

Measurement of Peptide Fractions and Soluble Proteins Found in MOTIV

OVERVIEW

MOTIV® is a unique protein hydrolysate derived from the fermentation of corn proteins with *Lactobacillus spp.* It is through this fermentation that the proteins are broken down into smaller subunits allowing for the production of a multichotomous variety of free amino acids (FAA) and peptides of different sizes. To better understand the range of peptides that are found in MOTIV an analysis was performed.

OBJECTIVE

The objective of this work was to measure the peptide fractions found in MOTIV and soluble proteins through untargeted proteomics analysis.

MATERIALS AND METHODS

- MOTIV samples were extracted at ambient temperature in water and processed in a series of steps illustrated in Figure 1.
- Extracts were then filter-fractionated into three molecular weight cut-offs (MWCs) utilizing the Pall MWCO filters in the 1k, 3k, and 10k ranges.
- All fractions were measured with the Thermo Scientific™ Colorimetric Peptide Assay (and the concentrations (µg/ml) were used to determine the net peptide percent corresponding to every sample's MWCO (<1KDa, 1-3KDa, & 3-10KDa).
- In addition to peptide quantification, total soluble proteins were measured using internal methods and FAA were measured externally at NP Analytical Laboratories (St Louis, MO).

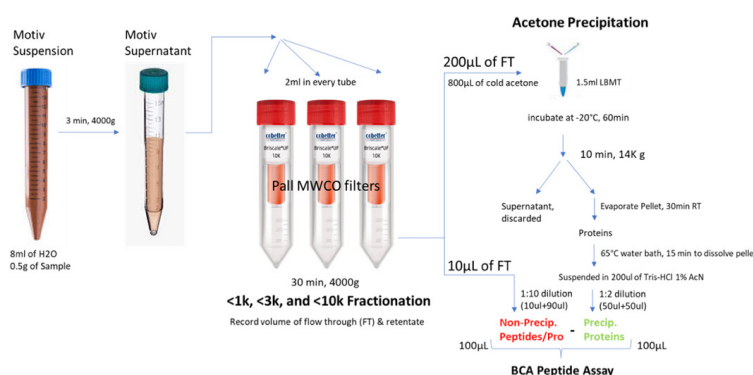


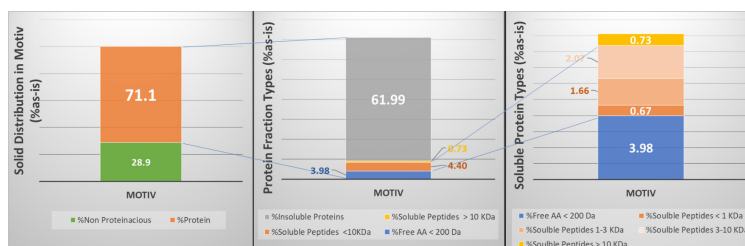
FIGURE 1. Process flow to measure peptide fraction sizes.

RESULTS

Overall, the free amino acid (FAA), peptide fractions, and soluble protein results for each production run were averaged, charted, and concluded that we have the following distributions of proteinaceous solubles:

Proteinaceous Fractions	M.W.	as % of total solids (as-is)
%Free AA	< 200 DA	3.98
%Soluble Peptides	< 1 KDa	0.67
	1-3 KDa	1.66
	3-10 KDa	2.07
	> 10 KDa	0.73
%Insoluble Proteins		61.99

Measurements of soluble and insoluble protein/peptide breakdown in the Motiv™ product and their corresponding molecular weight cutoffs (Averages of 15 production runs are reported):



SUMMARY

When looking at the protein/peptide breakdown in the fermented protein hydrolysate, MOTIV, it is important to note the following:

- Peptides with <1KDa MW are a mix of di- and up to penta-peptides.
- Peptides with 1-3 KDa MW are a mix of up to 20-AA peptide chain.
- More than 500 peptides have been identified on HRAM LCMS and they are present at different concentrations in MOTIV.