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# FRUITS AND VEGETABLES MARKET IN ROMANIA: BETTER UNDERSTAND CONSUMERS' PREFERENCES

ION RALUCA ANDREEA<sup>1</sup>

**Abstract:** *Fruits and vegetables are important for maintaining the human health, and, thus, they are present in everyday consumers' basket. They are seasonable and perishable products and, as a result, they need to be processed and transformed into cans and preserved products. The objective of this research is to identify the main directions of developing the sector of preserved fruits and vegetables products. Pursuing this, a survey was carried out, for collecting data about consumers' buying behaviour, their preferences for preserved fruits and vegetable, buying frequency and budgets spent for these products, on average, per month. Research findings show that over 94 per cent of respondents consume preserved vegetables and fruits. Among preserved vegetables, broth, tomato juice, pickles and frozen vegetables are consumed frequently. As regards preserved fruits, apples / pears juice is consumed more often than other products. The most important criteria for choosing canned vegetables and fruits products are composition, taste and origin. These results are useful for better understand consumers' behaviour of buying processed vegetables and fruits and to decide, further on, the directions of developing food processing industry for vegetables and fruits.*

**Key words:** *Preserved fruits, preserved vegetables, survey, consumer behaviour.*

## INTRODUCTION

The study regarding consumers' preferences for preserved vegetables and fruits aims to explore a phenomenon important for Romanian agricultural economy: vegetables and fruits selling, reducing loses on their chains, increasing farmers' revenues and supplying internal market with Romanian products. For analysing vegetables and fruits market, a survey has been carried out, which enable to collect information regarding consumers' needs and preferences, aiming to identify the directions of developing processing industry of fruits and vegetables.

Previous research (Turek, 2008) finds out that internal production is not enough to satisfy consumers' demand for fruits and vegetable, considering the specificity of agricultural products' demand and supply and losses within the sector. As regards the first aspect, taking into account the fact that, on one hand, supply of vegetables and fruits is seasonable and, on the other hand, consumption is continuous, imports fulfil the supply on the market, in extra season. Imports of vegetables account for 10 per cent of total supply, and imports of fruits account for 23 per cent. Imports of vegetables are 17 times more than export, in 2007, meaning almost 400000 tons of vegetable. As regards the second aspect, losses of vegetables reached 328197 tons, in 2006, accounting for 10 per cent of total production. Losses of fruits reached 98612 tons, in the same year, meaning 4 per cent of total production. Losses occur in field, during transportation, because the latter is done using means inadequate to specificity of these perishable products and on improper roads, and during storage, because they are stored in inappropriate rooms, with no microclimate conditions.

The context of the period 2006-2007 changed, because the market of fruits and vegetables is dynamic. The value of goods sold through retail was raised from 1581911.5 lei in 2008 to 184 880.7 lei in 2012, meaning 116.9 per cent (National Institute of Statistics, 2014). Retail trade concentrated, statistical data showing a reduction in the number of stores from 134878 in 2008 to 129875 in 2012 (National Institute of Statistics, 2014). The number of small shops with sizes up to 120 square meters, decreased, while the number of large stores increased, even doubled, in the case of stores of 10,000 m<sup>2</sup> and over. As a result, in current situation when retail trade developed, the sales opportunities in the production of fruit and vegetable diversified, producers having more options to put products on the market. In deciding the directions to develop their businesses, producers must have information about market, about consumers' needs and preferences.

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This article seeks to investigate the market of fruits and vegetables, trying to answer the overarching research question: What are consumers' preferences for preserved fruits and vegetables? Other specific questions that this research tries to find out are: What are the average quantities of preserved fruits and vegetables bought or consumed in one year? What is the frequency of their consumption? What is the average money spent for buying preserved fruits and vegetables? What are the main drivers for choosing preserved fruits and vegetables?

For answering these questions, a piece of quantitative research was carried out: a survey based on a questionnaire. Data have been collected online and the sample has been selected using the quotas methods.

