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Re: observations on the nutritional profile of the durum whole wheat pasta (whole wheat, wheat germ and fiber) marketed by Gruppo Agroalimentare Italiano (Troina, ENNA).

General framework

Many epidemiological studies have demonstrated that a regular assumption of food deriving from whole wheat cereals, reduces the risk factors for onset of chronic cardiovascular diseases, diabetes, obesity and some types of tumors (Slavin, 2003; Rui Hai Liu, 2007). The potential mechanisms of this preventive action are various, since all cereals are rich in nutrients and biologically active phytochemicals. Firstly, cereals are sources of dietary fiber, resistant starch¹ and an interesting part of antioxidant substances. Secondly, they contain vitamins, mineral traces, phenols and antitumorals elements (phytoestrogens, lignans). Moreover, whole wheat cereals influence positively glucose-insulin reaction system, contributing to the prevention of diabetes and obesity. Among cereals, the durum wheat plays the main role in the Mediterranean diet, as confirmed by the Guidelines for a Healthy Nutrition (National Institute for the Research on Food and Nutrition). It should provide at least the 45% of the daily energy of the diet. In particular the "durum whole wheat pasta" has, among the cereals derivatives present in our diet (conventional pasta, rice and soft wheat products), the lowest glicaeamic index. This fact allows a gradual and balanced assumption of energy, avoiding glicaeamic arises which are dangerous for our health.

Observations on whole wheat pasta - wheat germ and fiber (Gruppo Agroalimentare Italiano)

The production system implemented by Gruppo Agroalimentare Italiano (GAI) for the production of "whole wheat pasta - wheat germ and fiber," is characterized by a technological processing resulting in an interesting nutraceutical profile for a healthy nutrition. The rough materials, provided by Sicilian durum wheat producers, guarantees a high-standard hygenical profile of the end product. The use of exclusively Sicilian durum wheat is a distintive and qualifying element confirmed by numerous studies carried out on national scale (MICOCER Project) and confirmed by our Laboratories (*Città del Grano*, Raddusa). It has been shown that the grain produced in Sicily, thanks to particular climatic conditions and a low humidity level, has very few (sometimes none) microtoxines², which are dangerous for humans. Often microtoxines are present in

¹ Resistant starch is that starch portion that returns to dietary fiber, resists digestion in the small intestine and, reaching the distal portion of it, feeds the local microbial flora, producing short -chain fatty acids ; these acids reduce the colon pH, provide energy for the coloncites, influence positively the hematic element of lipids, and reduce the risk factors for onset of the colon cancer (Sgrulletta et al 2010, Marquet et al. 2000).

² Microtoxines are dangerous substances for human health. Their carcinogenic, teratogenic, mutagen, toxic and immunosuppressive action is effective also at low dosages and is not neutralized by cooking. The presence of such substances in food is regulated by a specific European Regulation which defines the allowed threshold levels.

lots produced in farming sited at northern latitudes. The production system implemented for this type of product, includes also “millstone” process and a the use of “real” whole wheat flour . Dehydration at mild temperatures (production site is in Valledolmo, Palermo) and bronze wire-drawing, give to the product a high nutritional value.

Laboratory analysis

The above written description is validated by laboratory analysis carried out on wholewheat pasta and flour samples, provided by GAI. We can confirm the absence of microtoxines in whole wheat flour samples (millstone) analysed by our laboratory (ACCREDIA certification for analysis on microtoxines; double methodology: screening in ELISA and confirm in HPLC)³. This aspect gives an added value to the product: whole wheat products are usually subject to microtoxines contaminations; moreover, it meets the requirements fixed for child nutrition (CE regulation No1881/2006 European Commission).

The analysis carried out by our specialized laboratory, certified by ACCREDIA, show that the product has the following elements: fiber (8,7 g/100 g t.q.), iron (3,14 mg/100 g t.q.), group B vitamins, (B1 0,408 mg/100 g t.q.; B2 0,06 mg/100 g t.q.; B6 0,214 mg/100 g t.q.; PP 5,53 mg/100 g t.q.). According to literature (Russo 2008, Rui Hai Liu, 2007) the whole wheat pasta has a high antioxidant property (Total antioixidant level: 0,280 mmol TE/100 g). It is likely to suppose that, after cooking, this pasta can guarantee the intake of antioxidants that, as known, has a positive action to contrast the free radicals action responsible of damages to human biomolecules.

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³ The concept of “absence” ha sto be considered with reference to the analytical methods which have been used.