



PPILOW

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



PPILOW, a European project dedicated to Welfare in Poultry and Pig Low-input outdoor and Organic production systems (2019-2024)

Newsletter - Issue 1

March 2020



The PPILOW project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement N°816172.



SUMMARY

The H2020 PPILOW project (2019-2024) has started!	2
Reports on the different WPs	3
2.1 WP1: The diversity of farming systems in Europe – by Jarkko Niemi (LUKE)	3
2.2 WP2: The first meetings on the multi - actor groups – by Martina Re (AIAB)	4
2.3 WP4: The first PPILOW chicks have hatched! - By Saskia Kliphuis (UU)	4
2.4 WP5: The best of both worlds - dual-purpose genotypes for organic agriculture - by Lisa Baldinger (Thuenen), Sanna Steinfeldt (AU), Maxime Reverchon (INRAE), Antoine Roinsard (ITAB)	5
2.5 WP6: Cognitive abilities and behavior of free-range broiler chickens - by Vitor H. B. Ferreira, Arthur Simoni, H�el�ene Leruste (YNCREA HDF), Karine Germain (INRAE, UE EASM), Elisabeth Duval, Sandrine Grasteau, Elodie Guettier, Ludovic Calandreau (INRAE Val de Loire), Vanessa Guesdon (YNCREA HDF)	6
New people in PPILOW project: Claire Bonnefous, Arthur Simoni, Vitor Ferreira	7
Upcoming events PPILOW Participation	8

The H2020 PPILOW project (2019-2024) has started!

The Kick-off meeting of the H2020 PPILOW project: ‘Poultry and Pig Low-input and Organic production systems’ Welfare’ was held at the INRA Headquarters in Paris, 4th to 6th of September 2020. Supported by 6 members of its European Multiactor Board, DG AGRI of the European Commission, 81 representatives of the 23 partners from 9 countries (Belgium, Denmark, Finland, France, Germany, Italy, The Netherlands, Romania, United Kingdom), the PPILOW multi-actor project started by building up the interactions between multi-actor groups and project partners.

The objective of PPILOW is to co-create with end-users welfare self-assessment tools and innovative breeding and rearing strategies and techniques for improving animal and human welfare based on robust scientific sets of data.

The innovations co-created thanks to tight interactions with 9 National Practitioner groups will allow to 1) prevent piglet castration by identifying genotypes allowing the rearing of entire male pigs without undesired impacts on behaviour and meat quality; 2) find enrichment alternatives to limit feather pecking while not trimming the beak of laying hens; 3) study two strategies for avoiding the elimination of one day-old layer male chicks, on the one hand by rearing dual-purpose strains efficiently producing both eggs and meat, and by building-up a non-invasive in-ovo sexing method; 4) propose breeding and management strategies for favoring positive behaviours and improving health and robustness in both species.

The feasibility of the proposed approaches and their impacts according to the ‘One welfare’ concept will be evaluated through appropriate multicriteria analyses and business models and the change in field practices will be facilitated through the interactions with the National Practitioner Groups.

The PPILOW consortium has started the work programme by identifying barriers to welfare in organic and low-input outdoor pig and poultry rearing systems and levers of improvement, adopting shared tools for evaluating

welfare and sustainability, and beginning to test experimentally and on-farm strategies and techniques for improving welfare in these systems in a participative approach.



