



GEFETEC

Gent Feed Technology Centre
Partners of Food2know



expertise and research activities



Who are we?

- Ghent University
 - ILVO - Institute for Agricultural and Fisheries Research
- Located within an area of 5km



Who are we?

Offering :

- Expertise on animal science
- Facilities : crop breeding and experimental fields, feed production pilot, small industrial plant for feed production; analytical labs (chemical, microbial, molecular, physical), animal metabolism and digestion units...



Who are we ?

Consortium of research laboratories :

- Which are active in research in the area of animal science, including animal nutrition and animal feed ;
- Which offer complementary expertise in animal science
- Which already proved that cooperation is a added value for solving sector problems



Aims ?

- International visibility – partner of EUFETEC - to promote and enhance collaboration in research
- Offer added value to the animal production industry through complementary expertise.
- Enhance the dissemination of project results and other scientific information to the animal production sector



Area of expertise and research

- Animal: feeds, (functional) animal nutrition, welfare, pathology, control of zoonosis, safety of feeds and feed additives
- Crop: sustainability, feed (and food) safety, feed security, molecular farming



Area of expertise and research (2)

- Technology: sustainable animal feed production, feed optimisation, sustainable protein sources, feed (and food) safety
- Analysis: accurate and fast methods for monitoring quality and safety animal feeds and products
- Pathology: control of animal diseases and infections



Faculties and departments involved

- Faculty of Bioscience Engineering (UGent- FBW)
- Faculty of Veterinary Medicine (UGent-FVM)
- Faculty of Pharmaceutical Sciences (UGent- FFW)
- ILVO – Animal Science
- ILVO – Technology and Food Science



Faculty of Bioscience Engineering

- dpt. Applied Biosciences - Laboratory of Feed Technology
 - Expertise
 - **Pilot testing for animal feed production – product development**
 - **Stability evaluation of feed supplements during steam conditioned pelletizing**
 - **Product development and formula optimisation**
 - **Development of indicators for sustainability assessment of production systems**



Faculty of Bioscience Engineering

- Research

- Influence of raw material characteristic on pellet quality
- CO₂-emission throughout the animal feed production chain: a Life Cycle Analysis

Contact:

Mia.eeckhout@ugent.be

Marijke.meul@ugent.be



Faculty of Bioscience Engineering

- dpt. Applied Biosciences Crop Production:
 - Expertise:
 - Crop husbandry / diseases / pests and crop protection of small grain cereals and maize
 - Relationship growing conditions and quality of small grain cereals and maize
 - Toxigenic moulds (e.g. *Fusarium* spp.) on wheat and maize (prevention, population dynamics, identification, monitoring and prediction)



Faculty of Bioscience Engineering

– Research:

- Plant pathology studies about *Fusarium* spp. (inoculum sources and infection process, genetic diversity, mycotoxins and influenced parameters, e.g.)
- Sustainable production techniques for small grain cereals and maize
- Opportunities for alternative protein rich crops (e.g. Lupins)

Geert.haesaert@ugent.be



Faculty of Bioscience Engineering

- Laboratory for Animal Nutrition & Animal Product Quality (Lanupro)
 - Expertise
 - **Ruminant nutrition, with emphasis on rumen function**
 - **Pig(let) nutrition**
 - **Animal product quality**
 - **Oxidative status of animals and animal products**



Faculty of Bioscience Engineering

- Laboratory for Animal Nutrition & Animal Product Quality (Lanupro)
 - Research
 - Fatty acid metabolism during feed conservation, in the rumen and in the mammary gland & their interactions
 - Milk fatty acid pattern in diagnostic milk based tests for improved dairy nutrition
 - Control of rumen methanogenesis
 - Application and mode of action of enzymes (NSP-ases, lipases and proteases) in pigs



Faculty of Bioscience Engineering

– Research (ctd)

- medium chain fatty acids and secondary plant metabolites to improve mono-gastric gut health and function
- Implications of polyunsaturated fatty acids and antioxidants in sow feeding on animal productivity and its transfer from sow to piglet
- Genetic factors and variability in oxidative status of meat producing animals
- Physiological status and metabolic disorders of dairy cattle in relation to oxidative status

Veerle.Fievez@UGent.be ; (Stefaan.DeSmet@UGent.be)



Faculty of Pharmaceutical Sciences

- Laboratory of Food Analysis



- Expertise: LC-MS/MS

- multi-mycotoxin analysis in feed and food
- ergot alkaloid analysis in cereal-based commodities
- multi-masked mycotoxin analysis in cereal-based commodities

