

**Title** – Method Development for the Determination of the Amino Acid Profile of Algae via HPLC

**Program of Study** – Chemistry

**Presentation Type** – Oral Presentation

**Subtype** – Basic

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**Abstract:** Each organism has a unique essential amino acid profile. Essential amino acids are the amino acids that the organism must obtain through its diet, as its body cannot produce them. When considering the animal feed given to common farm animals such as cows, chickens, sheep, pigs, and fish, the essential amino acid profile must be taken into account. One cheap way to supplement animal feed with the necessary amino acids is to add algae to it. This, however, requires an analytical method in order to be able to quantify the various amino acids in different species of algae. This multiyear research project seeks to do just that—develop a quantitative, reproducible method to analyze the amino acid content of various algae species. In order to do this, the amino acids must first be extracted from the algae cell, which is accomplished via hydrochloric acid and heat. Then, the amino acids must be derivatized so that they can be quantized. This is done by reacting the free amino acids with dinitrofluorobenzene (DNFB), causing the amino acids to absorb light at 360nm. Enough DNFB must be added to the amino acids to encourage a reaction, but too much excess results in an absorbance peak from the DNFB that overshadows the amino acid's absorbances. The project is currently focused on one amino acid at a time, using standards to determine the elution order and begin to quantify the amount of amino acid present in the sample. The future direction of the project is to be able to determine the amino acid profile of any algae sample in order to match various algae species with the correct animal for feed supplementation.