

# Soy Flour with Reduced Anti-Nutritional Factors

University of Chile has generated a fermentation method to produce Soy Flour with reduced Anti-Nutritional factors

## THE CHALLENGE

The rapidly growing marine aquaculture industry is projected to exceed the industry's ability to supply high quality, high protein feedstock which is currently derived from fishmeal. Due to overfishing, fishmeal is constrained 30% over the past 20 years. Soy flour contains high protein and it is economical and potentially suitable as a fishmeal replacement or supplement if the anti-nutritional factors can be neutralized. Several products have been launched using soy flour, however, these are very expensive due to high processing cost. Furthermore, the anti-nutritional factors (ANFs) are one of the main reasons why soy is not utilized more widely in commercial animal production.

## THE TECHNOLOGY

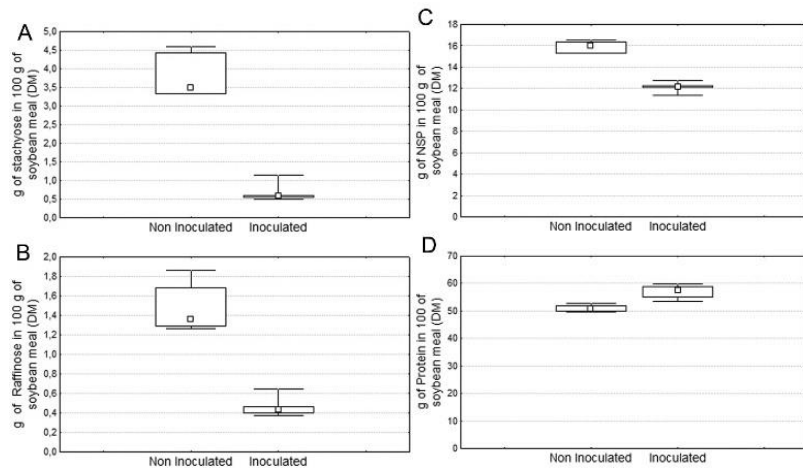
An industrial process to produce soy flour based in a dry fermentation method using selected microorganisms with the goal of significantly reduced the main anti-nutritional factors (ANFs) found in soy, the alpha-galactosides and the non-starch polysaccharides, in addition to increase the protein content of the flour.

## STAGE OF DEVELOPMENT

- Formulation of this product has been completed.
- A 50-day trial feeding the product has been tested successfully at a small scale in Atlantic Salmon.

## COMPETITIVE ADVANTAGES

- Increased digestion of nitrogen or amino acids.
- Increased growth ratio and feed conversion ratio.
- Increased protein content between 12 to 15% compared to non-fermented soy flour.
- The alpha-galactosides (raffinose and stachyose) were reduced by 90%.



**Figure 1. Reduction of NSPs and two sugars (stachyose and raffinose) that are the main alpha-galactosides of the soybean meal and an increase of the total contents of protein in the soybean meal with inoculate.** Opazo, R. (2012). Reduction of Soybean Meal Non-Starch Polysaccharides and  $\alpha$ -Galactosides by Solid-State Fermentation Using Cellulolytic Bacteria Obtained from Different Environments. PLOS ONE 7(9): e44783.

## APPLICATIONS

- Dietary protein source for use by aquaculture, specifically with Salmonids.
- Source of pre-biotics with microorganisms providing potential immune-stimulating effects.

## OPPORTUNITY

University of Chile is searching for industry partners for out-licensing.

## INTELLECTUAL PROPERTY/REFERENCES

- Chilean patent application 201200296
- USA patent application US14/376,214
- European patent application EPO13743077.3
- Brazilian patent application 11 2014-018803-3