

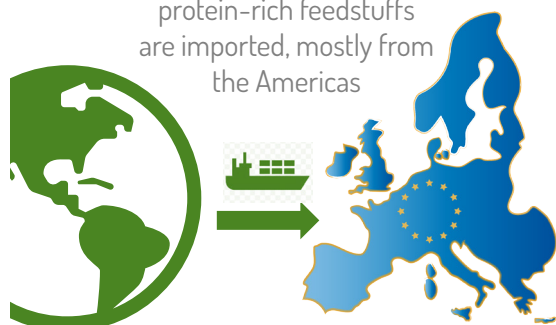


European protein autonomy: more and better

More European protein
Better protein quality
Better use of existing protein sources

The challenge

70% of plant protein-rich feedstuffs are imported, mostly from the Americas



Europe has for long been deficient in protein for its livestock production. Although rapeseed meal (RSM) is increasingly produced in Europe, its use for monogastric animals is hampered by its lower content and digestibility of protein and amino acids compared to soybean meal (SBM).

European-grown soybeans and protein from green biomass are promising alternatives to imported SBM. However, little is known about how processing technologies can be used to improve the nutritional value of these locally-produced protein sources.

Non-conventional feed ingredients vary more in nutrient content and value than conventional ones. Advances in near-infrared spectroscopy (NIRS) make it a promising tool for predicting nutrient content and value in real-time.

Our solutions



The Feed-a-Gene project has worked with:

- ▶ Technologies for the processing of European soybeans, green biomass and rapeseed meal
- ▶ Biotechnologies to improve feed quality
- ▶ Nutritional evaluation for pigs and poultry
- ▶ NIRS for the real-time determination of nutritional value



These technologies and methodologies allow to increase protein production in Europe, make a better use of existing European protein sources, and evaluate their nutritional value in real-time.

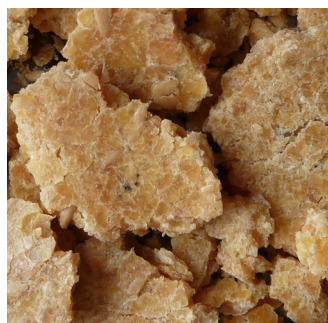
The developed technologies allow to improve the quality and quantity of European-grown protein for livestock production.

Novel technologies & concepts

Several technologies and methodologies have been developed in the Feed-a-Gene project for the production and evaluation of novel protein sources.

Soybean meal

- Processes that involve extrusion or cooking with or without dehulling have been used to produce expeller SBM with a reduced content of antinutritional compounds and high protein and amino acids digestibilities.



Expeller soybean meal

- These products can be produced in medium-sized crushing plants from local and GMO-free soybeans.

Green protein

- A process involving separation of green biomass from grass into a liquid stream high in protein and a fibre-rich solid stream has been developed and the resulting products have been evaluated nutritionally.
- The produced protein concentrates are lower in quality compared to SBM but their quality has been improved during the course of the project.



Green protein from grass biomass

Rapeseed meal

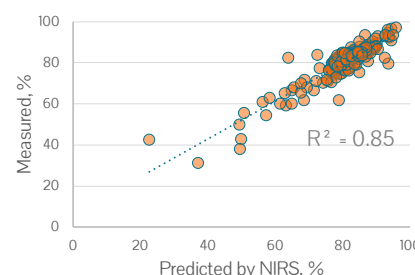
- Tail-end dry fractionation of RSM can be used to separate RSM in a fine, high protein-low fibre fraction, and a coarse high-fibre fraction. The fine fraction has a superior nutritional quality relative to reference RSM.
- Biotechnological means can be used to reduce antinutritional compounds and increase feed efficiency.



Fine and coarse fractions of rapeseed meal

Real-time evaluation of nutritive value

- A NIRS-based system has been used to develop equations enabling the real-time prediction of nutrient content, of the digestibility of macronutrients, and of the metabolizable energy of feedstuffs and diets for pigs.



Energy digestibility in pigs predicted by NIRS vs digestibility measured *in vivo*

Recommendations & benefits

- The technologies developed by Feed-a-Gene will ensure a higher supply of European protein, as they make possible the production of optimally processed protein concentrates obtained from European-grown soybeans and rapeseeds. Biotechnologies can be used to further improve the nutritional value of these protein sources.
- The developed NIRS methodologies enable the real-time evaluation of key nutritional parameters of economical importance.

Feed-a-Gene



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