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INTERVIEW: US Producer Sees Bright Future for Microalgae Feed Ingredients

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2 December 2010 - Much has been said of algae's potential as a sustainable and efficient biofuel or even feed ingredient source. One Dublin, Ohio-based company has spent several years studying algae technology and has turned its potential into commercialized products with patents pending.

Independence Bio-Products (IBP) has been looking at the production of algae oil for sale into the fuel market since 2007. The product has already been tested for conversion to jet fuel and could increasingly be used to power various modes of transportation. In addition to algae oil, IBP produces algae protein meal and feed grade whole algae at a pilot plant in operation since 2009.

Ron Erd
CEO
Independence Bio-Products (IBP)

The company has high hopes for these products as it believes they are, not only very high in protein, but will ultimately help reduce the cost of the food produced from the animals fed on them. Proven to be effective in fish diets, IBP is in the process of conducting trials on other species, such as swine, poultry and cattle.

Anticipating large demand for the technology in the future, IBP's founder and CEO, Ron Erd, said that his company, which currently grows its algae in specially-designed ponds near Shadyside, next to the Ohio River, is planning to build a larger-scale production facility in 2011 that will produce 4,000 tons of algae-derived feed ingredients per year.

“The company is in negotiations for this facility in both Ohio and Texas. We expect to produce significantly greater volumes in the years to follow”, he argued.

The project is still in planning phase. However, sources in Ohio have reason to believe that the facility could require up to 100 acres and create about 25 job positions.

Contrary to other manufacturers more inclined to use fermentation processes, IBP uses photosynthesis to grow its algae, which, as an energy source, comes at a lower cost and is seen to be a more sustainable method of production.

Commenting on this Erd said: “Fermentation, growing algae in the dark, feeding sugar, is a well known industrial technology. IBP believes that it has high capital costs and high sugar input costs. Look at the mass balance of fermentation. 1 gram of lipid has twice the energy content as a gram of sugar and a significant portion of the carbon from the sugar leaves the fermentation process as carbon dioxide emissions. So we decided to go in a different direction”.

IBP’s uses flue gas from the nearby FirstEnergy Corporation R.E. Burger power plant as a source of carbon dioxide. This CO2 is captured to produce algae oil and algae protein, and is then harvested and converted into biofuels and bioproducts, as well as solids for animal feeding.

“The exhaust gas from the power plant contains about 10% CO2, which is fed to the algae ponds. The algae consume the CO2, affix the carbon and release oxygen via photosynthesis. The algae double approximately once per day, while consuming large quantities of CO2; approximately 1.8 times their weight”, says IBP.

IBP currently produces two algae-based feed ingredients. The first one, “Algamaxx™ Complete”, is whole algae, which contains lipids, protein and other nutrients. The second one, “Algamaxx™ Protein”, contains a small amount of phospholipids, after the neutral lipid is extracted. It is grown in controlled open ponds, harvested and dried. It also undergoes a lipid extraction process very similar to soybean meal.

In terms of applications, IBP's Algamaxx™ Complete has been shown to be effective as a fish feed supplement.

Thanks to a research initiative conducted in collaboration with Dr. Konrad Dabrowski, an aquaculturist with the Ohio State University’s School of Environment and Natural Resources, the company was able demonstrate that the product used in diet formulations for Nile tilapia positively affected feed consumption and fish growth.

The study found that with 25% Algamaxx™ whole algae, the fish gained 20% more weight than the control group fed diets with other plant proteins.

Dr. Dabrowski’s laboratory also discovered that the replacement of up to 50% of dietary corn gluten meal protein with microalgae was found to significantly enhance fish growth when fish were fed on restricted ration.

The aquaculturist saw that satiation rate was almost doubled in fish fed algae containing feeds, suggesting that feeding the algae supplement ad libitum could significantly enhance fish growth.

Dr. Dabrowski also highlighted the fact that the microalgae were also a source of minerals. Differences in concentration of individual minerals in the whole fish body were significant and might have affected growth when diets contained more than 75% of plant protein replaced by microalgae.

“Any improvements of fish growth that result from the use of microalgae in fish diets would be immensely beneficial to US fish farmers due to intense competition from fish producers in other countries”, commented the Ohio State University researcher.

With such good results, Erd said that IBP is continuing its efforts to add on new partners in the fish feed business to buy the product and incorporate it into a complete feed, which they will be able to easily market. The fish companies themselves will be able to promote a cheaper and healthier product, which is expected to increase the attractiveness of the fish for human consumption.

IBP has also been carrying out feeding trials for pigs and is planning more for chickens and cows with a view to prove the effectiveness of Algamaxx™ in feed for these animals.

Illustrating this with a pig trial conducted earlier this year, Erd pointed out that an IBP collaborator substituted a 5% fishmeal ration in pigs with Algamaxx™ Complete. As a result, he found no significant difference in pig growth in the group fed the fishmeal as compared to the group fed Algamaxx™ Complete.

“We believe that our algae makes a superior feed ingredient and that the market will absorb large quantities of this ingredient, as companies like IBP produce competitively priced product”, went on to say Erd.

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+33 5 61 00 13 41
fns@feedinfo.com