ProOrg – Practice Abstract

Processing apple purees under vacuum to limit the loss of health-promoting compounds

Problem

Thermal processing of fruits improves palatability, extends shelf life, and destroys micro-organisms. However, high temperatures also induce some changes impacting the content of health-promoting compounds and the puree viscosity.

Applicability box

Theme

Food processing

Keywords

Cooking, microwave, conventional process, texture, polyphenol

Equipment

Under vacuum cooker, microwave cooker

Solution

Cooking under vacuum without additives allows obtaining the same polyphenol content and the same colour as cooking with vitamin C. A fast, innovative microwave cooking (8 min) of apples, followed by a refining, allows producing purees with similar polyphenol contents, yet a higher viscosity than the conventional process (24 min).

Impact

Cooking under vacuum limits the use of additives and maintains the nutritional and organoleptic properties of organic fresh fruits. Using a microwave cooker is faster than conventional cooking.

Practical recommendation

- **The colour of apple products significantly differs according to the presence of oxygen (+/-) and vitamin C (+/-). Purees produced with oxygen are darker and more brown than those produced without oxygen. Add Vitamin C to maintain the puree's initial colour parameters.**
- **Viscosity of the products is not modified by oxygen (+/-). However, it is significantly affected by the process (conventional *vs.* innovative). Innovative microwave cooking provides a higher viscosity, which could be due to a higher water evaporation in comparison with the conventional process.**
- **The effects of oxygen (+/-) and vitamin C (+/-) are significant on the content of polyphenols, which are direct or indirect substrates of the enzyme polyphenol oxidase. In the case of the microwave innovative process, the cooking is very fast, i.e. 8 min, compared to the conventional one, i.e. 24 min, giving a too short time to allow the diffusion of compounds from the peel to the purees.**
- **Cooking under vaccum allows obtaining the same polyphenol content and the same colour as cooking with vitamin C, without requiring any additive. The fast, innovative microwave process allows producing purees with similar polyphenol contents, yet with a higher viscosity than the conventional process.**
- **Sensorial analysis is needed in order to analyse consumer acceptability of this kind of products, combined with both economic and technical evaluations.**

Picture 1: Conventional cutter-cooker (RoboQbo, Qb8-3, Bentivoglio, Italy).

Further information

Weblinks

- Check the Organic Farm Knowledge Platform for more practical recommendations.
- Project web page: https://www.proorgproject.com/

About this practice abstract and ProOrg

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