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*Nutrient Concentrations for Biofuel Algae*

This purpose of this project was to find the best concentration of nutrients in a culture of algae that would produce the most chemically favorable algae for biofuel production. For this experiment the saltwater phytoplankton *Tetraselmus* was used to maximize its lipid content, and to test whether saltwater algae would be more favorable to its freshwater counterparts. In the experiment the goal was to find the algae with the highest percentage by weight of triglycerides, which are the lipids found in plants. The experiment started by making a base algae culture which all the other tests were to be based and act as the control. In this base culture and all of the other cultures the effects of changes in the concentration of the three most important nutrients, sulfate (as potassium sulfate), nitrate (as potassium nitrate), and iron had on the triglyceride content of the algae. Five cultures were made by diluting the base culture and then adjusting salt and nutrient concentrations in order to produce a culture with a specified concentration of the three nutrients. These five cultures were allowed to grow for two weeks and then placed into a refrigerator to try to stop any changes to the lipid concentrations to happen. The algae is then dried, massed, and ground up in order to break the cell walls of the algae. The algae are then reacted using a saponification reaction in order to determine the mass of triglycerides, and percentage of triglycerides in the algae.