

The Effect of Processing Operations on the Polyphenol Content of Cocoa Beans: A Review

ABSTRACT

Cocoa beans undergo processing operations to develop the aroma, and flavour precursors of chocolate and other cocoa products, in line with commercial preferences. However, processing has a negative effect on the polyphenol content of cocoa beans, reducing their health benefits, particularly their antioxidant properties. Therefore, the selection of suitable methods or conditions to minimise polyphenol degradation during cocoa bean processing is crucial. This review primarily focuses on understanding the adverse effects of drying, fermentation, roasting, and alkalisation on cocoa polyphenols. Additionally, this paper discusses the influence of extraction parameters on cocoa polyphenols, including method, solvent, time, and temperature. A comprehensive review of the relationship between processing operations and the polyphenol content of cocoa beans provides valuable insight into the mechanisms underlying these changes and outlines the necessary conditions for optimising processing techniques to preserve or enhance the polyphenol content, thereby improving the nutritional and health benefits of cocoa based products. Past studies have reported the negative influences of processing operations on cocoa bean polyphenols; however, degradation is favoured due to the astringency and bitterness of cocoa polyphenols, which are not preferred in cocoa products. Therefore, more data on processing operations that focus on minimising polyphenol degradation, are still needed for a better understanding of the effect of each processing step on the polyphenol content of cocoa beans.