Reports on the different WPs

2.1 WP1: The diversity of farming systems in Europe – by Jarkko Niemi (LUKE)

There is a diversity of low-input outdoor and organic farming systems in Europe. This is evident based on the characteristics of about 90 different organic or outdoor pig and poultry farming systems, animal welfare labels and regulatory frameworks for identified by PPILOW work package 1. Current European Union (EU) organic regulation sets the minimum standards for European organic production. These include, among other things, requirements on group housing and access to exercise (pigs) or open-air area (poultry) as well as prohibition to use cages, boxes, flat decks, preventive antibiotics or restricted feeding in organic farming. In pig farms, the organic rules require straw bedding in some pig groups, nest building possibility and non-slatted resting area, whereas physical castration and tail docking may be allowed in certain cases. In poultry, access to vegetation-covered area and some solid floor area is required by the EU rules, and beak trimming may be allowed in special cases. However, in some member states, such as Germany, actors have developed modified organic systems which go beyond the minimum standards in one or more areas. An example of a standard beyond the minimum is a poultry system which avoids killing day-old male chicks by using dual-purpose breeds. In addition, there are biodynamic labelled farming systems which feature space allowance, feed, sand bathing or group composition characteristics close to the EU organic requirements. Free-range non-organic systems appear to be more diverse than organic. For instance, in the United Kingdom, there are different outdoor farming systems on the market. The main difference between conventional and free-range system is the outdoor run requirement. However, the specification of outdoor run varies from system to system, and can include fixed floor or soil ground either with or without vegetation, grazing or agroforestry, and with or without additional

space allowance indoors. Some free-range systems also require using slow-growing breeds or are antibiotic-free production. While different farming systems may focus on similar characteristics of animal welfare, the actual requirements can vary widely. For example, in layers the minimum required outdoor area varies between 2 and 8 birds/m², and the maximum poultry flock size from 500 to more than 10 000 birds, if restricted at all. Some outdoor systems are mobile. This often refers to a mobile shelter wagon which can be transported from one pasture to another. The benefit of mobile housing is improved outdoor run quality and rotation when compared to fixed housing. Sometimes outdoor production is also associated with small-scale local farming with specialty breeds, such as Mangalica pigs, or short supply chain. Hence, investigations on the organic or outdoor pig and poultry farming systems, animal welfare labels and regulatory framework indicated that there is no one-size-fits-all definition for a low-input farming system.

2.2 WP2: The first meetings on the multi - actor groups – by Martina Re (AIAB)

The WP2 has organized the first meeting of the facilitators of PPILOW's National Practitioners Group (NPG) in Amsterdam (NL) from the 12th to the 13th of November 2019. During this meeting we discussed about how to facilitate our national groups (both for poultry and pigs), which actors need to be involved, which information and issues we need to address in our future meetings and how to report them.

The aim is to involve about 15 to 20 persons per NPG, some of them will be part of the core group for the 5 years of the project, while other actors will change depending on the topic discussed.

Subsequently each facilitator has contacted different stakeholders, in order to better represent the production chain from farmers to consumers and citizens.

During the first NPG meetings, each group has explored the most important topics concerning animal welfare in organic and outdoor production systems. Almost all countries have carried out the first NPG meeting, except Italy because of the Coronavirus emergency. The PIGLOW and EBENE applications, aiming at enabling pig and poultry welfare self-assessments, respectively, by farmers and advisers, have been presented and first feedback have been given on indicators to select by the NPGs.

2.3 WP4: The first PPILOW chicks have hatched! - By Saskia Kliphuis (UU)



Figure 1 - Saskia with chicks -© UU

The year 2020 had a very exciting start for the PPILOW project. On the 8th of January, we started the incubation of the laying hens for WP4. Using these chickens, we will investigate whether early-life improvements can reduce fearfulness and feather pecking and stimulate outdoor range use in later life. Half of the eggs were incubated in complete darkness, which is standard in commercial hatcheries, while the other half received a light-dark cycle of 12:12 hours with green light, which has been shown to have a positive impact on avian brain development and reduce feather pecking in previous studies. The last three days of incubation, we monitored hatching in shifts every six hours, in order to see if the light treatment has an effect on the hatching window. Quite exhausting, but very rewarding to see the first chicks of the PPILOW project! Since hatch, the chicks have been housed at Utrecht University, in 20 groups of 10. From one week of age onwards, half of the birds have been receiving daily enrichment in the form of a food puzzle with black soldier fly larvae. It didn't take the chicks long to figure out the puzzle, and they spend quite some time manipulating these dispensers! We have gathered a team of enthusiastic students around us, who will help us the following months with collecting data from behaviour tests and home pen

observations. Special thanks go to my colleague Maëva Manet, who started her PhD in the Horizon2020 ChickenStress project at the same time as I started mine. We collaborate since we both aim to improve laying hen welfare. In the light of the three R's (Replace, Reduce, Refine), this means more data with fewer animals! When I'm not busy with my 200 feathered kids, I'm working on establishing a National Practitioner Group of Dutch poultry farmers, with whom we can exchange ideas on how to further improve laying hen welfare. Together with these Dutch farmers, we aim to build the bridge between science and practice and really make a difference for laying hens on low-input and organic farms!



