

## LONG-CHAIN OMEGA-3 COLLABORATION – AQUACULTURE FACT SHEET

### General facts about aquaculture

- Aquaculture is one of the fastest growing primary industries globally and in Australia<sup>1</sup>.
- The global fish oil ingredients market is valued at \$1.45 billion (GOAD)<sup>2</sup>.
- Important source of fish oil and therefore long-chain omega-3.
- Food for fish in aquaculture is typically fish or krill, with an increasing amount of non-marine ingredients now also being added.

### The need

- The benefits of DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid) long-chain ( $\geq C_{20}$ ) omega-3 in human health are well documented, playing important roles in heart and brain health, child and infant development, inflammation and other health functions.
- These healthy oils are commonly derived in ocean microalgae and, then via the food-chain, the fish that eat them, such as salmon and tuna, with tuna oil containing the one of the highest natural proportions of DHA. Fish consume the microalgae via their food-chain and the long chain omega-3 oils accumulate in their flesh.
- Consumers are becoming more aware of these health benefits, and are eating more and more fish and fish products. When global population growth is taken into account, it is estimated that 70 million tones of aquaculture fish above existing production is needed, just to meet projected consumer demand<sup>3</sup>.
- Aquaculture should be ideally positioned to meet this projected increase in consumer demand. However, given aquaculture fish food – meal and oil – is essentially fish, the situation is potentially unsustainable. An alternate food source is required.

### About the Omega-3 Oil Research Collaboration

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<sup>1</sup> [http://www.australian-aquacultureportal.com/press/PDF/Industry%20Overview\\_FINAL\\_230904.pdf](http://www.australian-aquacultureportal.com/press/PDF/Industry%20Overview_FINAL_230904.pdf). Sourced 15 March 2011.

<sup>2</sup> Global Organization for EPA and DHA Omega-3 website. Sourced 5 April 2011.

<sup>3</sup> Public statement, Geoff Allan, NSW Department Industry and Investment 7/03/2010

- The CSIRO, Nuseed and the Australian Grains Research and Development Corporation (GRDC) have come together to undertake the research and trials to develop the highest quality of DHA long chain omega-3 in oilseed plants (initially canola) at levels similar to that provided by fish, that is low in saturated fat and is cholesterol free.
- The project will address the global challenge of achieving a sustainable, supply alternative for aquaculture.
- The project will derive high quality, EPA / DHA long-chain omega-3 oil from a plant-based production source. Peer reviewed precision technology is used to consistently achieve levels of DHA in oilseed plants at commercially viable levels, and an oil low in saturated fat.
- This project will commercialise alternative long-chain omega-3 canola oil to be supplemented in fish feed formulations, providing enough nutrition for fish to grow in a commercially viable way whilst still containing the EPA/DHA oil in the aquaculture fish that consumers demand.
- The collaboration aims to have commercial product targeted for release by 2016.

### **The benefits**

*Sustainability:* Plant-based EPA / DHA production is a sustainable long-term solution to growing demand for fish products and long-chain omega-3 oils, using advanced precision gene technology to transfer a plant gene (from microalgae) to another plant (canola).

*Quality:* This world first DHA rich long-chain omega-3 oil, low in saturated fat and achieves the highest levels of DHA in oilseed plants at commercially viable levels.

*Consistency:* The precision gene technology strategy is based on robust world leading science and can be produced with consistent EPA and DHA profiles.

*Commercial:* This alternative long-chain omega-3 canola oil supplement in fish feed will provide enough nutrition for fish to grow in a commercially viable way and still containing the EPA/DHA oil in aquaculture fish that consumers demand.

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### **About the Omega-3 Oil Research Collaboration**

This collaboration brings together three of Australia's leading organisations in grain research. The CSIRO through its Food Futures National Research Flagship providing investment, the research science behind long-chain omega-3 oils and developing transgenic long-chain omega-3 canola; Grains Research and Development Corporation (GRDC) providing investment; and Nuseed providing investment and development, including regulatory and breeding expertise to the collaboration.

### **Company background information**

#### **CSIRO**

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency and one of the largest and most diverse research agencies in the world. CSIRO applies its world-leading scientific knowledge to create jobs, national wealth, a healthy and sustainable environment and improved living standards for all Australians. CSIRO is enhancing Australia's food production systems through an integrated 'farm-to-fork' approach with much of this research conducted within the Food Futures Flagship. CSIRO is delivering science to enable increased productivity and efficiencies at the farm level, improving the quality and yield of Australian crops, developing innovative food processing technologies, creating new value-added foods, and developing the nation's livestock, aquaculture and fishery industries. [www.csiro.au](http://www.csiro.au)

#### **Nuseed**

Nuseed, a wholly owned subsidiary company of Nufarm is a global seed company committed to the breeding and production of high performance planting seed including canola, sunflower, grain and forage sorghum. Nuseed is committed to the development of elite seed products that drive value both on the farm and through the agrifood chain. Nuseed is a member company of the Global Organization for EPA and DHA Omega-3 (GOED).

[www.nuseed.com](http://www.nuseed.com)

#### **GRDC**

The Grains Research and Development Corporation (GRDC) is one of the world's leading grains research, development and extension (RD&E) organisations. GRDC invests in RD&E to provide growers with vital information, knowledge and resources to support effective competition by Australian grain growers in global grain markets, through enhanced profitability and sustainability.

The GRDC's investment in farming practices, plant varieties, and new products has helped position Australia's growers as the best in the world. [www.grdc.com.au](http://www.grdc.com.au)