

ProPIG

Farm specific strategies to reduce environmental impact by improving health, welfare and nutrition of organic pigs



Main research questions:

- ProPIG defined and compared the three most common husbandry systems in the EU (outdoor, partly outdoor, indoor) with respect to environmental impacts and animal health and welfare, with the hypothesis that, when well managed, all three housing systems are similar.
- ProPIG investigated, if good animal health, welfare and proper nutrition are correlated with decreased environmental impacts at farm level. The hypothesis tested was, that improved health and welfare impacts positively on the environmental impact through e.g. decreased medicine use, improved growth rates and feed conversion efficiency.
- During proPIG farm specific management strategies were implemented and the hypothesis tested, that implementation of improvement measures can improve animal health and welfare, profitability and feed management.



Main outcomes at this stage?

Three husbandry systems were defined, which are compared regarding the situation of animal health and welfare and environmental impact.



A



B



C

- a) Outdoor Pigs live permanently outdoors in paddocks with shelter for sleeping but unrestricted access to the soil (shelter could be a temporary hut or permanent building). The paddock is integrated in crop rotation and not just a sacrifice area for permanent pig use.
- b) Indoor – pigs live in buildings with access to an outdoor concrete run or a small sacrifice soil area for permanent pig use - not integrated into crop rotation.
- c) Partly outdoor – pigs spend part of the production cycle in each system type (at least one production stage is fully housed while the rest is outdoor. A production stage could be dry sows, lactating sows, e.g. group suckling, weaned piglets or finishing pigs. The combination of indoor and outdoor production might occur within the same farm or in linked farms if piglets are produced on one farm but finished on another, or within a seasonal housing of animals outdoors (“Swedish system”).

Farm visits

From June 2012 until December 2013 farm visits were carried out in Austria (16 farms), Germany (16), Denmark (11) Switzerland (9), Czech Republic (1), France (4), Italy (9) and UK (9).

- During the first visit the farmer was interviewed, a representative number of animals assessed, medicine and productivity records collected and feed samples taken.
- During the second visit, farm individual results were discussed with the farmer and specific goals and measures for each farm were agreed. The project partners’ role in this task was to act as facilitators. Additionally soil samples were taken on selected farms.
- The third visit included a complete assessment of all farms using PigSurfer, as well as immediate feedback, which included detailed information and benchmarking across all 75 pig farms as well as a within-farm comparison with the first visit.

"PigSurfer"

The Automated Recording and Feedback Software Tool ("PigSurfer"= PIG SURveillance, Reporting and Feedback) consists of the Software "PigSurfer" and is available as Android or Desktop version. It can easily be taken directly into the pig barn. Data can be uploaded into the existing data bank of 75 organic pig farms, benchmarked against these and printed.

All important aspects are included: animal welfare (e.g. scan sampling of oral behaviour), health (e.g. MMA treatments), nutrition (e.g. thin sows, feed ration), environmental impact (e.g. manure management). This enables a discussion with all involved and to agree on areas and measures to improve.

Feeding strategies

Farmers were asked to describe their feeding practices and for all farms, the nutrient content of feeds used was recorded, either from the manufacturer's claim or calculated from ingredients. Four farms used a single diet for all pigs, 46 % fed the same diet for all sows, 58 % for fatteners, 73 % for weaners. Results suggest using specific feeding for different types of pigs according to their needs may improve feeding efficiency and reduce the environmental impact.

Life Cycle Assessments (LCA) across the three housing systems (preliminary results)

Greenhouse gas emissions (CO₂-eq.) as well as acidification eutrophication potential, N and P balances were calculated for each farm. fatteners feeds used efficiency had most impact on greenhouse gas emissions, but the three husbandry systems did not differ regarding this aspect.

Two Decision support tools:

- All improvement measures implemented by farmers are collected as a "Catalogue of improvement strategies" which is the basis for a "Booklet" for farmers as a simple support to take into the pig barn.
- "A Decision support tool for environmental impact" was developed based on the data regarding environmental impact as well as expert opinion and literature, which provides an excel sheet as a guiding through several areas, which can influence the environmental impact on an individual farm. As a summary, areas to improve and positive factors can be shown to the farmer as green and red bars.





Recommendations to end-users

- (Organic) pig farmers: the tools developed will be suitable for all kind of indoor/outdoor organic pig farmers, but might also be applicable (or adaptable) for conventional farmers
- (Organic) associations: the tools developed can potentially be used within a producer group as monitoring and improvement support
- (Organic) Advisory bodies/veterinarians: tools allow an overall picture of the farm to monitor the situation as a preventative tool and to identify the most important areas for improvement
- Agricultural chambers and ministries across Europe: the scientific knowledge gained on animal health and welfare as well as environmental impact of the three husbandry systems can provide a basis for decision making.

Relevance

All outcomes (PigSurfer including farm reporting, Environmental Decision Support tool, Booklet with improvement strategies) can be used as above, however, they could also be adapted to other species (e.g. as “CowSurfer”) or other farming systems (e.g. the environmental decision support tool for arable farms) in various (European) countries.

New and important research questions

- Life Cycle Assessment is still a challenge for outdoor farms, as existing models are mainly based on indoor/conventional farming systems – this is caused by a lack of data on e.g. nitrogen leaching at different levels of vegetation cover.
- Partly outdoor systems offer a good opportunity for organic pig farming, however a huge variety exists in Europe. It would be interesting to look into this system in more detail by collecting data on more farms, e.g. within and across age groups, to gain more insight into animal health, welfare and environmental impact.

Coordinator

Christine Leeb, BOKU University of Natural Resources and Life Sciences, Austria
E-mail: christine.leeb@boku.ac.at

Partners

Barbara Frueh, FiBL Research Institute of Organic Agriculture, Switzerland
Gillian Butler, Newcastle University, United Kingdom
Davide Bochicchio, CRA – SUI Agricultural research council, Italy
Armelle Prunier, Institut National de la Recherche Agronomique, France
Tine Rousing, Aarhus University, Denmark
Sabine Dippel, Friedrich-Loeffler-Institut, Germany
Gudrun Illmann, Institute of Animal Science, Czech Republic
Jiri Urban, Institute for Organic Agriculture and Sustainable Landscape Management, Czech Republic

Find all publications at orgprints.org/view/projects/ProPIG.html.



Further information

This project is funded via the ERA-net CORE Organic II by national funds to each partner. CORE Organic II is a collaboration between 21 countries on initiating transnational research projects in the area of organic food and farming. In 2011, CORE Organic II selected ProPIG and 10 other projects.

Read more at coreorganic2.org/ProPIG.