

## Research on the presence of fishery products in the Moldovan diet'

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### Abstract

The paper proposes an analysis of the presence of fish-based food products in the nutrition of the population in the Republic of Moldova, highlighting the traditional Moldovan cuisine elements in the public catering services. The research methodology was based on the analysis of restaurant menus in the city of Chişinău emphasising the items in which fishery products were identified, differentiated by the raw materials used, the cooking technique and services, source, energy value or price. Research has highlighted the fact that, although the share of fishery products in the supply of public catering establishments is moderate, the food of the population between the Prut and the Nistru keep the tradition, originality, the ethnic significance and modality of food, characterised by some taste and visual particulars, according to which foods transmit the information, ancient knowledge and the food balance characteristic of the Romanian population.

**Keywords:** fishery products, food, restaurants, Moldova

### 1. Introduction

Consumption of fishery products is included in an old tradition in the region between the Prut and the Nistru. Thus, in the Republic of Moldova, people can visit traditional restaurants, which maintain a careful attitude towards the customers' wishes and the ability to satisfy the most demanding tastes of the food-minded people. The consumption of dishes at the restaurant began to grow in different stages of development; for example, Butoiaş Restaurant has its own history, being set up long ago in Chişinău and having the status of a symbol of ethnic culture in the restaurants industry; there are also many other restaurants with various particularities, ranging from traditional to modern. The highest concentration of the population and the area with the highest income in the Republic of Moldova is in the area of the capital city. The city of Chisinau is located in the central part of the country, with an area of 120.1 square km, being crossed by the river Bîc with the tributaries of Durlleşti and Bulbocica. From the administrative point of view, the city has five districts (Botanica, Buiucani, Centru, Ciocana, Rîşcani). Chişinău is considered the capital of the restaurant industry in the Republic of Moldova, hosting the most special traditions and culinary habits, characterised by a significant evolution of the network of restaurants with specific diversity. According to the business catalogues in the Republic of Moldova, about 170-270 restaurants are open and operate, of which more than half are in the Chişinău area ([www.businessclass.md](http://www.businessclass.md)).

### 2. Materials and methods

Information on the traditional fish-based recipes in restaurants in the city of Chişinău, the Republic of Moldova, was obtained through a market survey. This implied a differentiated analysis of the menus of 116 restaurants in the city of Chişinău, of which 80 restaurants are based on fish dishes prepared according to different traditions and habits. For the operation of sampling, we used the method of INFOMass, which recommended a minimum sample size of 89 for a population of 64 research units with a probability of 95% and a tolerable error of 5%. Data on tradition, originality and customs were collected from the database, the National Bureau of Statistics, and specialized works. The data collected were statistically sorted and processed. The results obtained were compared with other data from the specialty literature for an appropriate interpretation.

### 3. The Importance of Fish in Human Nutrition 3

Fish is considered a healthy food recommended for human nutrition, characterized by a moderate energy value, nutritional balance, acceptable price and the existence of renewable natural resources. The importance of fish in human nutrition is given by major issues, such as a basic food product containing animal proteins, a very important source of essential fat acids and a unique source of micronutrients, vitamins and minerals. The basis for good health is a balanced nutritional status at the individual and collective level. Proper cooking has a high sensory value, combining flavours, keeping individual characteristics, according to taste and preferences. Table 1 details the main nutritional components and the energy value specific to the fish, as a raw material

**Table. 1.** Nutritional and energy values for fish meat

Name of product	Saturated fats (g/100g)	Unsaturated fats (g/100g)	Cholesterol (mg/100g)	Total lipids (g/100g)	Proteins (g/100g)	Energy value (kcal/100g)
Crucian	0,4	1	50	1,8	17,5	87
Carp	1,1	3,8	66	5,6	17,8	127
Wels catfish	0,7	1,7	58	2,8	16,4	95
Pike	0,1	0,35	39	0,7	19,2	88
Pike-perch	0,30	0,20	61,50	0,70	19,2	84
Sturgeon	0,9	2,6	60	4	16,1	105

Note: Authors, by processing USDA data (2012)

The proportions of the constituent substances differ according to the type of fish. The nutrients supplied by fish to the human body have a fundamental and necessary role in the development of the metabolic processes which take place in the body. The mineral components in the fish meat play an essential role for the body's functionality. Fish is food rich in vitamins and minerals, which can cover the daily requirements of the human body, with daily needs, if properly consumed. Table 2 shows the composition of vitamins and minerals for the main species of autochthonous fishes.

