



## Welfare barriers and levers for improvement in organic and low-input outdoor pig and poultry production systems

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## THE MULTI-ACTOR PPILOW EUROPEAN PROJECT (2019-2024): A PARTICIPATIVE APPROACH TO CO-BUILD INNOVATIONS FOR WELFARE IMPROVEMENT IN ORGANIC AND OUTDOOR PIG AND POULTRY FARMS

Coordination: **INRAE**  
la science pour la vie, l'humain, la terre



The PPILOW project aims to co-construct innovations to improve Poultry and Pig Welfare in Low-input outdoor and Organic farming systems through a multi-actor approach



# Why is it important to consider welfare in organic and low-input outdoor farming systems?

- High quality of the rearing system and of the products
- Diversity of practices throughout Europe
- Still a need to improve animal welfare and limit mortality, in relation to outdoor access challenging the animals, ethical issues, the wish of practitioners and societal expectations

Evaluation of the welfare-improving practices by taking into account environmental, economic and social impacts *including human well-being (practitioners, consumers, citizens)*

*One Welfare Concept (Garcia Pinillos et al., 2016)*

## PPILOW partners and collaborators



**PPILOW**

Poultry and Pig Low-input and Organic production systems' Welfare

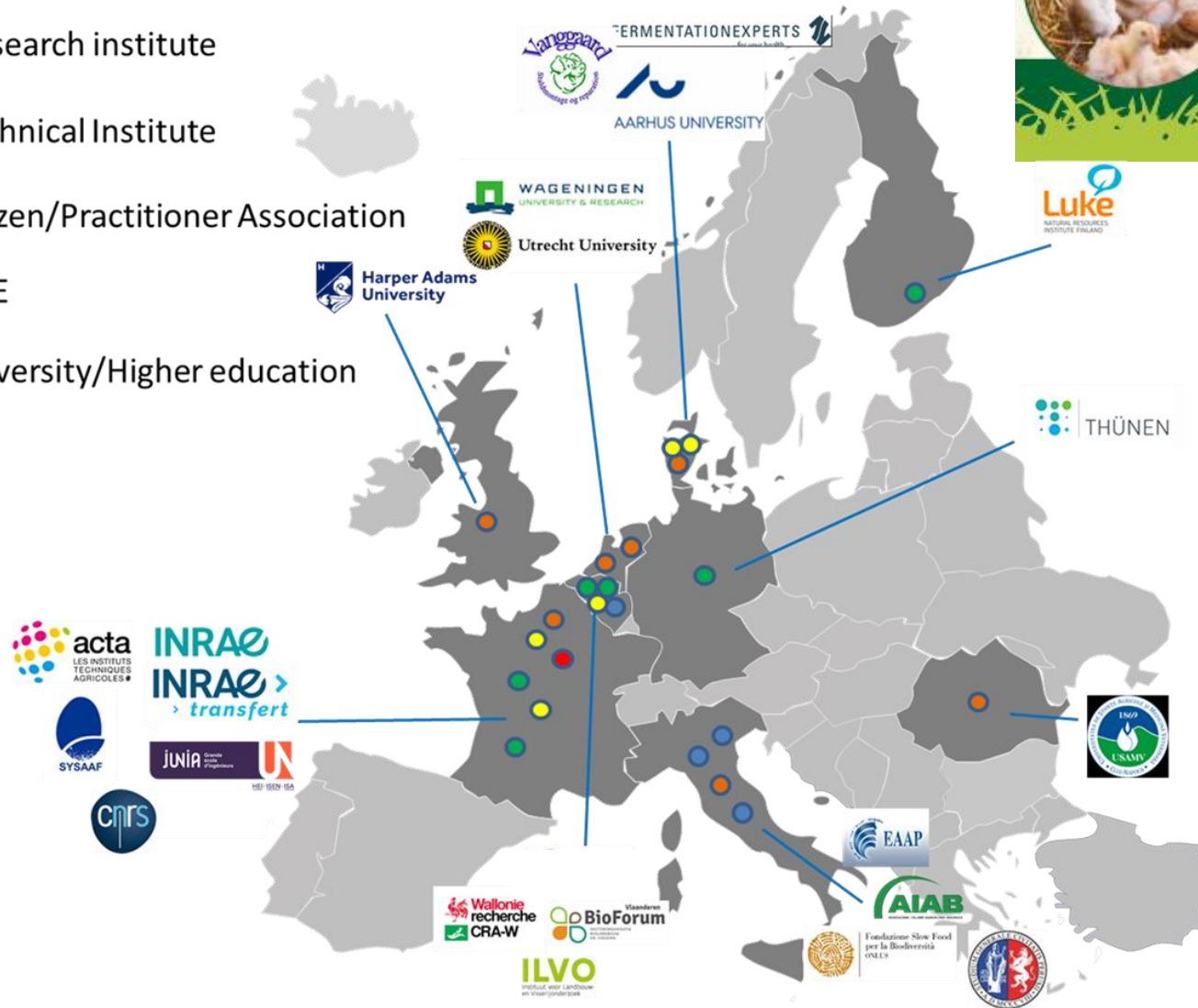


22 PPILOW Partners in 9 countries

9 National Practitioner Groups (NPG): 4 dedicated to pigs and 5 to poultry

[www.ppilow.eu](http://www.ppilow.eu)

- Research institute
- Technical Institute
- Citizen/Practitioner Association
- SME
- University/Higher education



## Innovative breeding and rearing strategies



*Favouring positive behaviours, improving health and robustness*

*Avoiding piglet castration, beak trimming, the elimination of layer male chicks*

The overall aim of **WP1** was to understand which **ethical, socio-economic and technical factors (barriers, levers)** are essential to **improve poultry and pigs welfare** in organic and low-input outdoor production systems

- **WP 1.1: Inventory of animal welfare practices in organic and low-input outdoor production systems**
- **WP 1.2: Stakeholder expectations towards organic and low-input farming**
- **WP 1.3: Adequacy of production practices to interest groups and citizens' expectations**
- **WP 1.4: Economic viability and value-adding potential of strategies improving animal welfare**

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An inventory of animal welfare practices in organic and low-input outdoor livestock production systems



Data from literature and research projects





An inventory of animal welfare practices in organic and low-input outdoor livestock production systems



Data from literature



complemented with  
interviews of key informants

**Objectives of the interviews:**

- To identify gaps and opportunities for animal welfare
- To obtain depth information on frameworks for solving the animal welfare challenges

**Interviews with 11 key informants working within the supply chain**  
(in Finland, France, Italy, UK)



