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Title:

A survey of genetically modified maize in the Portuguese market

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

During the past decade, the development of biotechnology has revolutionised agriculture by the introduction of genetically modified organisms (GMO) with characteristics of agronomic interest. Despite the controversies surrounding GMO, the production of transgenic crops is increasing, especially in developing countries [1]. Maize, the second most important GM crop, has the highest number of authorised transgenic events for food and feed in EU. Since the GMO entered the food chain, the EU has dedicated special attention to consumer information by requiring a compulsory labelling for food products containing more than 0.9% of GM material (Regulation (EC) No. 1829/2003). The need to monitor and verify the presence of low levels of biotechnology-derived material in complex food products demands sensitive and highly specific analytical methods. The most accepted methods for GMO detection and quantification are based on polymerase chain reaction (PCR), since protein-based assays are not suitable for processed food [2].

The aim of the present work was to isolate DNA from a range of maize foods, to screen for the presence of GMO, to detect specific GM events and finally to confirm and to quantify the positive results. The DNA was extracted using the previously optimised CTAB and Wizard protocols [3]. The screening of GM products was carried out by qualitative PCR targeting the 35S promoter and the NOS terminator. For the positive results, two types of PCR assays were applied and adapted for each GM event tested: qualitative PCR for the specific detection and real-time PCR with TaqMan probes for confirmation and quantitative purposes. The GM maize events analysed were Bt11, MON810, E176, GA21, MON863, NK603 and TC1507.

The screening results evidenced a considerable level of contaminated food products (grains, flours, snacks, cornflakes, cereals, biscuits, etc.) in the Portuguese market. From the events analysed, TC1507, MON810 and NK603 were the most frequent. The quantitative results indicate that a more severe control should be applied, as two of the products included levels above 0.9%, and none of the food products was labelled for the presence of GMO.

[1] James, C. (2008). Global Status of Commercialized Biotech/GM Crops: 2009. In: ISAAA Brief No. 41. James, C. Eds. ISAAA, Ithaca, NY

[2] Mafra, I., Ferreira, I.M.P.L.V.O., Oliveira, M.B.P.P. (2008). *Eur Food Res Technol* 227:649-665

[3] Mafra, I., Silva, S.A., Moreira, E.J.M.O., Silva, C.S.F., Oliveira, M.B.P.P. (2008) *Food Control* 19.1183-1190

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