This is a method of vertical farming, where the algae are cultivated in poly-ethylene bags and given nutrients to sustain growth.

What is algae farming?

In some form or another, algae have been incorporated in the human diet for centuries. From traditional usage of seaweed in Eastern cultures to the new take on algae as an additive for select foods, it's impossible to escape this aquatic organism. Algae is often used as a thickening or stabilizing agent in many types of foods, but research shows that it also has incredibly high protein composition.

Algal agriculture refers to the creation of farms in which algae is cultivated, protein is extracted, and the dry weight is collected for commercial use. The commercial usage referred to in this case will be for nutritional benefit in the human diet.

A Recipe to Get You Started

Raw Hemp Algae Bar

Ingredients

1/2 tsp spirulina powder
1/2 cup pistachios
1/2 cup pumpkin seeds
3/4 cup shredded coconut
1/4 cup orange juice
1/4 cup hemp hearts
1/4 cup coconut oil
3/4 cup dates, chopped

Directions

1. In a food processor, pulse the ingredients until the mixture is crumbly but beginning to come together.
2. Press into an 8-inch square cake pan or glass dish.
3. Chill in the refrigerator for at least an hour, then slice and serve.

Recipe courtesy of freshplanetfavor.com

ALGAL FARMS: SUSTAINING A LOCALLY GROWN PROTEIN SOURCE

Extracting Proteins from Algae

Though algae have been involved in the human diet for centuries, it is not readily bioavailable. Algae contains beta linkages in their polysaccharides (a type of carbohydrate), which prevents proper digestion since humans possess an enzyme called alpha amylase. This enzyme is uncapable of processing algae in our small intestines. In order to be able to consume algae as a protein source, it must first be extracted.

Various extraction methods can be used to increase the yield of collected protein. Such methods include ultrafiltration, chromatography, centrifugation, and enzyme hydrolysis. Hydrolysis is perhaps the most common technique, and involves the disruption of polysaccharides, making algae more available as a nutrition source.

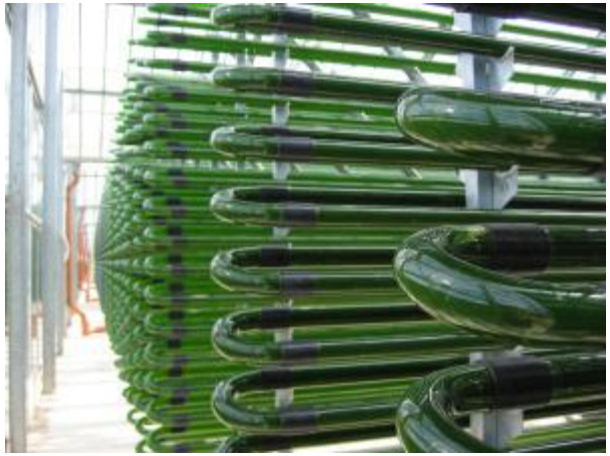
Why collect proteins from algae when there are other available sources?

Certain types of algae can grow and reproduce quickly, leading to faster turnover rates in comparison to terrestrial sources of protein, both plant and animal. While the protein composition in algae will vary, Spirulina (a blue-green algae) is the most highly consumed in the human diet.

According to the World Health Organization, Spirulina surpasses the standards for nutritional value.

The power of Spirulina

This classification of cyanobacteria is commonly used in dairy products, candies, and pastas as a binding agent, but also as a nutritional supplement. Spirulina has a higher digestibility coefficient (76.6%-88%) and a higher dry weight composition of protein (up to 70%) compared to other algae. Due to its quicker reproductive time, it can also be up to 60x more productive than alternative proteins, such as soybeans.



Another method of vertical farming, where cultivation takes place in glass tubes, opposed to bags.

Creating a local source of protein

There is hesitation regarding the usage of algae for food in terms of coloration and flavor. It tends to have a slight fishy taste, this paired with green coloration can be off-putting to consumers. This should not be a reason to avoid using algae as a protein. The pros of algal farming outweigh the cons of a fish-like taste.

Vertical algal farms take less space to grow a sustainable crop that can provide high nutritional value in comparison to traditional methods of farming. By implementing these farms, we can introduce a local, reliable source of protein that is both more economically friendly and nutritionally beneficial.