

FROM CRAB SHELLS TO WORM KILLER



An integrated biorefinery approach to add value to crab by-products

THE NEED

Between 3 and 7 thousand tonnes of crab processing waste is produced each year in the UK costing businesses around £60 per tonne to dispose*. We need to develop ways to divert food manufacturing streams away from landfill or low grade uses and towards higher value products to provide sustainable alternatives to petroleum-based products.

*Source:

http://www.seafish.org/media/publications/key_features_crustacea_processing_waste.pdf

THE PARTNERSHIP

Pennotec, part of innovation and marketing consultancy Pennog Ltd, has joined forces with Seagarden AS, a Norwegian manufacturer of seafood ingredients and marine bioactives.

Aberystwyth University in the UK provides the biorefinery facilities required to test the fermentation process and Scotland's Rural College provides agricultural application testing. They were awarded an Innovate UK and Innovation Norway funded grant in 2013.

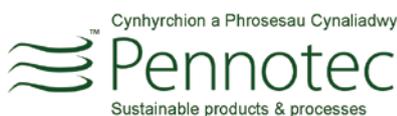
THE PROJECT

The iCRAB project integrates crab by-product with agricultural biomass using a biorefining approach to produce sustainable sources of high value chemicals. Chitin from crustacean shells is the most commercially important source of chitosan used in many sectors including the food and personal care and is being tested as a control for destructive nematode worms in agricultural sectors.

The project, still in its early days, will develop a process for the coproduction of organic acid and chitin by co-fermenting the crab by-product with plant sugars. An economic analysis will determine the feasibility of developing full-scale biorefineries in coastal

“ The project uses UK sustainable technology to extract high value products from processing waste. Norway has a similar coastal geography and seafood industry plus a similar attitude towards sustainable technologies. This means the commercial targets are provided by our Norwegian partner but there's also a common appreciation of the non-financial "green" benefits of applying industrial biotechnology. ”

Dr. Jonathan Hughes
Pennotec (Pennog Limited)



UK-NORWAY: DRIVING THE BIO-BASED ECONOMY



EXPECTED PROJECT OUTCOMES:

The project is expected to bring new high value products to the market based on chitin and chitosan:

- **Target markets: European**
- **Est. annual market potential: £1-5m**
- **Expected product launch: >3 years**

It should also result in the development of a grass bio-refinery based process for sustainable extraction of chitin from crustacean waste, and new intellectual property.

It is anticipated that 11 jobs will be created by this project and 3 jobs safeguarded.

It is likely that Pennog Ltd will seek further funding in order to enable process scale up in the future.

“ This is an exciting project that aims to integrate the underpinning science, skills and knowledge of the academic community with those of the industrial partners to innovate in the area of industrial biorefining. The integration of these communities will help to deliver an economic and environmentally sustainable process for the biorefining of both a readily available feedstock with a waste product to produce a number of commercially viable products. ”

Dr. Joe Gallagher, Bioconversion and Biorefining Group Leader/ BEACON Projects Leader, Aberystwyth University



UK-NORWAY COLLABORATIONS

The business funding agencies in the UK & Norway signed the Memorandum of Understanding in 2011 to enhance collaboration between the two nations in the area of industrial biotechnology & biorefining. The KTN & IBNN are the delivery team, ensuring opportunities for networking are in place and strategic. This project resulted from such activities.

If you are interested in finding a UK or Norwegian partner, or want to know more about the MoU or opportunities to network, visit the Norway-UK Group on [_connect](#) or email:

 biosciences@ktn-uk.org
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