

# GRASS PROTEIN FOR PIGS AND POULTRY -CAN IT SUBSTITUTE SOYBEAN MEAL?

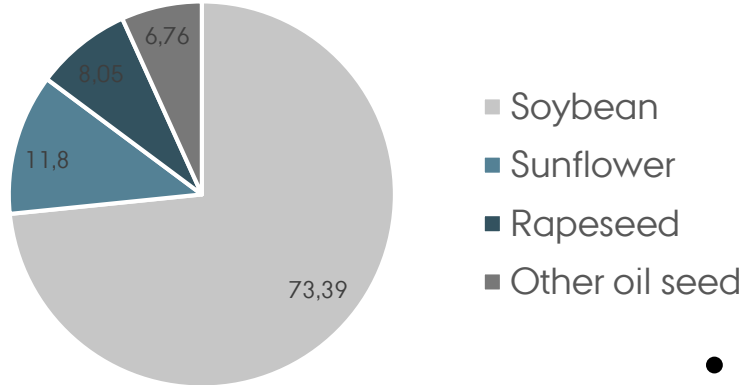


**CBIO**  
AARHUS UNIVERSITY CENTRE FOR  
CIRCULAR BIOECONOMY



# BIOREFINING OF LEGUMES AND GRASSES

Imported oilseeds (meal)



Danmarks  
Statistik  
2018/19

- Protein concentrate
  - Amino acid composition comparable to soy
  - Rat studies demonstrate potential as monogastric feed protein
  - High content of insoluble fibre
- Pulp for ruminants
  - Increased ECM in dairy cows
  - Increased digestibility



# MULTIPLANT- BROILER EXPERIMENT

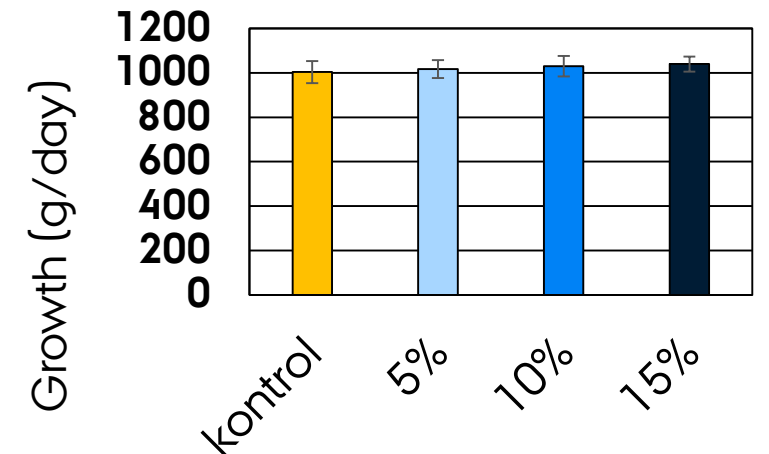
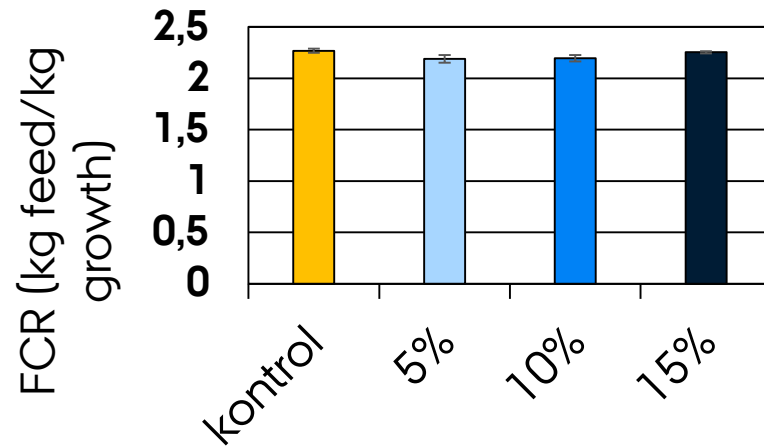
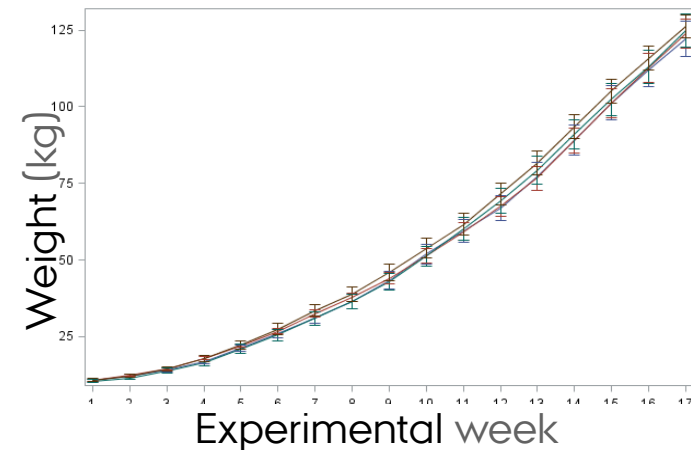
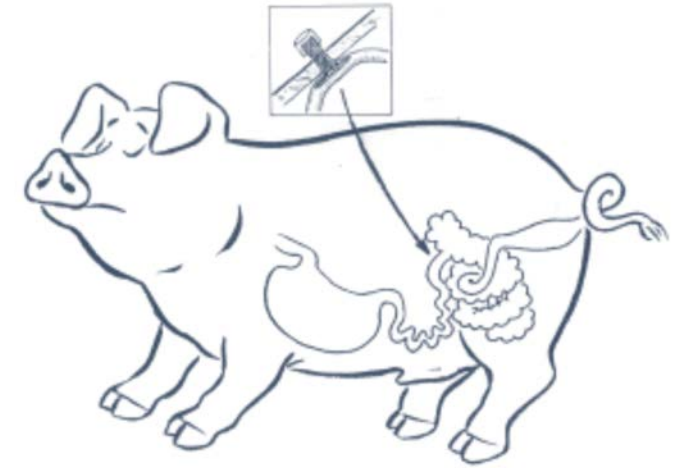


- Protein from organic grass-clover. 36 % crude protein
- Broilers responded well to a feed mixture, where approx. 13 % of total CP (8% inclusion) originated from grass-clover concentrate
- Low protein content and high fibre complicate higher inclusions
- Inclusion of grass-clover concentrate
  - Yellow colouring of meat and fat
  - Higher omega-3 FA content



# PIG EXPERIMENTS (ILEUM AND SLAUGHTER)

- Ileum-cannulated pigs (Biobase, Feed-a-gene)
  - Red clover and perennial ryegrass (**33 % crude protein**)
  - Low protein digestibility
- Slaughter pigs (Supergrasspork)
  - Grass-clover (**47% crude protein**)
  - No performance differences were found between groups (48 pigs)



# FUTURE EXPERIMENTS

- Demo-scale plant enables production-scale experiments
  - Production-scale slaughter/weaning experiments
  - Production-scale broiler experiments
- Ileal protein and amino acid digestibility (golden standard in feed quality evaluation)
- **Crucial to focus on quality and quality-impairing mechanisms**
  - Molecular mechanisms involved in the low digestibility (field to product)
  - Endogenous plant enzymes
  - Protein-fibre structures
  - Indigestible residue
- Yield (extractability)





AARHUS  
UNIVERSITY