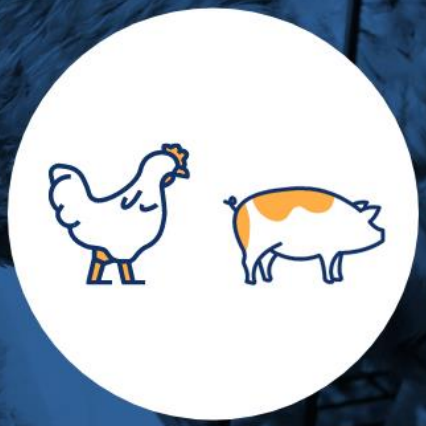
# Feeding monogastrics with grass proteins (new protein resource)



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- **Type of challenge**: Environment.
- **Challenges**: Climate change (deforestation, GHG emissions); resource management (resource efficiency, reduction of protein deficit).
- **Action**: Use of proteins from bio-refined grass and clovers.
- **Animal category**: Monogastrics.
- **Technique**: Incorporation in feed formulation of proteins derived from grass bio-refining as an alternative to imported soybean meal.
- **Mode of action**: Harvested grass, clovers and alfalfa are bio-refined into different fractions; protein concentrate, fibres, fructo-oligosaccharides and nutrient-rich 'whey'.
- **Mode of implementation**: The protein concentrate is suitable to monogastric animals too, allowing for European grass production to fulfil protein requirements for pigs and poultry in addition to ruminants.
- **Requirements/limitations**: More research & development is needed to unlock further potential, both in terms of plant breeding aspects of the best suitable varieties for bio-refining purposes as well as the bio-refining process itself to extract the highest level of proteins from the biomass.
- **Economic consequences**: Grass protein is not widely available on the feed market now, with current output not yet competitive vis-à-vis soybean meal imports.
- **Other considerations**: Wide-spread implementation of grass bio-refining (and other plant material) could help to reduce the EU protein deficit and boost the local bio-economy.
- **References**:
  - Ravindran *et al.* (2021). *Production of Green Biorefinery Protein Concentrate Derived from Perennial Ryegrass as an Alternative Feed for Pigs*. Clean Technol. 2021, 3(3), 656-669. https://doi.org/10.3390/cleantechnol3030039
  - Kamp *et al.* (2019). *Modelling matter and energy flows of local, refined grass-clover protein feed as alternative to imported soy meal*. Ecological Modelling Volume 410, 15 October 2019, 108738. https://doi.org/10.1016/j.ecolmodel.2019.108738
- **Other techniques**: Other alternative circular protein sources like microbial biomass, insects, plankton, etc.

Charter Ambitions: 2, 5