The research objectives and hypotheses are:

- O1: Identify the number of consumers of preserved vegetables
- P1: 80 per cent of respondents consume / purchase preserved vegetables
- O2: Identify the average frequency of consumption of preserved vegetables
- P2: Broth, tomato juice and pickles are consumed often; canned beans and frozen vegetables are consumed rarely, and potatoes and onion flakes are consumed occasionally
- O3: Identify the average consumption of preserved vegetables
- P3: One person consumes on average per year 500 g of broth, 2 litres of tomato juice, 100 g potatoes flakes, 100 g onion flakes, 4 kg of pickles, 2 kg of canned green beans, and 3 kg of frozen vegetables
- O4: Identify the number of consumers of preserved fruits
- P4: 90 per cent of respondents consume / purchase canned fruits
- O5: Identify the average consumption frequency of preserved fruits
- P5: Fruit juices are often consumed, jams are frequently consumed, and marmalade and compote are consumed occasionally
- O6: Identify the average consumption of preserved fruits
- P6: One person consumes on average per year 10 litres of apple juice, 5 litres of apricot / peach juice, 5 litres of other fruits' juice, 1 kg of plum jam, 1 kg of apricot / peach jam, 500 g of cherry jam, 500 g of strawberry jam, 500 g of apple / pear jam, 2 kg of compote and 500 g marmalade
- O7: Identify the place of purchasing preserved vegetables and fruits
- P7: 60 per cent of consumers purchasing preserved vegetables and fruits at hypermarkets
- O8: Identify consumers' choice as regards the origin of preserved vegetables and fruits: imported or domestic
- P8: 60 per cent of preserved fruits and vegetables consumed are domestic
- O9: Identify the source of acquiring preserved vegetables and fruits
- P9: Most people consume preserved vegetables and fruits more of their households, less from shops
- O10: Identify the average budget allocated for the purchase of preserved vegetables and fruits
- P10: Most people allocate, on average, 50 lei per month for purchasing preserved vegetables and fruits in winter
- O11: Rank criteria for consumers' choice for preserved vegetables and fruits
- P11: The most important criteria for choosing canned vegetables and fruits products are taste, composition and price.

## **MATERIAL AND METHODS**

As a method for gathering information, a quantitative survey was used, and as investigation technique, the technique of structured investigation, like self-administered questionnaire, was used. As a method of sampling, the method of quotas was used, which consists of the principle of representativeness of the sample to the total community investigated (Manole, 2003). Representativeness tracked through independent criteria: gender, age and income. The justification of using the allowance resides in the assumption that if the sample is representative for the population studied in terms of the criteria considered during the sampling, it will be representative from the point of view of other features, such as customs, behaviours, and attitudes

and so on. The research results can be extrapolated to the entire population studied. The total population is the population of Bucharest, which is the main market for canned fruit and vegetables for producers in the region. At a total local population of 1677985 people (the population of Bucharest), a 95 per cent confidence level and an error interval of 6.9 per cent, the sample size is 202 people.

The questionnaire contains 11 questions. After being drafted, the questionnaire was tested on ten people, to gather feedback on questions and improve, thus, the quality of research. Each interview lasted an average five minutes. The questions refer to information on socio-demographic characteristics of respondents, so-called questions of identification of the population from the sample, questions on the model of purchasing, needs and consumers' preferences for preserved vegetables and fruits, the criteria for choosing canned vegetables and fruits, the money spent, on average, per year, for these products etc.

The variables used are: dependent variables: consumer preferences for preserved vegetables and fruits and independent variables: gender, age, income.

The sample respects the quotas of the total population, as seen in Tables 1–3. Almost 44 per cent of respondents are male and 56 per cent are female, close to the statistical data for the total population in Bucharest: 46 per cent, 54 per cent respectively.

**Table 1.** Sample structure by gender, compared to total population

Variable	Gender			
	Total population		Sample	
	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
Male	871,530	46.3	88	43.6
Female	1,011,895	53.7	114	56.4

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

**Table 2.** Sample structure by age, compared to total population

Variable	Age			
	Total population		Sample	
	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
15–24 years	225,820	13.7	32	15.8
25–44 years	668,253	40.5	86	42.6
45–65 years	483,045	29.3	74	36.6
over 65 years	272,151	16.5	10	5

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

**Table 3.** Sample structure by income, compared to total population

Variable	Income			
	Total population		Sample	
	Absolute (persons)	Relative (per cent)	Absolute (persons)	Relative (per cent)
< 700 lei (under 160 euros)	-	15	32	15.8
700–1500 lei (160–340 euros)	-	37	42	20.8
> 1500 lei (over 340 euros)	-	48	128	63.4

Source: own calculations based on statistical data (Statistical yearbook 2013) and results of the questionnaire

The sample consists of 15.8 per cent young people (ages between 15 and 24 years old), 42.6 per cent people aged between 25 and 44 years old, 36.6 per cent people aged between 45 and 65 years old, and 5 per cent aged over 65 years old. As seen in Table 2, the quotas of the sample are close to the quotas of the total population, except the segments 45–65 years and over 65 years.

