Improving pig system performance through a whole system approach (PigSys)

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Overview objectives
Main findings

• A growth-bioclimatic model called Thermipig was developed (Python).
• Simulates the thermal balance (outdoor conditions) and the heat produced by the animals
• Mechanistic, dynamic and deterministic model
Decision support system (DSS)

- A data warehouse developed, updated and models (LCA and Thermipig) have been integrated.
- Data: INRAE, IFIP, SEGES, UniKassel, TLLLR, UNEW, SLU
Detection and control models

• Information from different sensors (NH$_3$, CO$_2$, temperature, humidity, air velocity).
• Data from different time and locations were recorded.
• Artificial intelligence-based monitoring system was developed and tested (Python).
• Data and sensor fusion models were developed.
• Control algorithms and failsafe functions for climate control were developed.
Emission and waste reduction

- Cooling the pigs during summer changes the occupation zone towards the lying area, decreases pen fouling and reduces ammonia emission.
Environmental and economic

• An integrated whole-farm life cycle assessment and environmental abatement cost analysis framework were developed.
Management and Dissemination

• Stakeholders were involved in the project

• The project website was developed and updated

• The project video clips about the findings

• Special issue of the journal “Sustainability”

• Series of monthly articles in Pig Progress, starting in November 2020.
Associate Partners

PigSys

Hölscher + Leuschner
Stallbau + Stalltechnik

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