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## Grains and lamb offer new sources of omega-3

CSIRO research on grains and lamb aimed at developing new dietary sources of long-chain omega-3 oils will be presented at the World Congress on Oils and Fats in Sydney this week.

CSIRO Food Futures Flagship scientist, Dr Surinder Singh, will outline his team's progress on the transfer into crop plants of biochemical pathways for long-chain omega-3 synthesis sourced from marine microalgae.

"Long-chain omega-3 oils such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have well-documented health benefits against coronary heart disease, rheumatoid arthritis and other disorders," Dr Singh says.

"The main sources of these long-chain omega-3s are algal oils and fish oils – with 88 per cent of global fish oil production used by aquaculture. Our research aims to ensure that a sustainable, land-based production system can be developed to help meet the increasing demand."

Dr Singh's team has isolated and characterised a suite of highly efficient algal genes, and demonstrated the production of EPA and DHA in model land plants.

They are now developing oilseed crop plants that synthesise EPA and DHA in their oils and are relevant for Australian agriculture. The plants are expected to be available for commercial release by about 2015.



**IMAGE:** Dr Surinder Singh leads a CSIRO team developing oilseed crop plants that synthesise long chain omega-3 and are suited to agricultural production in Australia.

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In related work, a PhD candidate with the Food Futures Flagship and the University of Tasmania, Will Bignell, will address the conference on the potential for raising the omega-3 oil content of lamb.

"Lamb already contains varied levels of long-chain omega-3 which can be boosted using marine algae and fish oils in feeds," Mr Bignell says.

"Canola and lupin meals are common sheep feeds and understanding their effects on omega-3 oils will provide a foundation for ultimately raising the long chain omega-3 content of Australian lamb."

In a feeding trial supported by Tasmanian sheep breeders, Mr Bignell found a diet of canola and lupin meal can maintain a base-level of long-chain omega-3 oil in five breeds of lambs and, while no variation in oil content was detected between breeds, there was a six-fold difference in long-chain omega-3 oil content between individual sheep.

"The results also show there is good potential to raise long-chain omega-3 oils in lamb through selective breeding and tailored feeding programs," Mr Bignell says. "The next phase of my research is the development of DNA markers to help farmers breed towards higher levels of long-chain omega-3 oils."

It is hoped these projects will lead to alternative dietary sources of long chain omega-3 oils.

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The World Congress on Oils and Fats and 28th ISF (International Society for Fat Research) Congress will be held at the Sydney Convention & Exhibition Centre from 27-30 September.



**IMAGE:** Trials conducted by Will Bignell as part of his PhD research have shown there is good potential for boosting levels of long chain omega-3 oils in lamb through breeding programs...

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CSIRO initiated the National Research Flagships to provide science-based solutions in response to Australia's major research challenges and opportunities. The 10 Flagships form multidisciplinary teams with industry and the research community to deliver impact and benefits for Australia.

Image available at: <http://www.scienceimage.csiro.au/mediarelease/mr09-172.html>

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