With regards to income (Table 3), the sample slightly differs compared to the total population. Statistics show that 37 per cent of the population has an income between 700 lei and

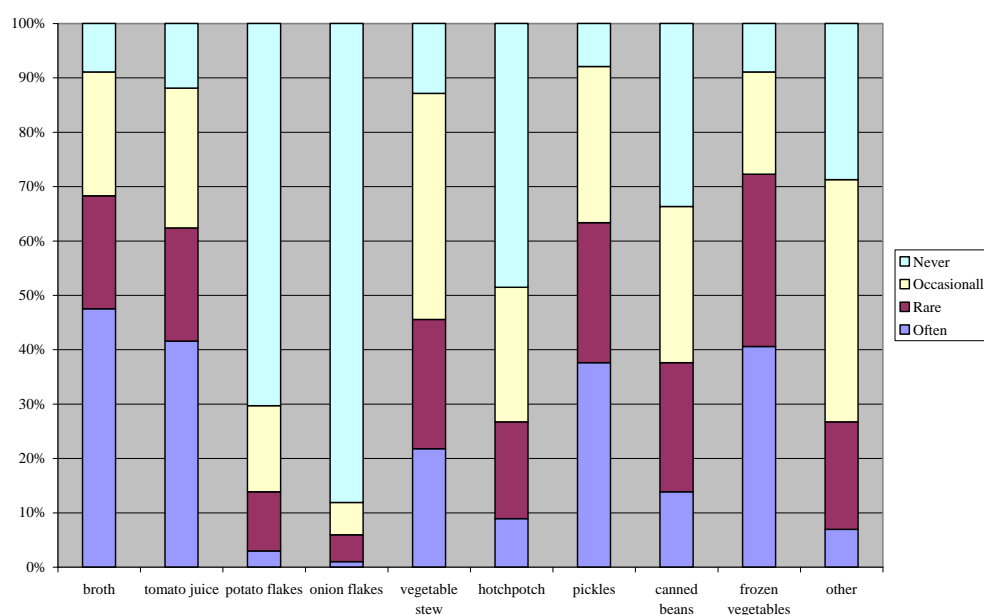
1500 lei, but 21 per cent per cent of respondents belong to this medium-income category. Statistics show that 48 per cent of the population has an income over 1500 lei, but 63 per cent per cent of respondents declare to have income over 1500 lei.

## RESULTS AND DISCUSSIONS

Data issued from computer program compilation have been analysed. The first question: “Do you consume/purchase preserved vegetables?” revealed that 94.1 per cent of respondents consume these products and 5.9 per cent do not consume.

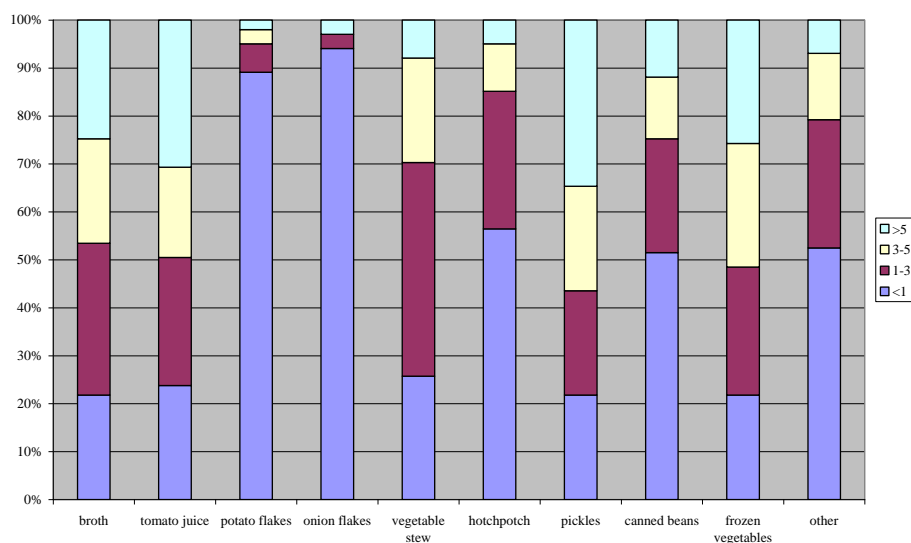
For the second question: “What kind of preserved vegetables consume/purchase more often?”, answers focused in the area “often” for broth, tomato juice, pickles and frozen vegetables and in the area “never” for potatoes and onion flakes. Other preserved vegetables are consumed occasionally (Chart 1).

