UDC: 663.813:634.233]-035.66
Original scientific paper

COMPARISON OF SOME QUALITY PARAMETERS IN SOUR CHERRY JUICE IN DIFFERENT PACKAGING

Namik DURMISHI[1*], Gafur XHABIRI[1], Ermira ALIJA[1], Durim ALIJA[1], Ljubica KARAKASOVA[2], Frosina BABANOVSKA-MILENKOVSKA[2], Viktorija STAMATOVSKA[3], Iliana LAZOVA-BORISOVA[4]

[1*]*University of Tetova, Faculty of Food Technology and Nutrition, Tetovo, R.N.Macedonia*
[2] *University Ss. Cyril and Methodius- Skopje, Faculty of Agricultural Sciences and Food Skopje, R.N. Macedonia*
[3] *University St. Kliment Ohridski - Bitola, Faculty of Technology and Technical Sciences Veles, R.N. Macedonia*
[4]*Institute of Cryobiology and Food Technology, Sofia, Bulgaria*
Corresponding Author: e-mail: namik.durmishi@unite.edu.mk

Abstract

Fruits and their products are of great importance in the food industry. Fruit juices are found in almost every market, which helps consumers to get nutritional value from their consumption. The quality and insurance must be at the right level, but even more important to apply permanent control. Sampling was carried out randomly directly in the supermarket, and the analysis of parameters in the study of sensory quality (color, taste, aroma, and homogeneity) and physical-chemical (pH, °Brix, total acidity, and turbidity) in sour cherry juice is of importance because the same juice in different packaging is compared. After the analyses that have been carried out and the results obtained, they provide additional insight into the analyzed parameters. So, the consumer receives additional information, also confidence in the quality of the product will increase based on the results obtained. In conclusion, even though we are talking about the same sour cherry juice, as a result of the % content of the raw material with different amounts and the different packaging, the analyses for the parameters under study prove the differences, but at the limit, so the analyzed juices are within the standard for quality.

Keywords: sour cherry juice, °Brix, total acidity, pH, turbidity, color, taste, aroma.

1. Introduction

Because of the fast way of life and lifestyle changes, the food industry constantly works so people can benefit from the many values of their ready-made food and products. Fruit juices are found in almost every market, which helps people to hydrate as well they also have nutritional value. The quality and insurance must be at the level properly and thus not present any possible causes of diseases or various infections. The purpose of the study will be: random sampling directly in the supermarket in our region, and then analyze sensory and physicochemical quality parameters in sour cherry juice in different packaging. The sour cherry (Prunus cerasus L) is a delicate fruit and requires careful handling to preserve its original texture and quality. The fruits contain high acid and low sugar, developing a sour taste mixed with sweet nuances. For the production of fruit juice, we have two or more ways depending on what the raw material is, that is, the fruit juice can come directly by squeezing the juice or by concentration.
The product may only contain authorized ingredients and authorized substances which are defined in the Directive. They can only be those food additives allowed by the Regulation of the European Commission (EC) No. 1333/2008 that can be added to juices and fruit nectar. Only flavors and aromas derived from the same fruit can be used (Fruit Juice Technical Guidance, 2016).
In the production of beverages, water is of particular importance as it participates with a high % in the final production. In particular, mineral content and pH are the two main effective properties of water because water is distributed in the food product and causes changes in the

https://doi.org/10.62792/ut.jftn.v7.i13-14.p2696

chemical, physical, textural, and sensory properties of food products (Sadiye M, and Mustafa B, 2021).

2. Materials and Methods

The experimental part for the comparison of the sensory, physical, and chemical qualities of sour cherry juice in different packaging mainly in Glass and Tetra Pak analyses and the experimental part was done in the laboratories of FFTN, at the University of Tetova. The samples for the study were taken in the market of Tetovo which has different percentages of fruit 35% and 50%.

Work methodology

Both samples were taken in the market of Tetovo in different places, then they were sent to the laboratory for their testing, the sensory analyses were carried out by 4 tasters, as well as the physical and chemical analyses in the laboratory.

Sensory analyses

The samples were taken from the market and sent to the faculty laboratories, then the liquid was placed in the container and then the analysis of the organoleptic characteristics was carried out, where for each sample the color, aroma, taste, and consistency were determined. Sensory analyses were carried out by a group of members where they evaluated the product with points from 1 to 5 and the same procedure was repeated for the other sample.

Physical and chemical analyses

pH scale control- Measurements of the pH scale were performed with a digital pH-meter. Where the sample was previously prepared for analysis, the same procedure was repeated for the other sample.
Determination of the total acidity in the juices of the sour cherry
Determination of soluble dry matter (˚Brix) - The measurement of soluble dry matter was carried out with an instrument called a refractometer.
Determination of turbidity- The way to determine the turbidity is digitally where the special container for the instrument is first filled with the sample, filled to the limit line, cleaned well and then inserted into the instrument to make the calculation, and the results for the turbidity measurement are displayed on the screen.

