

Acerola and Orange By-Products as Sources of Bioactive Compounds for Probiotic Fermented Milks

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Abstract : The fruit processing industries generate a large volume of residues to produce juices, pulps, and jams. These residues, or by-products, consisting of peels, seeds, and pulps, are routinely discarded. Fruits are rich in bioactive compounds, including polyphenols, which have positive effects on health. Dry residues from two fruits, acerola (*M. emarginata* D. C.) and orange (*C. sinensis*), were characterized in relation to contents of ascorbic acid, minerals, total dietary fibers, moisture, ash, lipids, proteins, and carbohydrates, and also high performance liquid chromatographic profile of flavonoids, total polyphenols and proanthocyanidins contents, and antioxidant capacity by three different methods (Ferric reducing antioxidant power assay-FRAP, Oxygen Radical Absorbance Capacity-ORAC, 1,1-diphenyl-2-picrylhydrazil (DPPH) radical scavenging activity). Acerola by-products presented the highest acid ascorbic content (605 mg/100 g), and better antioxidant capacity than orange by-products. The dry residues from acerola demonstrated high contents of proanthocyanidins (617 µg CE/g) and total polyphenols (2525 mg gallic acid equivalents - GAE/100 g). Both presented high total dietary fiber (above 60%) and protein contents (acerola: 10.4%; orange: 9.9%), and reduced fat content (acerola: 1.6%; orange: 2.6%). Both residues showed high levels of potassium, calcium, and magnesium, and were considered sources of these minerals. With acerola by-product, four formulations of probiotics fermented milks were produced: F0 (without the addition of acerola residue (AR)), F2 (2% AR), F5 (5% AR) and F10 (10% AR). The physicochemical characteristics of the fermented milks throughout of storage were investigated, as well as the impact of in vitro simulated gastrointestinal conditions on flavonoids and probiotics. The microorganisms analyzed maintained their populations around 8 log CFU/g during storage. After the gastric phase of the simulated digestion, the populations decreased, and after the enteric phase, no colonies were detected. On the other hand, the flavonoids increased after the gastric phase, maintaining or suffering small decrease after enteric phase. Acerola by-products powder is a valuable ingredient to be used in functional foods because is rich in vitamin C, fibers and flavonoids. These flavonoids appear to be highly resistant to the acids and salts of digestion.

Keywords : acerola, orange, by-products, fermented milk

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