

# Algae database comparison report

Report prepared by Steven Cunningham for the Anthropocene institute (June 2018)

## Goal of the algae database

[The Feed Innovation Network](#) (FIN), is an international group dedicated to promoting sustainable feed for aquaculture. Currently, forage fish are harvested from the open ocean as feed for farmed fish. With forage fisheries estimated to collapse by 2034 (get Froelich reference from Elif), this feed model is not sustainable. Shaped and inspired by the [F3 \(Fish-Free-Feed\) challenge](#), FIN facilitates testing of ingredients that can serve as nutritional substitutes for forage fish, and communicates findings.

In 2018, the FIN sponsored the creation of the FINALGA Database. This database purpose is to hold comparable information on one of the most sustainable resources in the world: algae. Algae are autotrophs or mixotrophs, meaning they all possess the ability to harvest sunlight for energy like terrestrial plants. Many single cell and more complex, multicellular alga exhibit rapid generation times and growth rates. These abilities make algae an ideal candidate as a sustainable feed supplement.

Within the FINALGA dataset, promising species of algae are listed and reviewed for nutrient content, market value, availability, and ecological information. The goal of this dataset is to give aquaculture feed designers and producers more information on fish alternatives and where they can be purchased.

## Comparison to other algae market platforms

While compiling the FIN algae database, it came to our attention that other algae selling platforms existed (Aquafind.com, Algix.com, ncma.bigelow.org). We compared the FINALGA database to these other platforms. Unlike the others, the FINALGA database compiles reported nutrient profiles for all species listed. While many sellers on other platforms list basic nutrients of their product, these profiles provide minimal information and are of little use to a feed designer. This also limits the feed designer to blindly investigate each product until a suitable one is found. The database was designed so that feed designers could find the nutrient profile first, and then select the product that yields the desired nutrients by compiling all the algal nutrient profiles in a single repository.

Secondly, the FIN database is specifically geared to large scale suppliers. Many online platforms offer small algal quantities for aquaculture hobbyist, laboratory culturing, or culinary/ dietary supplement markets. After reviewing the other online markets, we found that the FIN database has over 23x more feed appropriate suppliers compared to the others (Figure 1). For example, ncma.bigelow.org had the most species (Table 1), but they only sold small quantities of live cultures for laboratory purposes. Algix.com had a few bulk suppliers (5) on their platform, however, all were currently out of stock. Aquafind.com listed 303 species of algae, however, many of these are ornamental species for hobbyist and large scale production is lacking in the marketplace. Aquafind.com's list contained the most bulk suppliers

and species of interest listed on their platform, therefore a detailed analysis was performed on their product listing. If an online platform is neglected or improperly updated, there can be numerous errors in their platform.

The FINALGA dataset was populated by an expert with phycological training with an emphasis on ensuring that all species names are current and correct. On Aquafind.com, 25% of the 303 species names are incorrect. Most of the errors were due to the use of out-of-date species names. Others were not algae, including a fish and a few terrestrial plants. On one of the websites, a total of 757 links to products sold by 45 suppliers were listed but some of these links repeated species, eg on seller was linked to 269 species, even though they only sold 5 species at the time.

The FIN dataset has links to both supplier and product, which is up-to-date as of June 30, 2018. Since the FIN dataset creation (1 year ago), 31% of product links have gone offline, and 20% of suppliers have gone offline. Maintenance is required to keep the database user friendly and relevant. Database maintenance for species names be cross referenced with [algaebase.org](http://algaebase.org) is recommended once a year and product links are recommended to be checked weekly.

Table 1: Analytic comparison of the FIN database to other online algal market platforms after one year of database creation. NA symbolizes there was no need to investigate.

	<b>FIN database</b>	<a href="http://Aquafind.com">Aquafind.com</a>	<a href="http://Algix.com">Algix.com</a>	<b>ncma</b>
<b>Total species of algae</b>	88	303	5	2671
<b>Species names are incorrect</b>	0	76	0	NA
<b>Total links to product</b>	141	757	5	NA
<b>Total suppliers</b>	93	45	5	NA
<b>Suppliers linked to correct products</b>	69	9	5	NA
<b>Suppliers offline</b>	24	9	NA	NA
<b>Feed appropriate products and online</b>	117	6	5	0

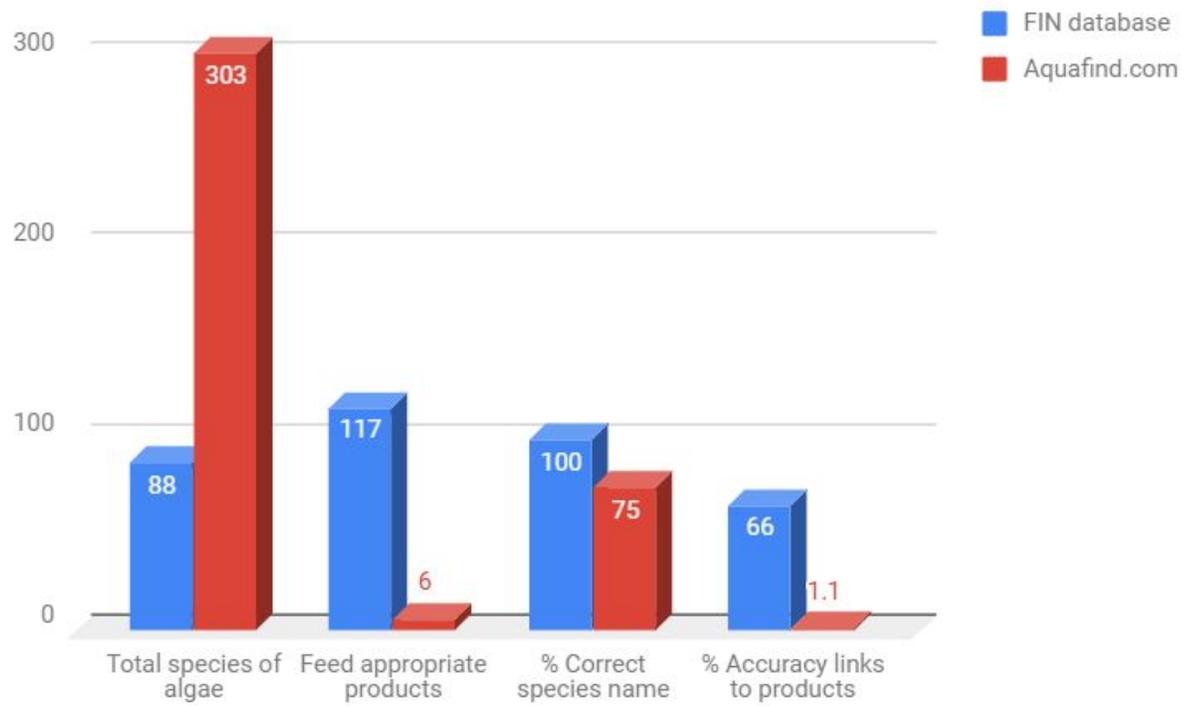


Figure 1: Analytical comparison between FIN database and Aquafind.com after 3 months of FIN database completion.