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Improvement of oxidative stability of vanilla cake by phenolic extracts of coconut oil meal

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Use of natural antioxidants to improve the shelf life of bakery products is limited due to the lower thermal stability of most of the natural antioxidants and higher doses needed to cause effective protection compared to synthetic antioxidants.However, among many types of antioxidants, phenolic antioxidants are known to be thermally stable.The residues remaining after expulsion of oil from coconut kernels are called coconut oil meal.In the present study, ethanolic extracts of phenolic substances of coconut meal (CME)and synthetic antioxidant BHT were introduced to cake at 200 ppm in cake.Control cake samples were prepared with no added phenolic compounds.The oxidative stability of cake was evaluated by monitoring levels of peroxides by colorimetry and levels of hexanal by headspace solid phase microextraction gas chromatography. The effect of CME and BHT on the microbial shelf life of the cake was assessed by total plate counts over time during storage.

The phenolic content of coconut meal, as determined by the Folin-Ciocalteu assay, is 775 ± 26 g/kg. The inhibition of peroxide formation in CME added cake samples was significantly ($p \leq 0.05$) higher than that in BHT added or control cake samples. CME added cake samples could maintain hexanal levels below 0.3 ppm up to at least 14 days of storage at room temperature while the BHT added and control samples exceeded this level by day 7. Cake baked with CME obtained the highest mean scores for all the sensory characteristics while BHT added cake sample showed the lowest mean scores for taste.The microbial growth (bacteria, yeast, and mold) in CME added and BHT added cakes as determined by total plate count only exceeded the maximum allowable limit by day 13 while the control sample exceeded this limit by day 7. The results indicate that both antioxidant and antimicrobial properties of the CME and BHT are important for improving shelf life. Due to favorable sensory characteristics and extended microbial shelf life, CME is an ideal alternative to synthetic antioxidants in bakery products.

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