



Impact of new fermentation supports on the physico-chemical quality of Mercedes cocoa beans (*Theobroma cacao* L.1753) grown at Soubré in the NAWA region.

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ABSTRACT

Objective: The cocoa bean fermentation process is a crucial step for obtaining quality beans. This study aims to evaluate the impact of six fermentation supports: banana leaves (control), palm leaves, cocoa pods, tarpaulins, polypropylene bags, and jute bags on the quality of Mercedes variety cocoa beans in Côte d'Ivoire.

Methodology and Results: Fermentation lasted six days on six different supports at the same producer's site. The analyses monitored temperature and pH variations. The results show that, except for beans fermented in cocoa pods, those on banana leaves, palm leaves, tarpaulins, polypropylene bags, and jute bags maintained a fermentation temperature above 45°C and an acidic pH between 2 and 6. After drying, beans fermented in cocoa pods exhibited higher proportions of mouldy and germinated beans, exceeding 3%, with a high pH of 6.23±0.04.

Conclusion and Application of Results: Monitoring the fermentation allowed the evaluation of temperature and pH conditions for each support. After drying, principal component analysis (PCA) and hierarchical clustering analysis (HCA) performed with R and Minitab 18 software, integrating all physicochemical parameters, reveal that beans fermented on palm leaves and jute bags have similar compositions to those fermented on banana leaves. Additionally, these supports are available, accessible, economical, and less labour-intensive. It follows that palm leaves and jute bags could be the best alternatives to banana leaves for maintaining cocoa bean quality in Côte d'Ivoire.

Keywords: Cocoa, Fermentation, Temperature, Support, pH, Quality.