trout and Herring) that lead to the stagnation of these products on the supermarket shelves at probably less controlled temperature conditions.

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