Fig. 2 and 3 - Incubation with green light and Chicks hatching - © UU

2.4 WP5: The best of both worlds - dual-purpose genotypes for organic agriculture - by Lisa Baldinger (Thuenen), Sanna Steinfeldt (AU), Maxime Reverchon (INRAE), Antoine Roinsard (ITAB)

While the European regulation for organic agriculture (Regulation 2018/848) encourages the choice of locally adapted breeds, so far most organic poultry farmers rely on the same genotypes as their conventional colleagues. For meat production, slow-growing broiler strains are used, with the definition of slow-growing varying between countries. In egg production, male siblings of high-performance layer hybrids are culled after hatching because of their low growth potential and meat quality. This ethically questionable practice has caused increasing public concern. Consequently, the German and French ministers for agriculture have recently declared their will to abandon the culling of day-old male layer chickens until the end of 2021. Apart from the not-yet widely practicable option of in-ovo sexing, another alternative is the use of dual-purpose genotypes. In contrast to specialized meat birds or layers, dual-purpose genotypes are characterized by a more balanced performance profile including a lower number of eggs but better fattening performance of both males and females. In order to evaluate such genotypes on a European scale, PPILOW will test three dual-purpose genotypes in three countries, namely France, Denmark and Germany. The genotypes have been selected in cooperation with breeding companies able to supply high numbers of chickens if demand increases. The comparison of their production potential under the different husbandry and feeding conditions will yield valuable information for farmers and breeders. In each country, one additional, commonly used genotype will serve as a control. Among the collected data are performance parameters such as feed consumption, weight gain and laying performance, but focus will also be put on the behaviour of the birds in the outdoor run, welfare indicators and meat and egg quality. The first female dual-purpose chickens have already been hatched and are currently being reared at Aarhus University in Denmark (see photos). They will reach maturity in April 2020, after which their laying performance will be tested. Trials in France and Germany will start in May 2020.



Fig. 1, 2 and 3 - three dual-purpose genotypes. Fig. 4 control genotype for Denmark - © Sanna Steinfeldt - AU

2.5 WP6: Cognitive abilities and behavior of free-range broiler chickens - by Vitor H. B. Ferreira, Arthur Simoni, H el ene Leruste (YNCREA HDF), Karine Germain (INRAE, UE EASM), Elisabeth Duval, Sandrine Grasteau, Elodie Guettier, Ludovic Calandreau (INRAE Val de Loire), Vanessa Guesdon (YNCREA HDF)

In free-range systems, some animals explore the outdoor range more than others. Scientific studies have already shown that range use depends on numerous factors such as season, weather, time of the day, presence of plant cover, or even internal factors such as age, sex, and breed. When all these factors are controlled, and the conditions are kept similar, there is still a great variation in range use between individuals of the same flock. Some chickens are more constant in their range use and exploration than other chickens, who prefer to stay in or close to the barn. For sanitary, welfare, and commercial purposes, it is important that animals use the available range more frequently and homogeneously.

The first experiments of the PPILOW WP6.1 focused on the search for early and stable behavioral signs of range use. Before and after range access, chickens from two flocks (spring and fall), reared under the same conditions, were followed continuously from a young age until slaughter age, through behavioral observation and individual testing on multiple situations. The results of these experiments (currently under analysis) are expected to identify whether and how more and less exploratory individuals differ in their behavioral patterns, and how stable and reliable these differences are in order to predict future range use. The outcomes of these works can be potentially useful to the selection of more exploratory individuals based on fewer and reliable behavioral criteria before their range access.

