Team Name:

Purdue ChemE

Team Schools/Organizations:

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Abstract:

This project aims to construct amino acid overproducing strains from Synechococcus elongatus PCC 11801 in order to find a cost-effective solution for essential amino acid supplements in the aquaculture industry. Two strains of cyanobacteria will be developed: one which overproduces lysine (LysOS) and one which overproduces phenylalanine and lysine (PLOS). These strains will be compared based on growth rates and amino acid productivity along with an existing strain which overproduces only phenylalanine (PheOS) in the following combinations: (1) LysOS, (2) PheOS, (3) PLOS, and (4) LysOS and PheOS in the same production system. Finally, an economic analysis of various feed compositions supplemented with the cyanobacteria's protein rich biomass as well as the overproduced amino acids can be conducted.

This project will not only provide an economic analysis of essential amino acids for tilapia feed, but will also reveal if a combined overproducing strain of cyanobacteria can create similar yields to the single counterparts. Understanding cyanobacteria's ability to coproduce amino acids may provide a novel, cost effective solution to improve feed quality.