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REVISITING MERGING ZONES IN A FLOW-BASED APPROACH FOR THE TOTAL PROTEIN CONTENT MONITORING IN HYDROLYSATES

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ABSTRACT

In the past few years, the interest in protein hydrolysates has been growing exponentially due to their nutritional and functional benefits for both human food and animal feed. In this context, total protein content is a key parameter for characterizing by-products, monitoring the hydrolysis processes, and hydrolysates. This study aims to develop an expeditious, revisiting a merging zones flow-based spectrophotometric method for total protein quantification in hydrolysates (Fig.1).

For this purpose, the conventional and reliable Biuret method was used. The flow-based approach consisted of a double injection of the sample and reagent, using an injector commutator, in a continuous stream, resulting in the reduction of the reagent consumption. For the development of the flow injection analysis (FIA) system, essential parameters, including reagent concentration, flow rate and reactor length, were optimized. The method was validated across various matrices, addressing potential interferences, and demonstrated repeatability and reproducibility. This optimized protocol offers a robust, efficient tool for the food industry, enhancing quality control and nutritional assessments.

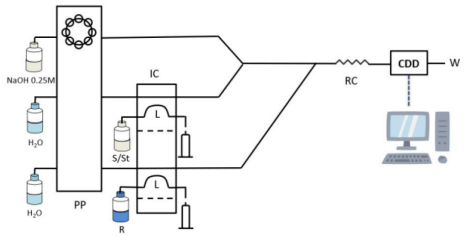

Fig.1. Flow injection manifold for the quantification of total protein content; PP, peristaltic pump; IC, injector commutator; L, loop (400 µl); S/St, sample/standard; R, Biuret reagent ($CuSO_4$ 0.028 mol/L; $Na_3C_6H_5O_7$ 0.17 mol/L; Na_2CO_3 0.24 mol/L); RC, reaction coil 100 cm; CCD, detector (λ= 554 nm); W, waste.

Keywords: Total protein; Hydrolysates; Biuret method; Flow injection analysis; Spectrophotometry.

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