



# Pasteurized fermented from valencia orange: physical and chemical characteristics

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## **1 INTRODUCTION**

The chemical stabilization of wines has been reduced due to food safety issues. Some producers use potassium metabisulfite ( $K_2S_2O_5$ ) due to its main advantage, which is cost and practicality. The thermal stabilization of wines and fermented products through pasteurization aims to eliminate the microorganisms present in the wine and is used as an alternative to chemical stabilization. The heat treatment can change the molecules of the fermented product and its constituents, this implies that the choice of the correct temperature and the residence time of the fermented product in the pasteurizer are necessary, and knowing its characteristics such as soluble solids, acidity and alcoholic degree that determine the quality of the final product.

## **2 OBJECTIVE**

The objective of this work was to produce fermented oranges of the valencia variety and undergo a flash pasteurization process using a double-tube heat exchanger as an alternative to replacing the use of potassium metabisulphite and to evaluate its physicochemical properties.

## **3 METHODOLOGY**

For the production of fermented products, the yeast *Saccharomyces cerevisiae* was used. Two types of fermented oranges were produced, one with chemical treatment using potassium metabisulfite, and another without the addition of metabisulfite. As an alternative to chemical stabilization of the fermented product, heat treatment through flash pasteurization was used, for this purpose two double-tube heat exchangers connected in series were dimensioned, and in the first phase the fermented product was heated to  $76^\circ\text{C}$  and in the second phase it was cooled to  $8^\circ\text{C}$ , so that heat exchange could occur and consequently pasteurization. In the fermented products produced, analyzes of total soluble solids, total acidity and alcohol



content were carried out. Comparisons were made between fermented valencia oranges with (CM) and without potassium metabisulphite, before and after the thermal stabilization process (SMAP and SMDP respectively).

#### **4 RESULTS AND DISCUSSION**

The fermented valencia orange was analyzed before and after the pasteurization process. The value for total soluble solids for the fermented product without metabisulfite/pasteurized (SMDP) was 5.5° Brix, and the fermented product without going through the pasteurization process presented 6.0° Brix. The acidity of the fermented product with potassium metabisulfite (CM) was 102.61 meq/L and 77.50 meq/L for the fermented product (SMDP) and this showed a significant reduction in total acidity after pasteurization. The fermented products were within the limits of Brazilian legislation, which must have a minimum of 50 meq/L and a maximum of 130 meq/L of tartaric acid. The initial alcohol content was 9.3% v/v, after the pasteurization process it resulted in 9.2% v/v. The alcohol content of fermented oranges complies with the limits established by Brazilian legislation.

#### **5 CONCLUSION**

Orange, due to its low cost, can become an alternative for the production of fermented beverages. With the results obtained from the pasteurized product, there were no major variations in the physicochemical characteristics of the fermented products when compared to the properties of the fermented pear orange with potassium metabisulphite.



## REFERENCES

- Aquarone, e.; lima, u. A.; borzani w. Alimentos e bebidas produzidos por fermentação, volume 5, são paulo, editora edgard blucher, 1983, 282 p.
- Castilhos, m. B. M.; vinificação em tinto de uvas americanas: efeito das técnicas de pré-secagem das uvas e de chapéu submerso nos perfis químico e sensorial, 2016, 205f, tese (doutorado em ciência e engenharia de alimentos), universidade estadual paulista júlio de mesquita filho, são josé do rio preto, 2016.
- Berselli, g.; influência da flash-pasteurização na coloração e análise sensorial de vinhos tintos. 2011, 37f. Trabalho de conclusão de curso (curso superior em tecnologia em viticultura e enologia), instituto federal de ciência e tecnologia do rio grande do sul, bento gonçalves, 2011.
- Delfini, c., formica, j. V.; wine microbiology, science and technology, marcel dekker editions, (2001), in: ezequiel, m. M. R. L.; ensaios de tratamentos térmicos em vinhos tintos, efeitos na composição físico-química e análise sensorial. 2010, 93p.
- Ezequiel, m. M. R. L.; ensaios de tratamentos térmicos em vinhos tintos, efeitos na composição físico-química e análise sensorial. 2010, 93f. Dissertação (mestrado em viticultura e enologia), instituto superior de agronomia, universidade técnica do porto; faculdade de ciências, universidade do porto, lisboa portugal, 2010.
- Foust, a. S. *Et al.*; princípios das operações unitárias, 2ª ed., rio de janeiro, ltc, 2012, 957p.
- Flanzy, c. *Et al.*; enología: fundamentos científicos y tecnológicos, 2ª ed. Madri, ediciones mundi-prensa, 2003, 797p.
- Hottel, h. C.; noble, j. J.; sarofin, a. F.; *et.al.*; perry's chemical engineering handbook, section 5 heat and mass transfer, 8ª ed. Nova iorque, estados unidos, mcgraw-hill, 2008, 2400p.
- ial, instituto adolfo lutz; métodos físico-químicos para análise de alimentos. 1ª ed. Digital, p.40-444-445, são paulo, 2008.
- Mendes, j. C.; marinho, s. C.; lopes, n. A.; *et.al.*; vinho de laranja (*citrus sinensis*), produção, processamento e controle de qualidade (organoléptico e bromatológico), caderno de pesquisa v.12, p. 132-149, 2001.
- O.i.v.; compendium of international methods of analysis of wines and musts, vol. 1, international organization of vine and wine, paris, França, 2018.
- Toledo, r. T.; fundamentals of food processing engineering, 3ª ed. Nova iorque, estados unidos, springer, 2007, 449p.
- Ribéreau-gayon, p.; glories, y.; maujean, a.; dubourdiou, d.; handbook of Enology, the chemistry of wine stabilization and treatments, v. 2, john wiley and sons, inglaterra, 2006, 544p.
- Valada, i. O. D. G.; avaliação microbiológica do vinho engarrafado, 2016, 63f. Dissertação (mestrado em engenharia alimentar), instituto superior de agronomia, universidade de lisboa, 2016.