**Table. 2.** Biologically active components for indigenous fish meat

Fish	Vitamins (mg/100g)	Minerals (mg/100g)
Crucian	E- 2,96; B12-1,60; B5-0,54; B6-0,14	Ca- 64; Fe-0,77; Mg- 0,55; P-268; Fl-122; Na-34
Carp	A-32; B1- 1,60; B3- 2,10; B5- 0,90; B60,20; B9 -170; B12- 110	Ca- 52; Fe-1,60; Mg- 38; P-427; Na-63; Zn-1,60
Wels catfish	A-50; C- 0,80; B1-0,40; B3- 0,10; B5- 2,50; B6- 0,60; B9 -70; B12- 280;	Ca- 9; Fe-0,80; Mg- 26 ; P-254;Na-80; Zn-1,10
Pike	A-81; C- 3,80; B1-0,10; B3- 2,80;B5- 0,90; B6- 0,10; B9 -17; B12- 2,30;	Ca- 73; Fe-0,70; Mg- 40; P-282; Na-49; Zn-0,90;Mn-0,90;
Pike-perch	C- 1 ; B1-0,16; B2- 0,25; B3- 2,31;	Ca- 50; Fe-0,69; Mg- 47; P-195; K-372; Na-24;
Sturgeon	A-875; E-0,60; K-0,10; B1-0,10; B3- 10,10; B5- 0,90; B6- 0,20; B9 -17; B12- 2,50;	Ca- 17 ; Fe-0,90; Mg- 45; P-271; K-364; Na-69; Zn-0,50; Cu-0,10;

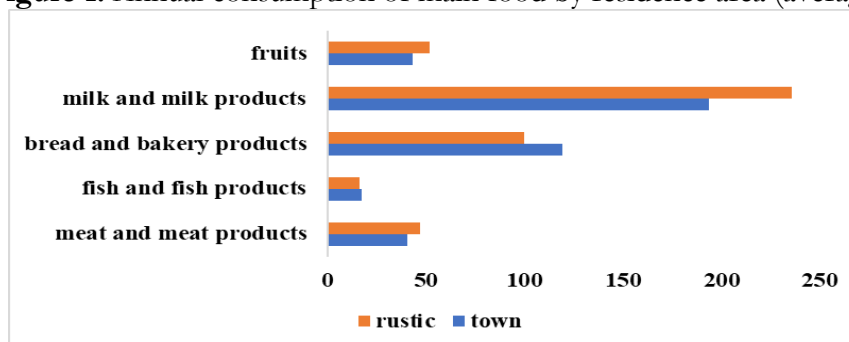
Note: Authors, by processing data from Fish Industry (Banu, 2013).

The Moldavian cuisine has gathered elements of the Greek, Byzantine, Slavonic and Mediterranean cuisine but has developed originally, retaining individual characteristics, succeeding in mixing combinations of incompatible products at first sight (fish in wine, meat and fruit, marinated fruits) (<http://moldovenii.md/md/section/20>). The value of the Moldovan cuisine consists, not in the number of dishes, but in the variety of aromas and tastes, by combining different products. Considering all these criteria, the Moldovan cuisine occupies one of the foremost places among the world's cuisine.

#### 4. Fish food in the Moldovan restauration 4

Fish and fish products are sold in Moldova through both an organized marketing chain and an informal service, such as the local markets. Aquaculture is the most promising sector for providing freshwater fish, both in specialized shops and in restaurants for proper preparation according to Moldovan recipes and traditions. The main problem is the dependence of fishery products entirely on the import, which has a negative impact on the competitiveness of the products, and the dependence on the international price volatility. For various reasons, such as the difficulty of cleaning it, the unpleasant smell, the fears of freshness of the fish, or the habit of consuming other types of food, national consumption has fallen substantially. According to studies conducted by Munteanu (2017), fish have the lowest consumption level compared to other foods of animal origin (figure)

**Figure 1.** Annual consumption of main food by residence area (average)

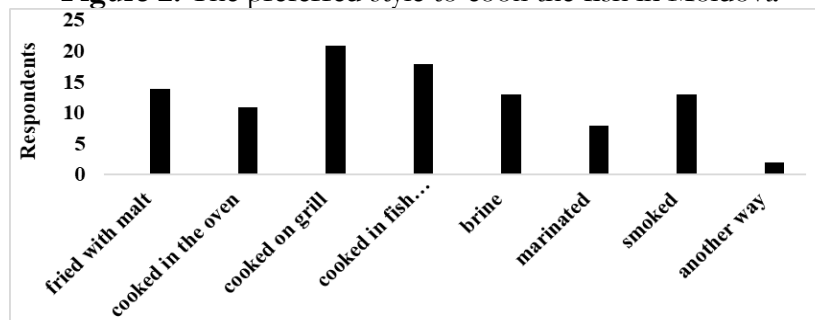


Source: Authors, by using Munteanu (2016)