Chart 1 Answers for question "What kind of preserved vegetables do you consume more often?"



The question “What quantity of preserved vegetables do you consume, on average, per year?”, people answer that they consume 1-3 kg of broth, over 5 litres of tomato juice; hotchpotch, potatoes and onion flakes under one kilogram, vegetable stew between 1 and 3 kilograms per year, pickles over 5 litres per year, canned beans under one kilogram and frozen vegetables between 1 and 3 kilograms (Chart 2).

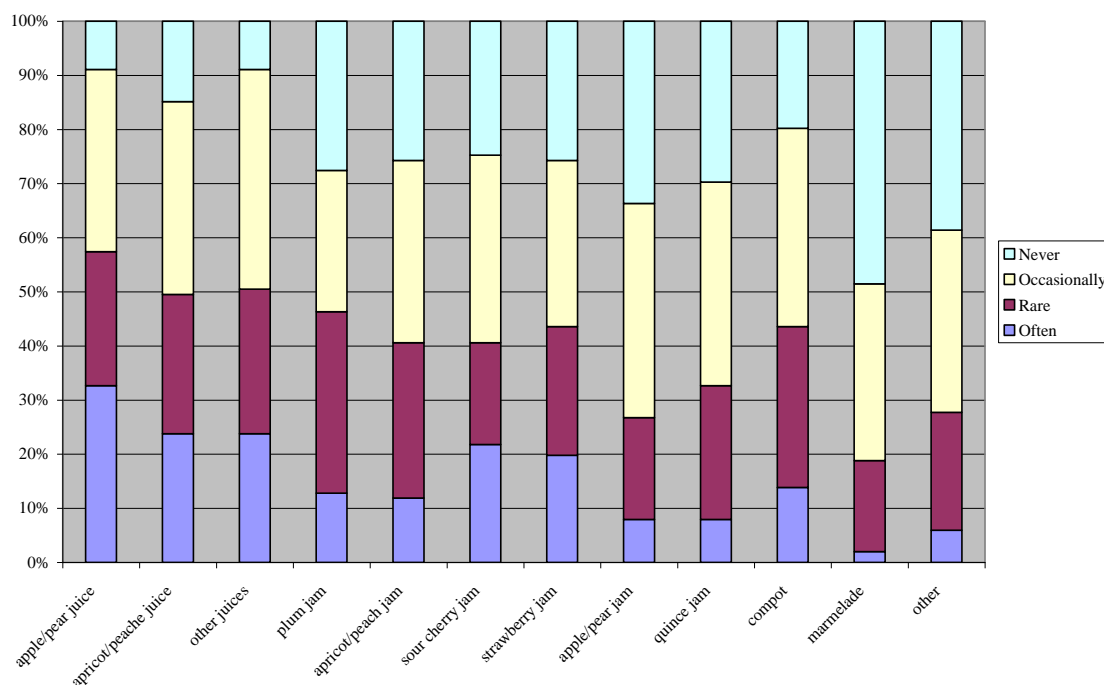
Chart 2 Answers for question "What quantity of preserved vegetables do you consume, on average, per year (kg or l)?"



The question "Do you consume/purchase preserved fruits?" revealed that 93.1 per cent of respondents consume these products and 6.9 per cent do not consume.

As regards the frequency of preserved fruits' consumption, the answers for the question "What kind of preserved fruits consume/purchase more often?", revealed that apples and pears juice are consumed often, plum jam rarely, and the other products: juices, apricot / peach, cherry, strawberry, apple / pear jams, and compote are consumed occasionally (Chart 3).

