Enrichment of bread with *Lycium barbarum* (goji) puree

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Abstract

With a great variety of foods on the market, the consumer's responsibility is choose food that can allow him to maintain his state of health and prevent chronic diseases. For this reason, several functional foods classified as fortified or enriched foods are developed In fact, the functional food market size is estimated to reach $267,924.4 million by 2027 [1]. Functional foods are able to provide essential nutrients such as vitamins, minerals and bioactive substances. The opportunities for incorporating these bioactive constituents into bread have grown rapidly as bread is the staple food in many countries. *Lycium barbarum* (goji) berries are a source of phytochemicals with important biological functions and are designated as super-fruits [2].

The aim of the study was to add goji puree at different percentages (50 and 70%) to the bread dough. To evaluate the characteristics of bread enriched in goji puree, chemical-physical, sensory, rheological analysis and radical scavenging activity test were carried out [3,4] The best results were obtained with the sample enriched with 50% of goji puree (B50G) that showed a total phenol content of 42.07 mg gallic acid equivalent /100 g bread and am ABTS radical scavenging activity of 833.48 µmol Trolox/ 100g bread. Bread sensory profile was identified by a trained panel using quantitative descriptive analysis, showing significant differences compared to the untreated sample in crust and crumb colour and for structural crunchiness, while olfactory and gustatory descriptors did not differ significantly. Furthermore, the enriched product is characterized by a higher content of bioactive substances with particular references to phenolic compounds and by an interesting antioxidant activity. The absence of substantial changes on the sensory profile will represent another fundamental and appreciated aspect by the consumers. Collectively, our results demonstrated the potential health properties of this enriched bread.

[1] Functional Food Market by Ingredient (Probiotics, Minerals, Proteins & Amino Acids, Prebiotics, & Dietary Fibers, Vitamins and Others), Product (Bakery & Cereals, Dairy Products, Meat, Fish & Eggs, Soy Products, Fats & Oils and Others), Application (Sports Nutrition, Weight Management Clinical Nutrition, Cardio Health, and Others): Global Opportunity Analysis and Industry Forecast 2021–2027, (https://www.alliedmarketresearch.com/functional-food-market, access 24 June 2021); [2] Yao, R.; Heinrich, M.; Weckerle, C.S. (2015). The genus *Lycium* as food and medicine: A botanical, ethnobotanical and historical review. *J. Ethnopharmacol*., 212, 50-66. https://doi.org/ 10.1016/j.jep.2017.10.010. Epub 2017 Oct 16. PMID: 29042287. [3] Carullo, G.; Scarpelli, F.; Belsito, E.L.; Caputo, P.; Oliviero Rossi, C.; Mincione, A.; Leggio, A.; Crispini, A.; Restuccia, D.; Spizzirri, U.G.; Aiello, F. Formulation of New Baking (+)-Catechin Based Leavening Agents: Effects on Rheology, Sensory and Antioxidant Features during Muffin Preparation. Foods 2020, 9, 1569. https://doi.org/10.3390/foods9111569; [4] Sicari, V.; Pellicanò, T.M.; Laganá, V.; Poiana, M. (2018). Use of orange by-products (dry peel) as an alternative gelling agent for marmalade production: Evaluation of antioxidant activity and inhibition of HMF formation during different storage temperature. *J. Food Proces. Preserv.* 42. e13429. 10.1111/jfpp.13429.