

# Enzyme-aided recovery methods' help in extracting protein from rapeseed press cake

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One third of cold-pressed rapeseed press cake consists of nutritionally valuable protein that could have many other uses besides animal feed. For her doctoral dissertation, Katariina Rommi, Research Scientist at VTT Technical Research Centre of Finland Ltd., developed enzyme-aided methods for rapeseed protein enrichment. Her study also provides estimates of the costs of different protein extraction schemes.

The purpose of Katariina Rommi's doctoral dissertation was to develop simple, water-saving methods for turning vegetable oil industry co-streams into [protein](#) ingredients suitable for food or cosmetic products and thus help to satisfy the increasing global demand for protein.

Globally, around 34 million tonnes of [rapeseed](#) press cake is produced annually as rapeseed oil by-product. At present, it is primarily used as feed for production animals. In Finland, the majority of oil mills use cold pressing in rapeseed oil production. The by-product of this method, rapeseed press cake, contains between 32 and 36% of nutritionally valuable protein. The marketing of rapeseed press cake as novel food was approved by the EU in 2014.

Several technologies based on alkaline or saline extraction have been developed for enrichment of rapeseed protein, but high energy and water consumption due to dilute conditions and multiple processing steps limit their profitability.

As part of the work done for her doctoral dissertation, Katariina Rommi

developed enzyme-assisted methods for the enrichment of rapeseed protein and studied the factors influencing protein extractability and the properties of the obtained protein-rich fragments. An enzyme that breaks down pectin was shown to be particularly effective in facilitating protein extraction at reduced water content and without chemicals such as alkali or salt.

A techno-economic evaluation of different extraction schemes also suggested substantial reduction of energy costs when the extraction was carried out at 20% solid content. The results indicate that enzyme-aided methods are well suited to rapeseed enrichment and may offer a techno-economically feasible alternative to alkaline or saline extraction. The results may be applied to the manufacturing of rapeseed-based protein ingredients in food, feed and other industries. In the study, bioactive rapeseed peptide fragments were also extracted from rapeseed press cake by proteolytic enzyme treatment; these fractions have novel application potential in skin care products.

**More information:** The dissertation is available online at [www.vtt.fi/inf/pdf/science/2016/S130.pdf](http://www.vtt.fi/inf/pdf/science/2016/S130.pdf)

Provided by VTT Technical Research Centre of Finland

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