Some Moldovans prefer to eat fish in restaurants because of their proper preparation and special taste. In the capital of Moldova there is a wide range of restaurants, with different customs and specific menus, ranging from a traditional kitchen to Italian, Georgian, Chinese, Japanese, Uzbek-style kitchen. Fish-based products are prepared in various restaurants, based on traditional styles, typical of the Moldovan cuisine, to modern recipes, characterized by original combinations of the Mediterranean style with the Balkan and Russian styles.

The fish is boiled, baked, steamed, fried, smoked, salted etc. It is prepared combined with all kinds of vegetables and spices. In addition to the traditional methods of preparation (such as salting, steaming, roasting), the Moldovans still love a quite delicate method, namely, preparing the fish on open-fire grill. The research carried out by Munteanu (2017) shows that there are many ways of cooking the fish, but most Moldovans prefer grilled fish (21%), soup (18%) or roasted with corn flower (14%), (figure 2).

**Figure 2.** The preferred style to cook the fish in Moldova

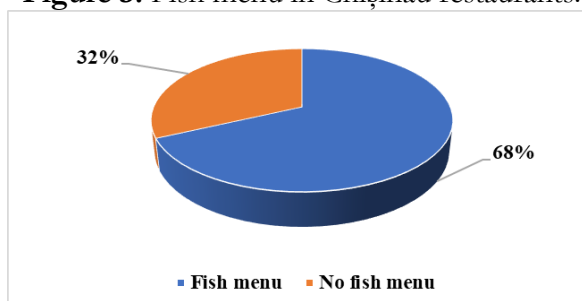


Source: Authors, own research

The present study included a representative sample of restaurants in the capital of the Republic of Moldova. Thus, 116 restaurants in the city of Chişinău were evaluated in order to highlight how many restaurants contain fish dishes in the menu (figure 3).

The menu of the analysed restaurants offers European, Japanese and Moldavian cuisine based on grilled dishes, vegetarian dishes and delicious desserts

**Figure 3.** Fish menu in Chişinău restaurants.

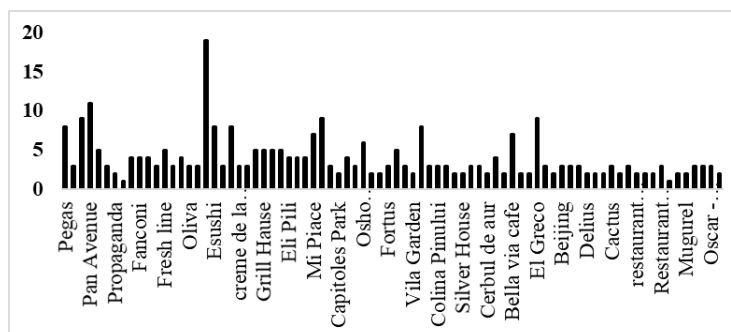


Source: Authors, own research

Besides the preferences of every person, a research has been conducted on the presence of fish-based menus in various restaurants in the city of Chişinău, the analysis being carried out taking into account preferences, dishes made from native or imported fish.

The menus of 80 restaurants were analysed, with an emphasis on present fish products, quantities offered, price per 100 g of product. Out of the 80 restaurants evaluated, with a total number of items of up to 90, between 1 and 19 fish products were found, as represented in figure 4.

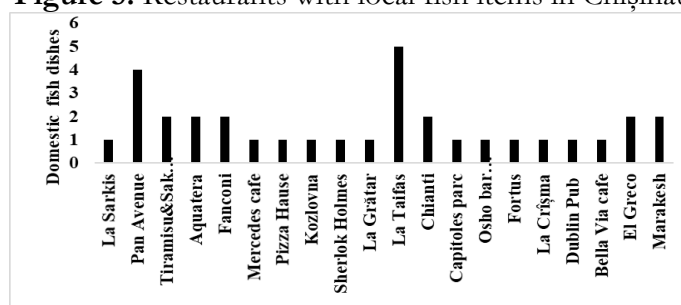
**Figure 4.** Fish based items in Chisinau restaurant menu's



Source: Authors, own research

Analysing the restaurant menus, we can point out that out of the 80 restaurants, 20 have 1 to 4 dishes from local fish dishes (Figure 4) and only one restaurant "La Taifas" is based exclusively on the preparation of local fish (figure 5).

