



World Conference on Sustainability, Energy and Environment

Paris, France

08 - 10 Apr 2022

Development and validation of an analytical method to ensure quality requirements of hydrolyzed proteins intended for agricultural use as biostimulants

Chiara Povolo^{1*}, Enrico Doria^{2*}, Rosa Avolio³, Maurizia Dossena², Massimo Neresini¹

¹SICIT Group S.p.A., Via del Lavoro 114, 36071 Arzignano (VI), Italy.

²Department of Biology and Biotechnology, University of Pavia, via Ferrata 9 - 27100, Pavia (PV), Italy.

³Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta- National Reference Centre for the Surveillance and monitoring of animal feed (CReAA), via Bologna 148, 10154 Torino, Italy.

*equal contribution to the oral presentation

ABSTRACT

According to FAO, world population will increase to more than 8 billion people in 2030, which will require more safe and healthy food; therefore, innovative agricultural practices optimizing natural resources and reducing environmental impact are strongly required. Plant biostimulants, developed to promote plant growth, seed germination and enhance horticultural crop productivity, represent a promising solution to increase agricultural production. The development of biostimulants from industry by-products provides innovative and environmentally friendly solutions to disposal and reuse of waste, as required by the European Green Deal. At present, protein hydrolysates represent the main class of biostimulants as they increase yield and product quality of various crops. Several sources of proteins are used to produce protein hydrolysates, but in this context of environmental protection and green economy, the development of biostimulants from industry by-products is of great interest. Industry by-products of animal origin (ABPs) are classified into three categories based on the degree of risk for animal, human and environmental health; category 3 ABPs must be hydrolyzed to a molecular weight below 10.000 Da, to comply with safety criteria, according to EU Reg.142/2011, *Annex X*. This research aims to set up and validate an analytical method for a reliable determination of the high limit molecular weight of hydrolysed proteins derived from Category 3 ABPs. A gel filtration chromatography method was developed and validated according to Eurachem and ISO guidelines. Acceptance criteria of linearity $R^2 > 0.990$, repeatability $RSD\% \leq 5$, intermediate repeatability $RSD\% \leq 10$ and uncertainty



World Conference on Sustainability, Energy and Environment

Paris, France

08 - 10 Apr 2022

measurement $U \leq 20\%$ were met. Therefore, it is considered suitable to assess the compliance of the hydrolysed proteins to 10.000 Da limit in biostimulants from animal by-products.

Keywords: Animal by-products; biostimulants; circular economy; reliable analytical method; waste management;