



What is COST?

COST (European Cooperation in Science and Technology) is a pan-European intergovernmental framework. Its mission is to enable break-through scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities. www.cost.eu.

Background of COST Action FA1401

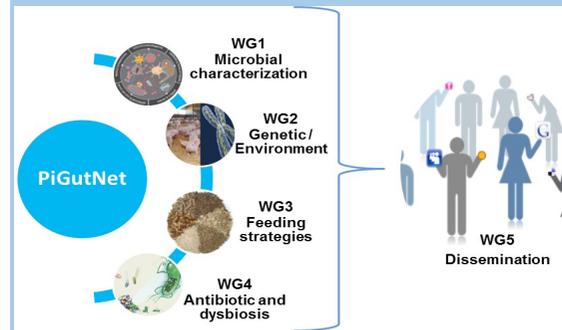
The European Union (EU) is facing major challenges in the area of farm animal production. Pork is the most important meat source in many European countries but its manner of production is criticized by consumers and other groups for paying insufficient attention to animal welfare and the wide use of therapeutic antibiotics to control GIT diseases. The latter practice promotes the development of multi-resistant bacteria, challenging animal health and welfare as well as food safety. The EU has prioritized to combat the threat of antimicrobial resistance. Therefore, strategies are needed to improve animal health. The stability of the GIT microbiota, therefore, is of utmost importance for achieving this goal. The establishment of a "balanced" intestinal microbiota is determined by host factors and a broad spectrum of environmental factors with husbandry and feeding practices being the major sources of variation. Optimizing GIT maturation is a major goal for preventive strategies against infectious diseases in pig. PiGutNet will establish the first network focused on this topic.



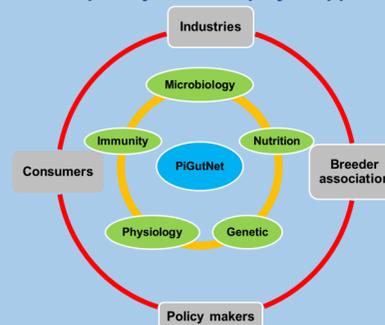
To disentangle all the factors involved in the gut microbial balance, PiGutNet network consider the following 4 gaps:

- Gap 1 • **Molecular microbiology**
- Gap 2 • **Environment and host genetic**
- Gap 3 • **Feeding strategies**
- Gap 4 • **Antibiotic resistance**

The 4-year PiGutNet program will be carried out within 4 working groups (WGs).



Multidisciplinary and Multiplayer Approach



Objectives of COST Action FA1401

Main objective of the Action:

Increase the knowledge about the effect/interaction of environmental and genetic factors on the composition of the microbiota in the gastrointestinal tract of pigs and to improve the risk management associated with antibiotic resistance in pig production.

Secondary objectives:

- Develop and standardize metagenomic tools to define the composition and functionality of the microbiota in the GIT of pigs, characterizing the potential role of genomics, including the approach of genome-wide association studies (GWAS), to assess the link between host genotype and the pig gut microbiome. This approach may provide the opportunity to include the GIT microbiome in genomic indexes as phenotype

- Coordinating the methodological approaches to define the baseline for an "optimal" microbial gut colonization at various age of the pigs, and define a priority list of factors able to determine the occurrence of dysbiosis in the GIT of pigs, consequently providing a roadmap to develop novel tools for improving health status.

- Develop a continuity concept in which the chain from sows to piglets to fattening pigs is considered and the GIT microbiota is optimized at each stage of production.

- Evaluate the risks associated with long-term antibiotic exposure to the variability of the gut microbiota and to quantify its effect on the health status of pigs throughout life.

- Exchange of experiences and knowledge, protocols, experimental design, data acquisition and analysis strategies between the PiGutNet partners.



Working Groups

In order to achieve the above objectives, five working groups have been established along three main work packages, corresponding to the structure of the Action:

WG 1 - Functional and genetic characterization of microbial communities in the gastrointestinal tract of pigs

Chair Dr. Sara Botti (IT)
Co-Chair: Prof. Mick Bailey (UK)

WG 2 - Genetic and environmental factors to understand dysbiosis including their interaction (epigenetics)

Chair: Charlotte Lauridsen (DK)
Co-Chair: Jordi Estelle (FR)

WG 3 - Feeding strategy to maintain/restore the gut homeostasis

Chair: J. Francisco Perez (ES)
Co-Chair: Jan-Erik Lindberg (SE)

WG 4 - Antibiotics as a factor of dysbiosis and spread of antibiotic resistance genes

Chair: Papadopoulus Dimitris (EL)
Co-Chair: Geert Bruggeman (BE)

WG 5 - Knowledge and management exchange

Chair: Olivera Djuragic (RS)
Co-Chair: Geert Bruggeman (BE)



Contacts

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COST Action FA1401

European Network on the Factors Affecting the Gastro-Intestinal Microbial Balance and the Impact on the Health Status of Pigs
(PiGutNet)

'Domain Food and Agriculture'

Partnership

COST Action Country:

Austria; Belgium; Croatia; Czech Republic; Denmark; France; Germany; Greece; Ireland; Italy; Netherland; Norway; Poland; Portugal; Republic of Serbia; Romania; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom

Near Neighbour Country:

Albania

International Partner Country:

Australia; Canada; China

Organization:

European Federation of Animal Production

More information are available at:

- <http://www.cost.eu/>



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