MaquiNews

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Organic Maqui Berry Key information

Information

Characteristics of maqui berry

Scientific evidence shows that maqui berry is one of the berries with the highest content of phenolic compounds, related to its high antioxidant capacity. In this sense, the total phenol content reaches 14 g EAG / kg fresh weight, anthocyanins exceed 9 g ci-3-glu / kg fresh weight, the content of total phenols is approximately 1,600 mg EAG / 100 gr weight fresh and the flavonoid content exceeds 200 mg / 100 gr fresh weight.

Freeze-drying process

Freeze drying is the process of dehydrating frozen foods under a vacuum so the moisture content changes directly from a solid to a gaseous form without having to undergo the intermediate liquid state through sublimation. In this process, freeze dried food maintains its original size and shape with a minimum of cell rupture. Removing moisture prevents a product from deteriorating at room temperature.

The dried product will be the same size and shape as the original frozen material and will be found to have excellent stability and convenient reconstitution when placed in water. Freeze dried products will maintain nutrients, color, flavor, and texture often indistinguishable from the original product.

Depending on the product and the packaging environment, freeze dried foods are shelf-stable at room temperature for up to twenty-five years or more, if canned, and between 6 months to 3 years if stored in a poly-bag container, making it perfect for commercial use. Here, the main determinant of degradation is the amount and type of fat content and the degree to which oxygen is kept away from the product. However, the concentration of polyphenols and anthocyanins may vary according to the food matrix used, the processing method for making the final product and the packaging used for storage.

Composition of freeze-dried maqui berry

According to recent literature research in freeze dried maqui berry, dried maqui berries exhibit the highest total anthocyanin content (of 36.9 ± 3.2 g/kg) compared with fresh maqui (26.1 ± 1.1 g/kg) and maqui juice (11.6 ± 0.1 g/L). Also, dried maqui shows highest antioxidant capacity when using FRAP and TEAC method, with values around 116.0 ± 0.5 mmol/kg and 154.6 ± 8.8 mmol/kg, compared with fresh maqui (66.7 ± 3.8 mmol/kg and 73.6 ± 2.1 mmol/kg) and maqui juice (45.8 ± 0.0 mmol/L and 63.7 ± 1.6 mmol/L).

In this way, our lyophilized maqui powder provides an antioxidant capacity of 11,154 μmol ET for each 2g portion of product.

Stability of compounds during storage

In the scientific literature, there is a lack of information regarding the photosensitivity of the antioxidant compounds present in maqui berry and whether the antioxidant capacity of lyophilized maqui powder is affected by light. However, a study carried out on fresh strawberries where the effect of the application of light pulses was analyzed (4, 8, 12 and 16 J · cm - 2) showed that no significant differences were observed between the total phenolic content between treated strawberries and untreated. In addition, it was shown that the content of vitamin C and total anthocyanins was maintained in the samples treated with low doses of energy, while those of the samples treated with high doses of energy decreased between 20 and 30%, respectively. On the other hand, the initial antioxidant capacity is maintained regardless of the applied dose.

Regarding the stability of the compounds when the lyophilized product is subjected to different temperatures, there is a lack of scientific studies that support the stability in powdered maqui. However, studies on lyophilized powder of cranberry (Myrica rubra) showed that the retention of total polyphenols, gallic acid, protocatechuic acid, cyanidin-3-o-glucoside and anthocyanins gradually decrease with the longer storage time. Along with this, these significant differences were not detected for the retention of compounds when stored at 4°C or 25°C. In addition, it was identified that the browning index of the lyophilized powder increased significantly during a storage period of 50 days. Finally, the study concludes that all the results indicate that freeze-dry drying and storage at 4 ° C is an efficient and convenient method to maintain the bioactive polyphenolic components and the high-quality characteristics of blueberry fruits.

Use of lyophilized maqui powder in food

Regarding the use of lyophilized maqui in different food matrices, there is limited information regarding the stability of the compounds at the time of being applied in cream, milk and ice cream. A study focused on the elaboration of yogurt using 0.75% and 1.5% of lyophilized organic maqui shows that the antioxidant capacity evaluated by the DPPH method presents a high percentage of inhibition of the radical DPPH +, thus demonstrating a high antioxidant power, obtaining values between 41,063 and 54,046 (0,75% and 1,5% respectively) and that are preserved until the 28 days that the trial lasted.

Summing up

The maqui berry is one of the berries with the highest content of phenolic compounds, compared to strawberry, blueberry, blackberry and pomegranate, which is directly related to its high antioxidant capacity. This product can be subjected to different preservation methods, among which Freeze-drying has become one of the best cost-benefit techniques.

Freeze-drying is a technique in which moisture is removed from the product to prevent its deteriorating at room temperature. This technique allows the preservation of nutrients, color, flavor and texture similar to the original product.

Recent scientific research has shown that lyophilized maqui has a higher total anthocyanin content and a higher antioxidant capacity. In this sense, a 2 g portion of product is necessary to achieve an antioxidant capacity of 11,154 μmol ET. On the other hand, regarding the photostability of the lyophilized product (phenolic compounds and antioxidant capacity), there is a lack of information focused on analyzing the lyophilized maqui, a similar situation with studies focused on analyzing the stability of the product at different temperatures. However, the analysis in lyophilized strawberries did not show significant difference in the presence of these compounds when stored at 4 ° C or 25 ° C.

Finally, there is a lack of information regarding the stability of phenolic compounds and antioxidant capacity of the freeze-dried maqui powder when it is applied in different food matrices (cream, milk and ice cream). Despite the potential of maqui powder to be used in food and nutraceutical products, such as drinks, tablets, capsules, sweets, chewing gum and water-soluble powder, as well as in cosmetic products (skin care) such as lotions, tonics, gels body or serum, there is a lack of information that evidence their use.

References:

1. Why Freeze Dried Food?. En: Freeze Dry, http://www.freeze-dry.com/technology/

2. Prosapio, V., & Lopez-Quiroga, E. (2020). Freeze-Drying Technology in Foods.

3. Brauch, J. E., Buchweitz, M., Schweiggert, R. M., & Carle, R. (2016). Detailed analyses of fresh and dried maqui (Aristotelia chilensis (Mol.) Stuntz) berries and juice. Food chemistry, 190, 308-316.

4. Maqui + Propóleo. En: Mas maqui, https://www.masmaqui.com/nuestros-productos/

5. Avalos-Llano, K. R., Martín-Belloso, O., & Soliva-Fortuny, R. (2018). Effect of pulsed light treatments on quality and antioxidant properties of fresh-cut strawberries. Food chemistry, 264, 393-400.

6. Cheng, A. W., Xie, H. X., Qi, Y., Liu, C., Guo, X., Sun, J. Y., & Liu, L. N. (2017). Effects of storage time and temperature on polyphenolic content and qualitative characteristics of freeze-dried and spray-dried bayberry powder. LWT, 78, 235-240.

7. Martínez, M. P., Tinoco A. E. (2018). Desarrollo de una bebida láctea fermentada con poder antioxidante elaborada con polvo orgánico liofilizado de maqui (aristotelia chilensis). Universidad De Guayaquil, Facultad De Ciencias Químicas.

http://item.gmarket.co.kr/Item?goodsCode=1663799207