3. Results and Discussion

3.1 Sensory analysis results:

Table 1. Sensory results in sample S1

Parameters	**D_1**	**D_2**	**D_3**	**D_4**
Color (1-5)	3	4	3	4
Taste (1-5)	5	4	5	4
Aroma (1-5)	4	5	5	4
Homogeneity (1-5)	5	4	4	4
Total Points	**17**	**17**	**17**	**16**

The results obtained by the tasters in sample S1 are: taster D1 evaluates the color with 3 points, the taste with 5 points, the aroma with 4 points, and the homogeneity with 5 points. From taster D2, sample S1 for sensory parameters was evaluated with points: color 4, taste 4, aroma 5, and homogeneity 4 points. D3 taster evaluates the color with 3 points, the taste with 5 points, the aroma with 5 points, and the homogeneity with 4 points. The D4 taster evaluates the color with 4 points, the taste with 4 points, the aroma with 4 points, and the homogeneity with 4 points. Based on the evaluations of the tasters and the points obtained, sample 1 results with high quality, but there were differences between the evaluators.

Table 2. Sensory results in sample S2

Parameters	**D_1**	**D_2**	**D_3**	**D_4**
Color (1-5)	3	4	4	4
Taste (1-5)	4	4	3	3
Aroma (1-5)	4	3	3	4
Homogeneity (1-5)	4	4	4	4
Total Points	**15**	**15**	**14**	**15**

The results obtained by the tasters in the sample S2 are: taster D1 evaluates the color with 3 points, the taste with 4 points, the aroma with 4 points and the homogeneity with 4 points. From taster D2, sample S2 for sensory parameters was evaluated with points: color 4, taste 4, aroma 3 and homogeneity 4 points. D3 taster evaluates the color with 4 points, the taste with 3 points, the aroma with 3 points and the homogeneity with 4 points. While taster D4 evaluates the color with 4 points, the taste with 3 points, the aroma with 4 points and the homogeneity with 4 points. Based on the evaluations of the tasters and the points obtained sample S2 results with poor quality from the sensory aspect also there were differences between the evaluators.

3.2 Results of physical and chemical analyses

Table 3. Physical and chemical results in sample S1, S2

Parameters	**S_1**	**S_2**
pH	3.80 ±0.01	3.60 ±0.01
Total acidity (%)	0.53 ±0.02	0.69 ±0.02
°Brix Value	12 ±0.01	13 ±0.01
Turbidity (NTU)	260 ±0.01	224 ±0.01

The results obtained in the table were as follows, the pH scale results with values in sample S13.80±0.01 in sample S1 3.60±0.01 with small differences, the total acidity in sample S1 was 0.53±0.02 (%) while in sample S2with higher values of 0.69±0.02 %. Scale ºBrix in sample S1 results in 12 ±0.01 while sample S2 value ºBrix 13 ±0.01. The turbidity expressed in NTU in sample S1 resulted in higher values of 260±0.01, while in sample S2 with 224±0.01. The results obtained were within the limits stated on the packaging for the analyzed samples, but there were differences because it is affected by the content of the fruit as % in the production, i.e. the juice analyzed.

4. Conclusions

Based on the use of raw materials with different concentrations and different packaging, auxiliary materials, water treatment, and the technological process applied for the production of the liquid, from the results obtained with the research carried out in this work, we can draw the following conclusions:

- The results for the sensory parameters in the S1 juice resulted in higher values from all the tasters, while the S2 sample with lower values for the analyzed parameters, but it can be freely said that the juice was of high quality;
- The average value from the three measurements for the pH level in the final liquid in S1 S2 resulted in small changes but the same were within the allowed limits;
- The total acidity expressed in citric acid in the final juice resulted in lower average values in sample S1 0.53±0.02% while in sample S2 the values were higher 0.69±0.02;
- Soluble dry matter was different based on the declaration on the label with an average value of 12 ±0.01°Brix in sample S1 while in sample S2 13 ±0.01;
- The turbidity in sample S1 resulted in high values of 260±0.01 NTU while liquid S2 had lower values of 224±0.01.

As a conclusion and recommendation, we need permanent control of raw materials from a sensory, physical, and chemical point of view, treatment of the auxiliary substance water before mixing with other auxiliary substances for the standardization of the recipe.

References

[1] British Soft Drinks Association, Fruit Juice Technical Guidance, 2016;
[2] Bates R.P, Morris J.R and Crandall P.G, 2001. Principles and practices of small – and medium – scale fruit juice processing, , University of Florida, USA;
[3] Ivan E. 2018. Sour cherry (Prunus cerasus L.) - morphological characteristics, cultivation and products, Osijek;
[4] Puškar, B. 2005. Intravarietal variability of cloud cherry. Doctoral thesis. Faculty of Agriculture at the University of Zagreb. Zagreb,;
[5] Syndyze K, Dilaver S, Mensur K, Arber H. 2020. Investigation of the quality of sour cherry, raspberry and bilberry fruits after refrigerated storage, Mitrovica;
[6] Sadiye M, Mustafa B. 2021. The importance of water composition on some characteristics of food products;
[7] Susan F. 2015. Hazard analysis and critical control point (HACCP) systems in food canning;
[8] Alush M. 2011/2012. Food quality control. Mitrovica;
[9] https://www.specialtyproduce.com/produce/Sour_Cherries_2911.php.