The Future of Animal Feed: Materials and Methods

Methodology

The report adopts a holistic approach to review and evaluate sustainability implications of potential alternative protein feed ingredients, considering equally the environmental, economic and social dimensions throughout. This report was based on a rapid evidence assessment and synthesis of available scientific and grey literature, including peer-reviewed scientific articles, news articles, industry and government reports and relevant databases of the agri-food sector (e.g., Farm Accountancy Data Network, 2022; Tables of composition and nutritional values of feed materials, 2004). The research method involved extensive desk-based, qualitative research. The report adopts a holistic approach to review and evaluate sustainability implications of potential alternative protein feed ingredients, considering equally the environmental, economic and social dimensions throughout.

Structure of the report

The following sections of the report present a brief description and overview of potential alternative protein sources that can be used to substitute conventional protein crops in livestock feeds. Specifically, Chapter 2 identifies categories of alternative protein sources and drivers that call for a shift from conventional protein production. The categories are identified through extensive scientific and grey literature review that focused on alternative protein sources whose implementation on small scales had been previously explored, and whose upscale may be enabled by the technological advancements of the next 10 years. The assessment discusses the aspects of production and supply economics, and relevant economic uncertainties that may affect the implementation of alternative proteins in future livestock feeds. Such issues must be considered as they often largely dictate stakeholder investment behaviour and willingness to adopt alternative strategies in their production systems Through this analysis, the REA attempts to present pragmatic solutions considering a 10-year horizon while acknowledging the potential existence of further alternatives that may be currently under development.

They specific four categories presented in this REA are:

1. Protein from genetically modified / engineered protein crops and alternative protein crop growing methods,
2. Protein from cellular agriculture,
3. Protein from former foods, food waste and industry by-products and waste streams, and
4. Protein from animal by-products and insects.

For each of these categories, Chapters 3 through 6 present an assessment of the potential opportunities for improvement of livestock feed sustainability and of the potential risks to sustainability, considering the environmental, economic and social dimensions. Based on this assessment, Chapter 7 identifies key trade-offs within and across the three pillars of sustainability – environment, economy, society – and the state-of-the-art in trade-off assessment methods.

Chapter 8 then discusses emerging threats for sustainability of the livestock feed production sector within and beyond a 10-year time horizon. Finally, Chapter 9 concludes the report by synthesising key policy pathways to facilitate the development of strategic and regulatory plans for FSA towards future sustainable livestock feed formulations.