Organic World Congress 2020 | FRANCE

SEPTEMBER 21ST TO 27TH, 2020 IN RENNES
AT THE COUVENT DES JACOBINS • RENNES MÉTROPOLE CONFERENCE CENTRE
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OWC 2020 Paper Submission - Science Forum

Topic 2 - Product and process quality in Organic Agriculture: methods and challenges

OWC2020-SCI-1226

QUALITY PARAMETERS VARIATION OF ORGANIC STRAWBERRY REGINA CV. DURING FREEZING AND STORAGE

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Preferred Presentation Method: Poster only

Full Paper Publication: Yes

Abstract: *Organic strawberries represent a good source of vitamins, polyphenols and mineral elements. The postharvest storage of organic fresh strawberry is relatively short and the injuries, rapid spoilage, nutritional (vitamins, polyphenols, anthocyanins) and moisture loss lead to dramatically reduces of their commercial value. Therefore, limited production period and short postharvest storage remain the most important problems for food industries and consumers. Due to these, aim of the study is to investigate the effect of frozen storage temperatures and period on quality parameters of organic strawberry Regina cv. during 12 months.*

Introduction: Preservation of foods by freezing is widely used in industry, since it can extend the shelf-life without requiring a heating process (Kobayashi & Suzuki, 2019). Freezing rate and storage time are the most important parameters in the losses of bioactive compounds of food during the freezing process (Yanat & Baysal, 2018). Faster freezing process lead to small ice crystals with a better frozen food quality (Alexandre et al., 2013). Slow freezing normally forms large ice crystals in the extracellular regions of the frozen foods, which may cause damage to food microstructure, resulting in the color, flavor, nutrition and texture modification after thawing, such as tissue softening, increase in drip loss, tissue browning and so on (Sun, 2016). Because of their taste, appearance and biochemical composition strawberries can be used as fresh, frozen or processed products (concentrates, jam, juice, nectar, syrup, dairy products). Strawberry contains higher amounts of polyphenol compounds and provides substantial amounts of folates and vitamin C (Giampieri et al., 2014). Strawberry polyphenols are known to be associated with preventing human diseases and promoting health by their antioxidant, anti-inflammatory, antimicrobial, antiallergy, and antihypertensive properties. In addition, vitamin compounds also have variety of health benefits including anti-cancer and anti-chronic properties (Giampieri et al., 2014). Therefore, this study investigate the effect of frozen storage temperatures and period on quality parameters of organic strawberry Regina cv. during 12 months.

Material and methods: Regina cv. of strawberry was harvested at the optimal stage from an organic orchard, from Singureni, Giurgiu in June 2019.

Three types of freezing and storage methods were applied for organic strawberries: (1) freezing and storage at -80°C, (2) freezing and storage at -20°C and (3) freezing at -80°C for 24 h and storage at -20°C. Samples were analysed in different moments of storage, as follows: initial (before freezing), after 3 days of freezing and then every two months during one year.

The analytical methods: total anthocyanin content by spectrophotometer, mineral elements by ICP-MS, ascorbic acid identification and quantification was realized through High Performance Liquid Chromatography (HPLC). An Agilent Technologies 1200 chromatograph equipped with an UV-DAD detector was used for HPLC analysis. Determination of dry matter and water content were performed with Partner MAC 50 thermobalance. The soluble solids (TSS) were measured with digital refractometer (Kruss DR301-95) according to Brix reading. The total titrable acidity (TTA) was realised using an TitroLine automatic titrator. The TTA was expressed in g citric acid/100g. pH values were measured using attached pH electrode from TitroLine equipment used for TTA.

Results: For organic strawberries samples investigated during storage in frozen state it can be mentioned that the ascorbic acid content registered decreases in all storage methods. Results obtained after frozen storage were compared with initial moment and it was observed that total anthocyanin content registered also small decreases for strawberries stored at -20°C and for those stored at -80°C.

Discussion: This study reports that there are variations in quality parameters which depend on both period and method used for freezing storage of strawberries.

Acknowledgements

This work was supported by a grant of the Romanian Ministery of Research and Inovation, CCCDI – UEFISCDI, project number PN-III-P1-1.2-PCCDI-2017-0662, within PNCDI III.

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Disclosure of Interest: None Declared

Keywords: ascorbic acid content, freezing, organic strawberry, storage