

FOOD QUALITY OF SOME VEGETABLES AND FRUITS JUICES

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Abstract

Fruits and vegetables juices are those drinks which are obtained by mechanical procedures (pressing, centrifugation) or by diffusion and which are conserved using different methods (concentration, chemical conservation, pasteurization). The juices with pulp or the nectars preserve the nutritional value of the products from which they come, but they are exposed to sedimentation.

Five types of juices with pulp obtained from apples, pears, carrots, tomatoes and a blend (1:1:1 apples, pears, carrots) were analyzed regarding the efficiency of converting in juice, acidity, sugars, the content of C vitamin, nitrates and nitrites. The efficiency in juice for all the utilised variants was within the values found in the speciality literature. The results regarding the acidity and C vitamin revealed smaller values of those characteristics in natural juices with pulp in comparison with the similar juices from the supermarket for with those characteristics are adjusted.

Key words: Juices, fruits, pears, blend, efficiency in juice

“Always, human found in nature all the vegetal materials and minerals necessary for keeping his health and beauty. Over millions of years, the therapeutic capacities of the plants were experienced and their extraordinary properties were transmitted from generation to generation, firstly verbally and then in writing. We can say without doubt that the plants were, since ancient times, used as medicine” (Xaël de Sainte-Breuves, 2001).

Vegetables are fresh and edible parts of the herbaceous plants. Those are important as nutrition, with beneficial effects for maintaining health and preventing the diseases. Also, they are known for the carbohydrates, vitamins and minerals content. They can be represented by edible roots, strains, leaves, fruits or seeds. Each group leads to some benefits for the organism. (Robinson DS., 1990, Hanif R. *et al*, 2006).

The natural juices obtained from fruits, vegetables and other green plants, planted or spontaneous, were used since ancient times for preventing and treating the diseases. They are important because of their content full of organic components, which are easy to assimilate.

The advantages of the introduction of fresh juices in our daily menu are indisputable. The juices with pulp or the nectars preserve the nutritional value of the products from which they

come. What is considered a problem for this method is avoiding the sedimentation (Stoica F., 2007).

MATERIAL AND METHOD

The experiences were made in 2015, organized as a bifactorial experience.

A factor – assortment with five graduation

- a₁** apple juice
- a₂** pears juice
- a₃** carrots juice
- a₄** tomatoes juice
- a₅** apples+pears+carrots juice(1:1:1)

B factor – provenance with two graduations

- b₁** own
- b₂** supermarket

Methods for determining the chemical analysis:

- dry soluble substance from fresh fruits, vegetables and nectar – refractometric method (Bota T.M., 2013)
- acidity – titrimetric method (Bota T.M., 2013)
- determining the sugars – School method (Muste S. and Mureșan, C., 2011)
- C vitamin – iodometric method (Bratu *et al*, 2008)
- nitrates and nitrites content – photometric method (Bota, T M., 2013)

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RESULTS AND DISCUSSIONS

The efficiency in juice (*figure 1*) was determined from converting fresh fruits and vegetables in juice with pulp. The efficiency of the juice was determined from a kilo of fresh product, by squeezing and measuring in cylinder.

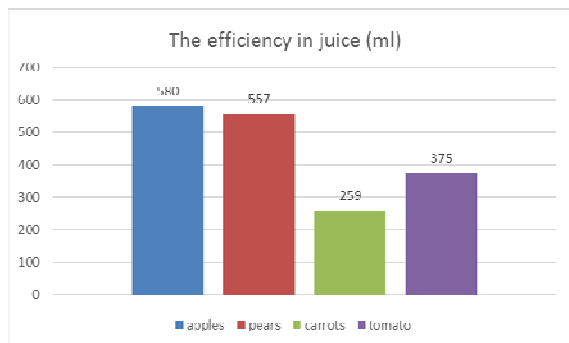


Figure 1 The efficiency in juice of the studied fruits and vegetables, ml/kg

It can be observed that the efficiency in juice has high values for all the experimental variants, with a maximum of 580 ml/kg for apples and a minimum of 25 ml/kg for carrot, which have a high content in vegetal fiber (*figure 1*).

The lowest value for tomatoes is caused by the period when the experience have been made, in october, when the product was processed. In *figure 2*, it can be observed that the lowest refractometric extract is obtained for the tomatoes juice (5,20 %) and the highest extract is obtained from the pears juice from supermarket (12,2 %); the differences from the assortments of juice from supermarket are caused by the fact that there were not added sugars or glucose syrup, regardless the product used for processing.

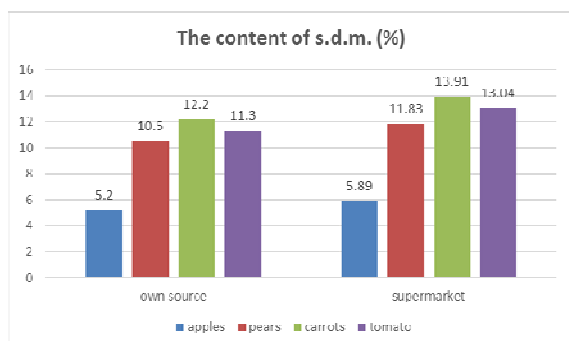


Figure 2. The content of s.d.m. (%) from the analyzed fruits and vegetables juices

The lowest value for the juices acidity is registered for carrots, regardless the provenance, followed by the blend and the pears juice (*table 1*). For the similar assortments of juice from

supermarket, the highest acidity is caused by the addition of citric acid, while for the natural juices from own source there were not added acidifiers. The increased acidity of the products contributes to their conservation, decreasing time-temperature value pair to thermal penetration.