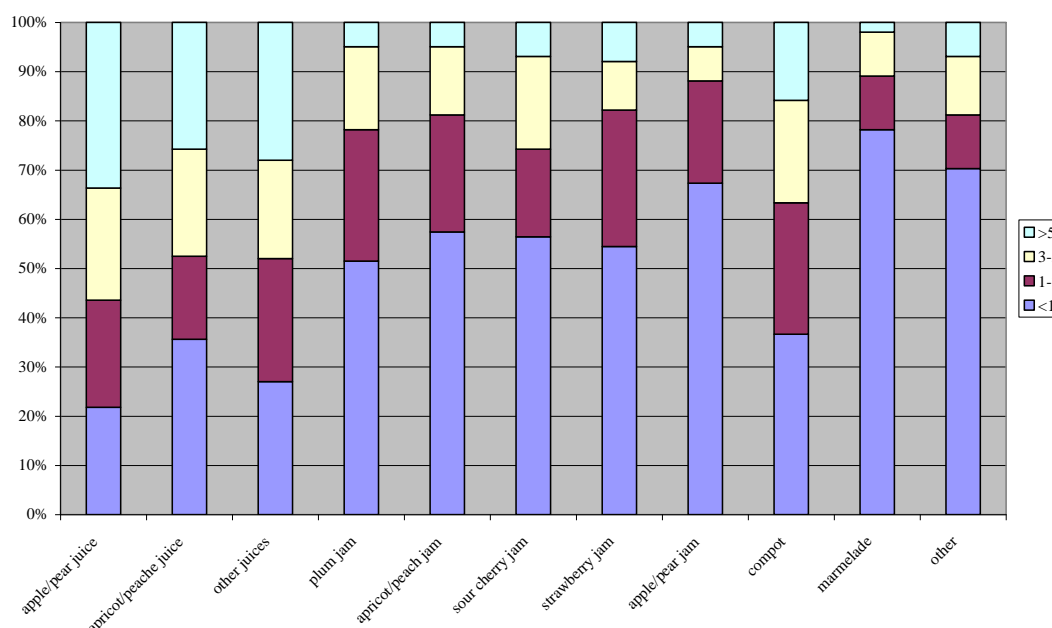
Chart 3 Answers for question "What kind of preserved fruits do you consume more often?"



To the question "What quantity of preserved fruits do you consume, on average, per year?", people answer that they consume over 5 litres of apple and pear juice, and other fruits' juice, and apricot and peaches juice under one litre per year. The other products: plum jam, apricot and

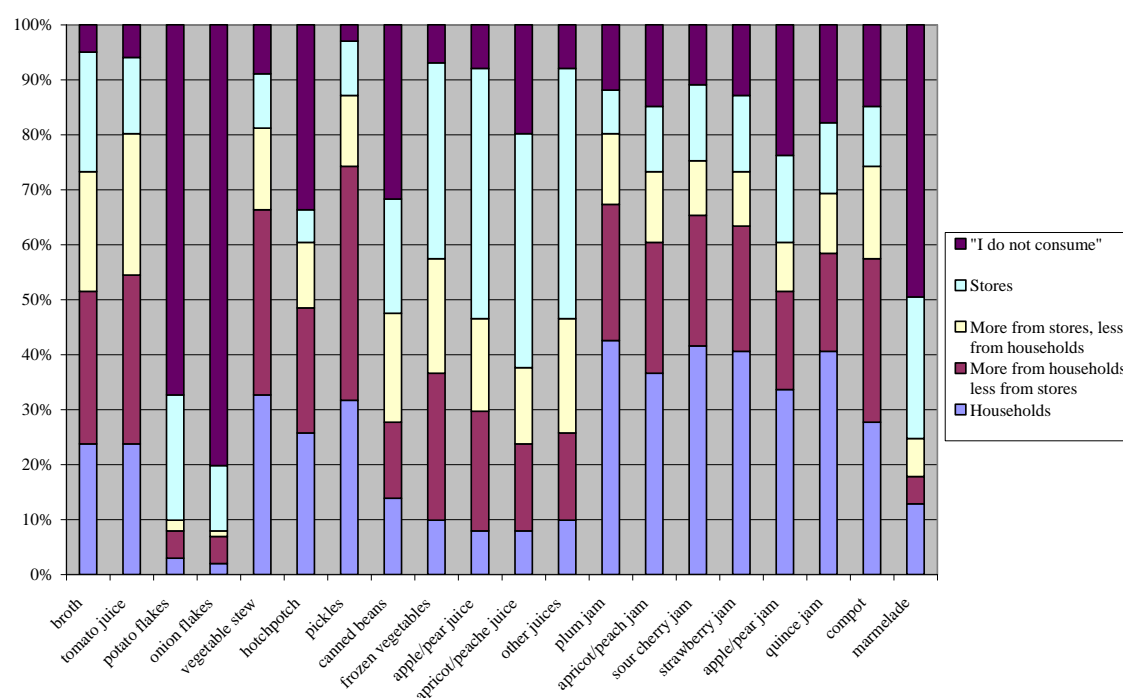
peach jam, sour cherry jam, strawberry jam, apple and pear jam, compote, and marmalade are consumed under one kilogram per year (Chart 4).

