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Study of the Influence of Four Different Geographic Origins on Coca Butter Crystallisation

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Abstract

Cocoa butter is an essential ingredient in the manufacture of chocolate and has a direct influence on the rheological characteristics of this globally consumed product. The crystallisation properties of cocoa butter influence the tempering process, a necessary step in the production of quality chocolate. The composition and hardness of the butter can vary considerably depending on the geographic origin of the cocoa beans, particularly with the environmental temperature at the time of maturation of the beans. Additionally, aroma compounds such as they exist in fine cacao (eg. Colombia) can influence crystallisation behaviour. Mastery of crystallisation behaviour is key for the process of tempering, which is necessary for high-quality chocolate. This study, therefore, proposes to study the influence of the environmental temperature at the time of maturation of the beans on the crystallisation of cocoa butter. We compare cocoa butter from distinct locations in Ivory Coast, Peru, and Colombia with commercial-grade cocoa butter. Differential scanning calorimetry was used to monitor and compare the melting behaviour of butter of known origins obtained after different heat treatments. The results show in for several heat treatments a notable Physico-chemical difference between cocoa butter. Notably, they differ in their final melting points but we can clearly follow different melting behaviour indicating difference n composition. Due to 2020 pandemic, we were not able to obtain composition data. Still, the calorimetry data encourage further experimentation with the knowledge of the cocoa butter agronomic practices are perfectly identifiable, in order to understand precisely the influence of these parameters on the crystallisation of cocoa butter.

Keywords: Cacao, chocolate, chocolate processing, cocoa, DSC, geographic origin, tempering, thermal analysis