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DEVELOPMENT OF FUNCTIONAL DURUM WHEAT PASTA DERIVED BY WASTE MATERIAL FROM THE BREWING PROCESS

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Currently, the re-use of by-products from agro-food processes is one of the main circular economy strategies. Brewer spent grain (BSG), the major by-product of the brewing industry, has desirable nutritional and functional properties and can be an interesting supplement for human consumption to provide health benefits. The incorporation of spent grain as ingredient in the formulation of food products has been limited to a smallscale production of high-fibre bakery stuff. Dry pasta is considered an optimal, economic and easy-to-use vehicle for health promoting phytochemicals since it comes widely and frequently in Western countries' diet. In this work, BSG from barley was used in addition to durum wheat semolina to develop pasta with an increased nutritional value. Three different concentrations of BSG (5, 10, 20%) were added to semolina. Barley spent grain enriched pasta have been compared with traditional durum wheat pasta for ash, proteins, β -glucans, total starch and total dietary fibre content and for total antioxidant capacity (TAC) level. Protein content resulted to be similar in traditional and spent grain enriched pasta whereas the last showed an increase in total starch content up to 4%, in TAC up to 22%, in β -glucans up to 86% and in fibre up to 184%. Results relative to ash content in BSG enriched pasta revealed a gradual increment staying, however, largely within Italian legal limits for whole grain pasta. A rise of bulkiness and stickiness along with a decrease of firmness of cooked spaghetti was observed with the increase in the percentage of BSG added. This study can help to develop new functional and innovative food products that, starting from waste materials, can respond to different needs in terms of quality, sustainable development and efficiency in the use of resources.

ABSTRACT