**Chart 4** Answers for question "What quantity of preserved fruits do you consume, on average, per year (kg or l)?"



Preserved vegetables and fruits are purchased, mostly, from hypermarkets (39.6 per cent) and supermarkets (29.9 per cent). As regards their origin, domestic or imported, 94 per cent of respondents prefer domestic products and 6 per cent prefer imported products.

The question "What is the source of consumption of preserved vegetables and fruits?" revealed different answers. People declare that they consume broth more from their household and less from stores. Tomato juice is consumed both from households and stores. Potatoes and onion flakes, excluding respondents who chose "do not consume" are brought from stores. Vegetable stew is prepared mainly in households, as well as hotchpotch and pickles, which are purchased less from shops. Canned green / yellow beans, frozen vegetables, apple juice, apricot / peaches juice, other fruit juices are purchased exclusively from stores. Jams and marmalades are prepared within households and only marmalade is purchased from stores. Compotes are consumed more from households, and less from stores (Chart 5).

**Chart 5** Answers for the question “What is the source of consumption of preserved vegetables and fruits?”

The average monthly amount allocated for the purchase of canned vegetables and fruit, during winter, is between 50 and 100 lei. However, the distribution between answers of the question is uniform, for example 33.7 per cent of respondents allocate less than 50 lei per month, 40.6 per cent allocate between 50 and 100 lei per month and 25.7 per cent allocate over 100 lei per month.

Taste, composition and origin are very important in purchasing preserved vegetables and fruits, and the rest features: price, appearance / packaging, promotions and brand are important (Table 4).

**Table 4.** Answers for the question “How important are the following criteria in choosing preserved vegetables and fruits?”

Criterion	Less important	Important	Very important
Taste	4	44	<b>154</b>
Composition	6	36	<b>160</b>
Price	24	<b>114</b>	64
Aspect/packaging	74	<b>98</b>	30
Promotions	70	<b>104</b>	28
Brand	44	<b>116</b>	42
Origin/producer	12	<b>96</b>	<b>94</b>

Source: own calculations based on results of the questionnaire

For each of the features listed, an average mark is calculated as a weighted arithmetic average of frequency of responses. The taste obtain an average mark of 2.74, the composition of 2.76, price 2.19, appearance / packaging 1.78, promotions 1.79, brand 1.99 and the origin/manufacturer 2.44. The rank of criteria by which consumers choose preserved vegetables and fruit products is: composition, taste, origin / manufacturer, price, brand, promotions, appearance / packaging. The features can be grouped into two categories: important features, with marks over 2:



taste, composition, price and origin / manufacturer, and features less important, with marks below 2: appearance / packaging, promotions, brand.

## CONCLUSIONS

In conclusion, over 94 per cent of respondents consume preserved vegetables and fruits, which validate the assumptions made, claiming that 80 per cent of respondents consume / purchase preserved vegetables and 90 per cent of respondents consume / purchase preserved fruits. Tomato broth, tomato juice, pickles and frozen vegetables are consumed frequently. Apples / pears juice is consumed often, as estimated, plum jam is consumed rarely and other products: apricot / peach juice, other fruit juice, apricot / peach, cherry, strawberry, apple / pear, quince jams and compote are consumed occasionally. Preserved vegetables and fruits are purchased, mainly, from hypermarkets (39.6 per cent) and supermarkets (29.9 per cent), although it was estimated that 60 per cent of consumers purchase canned vegetables and fruits from hypermarkets. Most people allocated, on average, between 50 and 100 lei per month to purchase canned vegetables and fruits in winter, more than estimated in the research hypotheses. The most important criteria for choosing canned vegetables and fruits products are composition, taste and origin / manufacturer, and less the price, as originally estimated. These findings are useful in deciding directions of developing processing industry for vegetables and fruits. We may conclude that juices, especially made of apple and pears are suitable branches for developing fruits' processing industry and tomatoes juice and broth, and pickles and frozen vegetables are, also, good directions of vegetables' processing industry.

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