
Anti-oxidative potential of honey and ascorbic acid in yoghurt fortified with omega-3 fatty acids

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Decreased consumption of polyunsaturated fatty acids (PUFAs) of the omega-3 series has been associated with increased incidence of non-communicable diseases. These fatty acids are majorly found in sea foods such as fish and their by-products. Processing of Nile perch (*Lates niloticus*), a commercial fish in Eastern Africa results in generation of by-products rich in omega-3 PUFAs. Oil from such by products can be incorporated in commonly consumed foods such as yoghurt, juices, and spreadable fats to boost consumption of omega-3 PUFA. These fatty acids are however highly susceptible to oxidation and their inclusion in foods would require addition of antioxidants. Honey and ascorbic acid derived from citrus fruits are natural anti-oxidants that play a role in preventing lipid oxidation in addition to their many other proven health benefits.

In the current study, omega-3 rich oil was extracted from *L. niloticus* viscera and used in yogurt fortification. A 150g of oil/ 150g yogurt was used and to each sample, honey or lemon juice was used as antioxidant; YFH (yoghurt fortified with Omega-3 rich oil and honey) and YFL (yoghurt fortified with Omega-3 rich oil and lemon juice). In order to mask the fishy flavor, four commercial flavors were added to the fortified yoghurt samples. Sensory evaluation was performed at two levels; to determine most preferred flavor and antioxidant. Stability of the fortified yogurt was monitored over one month period where Peroxide value (PV), Anisidine value (AV), total oxidation, free fatty acid, pH and ascorbic acid content were determined.

The Ascorbic acid Equivalent Antioxidant Capacity (AEAC) of lemon juice and honey were 312 ± 2.34 and 197 ± 3.65 mg/L, respectively. The fish oil fortified yogurt was acceptable to the tasting panel. Most preferred flavors were strawberry + honey and strawberry + lemon with ranks of 4.80 and 4.81, respectively in a five point hedonic scale. After four weeks of storage, the PV, AV and FFA contents were within the acceptable range with YFH sample being most stable. The ascorbic acid content was highest in lemon juice fortified samples (30 mg/100g) while in honey fortified samples it was below 1mg/100g. Honey and Ascorbic acid are therefore good natural anti-oxidants and their anti-oxidative potential can be utilized in the prevention of lipid oxidation in omega-3 fortified yogurts.

Key words

Omega-3 fatty acids, honey, ascorbic acid, yogurt, antioxidants