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Effect of 1-MCP preharvest treatment on apple quality characteristics at harvest time and during storage

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Fresh apple is one of the most important fruit in the world. In many cases it is not easy for growers, as weather conditions in some areas are not always suitable for apple colouration and the simultaneous ripening of varieties also makes it difficult to time harvesting. Ethylene plays a major role in the ripening process of climacteric fruits and thus also affects the changes in ripening-related properties (colour, hardness, refraction). In the case of apples, 1-MCP ripening inhibitor has been used for many years in post-harvest storage, which can extend shelf-life by months. Pre-harvest 1-MCP treatment is a relatively new technology, whereby we treat apples in the orchard that have reached physiological maturity but have not yet fully matured and developed colour. The pre-harvest treatment can delay the time to harvest, allowing simultaneous ripening varieties to harvest at different times and the apples to spend more time on the plant, which results in better colouring. Measurements were carried out by treating apples on the trees with 1-MCP at 7 days before of storage maturity and studying the changes in surface colour and ethylene emission. The results obtained show that the treated samples had lower ethylene emissions and better coloration.

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AUTHENTICATING PEANUT BUTTER AND YOGHURT IN THE KUMASI METROPOLIS OF GHANA USING NEAR-INFRARED SPECTROSCOPY

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Peanut butter and yoghurt are targeted for adulteration intended at consumer deception. This study aimed to fingerprint and detect peanut butter and yoghurt adulteration with cassava flour and starch using Near Infra-Red Spectroscopy (NIRS) in a quasi-experimental approach. Ingredients for laboratory sample preparation were obtained from the Kumasi Metropolis. Peanut butter was adulterated at 1%, 3%, 5%, 10%, 15%, 20% w/w and yoghurt at 0.25%, 0.5%, 1%, 3%, 5%,10%,15%,20%,25%,45%, 50% w/w. Selected concentrations mimicked practices on the market. Marketed products were randomly sampled from six markets in the Kumasi Metropolis to validate the study models. Samples were scanned with a hand-held NIRS in triplicates. Chemometric (PCA, LDA and PLSR models) statistical methods were employed to develop classification and prediction models. Peaks with spectral bands for fingerprinting peanut butter and yoghurt adulteration were visible in the NIR spectrum. Some yoghurt brands were suspected of containing cassava starch, while Peanut butter from the different markets differed based on classification models. Cassava flour and starch concentrations were quantitatively predicted by PLSR with an R2CV of 0.98 and error of 0.9g/100g (low error). The findings position NIRS as a viable tool that could be adopted for quality control in yoghurt and peanut butter regulation.