



Novel feeds and feeding techniques with positive environmental, economic and social impacts

## More sustainable pigs and poultry production systems

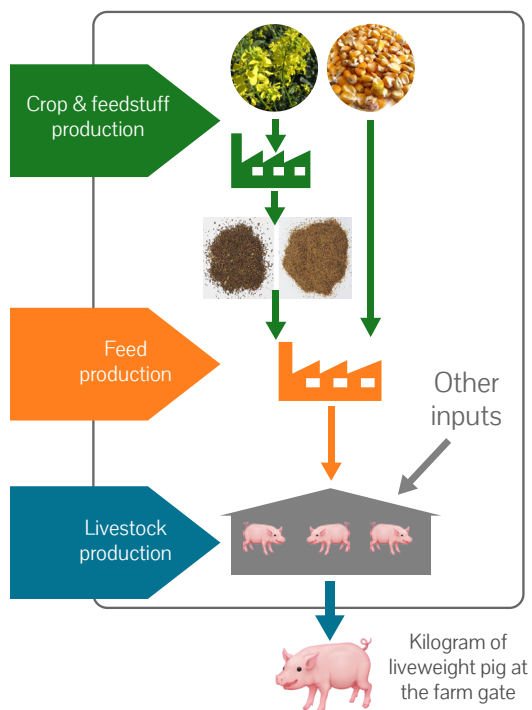
### The challenge



The Feed-a-Gene project has developed a range of new approaches to feeding pigs and poultry with the aim of improving efficiency and reducing environmental impacts. This has been done by developing novel feed resources and technologies, while at the same time identifying animals better adapted to changing global conditions, and introducing techniques that ensure feeds are used as efficiently as possible.

These approaches have economic, environmental and social implications that must be assessed before they can be adopted.

### Our solutions



Well-established techniques were used to assess the sustainability of the new feeding approaches that have been developed in the project.

- ▶ **Life-cycle assessment and cost-benefit analysis** are used to, respectively, evaluate the environmental and economic impacts of novel feeds, precision feeding systems and selective breeding for pigs and poultry.
- ▶ **Interviews with farmers and questionnaire surveys of citizens** provide insights in the acceptability of feeding approaches and practical issues around their implementation.
- ▶ **A simple composite indicator**, weighted using the results of a survey of industry experts, provides a means of evaluating the sustainability of our proposed solutions.

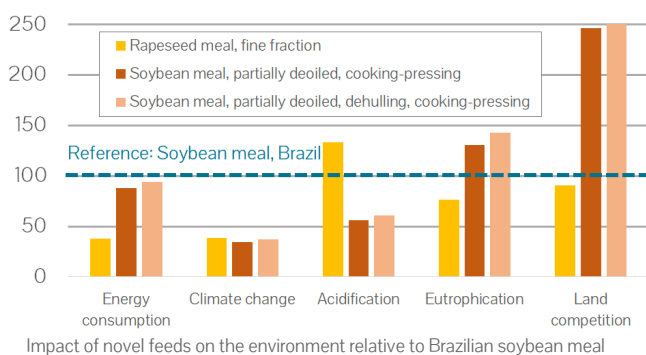


# Positive effects on sustainability

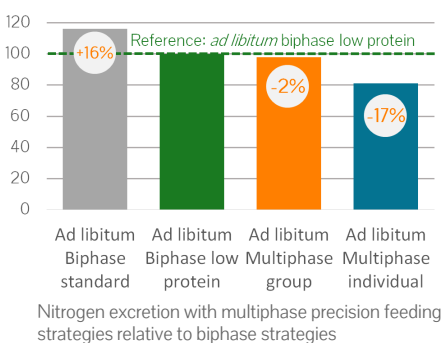
Feed-a-Gene provides encouraging results for livestock producers seeking to reduce the environmental footprint and at the same time improve their profitability. Many consumers and farmers are supportive of the innovations proposed by the project.

## Environmental impacts

- Novel feeds have the greatest environmental benefits when they replace Brazilian soybean meal, resulting in a reduction in climate change impacts but leading to land-use transfer and more land being used to produce livestock feeds.



- Precision feeding can have significant environmental benefits particularly in reducing nitrogen excretion in pigs.



## Economic impacts

- For pigs, novel feeds can have a positive impact on farm income provided that increases in feeding costs are small. An individual precision feeding strategy can improve economic performance.
- For broilers, small income gains are associated with the use of European soybean meals, while green protein has a negative impact.



## Social impacts

- Surveys in the UK and Spain revealed that consumers are willing to pay a premium for eggs produced with a lower carbon footprint.
- Consumers find precision feeding technologies and novel feeds acceptable, though they may be reluctant to certain aspects (e.g., interactions between the farmer and the animal). Farmers are open to the use of these technologies in the right circumstances.



## Sustainability appraisal

- These new approaches yield a combination of economic, environmental and social benefits.
- Individual *ad libitum* precision feeding strategies for pigs and the use poultry feeds incorporating European soybean meal are found to offer important sustainability gains compared with the current situation.

# Recommendations & benefits

The feeding solutions proposed in Feed-a-Gene offer a number of important opportunities for livestock producers to become more sustainable.

- Replacing Brazilian soybean meal in the diet with locally-produced protein, such as rapeseed meal or European soybean, can reduce energy costs and impacts on climate change, though this will result in a transfer of land-use and in more arable land used to produce animal feed.
- Precision feeding is another route to more sustainable livestock production. The adoption of feeding systems that allow pigs to eat when they choose reduces key environmental impacts and increases profitability compared to conventional alternative feeding systems.

**Feed-a-Gene**



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