

Spirulina Production on Flue Gas
Global Algae Innovations
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Global Algae Innovations Inc. (Global Algae) has developed low cost algae production technologies aimed at achieving commercially viable production of biofuel and protein meal. Radical advances have been designed and implemented throughout the entire process, resulting in many industry breakthroughs for large-scale algae cultivation, harvesting and processing. In this project, cultivation of spirulina (genus *Arthrospira*), a commercially relevant strain with existing markets in food and some feed, will be grown on carbon dioxide flue gas, harvested, dewatered and dried, to create a consistent, quality product.

Further, the overall objective of the project is to develop high quality (>60% total protein/AFDW) consistent spirulina with an average productivity of at least 20 g/m²d productivity, 90% carbon utilization efficiency, and 70% capture efficiency for a 30-day field trial using

- CO₂ captured from the flue gas of a naphtha-fired power plant
- Optimized wave assisted mixing to account for weather and growth dynamics
- Low energy processes to harvest and dry the spirulina
- State-of-the-art assays to assess nitrate, phosphorus, pigment, stress, and growth either online or the same day if off-line.

The resulting end product from spirulina biomass will be validated that it is shelf stable high quality, safe non-degraded protein with bioavailable micronutrients. This project will be tested in rainbow trout to compare nutritional value and digestibility for use as a fishmeal replacement in aquafeed. Data will accurately quantify economic and environmental benefits of the target products through techno-economic analyses (TEA) and life cycle analyses (LCA) informed by the field testing results that:

- validate of the net decrease in CO₂ emissions;
- validate required selling price for the products;
- provide a projected minimum composite selling price of less than \$1/kg AFDW; and at least 50% GHG reduction relative to fishmeal

Project Partners:

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