Pot ale – a sustainable source of protein for salmon feed

Horizon Proteins, a spin-out company from Heriot-Watt University, has developed a process for using pot ale from malt whisky distilleries to produce a sustainable, nutritionally-suitable protein for salmon feed. The integrated by-product processing technology has been installed and tested at a distillery and has not only benefits for the food chain, but also wider implications for bioenergy processes such as anaerobic digestion.

Traditionally whisky by-products have been used directly as animal feed. However as the global population grows and the demand for food increases, emerging protein markets require protein of far higher quality and of a consistent composition. Horizon Proteins has developed an innovative method of using pot ale to produce sustainable protein ideally suited for use in fish food for salmon farming. By adapting techniques more usually applied to high-value pharmaceutical products and taking advantage of a unique process engineering skillset within our team, we have developed and patented a cost effective process, that operates under mild conditions and is readily scalable, to recover protein nutritionally suited for salmon. This technology adds significant value to a traditionally underutilised by-product and could also improve performance of downstream operations such as anaerobic digestion, potentially adding significant benefits when integrated into a distillery.

In 2015, a pilot plant with the capacity to process one fifth of the daily pot ale output was designed, commissioned and installed on-site at Glendullan distillery in Dufftown, in co-operation with Diageo. The trial has allowed us to produce enough protein for fish feed trials. The Horizon Proteins process removes yeast and protein from the pot ale stream as feed products leaving a protein-reduced, carbohydrate-rich stream which could also offer enhanced downstream anaerobic digestion performance.

The protein produced is a viable alternative to much of the protein currently used in fish food, primarily fish meal and soya bean meal from South America. The availability of a domestic source of protein substantially improves the overall stability and sustainability of the feed formulation process, with particular advantages in reliability of supply and cost control. Furthermore, the use of Horizon Protein’s product in the formulation of salmon feed could result in a 30% reduction in CO₂ emissions in the feed manufacturing process.