- accreditation EN ISO/IEC 17025



Faculty of Pharmaceutical Sciences

– Research



- Development of innovative analytical methods for mycotoxins
 - sample preparation
 - rapid screening tests (biosensors, synthetic antibodies and quantum dots)
 - confirmation (LC-MS/MS and HRMS)
 - Metabolomics in mycotoxin research
- Development of new sampling techniques
- Surveys on mycotoxin contamination

Sarah.desaeger@ugent.be



Faculty of Veterinary Medicine

- Laboratory of Chemical Analysis

- Expertise

- Multi-residue (UH)PLC-MS/MS or HRMS analysis**

- Thyreostats, corticosteroids, anabolic steroids, NSAIDs, avermectines, quinolones, tranquillizers in meat and biological matrices
 - (Phyto)sterols, phyto-estrogens, anti-oxidants, plant hormones in feed, food and biological matrices



Faculty of Veterinary Medicine

- **Laboratory of Chemical Analysis**

- Expertise

- Multi-residue (UH)PLC-MS/MS or HRMS analysis**

- **Pharmaceuticals, perfluorinated compounds, pesticides, marine toxins, mycotoxins in water and animal matrices**
 - **Boar taint in fat, serum and meat products**
 - **Metabolomic approaches including one of the above-mentioned compound-matrix combinations**

- accreditation EN ISO/IEC 17025



Faculty of Veterinary Medicine

– Research:

- Endogenous formation of corticosteroid (prednisolone) or thyreostatic (thiouracil) residues in livestock through feed-related mechanisms
- Relationship between phytosterol consumption through feed and housing and excretion of boldenone in veal calves and horses
- Transfer and bioaccumulation of micro-pollutants or marine toxins from feed or water to animal matrices (mollusks, fish)



Faculty of Veterinary Medicine

— Research:

- Optimization of nutritional food and feed quality through plant hormone-metabolic (antioxidant status) interactions
- Alternative analytical strategies to measure boar taint at the slaughterline
- Metabolomic approaches to study gut health status

Lynn.vanhaecke@ugent.be



Faculty of Veterinary Medicine

- Research Laboratory of Pharmacology and Toxicology
 - Expertise :
 - In vitro and in vivo models for efficacy and safety testing of feed additives (i.c. mycotoxin detoxifiers)
 - In vivo pharmaco- and toxicokinetic studies of veterinary drugs, coccidiostats and contaminants (ADME = absorption, distribution, metabolism and excretion)
 - Gastro-intestinal models for the study of absorption, first pass effect and oral bioavailability in different animal species



Faculty of Veterinary Medicine

- Research Laboratory of Pharmacology and Toxicology
 - Expertise :
- Analytical methods for quantification of drugs, coccidiostats and contaminants in feed and biological samples (a.o. LC-MS/MS)
- GLP compliant for pharmacokinetic studies, withdrawal time determination and bio-analysis of veterinary drugs (OECD GLP principles)



Faculty of Veterinary Medicine

- Research Laboratory of Pharmacology and Toxicology
 - Research:
 - Impact of mycotoxins on animal health in several species
 - Interaction of mycotoxins with the pathogenesis of *Clostridium* and *E. coli* in broiler chickens; and *Salmonella* in broilers and pigs
 - Toxicity testing and ADME studies (absorption, distribution, metabolism and excretion) of mycotoxins in several animal species



Faculty of Veterinary Medicine

- Research Laboratory of Pharmacology and Toxicology
 - Research:
 - Efficacy and safety testing of mycotoxin detoxifiers in pigs and poultry
 - Residues of veterinary drugs and coccidiostats in animal feed and food (muscle, liver, egg, etc)
 - ADME studies and withdrawal time of veterinary drugs and coccidiostats in several animal species

Siska.croubels@ugent.be



Faculty of Veterinary Medicine

- Laboratory for Pathology and Bacteriology
 - Expertise
 - **In vitro studies on bacteria – host interactions in relation to zoonosis**
 - **Isolation, identification and characterization of pathogenic bacteria**
 - **In vivo studies: model for broiler necrotic enteritis, on pathology and animal nutrition**



Faculty of Veterinary Medicine

- Laboratory for Pathology and Bacteriology
 - Research
 - Influence of feed composition on the animal's physiology and gut microbiota composition in relation to performance and intestinal health
 - Pathogenesis of the zoonoses carrier state



richard.ducatelle@ugent.be

Faculty of Veterinary Medicine

- Laboratory for Animal Nutrition
 - Proximate analysis
 - **In vivo studies** (animal nutrition)



