Poster

Tuning and validation of an analytical method for the determination of gluten in food samples: The immunochromatographic strips

Vázquez Martínez, Beatriz (1*), Floriano Pardal, Belén (1) y Miguel Ángel Siglez Granado (2)

(1) Molecular Biology and Biochemical Engineering Dpt., Experimental Sciences Faculty, Pablo de Olavide University. Ctra. de Utrera km 1, 41013 Seville, Spain.

(2) Analysis department., BIOMEDAL S.L. Polígono Industrial Parque Plata, Calle Calzada Romana, 40, 41900 Camas, Seville, Spain.

Tutor académico: Belén Floriano Pardal.

Keywords: Gluten; Valitation; inmunocromatographic strips.

ABSTRACT

Motivation: Gluten is a food allergen present in many cereals it is composed for complex mixture of proteins, mainly prolamines and glutenines. (Biesiekierski, J.R, 2017) Prolamins contain immunogenic peptides that are resistant to gastrointestinal digestion, such as peptide 33-mer, and trigger adverse reactions in people with hypersensitivity, causing from the mild allergic reactions to the well-known, celiac disease. Currently, gluten hypersensitivity is one of the most spread digestive disorders in the world. (Ozuna, C., et al, 2016) That's why there is a need to detected foods that contain gluten to provide this information to consumers to their own safety.There are many different techniques to detection gluten very effectively like Enzyme-Linked ImmunoSorbent Assay (ELISA). However, the present work aims to carry out the validation and tuning of a new method faster and simpler: immunochromatographic strips. This is ultimately intended to accredit the method so that the analytical laboratory can offer its customers reliable and reproducible results. Accreditation is "the internationally established tool to build confidence in the proper execution of a certain type of activity." The National Accreditation Entity is responsible for accrediting an analytical method under Regulation (EC) Nº765/2008.

Methods: These strips are based on the detection of inmmunogenic peptides. On the support of the strip is a nitrocellulose membrane that containing prefixed antigydine antibodies, which will be colored if the sample analyzed has gliadin. This technique is usually a qualitative metod, unlike the previous ones that is quantitative, however, it's intended to include a strip reader to obtain quantitative values.In this study, different test has had to be carried out to analyse a number of parameters that need to be studied in validation. The parameters studied have been: detection limit, quantification limit, accuracy, precision and robustness.

Results:It can be said that this method is able to unequivocally detect the presence of gluten in the sample, as well as provide values of it, however this quantification is not as accurate as other current detection techniques would be.

Conslusions:It's a reliable method that could be competent in the market for a given sector in which it's only interested to know the presence or not of gluten, however there is still a lack of development in terms of the accuracy of the quantification.

REFERENCES

Biesiekierski, J. R. (2017). What is gluten? Journal of Gastroenterology and Hepatology, 32(1), 78–81. http://doi.org/10.1111/jgh.13703

Ozuna, C., Lehisa, J., Giménez, M. J., & Barro Losada, F. (2016). Variantes del complejo inmunogénico de las alfa gliadinas en trigo: origen y evolución del péptido 33-mer. http://hdl.handle.net/10261/160805