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DETECTION OF SOYBEAN DNA IN COMMERCIALY AVAILABLE VEGETABLE OILS

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The soybean is the most important genetically modified crop, from which 60% of world's planted area corresponds to Round Ready soybeans [1]. The need to monitor and verify the presence and amounts of biotechnology derived material in food products demands analytical methods able to detect, to identify and to quantify either the introduced DNA or the expressed protein(s) [2]. Although DNA can be detected in crude vegetable oils, due to the physical and chemical treatments used during refining, its detection is very difficult in the final product [3]. In the present work we intended to extract soybean DNA from ordinary commercial vegetable oils and compare the different methods used.

Four methods were tested in order to extract DNA in different commercially available vegetables oils. Previous work has proved the applicability of extracting soybean DNA from a wide range of foodstuffs by using the CTAB and the Wizard methods and the Nucleospin[®] food kit [2]. Thus, those three methods were tested and compared, in addition to the Wizard[®] Magnetic DNA purification system for food. The DNA extracts were evaluated for their amplifiability by polymerase chain reaction (PCR) targeting the lectin gene as a marker for soybean.

The results showed that the Wizard[®] Magnetic kit following the instructions of manufacturer and increasing the amount of extracted oil (from 160 to 200 g) did not allow the detection of amplifiable DNA. The pre-concentration of refined oil by centrifuging 200 g of sample did not allow the detection of soybean DNA with the CTAB and Wizard methods. However, using the same amount of oil with the NucleoSpin[®] kit it was possible to detect of soybean DNA from refined vegetable oils and soybean oil. This result was never reported and is an achievement taking in consideration the need to detect genetically modified DNA.

- [1] James, C. (2006). Global status of commercialized Biotech/GM crops: 2006. ISAAA Briefs No 35 New York Ithaca: ISAAA.
- [2] Mafra, I; Silva, S. A.; Moreira, E. J. M. O.; Silva, C. S. F.; Oliveira, M. B. P. P.; (2008). Comparative study of DNA extraction methods for soybean derived food products; *Food Control*; in press.
- [3] Gryson, N.; Ronsse, F.; Messens, K.; De Loose, M.; Verleyen, T.; Dewettinck, K; (2002). Detection of DNA during the refining of soybean oil; *J. Am. Oil Chem. Soc.*; 79; 171.