## PPILOW WP1.1 What are the issues in poultry production ?


Data from publications and research projects

Health	Animal behaviour	Management practices
Parasitism Digestive diseases Arthrosis, Pododermatitis Fractures, Osteoporosis Mortality Lack of alternatives to antibiotics Poor water quality Lack of robustness Unsuitability of biosecurity rules	Feather pecking  Fearfulness  Low use of the outdoor space  Lack of expression of natural behaviour	Risk of predation  Weather risks  Human welfare/well-being  Need to increase time spent with the animals by farmers  Depopulation & loading procedure  Range management

*Bonnefous et al. 2022, Frontiers Vet. Sci.*

# PPILOW WP1.1 What are the main issues in poultry production ?

## From the interviews



	United Kingdom		Finland
	<i>Field management</i>		<i>Human welfare</i>
<b>France</b>	<ul style="list-style-type: none"> <li>Worm infection</li> <li>Pododermatitis</li> <li>Arthrosis</li> <li>Water quality</li> <li>Time spent by farmers</li> <li>Catching</li> <li>Nervousness</li> </ul>	<ul style="list-style-type: none"> <li>Fractures</li> </ul>	<ul style="list-style-type: none"> <li>Feather pecking</li> <li>Weather</li> <li>Robustness</li> </ul>
<b>Italy</b>		<ul style="list-style-type: none"> <li>Food</li> <li>Biosecurity</li> <li>Lack of range use</li> </ul>	<ul style="list-style-type: none"> <li>Predation</li> <li>Environment</li> </ul>
		<ul style="list-style-type: none"> <li>Regulation</li> <li>Flock size and density</li> </ul>	

# PPILOW WP1.1 What are the levers in poultry production ?

Food  
Biosecurity  
Lack of range use

Type of item to be altered	Rationale of solutions: examples in broiler chickens
Food: Using new raw materials	Insects, resources found on the range
Food: Producing one's own diet	Feed composition, Feed manufacture
Biosecurity: Need for new treatments	Probiotics, phytotherapy
Biosecurity: Regulation non adapted to free-range	New insights in food-borne diseases and in the biosecurity concept
Lack of range use: Heat and/or bad weather	Range design and management Trees, verandas, winter gardens
Lack of range use: Range design and management	Personality traits, genetics Relationship with physiological parameters



# PPILOW WP1.1 What are the levers in poultry production ?

## Example: Feather pecking

Type of item to be altered	Rationale of solutions in laying hens
Management: housing	Enrichment, lighting programme, litter quality
Management: outdoor space	High use of the outdoor space
Management: nutrition	Feed distribution: Scattering feed on the floor Reduced diet change occurrence during the laying period Feed presentation and composition
Management: early life management	Enrichment as pullets. Specific light during incubation? Adjusting the time when pullets get access to the range Type of heating ?
Management: flock characteristic	Adding cockerels in the flock?
Management: enrichment	Perches and material to redirect foraging behaviour.
Genetics	Changing genetics and breeding?