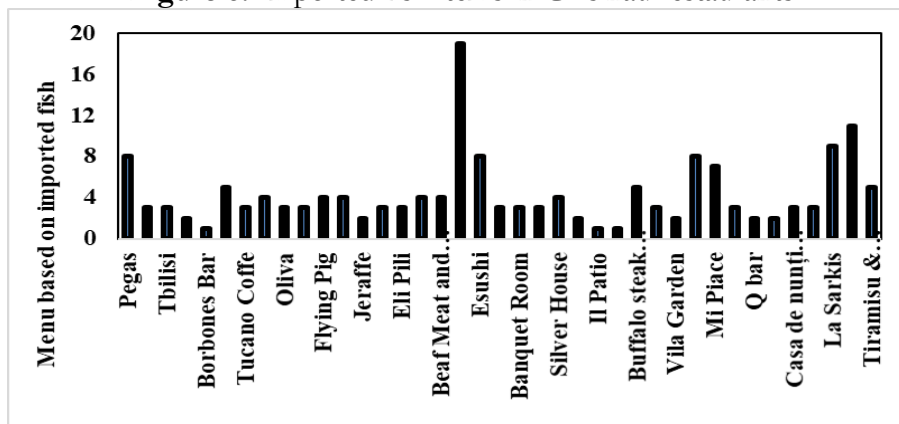
**Figure 5.** Restaurants with local fish items in Chişinău



Source: Authors, own research

Almost all the menus in the analysed restaurants the imported fish is present, prepared according to traditional and modern recipes (figure 5). Besides, many of the foreign tourists who visited the city of Chişinău mentioned in their travel notes, the presence of special restaurants, where any fish lover can find special dishes (figure 6).

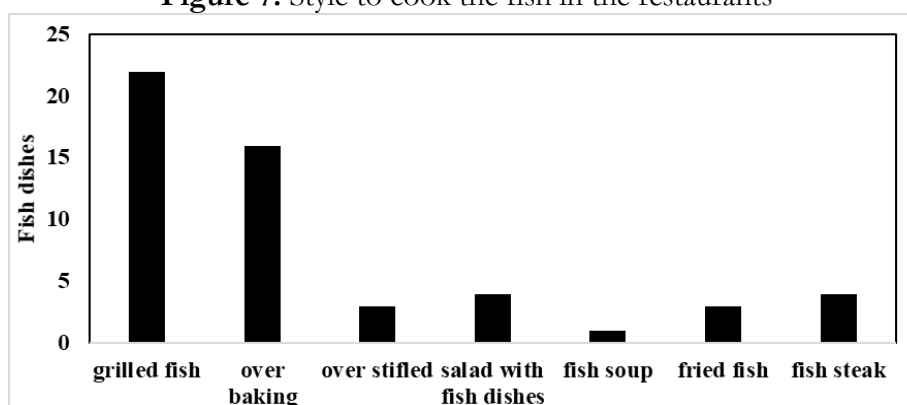
**Figure 6.** Imported fish items in Chisinau restaurants



Source: Authors, own research

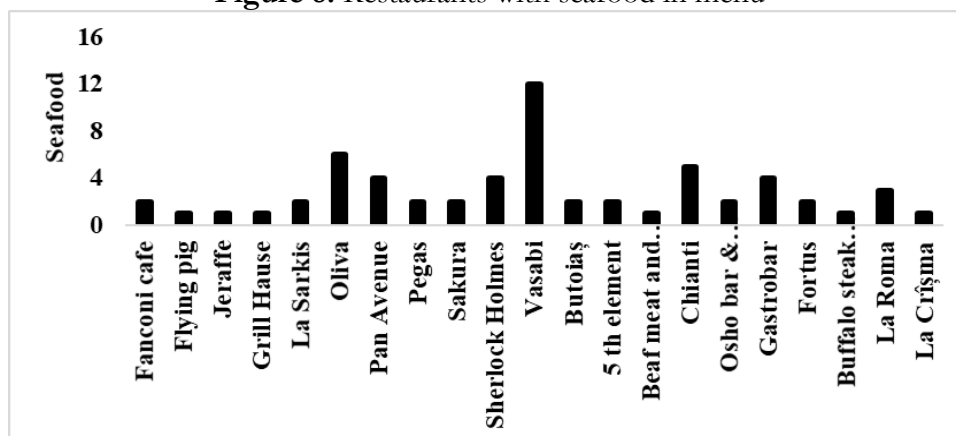
The most common are fish dishes based on the methods of grilling, by baking and chocking the fish and preparing it in salads and soups. In the menus of the restaurants the predominant preparation is the baked and the grilled fish (figure 7).

