



# 10º Encontro Nacional de Cromatografia

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COM O ALTO PATROCÍNIO DE SUA EXCELÊNCIA



*O Presidente da República*

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10th Chromatography Meeting

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10º Encontro de Cromatografia

## Authors / Autores

António M. Peres (Instituto Politécnico de Bragança, Portugal)

Lillian Barros (Instituto Politécnico de Bragança, Portugal)

Luís G. Dias (Instituto Politécnico de Bragança, Portugal)

Isabel C.F.R. Ferreira (Instituto Politécnico de Bragança, Portugal)

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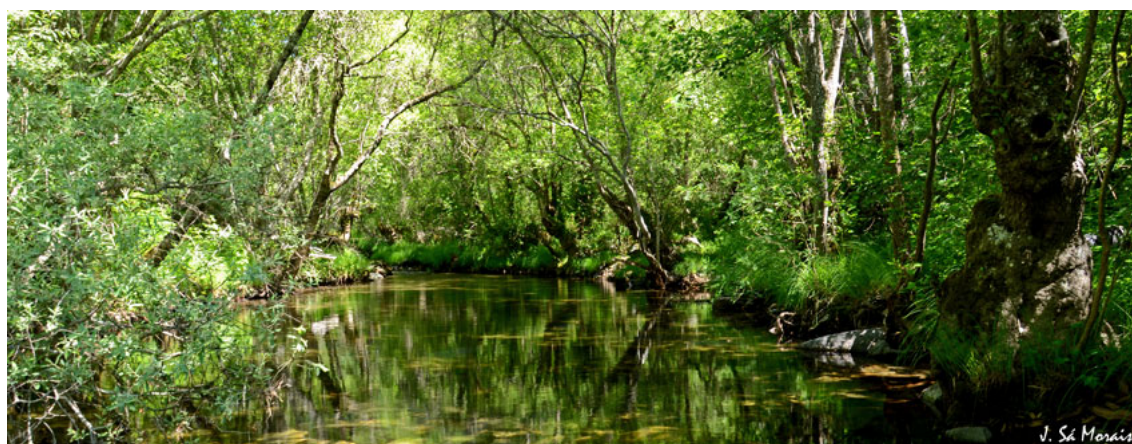
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## PC-110

# Tocopherols content in gluten-free extruded composite flours of rice and different legumes

C. Arribas<sup>a,\*</sup>, E. Pereira<sup>b</sup>, L. Barros<sup>b</sup>, E. Guillamón<sup>c</sup>, I.C.F.R. Ferreira<sup>b</sup>, M.M. Pedrosa<sup>a</sup>

<sup>a</sup>Food Technology Department, SGIT-INIA, Ctra de La Coruña, Km 7.5., 28040 Madrid, Spain.

<sup>b</sup>Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal.

<sup>c</sup>Centre for the Food Quality, INIA, C/ Universidad s/n, 42004 Soria, Spain.

\*arribas.claudia@inia.es

Extrusion cooking is a high temperature short time process, which modifies flour properties through starch gelatinization, protein denaturation, complex formation between amylose and lipids, degradation of pigments and improvement of sensory characteristics [1]. Vegetables contain numerous phytochemicals, such as tocopherols, useful for their nutritional and nutraceutical properties. Tocopherols (constituents of vitamin E) appear in several active forms, presenting  $\alpha$ -tocopherol the highest biological activity, and being  $\gamma$ -tocopherol the most abundant in vegetable foods, such as sesame seed, soybean, black bean and peanut. Due to its action as a free radical scavenger, vitamin E also plays a role on body protecting against degenerative abnormalities, mainly cancer and cardiovascular diseases [2]. The aim of this study was to evaluate the changes induced by extrusion-cooking on tocopherols content in functional novel formulations of flours containing different proportions of rice (50-80%), bean (20-40%), and carob (5-10%) using the raw materials as control. Tocopherols were determined in the different flours mixtures of rice-legumes by high performance liquid chromatography coupled to a fluorescence detector (HPLC-FL) programmed for excitation at 290 nm and emission at 330 nm, following a procedure previously described by Barros *et al.* [3]. In general, the samples showed low levels of tocopherols and, in some cases, namely in extrusion samples, the total absence of this vitamin was verified.  $\alpha$ -,  $\gamma$ - and  $\delta$ -Tocopherols were the vitamers detected in several flours, highlighting bean with the highest concentration of total tocopherols ( $180 \pm 1 \mu\text{g}/100 \text{g}$ ). In the samples where tocopherols were detected, the raw materials and in all the evaluated mixtures,  $\gamma$ -tocopherol was the predominant vitamer, being present in greater concentration in bean with values of  $172 \pm 1 \mu\text{g}/100 \text{g}$ . In this study it was also observed that, after extrusion, a significant reduction occurred in the total tocopherols content, being verified the absence of these molecules in different flour mixtures.

In addition, the sensitivity of vitamin E to extrusion cooking depends on the extrusion processing variables and conditions used, particularly extrusion temperatures (that promotes the decrease in  $\alpha$ -tocopherol) and moisture during extrusion (decreasing  $\gamma$ -tocopherol content).

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