

## Potential Use of Phototrophic Algae as Protein and/or Lipid Source in Aquafeeds

**In aquaculture, producers commonly rely on formulated feeds to ensure optimal growth, health and quality of the farmed animal. Fish meal and fish oil from wild fisheries have traditionally been major constituents of aqua-feeds as they are excellent raw materials from a nutritional point of view, but their supply is finite, writes Dr Ingrid Lupatsch/AB Agri Ltd.**

Therefore feed ingredients other than fish meal are selected for their nutritive value, balance of amino acids, digestibility of proteins, lipids and quality of fatty acids, availability and cost. There is already a choice of protein substitutes on the market including animal by-products and plant proteins, however, very few resources contain the long chain omega three fatty acids EPA and DHA and thus algae biomass is being considered as one of the alternative ingredients of the future.

The composition of micro and macroalgae vary considerably among species but also depending upon culture conditions. The average protein level in macro-algae is around 8 – 15% per dry matter, whereas the average lipid is only 1 or 3%. This compares to a protein content of 40 to 50% per dry matter for the micro-algae and lipid contents as high as 40%. Freshwater algae such as Chlorella and Spirulina seem to have a good potential as protein sources whereas marine microalgae such as Nannochloropsis, Tetraselmis etc. are the fundamental source of the long-chain polyunsaturated fatty acids EPA and DHA. Without the DHA and EPA in aquafeed, the end product would also lack these long chain omega 3 fatty acids, an important nutritional element of fish and seafood for humans.

Nutritional studies evaluating the suitability of algae as feed supplement or fish meal substitute are currently few in number, due to the large amounts of algae biomass needed. Furthermore, each algae species possess their own characteristic nutritional properties (proteins, lipids, fatty acids, minerals, etc), not one formula fits all. In some cases the cellulosic cell wall poses a serious problem since it is not digestible for non-ruminants. A possible means of increasing the nutritional value of algal biomass would be to break down the cell wall

fragments by mechanical treatment, or even by removal of most of the fibre, although such additional processing steps may add to the already high costs.

Thus, if a source of protein-rich or lipid-rich algal meal came onto the market at an affordable price, the aqua-feed industry would certainly consider using it. However, until supplies increase and costs decrease, algal biomass and biomass extracts will continue to occupy niche markets within the aqua-feed sector.

**Lien article :** <http://www.thefishsite.com/articles/2241/potential-use-of-phototrophic-algae-as-protein-and-or-lipid-source-in-aquafeeds/>