**Figure 7.** Style to cook the fish in the restaurants



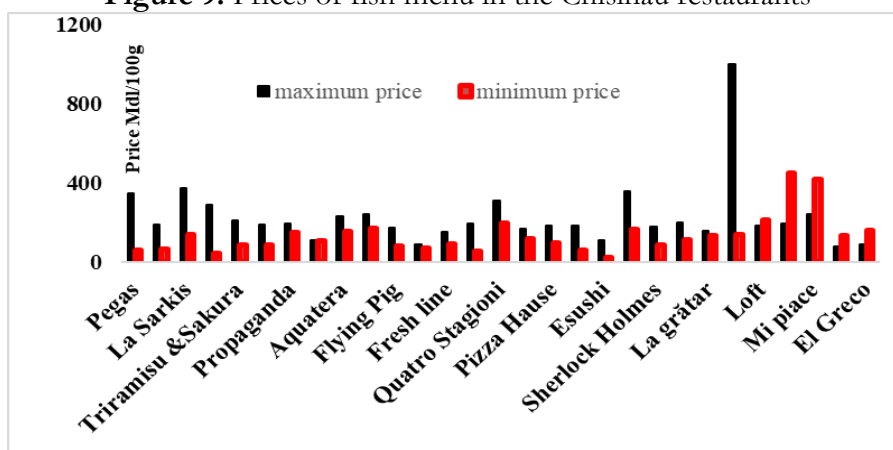
Source: Authors, own research

Of the total restaurants analysed, it can be mentioned that in 21 restaurants in the city of Chişinău people can serve dishes prepared from seafood. Vasabi and Oliva, respectively, are the most diversified restaurants for seafood lovers (Figure 8). These restaurants harmoniously blend Japanese traditions with Western trends. In fact, Japan's preference for the warm, elegant, comfortable, almost seductive and, most importantly, tasty atmosphere is present in the restaurants of Chişinău.

**Figure 8.** Restaurants with seafood in menu

Source: Authors, own research

The unit price, expressed MDL / 100 g, in the analysed restaurants ranged between 25 lei and 360 lei, analysing the menus, we concluded that the most expensive restaurants in the city of Chișinău are the restaurants Acasă La Mama, La Taifas, Chianti, Loft, Osho Bar, La Sarkis, Pegas, Kozlovna, Quatro Stagioni, and the cheapest places where fish dishes can be served are: Mercedes café, Oliva, La Grătar, Esushi, Pizza House, Marakesh, El Greco (figure 9).

**Figure 9.** Prices of fish menu in the Chisinau restaurants

Source: Authors, own research

The high value of the menus is given by the range of products used, the way they are prepared, the elegance of the place, the way it is served. Customers can choose cooked dishes, according to the most inseparable recipes. The average price for fish dishes in Chisinau's restaurants ranges between 150 and 360 MDL / 100-150 g depending on the selected dishes. In addition to the dishes served, customers can enjoy a quality wine, a friendly atmosphere and live music. At the same time, most restaurants host various ceremonies, from anniversaries, charity events to business meetings.

## 5. Conclusions

Fish has a major importance in human nutrition. It can be cooked in various shapes, combining special flavours. The paper conducted an analysis of items based on fishery products found in the restaurants in the city of Chișinău. A number of 80 restaurants were evaluated in the city of Chișinău, highlighting the dishes and how they can be prepared, the quantities offered and the unit price of the fish products. From the 116 restaurants analysed, 80 units were found in the menu fish-based dishes. Most restaurants are supplied with imported fish, with only one restaurant



based exclusively on native fish dishes. Seafood have been identified in 21 menus. The value of a meal based on fishery products is not accessible to the ordinary citizens, as prices may reach 360 MDL / 100-150 g. At an average monthly salary of 5000 lei, the citizens of the Republic of Moldova can only occasionally consume fish products at the restaurant.

Unlike other activities, entertainment activities and customs that can attract tourists, the indigenous cuisine is available throughout the year, at any time of the day, for any taste and preference. The Republic of Moldova can be considered a hospitable country for tourists, the formula of success being the traditional cuisine offered, although the fishery products are relatively modestly represented in the menus of the restaurants.

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