Table 1

The organic acids content of the studied vegetables and fruits juices

Variants	ACIDITY IN JUICE (malic acid %)	
	Provenance	
	Own	Supermarket
Apple juice	0.57	0.65
Pear juice	0.46	0.62
Carrots juice	0.40	0.50
Tomatoes juice	0.78*	0.87*
Blend (1:1:1) (apples, pears, carrots)	0.43	0.58

(* citric acid%)

The increased content of sugars correlated with the decreased values of acids content sweetens the juices.

It can be observed that even without any addition of sucrose and glucose, the natural vegetables and fruits juices obtained in this study bring a valuable contribution of reducing sugars, the registered valuest being within 5,99 mg/100 g and 11,19 mg/100 g (*table 2*).

Table 2

The content of sugar in the studied vegetables and fruits juices

Variants	SUGAR (mg/100 g)	
	Provenance	
	Own	Supermarket
Apple juice	10.50	11.92
Pears juice	11.19	13.07
Carrots juice	7.33	8.12
Tomatoes juice	5.99	7.25
Blend (1:1:1) (apples, pears, carrots)	8.60	9.62

The C vitamin obtained in a natural way is found in important quantities in fresh vegetables and fruits. It is destroyed very easy by exposing to high temperatures, to light, oxygen and water, being a hydrosoluble vitamin (<http://www.realvitaminc.com/ascorbic-acid.html>).

Since the pasteurisation is a usual method in food industry, for conserving food and killing bacteria, it was used the supplementation of ascorbic acid, which were meant to replace the C vitamin from the food where it is destroyed.

The values presented in *table 3* show the quantity of ascorbic acid for all the variants from supermarket, which were supplemented with ascorbic acid, to correct their taste, to conserve them well or to prevent light oxidation.

Table 3

The content of C vitamin (ascorbic acid) in the studied vegetables and fruits juices

C VITAMIN (ascorbic acid mg/100 g)		
Variants	Provenance	
	Own	Supermarket
Apple juice	12.20	13.65
Pears juice	11.63	13.06
Carrots juice	5.32	6.89
Tomatoes juice	6.67	8.73
Blend (1:1:1) (apples, pears, carrots)	6.39	8.23

The biggest fertilization error is to apply excessive doses of chemical fertilizers based on nitrogen, accumulating, thus, in vegetable products, big quantities of nitrates, which, in the human body, are converted in nitrites, producing phenomena of intoxication and diseases.

Regarding the toxicity of those substances, the dose established by O.M.S. for nitrates is of 5 mg/kg/body for an adult and of 0.2 mg/kg/body for nitrites (Hura C., 2007).

In *table 4* there are registered the values obtained from the studied vegetables and fruits juices.

Table 4

The content of nitrates in the studied vegetables and fruits juices

NITRATES (mg/1000 ml)		
Variants	Provenance	
	Own	Supermarket
Apple juice	183.57	227.67
Pears juice	173.33	221.20
Carrots juice	199.60	317.06
Tomatoes juice	143.66	450.79
Blend (1:1:1) (apples, pears, carrots)	167.66	201.17

Table 5

The content of nitrites in the studied vegetables and fruits juices

NITRITES (mg/1000 ml)		
Variants	Provenance	
	Own	Supermarket
Apple juice	4.23	9.13
Pears juice	5.00	10.40
Carrots juice	2.49	8.01
Tomatoes juice	5.37	7.39
Blend (1:1:1) (apples, pears, carrots)	6.00	9,03

Considering the agricultural technologies as a main factor of nitrate pollution has lead to their change in last decades, by promoting a new idea regarding the chemical fertilization based on nitrogen (Skriver, 1990). The content of nitrites is a very important element for the appreciation of the food quality.

The content of nitrites in the studied vegetables and fruits juices, presented in *table 5*, shows that the biggest quantity is registered in the juices from supermarket, regardless the assortment

CONCLUSIONS

The analysis of some characteristics of quality in the studied vegetables and fruits juices showed that for all the analyzed chemical parameters, the obtained results were very close to the average values found in the speciality literature.

Regarding the efficiency in juice, the values were over the average for all the studied vegetables and fruits.

The content of soluble dry substance (s.d.m.) was constant for the fresh products and in juices;

For the juices from supermarket, there were registered increases regarding the acidity, the sugar content and the C vitamin, in comparison with the natural juices from own source, because of the corrections applied for these parameters in the technological process.

The content of the nitrates and nitrites registered lower values, in comparison with the juices from supermarket.

Due to their composition, the vegetable and fruits cocktails can be used in the daily menu, being an alternative to the consumption of fresh vegetables and fruits.

It is recommended the consumption of the natural juices obtained from fresh vegetables and fruits, with a low content of additives. Those juices can be consumed both by kids and adults, due to their quality of functional food and their protecting role in the human body.

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