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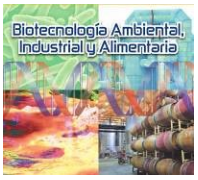

ELISA vs PCR. Advantages and disadvantages of each method for allergens and gluten detection in food.

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ABSTRACT

The presence of allergens in food poses an important health risk. It is a difficult problem to solve by the food industry, due to the wide range of existing allergic agents that may cause adverse reactions for specific groups of individuals. This problem is compounded by the possibility of cross contamination during transport, processing and handling of food products. Thus, food industries and facilities must follow a number of legal guidelines in order to be able to state that their products are free from a certain allergen, such as gluten-free products destined for celiac consumers.

In this mostly bibliographic work, we discuss the two most prominent and efficient laboratory techniques that are used in analytical laboratories, in order to detect and/or quantify unwanted allergens in their products. On the one hand, the widespread use of the immunochromatic technique ELISA stands out for the analysis of most common allergens, because it is highly sensitive even at very low concentrations, and because its kits are reasonably priced and easy to use for most specialized laboratories. However, this technique still has some limitations, such as some lack of specificity to discern among highly-related proteins of different vegetable species belonging to the same genera, or the possibility of generating false positives, which are often due to the similarity of some related proteins to activate binding sites of the used antibodies.

On the other hand, food industry has been actively investigating new applications of PCR (polymerase chain reaction) techniques, which is currently used to detect the presence of potentially harmful allergens in food products, as an interesting alternative for ELISA immunoassays. In this case, this the PCR method is based on the amplification and detection of genes, constituted by DNA molecules, of different edible plants and animals, instead of on the immuno-quantification of protein-antibody binding in ELISAs, which may lead to different purposes, goals and issues.

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