



In Food & Agriculture, We Set the Standard

Whey Protein Hydrolysates

OVERVIEW

AOAC INTERNATIONAL (AOAC) is proposing a new initiative funded by stakeholders to collaboratively address the need for standardized methods for characterization of protein hydrolysates, specifically whey protein hydrolysates, which is a key ingredient incorporated into a variety of products including infant formula, sports nutrition, clinical nutrition, and others.

The development of global standards and subsequent methods for the characterization of hydrolysates is essential to support the industries who manufacture hydrolysates, the nutritional companies who utilize these hydrolysates in their product formulations, and ultimately the consumer of such products. This initiative is designed to provide food manufacturers, testing laboratories, NGOs, researchers, regulatory agencies and retail establishments with the analytical resources necessary to ensure product safety and quality, including accurate information for regulatory and registration purposes and to aid in global trade.

Building upon AOAC's compilation of previously published analyte-specific Standard Method Performance Requirements (*SMPRs*[®]) and fit-for-purpose *Official Methods of Analysis*SM, the **Whey Protein Hydrolysates** initiative will offer a multi-faceted approach that encompasses the following workstreams:

- Development of voluntary consensus performance standards (*SMPRs*[®]) for methods used to characterize whey protein hydrolysates,
- Call for methods and establishment of *Official Methods of Analysis*SM,
- Scientific symposia, thought-leader sessions and other training or education programs that will support harmonization.

BACKGROUND

Whey Protein Hydrolysates (WPH) is a general term used to encompass products produced from whey protein via chemical or enzymatic hydrolysis, including Whey Protein Hydrolysate, Whey Protein Concentrate Hydrolysate and Whey Protein Isolate Hydrolysate. Hydrolysis results in the cleavage of the peptide bonds of the proteins derived from the whey protein source, increasing the number of hydrolysed peptide bonds. WPH composition will include mixtures of polypeptides, oligopeptides, and amino acids as produced from the partial hydrolysis of the whey protein source, dependent on the degree of hydrolysis.

In the “Methodology for Determining Degree of Hydrolysis of Proteins in Hydrolysates: A Review” article published in the *Journal of AOAC International* in 2010¹, author Shane Rutherford states that “there is no consensus as to the best method for determining the degree of hydrolysis (DH) of protein hydrolysates; consequently, there is a need for a standardized approach if interstudy comparisons are to be made.” The report concludes that there is generally a poor correlation among the various DH methods commonly used, and some of the methods (e.g., SN-TCA) do not even determine DH. Consequently, to permit the comparison of DH data and to allow a superior assessment of the extent of hydrolysis in hydrolysates generated in different laboratories, the use of a standardized protocol to determine DH is imperative.

In addition to the DH, there are several other methods needed for characterization of WPH to provide information on the following parameters:²

- Degree of hydrolysis of the protein
- Molecular weight distribution of peptides and proteins
- Amount of residual proteins
- Amount of peptides
- Amount of free amino acids
- Amino acid pattern
- Total nitrogen content
- Amino nitrogen content

This AOAC INTERNATIONAL initiative will develop voluntary consensus standards (*Standard Method Performance Requirements*) for methods needed for WHP characterization as a basis for development and validation of corresponding *Official Methods of Analysis*SM, which could be adopted by Codex Alimentarius.

¹ Shane M Rutherford, Methodology for Determining Degree of Hydrolysis of Proteins in Hydrolysates: A Review, *Journal of AOAC INTERNATIONAL*, Volume 93, Issue 5, 1 September 2010, Pages 1515–1522, <https://doi.org/10.1093/jaoac/93.5.1515>

² Scientific and technical guidance for the preparation and presentation of a dossier for evaluation of an infant and/or follow-on formula manufactured from protein hydrolysates, European Food Safety Authority, 26 March 2021, <https://www.efsa.europa.eu/en/efsajournal/pub/6556>

MOVING FORWARD WITH AOAC's Whey Protein Hydrolysate Initiative

AOAC INTERNATIONAL is seeking financial support to launch the Whey Protein Hydrolysates initiative, which will be guided by an Advisory Panel comprised of funding organizations from government, industry and academia to determine priorities and working group objectives. This panel will meet quarterly to review progress and consider additional objectives.

AOAC INTERNATIONAL is asking organizations to join this important program with an annual contribution of \$10,000. Other levels of contributions will be considered as well. Funding will support the following for each workstream:

- Project management support for convening the Advisory Panel and subsequent technical Working Groups to develop voluntary consensus standards (*Standard Method Performance Requirements*),
- Oversight of the standard development process,
- Processes for drafting documents and consensus building,
- Publication of approved consensus documents,
- Call for methods,
- Establishment of Expert Review Panel(s) for methods considered for AOAC official method status,
- Oversight of the *Official Methods of Analysis* process,
- Publication of established official methods in *Official Methods of Analysis of AOAC INTERNATIONAL*SM (OMA),
- Facilitation of global alignment,
- External outreach and training events to publicize the work of the group as well as to attract additional scientists.

Advisory Panel Member Benefits

- Leadership in standardizing and harmonizing the characterization of Whey Protein Hydrolysates, thereby enabling more efficient global commerce for these key ingredients,
- Driving the development of internationally recognized method performance standards that will foster the development of needed *Official Methods of Analysis*,
- Engagement with a select group that will set benchmarks for product integrity.

Contact us at scienceprograms@aoac.org to get involved with the Whey Protein Hydrolysates initiative!