Our previous studies on free-range chickens have shown that range use is linked to individual cognition, or, in other words: how chickens perceive, process, and memorize information from their environment. Less exploratory chickens performed better during a spatial memory task and exhibited increased inhibitory control compared to more exploratory ones. These studies, however, started after range access and ended few days before slaughter. For the next experiment of the PPILOW WP6.1, we aim to implement less time-consuming cognitive tests on chicks (before range access) and focus attention on selected behaviors of the first experiments. These studies are needed to understand and better interpret the differences in cognitive and behavioral patterns and to discover by which mechanisms they influence the exploratory behavior of animals. The investigation of the cognitive abilities of farm animals advances our knowledge of their biology. In the case of free-ranging chicken production, this knowledge is essential to design farms better suited to allow animals to express their natural behavior, and thus more respectful of their welfare.



© Vitor Ferreira (INRAE, ISA Lille - Yncréa Hauts-de-France)

New people in PPILOW project: Claire Bonnefous, Arthur Simoni, Vitor Ferreira



Claire Bonnefous (INRAE Research engineer)

After completing her agronomic engineering degree, Claire started working for INRAE on the PPILOW project. Dedicated to the identification of barriers and levers to animal welfare, she is taking part in the first task of the project (T1.1) to reference the main behavioural and health issues in outdoor and organic systems for broilers, laying hens and pig. To do so, Claire is not only looking through peer-reviewed articles but also conducting interviews in order to gather state-of-the-art information regarding current practices in these production systems. As her supervisor, Christine Leterrier, is the task leader of T1.1, coordination of the T1.1 is a consistent part of her work.



Arthur Simoni (Yncréa Hauts de France, Research engineer)

Arthur Simoni studied first veterinary medicine in a bachelor, completed by a master in Applied Ethology at Université Sorbonne Paris Nord (2017-2019). Currently working at Yncréa Hauts-de-France (CASE research group) on Work Package 6.1 regarding free-ranging broiler chicken behavior and cognition in collaboration with INRAE Magneraud (France) and INRAE Val de Loire (France).



Vitor Ferreira (Yncrea Hauts de France, Ph.D. student))

Vitor Ferreira is currently a Ph.D. student at Yncrea Hauts-de-France (CASE research group) under the supervision of Dr. Vanessa Guesdon (Yncrea Hauts-de-France) and Dr. Ludovic Calandreau (INRAE Val de Loire). Vitor has a bachelor's degree in Animal Sciences (UFRA, Brazil) and a master's degree in Psychobiology - Animal Behavior (UFRN, Brazil). Vitor's doctoral research focuses on free-ranging broiler chicken behavior and cognition. Part of his experiments is included and funded by PPILOW Work Package 6.1, in collaboration with INRAE Magneraud (France) and INRAE Nouzilly (France).

Upcoming events PPILOW Participation

- World Poultry Congress (WPC): 16th to 20th August 2020 in Paris, France. Several abstracts will be presented.
- The 8th International Conference on the Assessment of Animal Welfare at Farm and Group Level (WAFL2020): 17th to 20th August 2020 in Cork, Ireland. Some abstracts will be presented.
- The European Association of Agricultural Economist Congress (EAAE): 25th to 28th 2020 in Prague, Czech Republic. Some abstracts will be presented.
- The Organic World Congress (OWC): 21st to 27th September 2020 in Rennes, France. PPILOW will organise a dedicated session.

For more information visit our website:

www.ppilow.eu



[@PPILOWH2020](https://twitter.com/PPILOWH2020)



[@PPILOW](https://www.facebook.com/PPILOW)

- Project Coordinator: Anne Collin, INRAE (BOA Joint Research Unit) anne.collin@inrae.fr
- Project Supervisor: Emmanuelle Lagendijk, INRAE Transfert Emmanuelle.lagendijk@inrae.fr

Disclaimer: the sole responsibility of this publication lies with the authors. The European Commission and the Research Executive Agency are not responsible for any use that may be made of the information contained therein. **Copyright 2020 PPILOW Project, All rights reserved.**

Images Cover ©: CRA-W, ILVO, INRAE-Armelle Prunier, ITAVI, Pascal Le Douarin Réussir Aviculture, VANGGAARD.