



TITLE : Method of alkalization of cocoa

DESCRIPTION OF THE TECHNOLOGY

At various stages during manufacturing, cocoa can be subjected to a treatment with an alkali (NaOH, K₂CO₃) at a high temperature. This treatment, known as alkalization, reduces the acidity and harshness of natural cocoa and improves its sensory qualities. However, the cocoa alkalization process can be expensive and has several limiting aspects. First of all, it is necessary to use a large amount of water, which must be removed by heat at the end of the process to avoid microbial proliferation and enzymatic reactions. This drying process involves a great energy cost. Secondly, the heating of the particles is superficial. Subsequently, the larger the treated particle, the less effective the alkalization process is. In third place, compact and very hard spheres are produced during this treatment. Due to its hardness, the amount of energy used in the refining process is very high and therefore is the economic cost. Finally, alkalization causes losses of vitamins, amino acids, and polyphenols. Consequently, there is a need to develop a cocoa alkalization method that solves at

least one of the aforementioned problems.

The invention relates to a cocoa alkalization method and the cocoa product obtained by such method, comprising the steps of a) progressively mixing cocoa with water and an alkalizing agent; b) applying a microwave treatment to the mixture obtained to simultaneously perform its alkalization and drying, and c) grinding the mixture obtained in step b) using a mill of blades or a sorting mill until the desired particle size is achieved.

The mixing can be done in open containers (which allow the entry of oxygen) or hermetically sealed ones (which do not allow the entry of oxygen but can raise the pressure of the system once the microwaves are applied), using mechanical means.

The product obtained, at the end of the aforementioned process, has the same or an even higher quantity of polyphenols and/or antioxidants to that of the natural cocoa.

MARKET APPLICATION SECTORS

Agri-food - Cocoa processing

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The present invention presents many benefits compared to the current alkalization methods because:

- The microwave treatment allows the alkalization of the cocoa mixture and eliminates between 60 and 100% of the moisture content of the sample without burning it.
- Microwave treated samples have a similar profile to that of cocoa processed in traditional reactors and show increased antioxidant activity and total polyphenols content.
- The microwave treatment method (4-7 minutes) is much faster than the conventional method (20-80 minutes), resulting in energy savings up to 90% compared to traditional methods, which lowers the costs and increases production capacity.
- Unlike usual steam heating, microwave heating causes uniform heating throughout the particle (not only on the surface), resulting in a homogeneous product in terms of color and other properties.
- The particle size achieved is much smaller and its distribution is more homogeneous.
- Consequently, the amount of energy applied to grind the product is much smaller, which makes the procedure cheaper.



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CURRENT STATE OF DEVELOPMENT

The technology has been validated at laboratory scale, and the resulting product has been tasted by an expert panel. Researchers are currently working to test the technology at an operational level.

INTELLECTUAL PROPERTY RIGHTS

Patent Pending
Priority SPTO: P201930746.
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PCT: PCT/ES2020/070511
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COLABORATION SOUGHT

Inventors are looking for companies interested in establishing patent license agreements to bring this innovation to market.

RELATED IMAGES

Image 1:



Image 2:

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