# PPILOW WP1.1 What are the issues in pig production ?

Data from publications and research projects

General remark: **huge heterogeneity among countries, systems and among farms**

⇒ huge diversity of problems, that are highly **farm-dependent**

⇒ **solutions often already exist**

## Sows

Endo and ecto-parasitism

Reproduction: issues related to estrus, poor conception rate and abortion

## Piglets

Neonatal mortality (crushing, chilling)

Hunger, anemia, nutritional deficiency

Diarrhoea

Endoparasitism

## Grower pigs

Diarrhoea, respiratory problems: less significant outdoor than indoor

Endoparasitism






# PPILOW WP1.1 What are the main issues in pig production ?

## From the interviews

		United Kingdom	Finland	
		Destruction of park Pollution	Human welfare Biosecurity	
France	Parasitism Insolation burns Aplomb Parturition in freedom	Aggressiveness Competition Water quality	Feeding Cannibalism Mortality Weather	
Italy	Castration	Predation Robustness		
	Environment plan		Lack of range use	Flock size and density

# PPILOW WP1.1 What are the levers in pig production ?

## Mortality and welfare in piglets

Type of item to be altered	Rationale of solutions: examples in sows and piglets
Management: housing	Huts that protect against heat and cold
Management: housing	Efficient control of temperature, humidity and air quality in the house
Management: Sow behaviour	Well designed pen partitioning to avoid piglet crushing
Management: Sow behaviour	Materials and pen design which allow the sows to build a nest
Sow health	Sow nutrition and environment Phytotherapy in sows
Genetics	Selection for increased robustness and reduced mortality  Selection for maternal behaviour

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Identify opinions of stakeholders regarding:  
poultry and pig welfare in organic and low-input outdoor farming  
the production practices currently employed  
and the buying behaviour of consumers

Focus groups



- **Lack of consensus as to what constitutes the best practices**

- **Labelling was considered important** in communicating information regarding production systems and animal welfare to consumers,  
**however the people were often confused**  
This reduces the efficacy of communication

- **Industry members showed interest in a smartphone app** for welfare self-assessment on farm.

App extended

**EBENE®**

App developed



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### Farm survey

- Farmers indicate that several measures are not applicable despite their benefits:  
e.g. increasing space
- Some of the measures divided opinions:  
castration, beak trimming, killing day-old male chick
- Higher production costs have to be covered by increasing market prices or by other means

### Citizen survey

- Expectations for animal welfare, examples:  
Special expectations / without welfare requirements  
Systems “pleasant” for animals
- Buying behaviour: various influences
- Willingness
  - to get information
  - to pay

Many differences between countries

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## How costly the measures are and do they involve economic benefits?