Geert.janssens@ugent.be

ILVO-Animal science

- Expertise on farm animals
 - Performance trials with poultry, pigs and cattle (feed intake, feed efficiency, ...)
 - Digestibility and balance trials with ruminants, pigs and poultry
 - Feed evaluation
 - In vitro/in situ techniques for fast feed evaluation of ruminant feeds
 - Measurement of emissions (greenhouse gasses) of individual ruminants



ILVO-Animal science

- Expertise on farm animals
 - Determining nutrient requirements for poultry, pigs and cattle
 - Diet formulation for production animals
 - Effects of feeding and management on product quality, animal behavior and welfare
 - Analysis of feed, meat, milk and eggs
 - Farm animal behavior and welfare assessment



Sam.decampeneere@ilvo.vlaanderen.be

ILVO-Animal science

- Research on farm animals
 - Evaluation and optimal use of feedstuffs and byproducts in poultry, pigs and cattle
 - Evaluation of additives on feed efficiency, gut health, emissions, interaction with other nutrients, ...
 - Measures to reduce the environmental impact of intensive animal production (N, P, greenhouse gases, ...).
 - Refining nutrient requirements of production animals



ILVO-Animal science

- Research on farm animals
 - Effect of diet composition on animal health and product quality (health value and product image)
 - Management strategies for production animals
 - Develop, validate and apply welfare assessment protocols for farm animals



Sam.decampeneere@ilvo.vlaanderen.be

ILVO-Animal science

- Expertise on fisheries research
 - **Biology of marine culture species**
 - **Structural and nutritional requirements for aquaculture**
 - **Optimisation of aquaculture techniques**
 - **Fishing gear technology**
 - **Detecting chemical contaminants in marine matrices**



ILVO-Animal science

- Expertise on fisheries research
 - Determination of the quality and freshness of fish, crustaceans and molluscs
 - Determination of authenticity/traceability of fish, crustaceans and molluscs with advanced genetic and (bio)chemical techniques
 - Fish market sampling and surveys at sea
 - Welfare of fish

Kris.cooreman@ilvo.vlaanderen.be

Hans.polet@ilvo.vlaanderen.be



ILVO-Animal science

- Fisheries Research
 - Improved feed conversion and feed composition in aquaculture
 - Water purification, waste treatment and polyculture systems in aquaculture
 - Scoring sustainability of aquaculture and marine products
 - Research on mussel seed



ILVO-Animal science

- Fisheries Research

- Species identification and freshness determination of marine products
- Chemical contaminants in fish products
- Research on by-catch and discards in fisheries (valorisation of discards)



Kris.cooreman@ilvo.vlaanderen.be

Hans.polet@ilvo.vlaanderen.be

ILVO – Technology & Food

- Expertise on Microbiological food safety
 - Molecular and phenotypic characterization of zoonotic or food pathogens and spoilage organisms (bacteria, viruses, moulds)
 - *In vitro* techniques (cell culture, batch & continuous fermentations)
- Research on Microbiological Food Safety
 - Development and implementation of techniques for identification, detection, typing and virulence characterization of pathogens & spoilers in animal and plant products
 - Investigation of eradication or control measures for pathogens & spoilers in the production chain
 - Investigation of alternatives for antibiotics



ILVO – Technology & Food

- Expertise on Chemical feed and food safety
 - Screening techniques for antibiotic residues & allergens
 - LC-MS/MS confirmation and quantification of residues of veterinary drugs and mycotoxins
- Research on Chemical Food and Feed Safety
 - Development and validation of new analytical techniques for detection of residues, contaminants and mycotoxins in biological matrices
 - Evaluation of Molecularly Imprinted Polymers (MIPs) as alternative clean-up technique for food matrices
 - Implementation of high resolution MS for residues and plant metabolites and plant hormones



ILVO – Technology & Food

- Expertise

- **Authenticity of plant products**
 - Molecular typing of plant products: inherent plant toxins and botanical impurities in feeds
- **GMO characterization and detection in plants and plant derived products**
 - Method development
 - Analytical service according to ISO17025



ILVO – Technology & Food

- Research on Molecular Farming
 - The production of valuable proteins in transgenic plants
 - Applications:
 - Production of therapeutic antibodies that can be produced in feed crops, allowing oral administration = alternative for growth-promoting antibiotics.
 - Production of feed additives e.g. of phytase containing maize or “high-lysine” maize
 - Efficient production of veterinary vaccines in plants

Marc.deloose@ilvo.vlaanderen.be; Marc.heyndrickx@ilvo.vlaanderen.be

