A comparison between the pasteurization efficiency of pulp juices and not pasteurized juices

Borozan Aurica Breica 1*, Bordean Despina 1, Dogaru Diana 1, Mișcă Corina 1, Filimon Nicoletă 2, Hărâncescu Monica 1

1 Banat’s University of Agricultural Sciences and Veterinary Medicine Timisoara, Romania, 2 West University of Timisoara, Romania

*Corresponding author. E-mail: borozan_a@yahoo.com

Abstract

Global health problems led to the popularization of natural fruits juices as a healthy alternative to other kinds of drinks. Fruits juices has to correspond to consumers demands, to offer the guarantee to be a food product from production, organoleptic and nutritional qualities besides production normative.

In the present study it was determined microbiological lowdind from juice samples (apples, pears and oranges) pasteurised and without preservation agents and not pasteurised (fresh). Analysis were effectuated on medium for mesofile microorganisms in shelf life of the three products (9 month shelf life).

After heat treatment at 37°C applied 5 days, pasteurized juice samples presented an evolution of microbial segment that show the presence of spoilage and the possibility of human health incident in an improper stored. For samples not treated with heat it wasn’t a significant difference in number of germs.

Key words

pulp juices, pasteurisation, total number of germs

Because of their nutritional and sensorial qualities, fruits and vegetables are essential compounds for human diet and a benefit for his health (7,9). Their consumption is restricted by the time of ripening and because of the rapid degradation at usual temperature.

Lately, cold preservation gained field for these products or production of natural not pasteurized juices and pulp pasteurized juices. The fruits must have ripening maturity in order to permit obtaining juices with those characteristics from normative. In order to obtain a qualitative product must have a laboratory control both on raw material and during obtaining technological process.

Some authors reported that the stability of juices depend, mainly, on raw material, storage and preparation conditions and on the storage device material. All these factors could be the cause of physical-chemical and enzymatic modifications and that it is shown in nutritional and sensorial characteristics of final product (3,4).

Besides, although fruits juices are pasteurized, resistant microorganisms could cause problems for consumers. That’s why these products are susceptible of degradation even for recommended shelf live (8).

A study made by Addo et al. (2008), in 2007-2008 on microbiological and sensorial modifications of some imported juices (apple, mango, orange), showed a significant increase of microbian load in juices from apple and mango. Although significant, number of germs from orange juice was smaller, being between 3.1x10³ and 9.5x10³ in june, 2007 and february 2008.

Materials and Methods

Microbiological exam establish microbiological load of market pasteurized juices (minimum 50% fruit content, without preservation agents), shelf life 9 months and not pasteurized (fresh), ones being responsible for morbid phenomena.

For these studies were used 3 storage recipients with pasteurized juice of pears, apples and oranges of 330mL, respectively 3 bottles with not pasteurized juice from the same fruits but with a capacity of 500mL.

More than that for pasteurized pulp juices were taken 3 samples which were kept at 37°C, being inoculated on culture medium after 5 days of incubation. All experiences were put in 3 repetitions.

The principle of method for microbiological determination for non alcoholic beverages was realized after Misca (2001) and Borozan (2006).

Results and Discussions

After 24 hours of incubation on nutritive medium at 37°C, was determined the number of germs from analized samples (figure 1, 2).
According to the quality standards for juices (6), they must have the following microbiological parameters:

a. refreshing beverages not pasteurized
   - aerobes mesofile germs = 300/ mL
b. refreshing pasteurized beverages
   - total number of germs = 3/mL

From statistical point (figure 1) of view for total number of germs from studied juices could be said the following:

- fresh and pasteurized juices are characterized by a small number of microorganisms by comparison with samples of pasteurized and treated with heat juices, but didn’t overcome maxim admissible limits;
- pears and oranges juice presented a higher number of microorganisms, by comparison with apple juice, but didn’t overcome maxim admissible limits.

**Figure 1.** Microbial load from pasteurized and not pasteurized fruits juices (FJ-Fresh Juice, UT-without termic treatment, TT- Termical treatment)

**Figure 2.** Differences between the three variables from study
Cluster statistical analysis, using square root of corresponding mathematical values, showed a similarity in behavior for germs number between fresh juices and samples pasteurized and not treated with heat, different from heat treated juice samples (figure 2).

**Conclusions**

Similarity and the differences between analyzed products are because of the raw material, chemical composition, way of prelucration, storage condition and heat treatment. Total number of germs didn’t cross admitted values from quality standards for any sample analyzed.

It could be established that all analyzed products are between legal limits for analyzed samples.

It could be said that an inappropriate temperature on storage period led to the germination of spors, spoilage of juices and modify consumers health.

**References**


2. Borozan Aurica-Breica, (2006), Microbiologie (îndrumător de lucrări practice), Editura Mirton Timișoara, pp. 64,70


