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Enhanced stability of an emulsion enriched in unsaturated fatty acids by dual natural antioxidants fortified in both the aqueous and oil phases

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23

24 **Abstract**

25 Emulsions containing unsaturated fatty acids (UFAs) have potential in the
26 treatment of clinical malnutrition. However, the stability of UFAs is a major problem
27 due to the presence of double bonds, which are susceptible to oxidation, leading to the
28 loss of nutrition and even resulting in side effects. The factors that affect the UFAs are
29 complex, and the protective effect of single antioxidant is not satisfactory. The goal of
30 the study was the development of UFA-enriched oil-in-water (O/W) emulsions with
31 improved stability, simultaneously employing a hydrophilic (catechol) and a
32 hydrophobic (tocopherol) antioxidant, and then to investigate the stabilization
33 mechanisms of catechol and tocopherol for emulsions. The emulsions obtained in this
34 study showed uniform nanoscale droplets and good storage stability for three months

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