### Examples in pigs

- **Economic value addition of measures was**



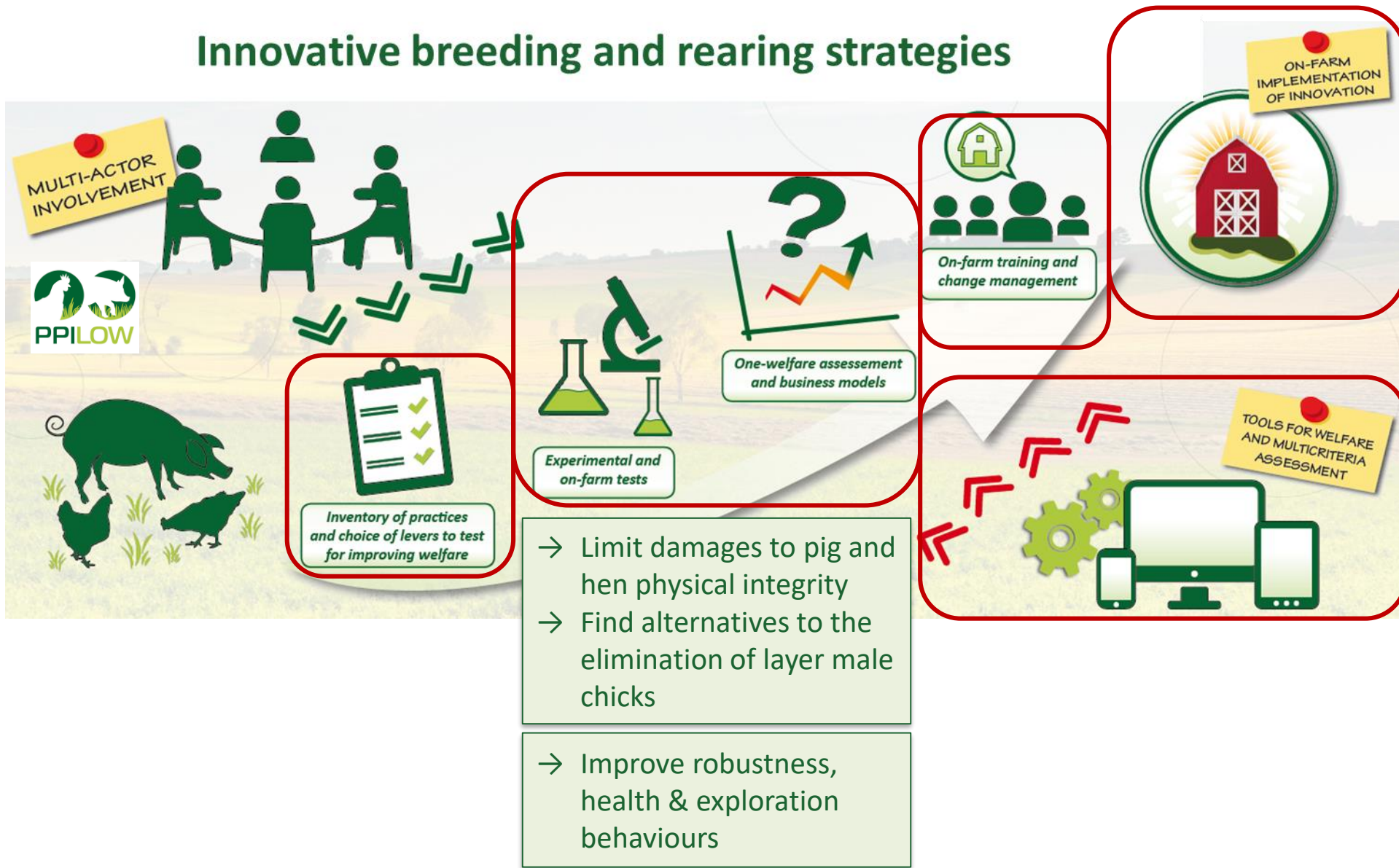
<b>Positive:</b>	Biosecurity	+ € 6.4 or more per pig
<b>Unclear:</b>	Genetic selection for low aggression	± € 0.3/finished pig
	Management to reduce piglet mortality	± € 5.1/pig
<b>Negative:</b>	Specific nutrition to lower aggression	- 3.8 c/kg meat



**Several measures were found to be potentially applicable and viable:****Examples  
for pigs**

- **Nutritional** measures, **Genetic selection & Management** to
  - to reduce sow's aggression and susceptibility to environmental stressors outdoors
  - to enhance pig health and reduce piglet mortality ★
- **Enhanced biosecurity**, hygiene and monitoring, **Plants & plant extracts**
  - to reduce antimicrobial use
  - to limit parasitic and bacterial infection pressure
- **Range & Outdoor management**, innovative, animal-friendly hut design
- The rearing of **entire male pigs** ★
- **Welfare self-assessment tools** ★

## Innovative breeding and rearing strategies



## Several communications on PPILOW results will be presented in session:

- Range use relationship with welfare and performance indicators in four organic broilers strains – [Bonnefous et al.](#)
- Case study of a newly-developed genotype for dual-purpose rearing of male chicks – [Lombard, Pluschke et al.](#)
- Poultry production: Using dual-purpose genotypes to reduce the culling of day-old male chicks? – [Niemi, Thobe et al.](#)
- Animal welfare and pork quality of intact male pigs in organic farming according to genotype – [Lebret et al.](#)
- Large White genetics in organic system: breeding for piglet survival – [Canario et al.](#)
- Comparing animal welfare assessments by researchers and free-range pig farmers with the PIGLOW app – [Graat et al.](#)



## Poultry and Pig Low-input and Organic production systems' Welfare

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*Register to PPILOW  
Autumn school*  
[www.ppilow.eu](http://www.ppilow.eu)

### PPILOW Autumn School

**"How to improve welfare in poultry and pig low input outdoor and organic farms?"**

25-27 October 2023, Assisi (Italy) - Registration deadline: 6 September 2023

Registration

*Thank you for your attention*



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