



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 3

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NPGs meetings – by Martina Re (AIAB)

Last year, the COVID-19 restrictions were a big challenge for all NPGs since live meetings (the core NPG activity) could not take place. This has been challenging especially because it was the first year of the project. Even now, it remains unclear when the NPG members will be allowed to come together and it is very likely that this timing will vary among different countries. However, NPG facilitators have adapted their strategy and NPG meetings and discussions were organized online. By now, all facilitators have organized at least one NPG meeting. Most NPGs had a second meeting in the end of 2020 or the beginning of this year. Also, the agenda for next year has been developed based on the needs of the NPGs and of the other WPs. In 2021, there will be a strong interaction between WP3 and the NPGs to give feedback on the levers and the indicators to define typical farm systems. WP4 will share the first results of the chicken experiments with the poultry NPGs while poultry NPG in France, Denmark and Germany will be involved in the experiments with the dual-purpose genotypes in Task 5.2. If the involvement of the NPGs is requested in other PPILOW tasks or if somebody wants to share information with the NPGs, please let us know as soon as possible!



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PPILOW first results: Foraging, an early behavioural predictor of range use in free-range broiler chickens? – by Vitor Bessa-Ferreira and Vanessa Guesdon (JUNIA)



Free-range broiler chickens – © JUNIA

Many species prefer to make efforts to acquire their food (or contra-free-load, in scientific language), even when they have readily available food sources, at no cost. The contra-free-loading phenomenon also happens in free-range chicken systems. Although chickens have *ad libitum* food in the barn, they spend some of their energy exploring and searching for food (i.e., foraging) in the range. In a recent paper (Ferreira et al., 2021), researchers from JUNIA and INRAE tested whether individual differences in range use were linked to contra-free-load. They followed chickens' behaviour all over their productive cycle, from chicks, before they had access to the range, until some days before slaughter. They also tested chicken behaviour in a standardized testing situation: in a two-chambered apparatus, chickens were exposed to a chamber where the mealworms were readily available on the floor, while in the other chamber, mealworms were mixed with foraging substrates, therefore finding and eating them was more difficult. Finally, to test their contra-free-loading motivation, chickens were exposed to both empty chambers. The time spent on each one was quantified. The results showed that chickens who spent more time

foraging in their home environment (barn and range) and those who preferred the chamber where mealworms were hardly accessible were more prone to use the range than those who foraged less and preferred eating the easily accessible mealworms. Interestingly, the results also showed that these differences can be seen in chicks before they accessed the range, which points to an early predictive behaviour of range use that merits further investigation. Follow-up experiments are in progress, more results to come in a future PPILOW newsletter.

Ferreira, V. H. B., A. Simoni, K. Germain, C. Leterrier, L. Lansade, A. Collin, S. Mignon-Grasteau, E. Le Bihan-Duval, E. Guettier, H. Leruste, L. Calandreau, V. Guesdon. 2021. Working for food is related to range use in free-range broiler chickens. Sci. Rep. 11:6253. Available at <https://doi.org/10.1038/s41598-021-85867-2>

PPILOW Current activities

3.1: Adapting the rearing of dual-purpose breeds in PPILOW experiments in times of avian influenza! - by H. Pluschke (Thuenen) with contributions Thuenen, INRAE, AU, ITAB and SYSAF

Danish and German experiments compare both males and females of dual-purpose crossbreeds to local breeds and currently-used genotypes of layers and broilers, and males are also evaluated in France. These experiments are part of PPILOW strategies of Work package 5 aiming at proposing alternatives to the killing of day-old layer male chicks. However, since October 2020, regional outbreaks and cases of the highly pathogenic avian influenza (HPAI) have been reported in various European countries. The spread of the avian influenza is closely connected to the routes of migratory birds. As a consequence, various precautionary measures, often referred to as a stamping-out strategy, have been put in place to reduce the spread of the virus. Commercial poultry



Net-covered outdoor runs at the INRAE research facility in France that currently house the PPILOW cockerels - © Karine Germain, INRAE

production may contribute to the spreading of the virus, therefore local outbreaks are often followed by preventive culling of the whole flock. Hence it is important to carefully implement precautionary measures to reduce the risk of this harsh method. One of the measures has been the prevention of cross-contamination with wild birds as they might be carriers of the virus. For this, outdoor runs are required to be completely covered to avoid contact to secretions and faeces of wild birds on the pasture. Feeding troughs and drinkers can only be set up in the barn/pen. In some regions, the transport of live poultry across municipalities is not permitted without a negative blood sample. This causes difficulties regarding slaughter scheduling. The ban of the global export of poultry meat from areas with higher infection rates has been implemented as a biosecurity measure. The European regulation for organic production requires that meat-type poultry have access to pasture for 1/3 of their lifetime which can be limited under current circumstances. For organic farms, access to pasture is one of the requirements of the rearing system. Hence with these limited circumstances, it is essential to find ways to provide an environment that can both meet the expectations to organic husbandry and respect the regulations during avian influenza. It is advisable to provide chicken, especially those that have had access to

pasture, with enough enrichment to minimize aggressive behaviour. This can be provided by straw bales, lucerne/alfalfa hay or pellets, sand bathing options, pecking stones, a higher number of perches, occasionally changing the location of separate feeding troughs/drinkers (explorative behaviour), occasionally offering novel feed or changing feed (maize silage & vegetables in rotation). Further on, it is important to support the birds with vitamins and sodium which they can no longer source from the pasture. This may also contribute to prevent aggressive behaviour such as feather pecking. And of course, construction measures should be considered such as a generous roofed veranda to expose the birds to the natural ambient temperatures and weather which is a real immune-booster. Below, there are two pictures of outdoor run solutions from Germany and France of the PPILOW Task 5.1 experiments. In France, the PPILOW dual-purpose cockerels are currently 7 weeks of age. In Germany and Denmark, the experimental phase of the fattening of cockerels has been completed with slaughter dates at ages 10, 12, 14 (only in Denmark) and 16 (only in Germany) weeks. Results are currently under analysis and will soon be discussed with members of PPILOW National Practitioner Groups to prepare for PPILOW task 5.2 dedicated to on-field studies. Exciting news to follow for sure!



Set-up of polytunnels at the Thuenen Institute's research farm, Germany - © Helen Pluschke, Thuenen

3.2: Improving the robustness of laying hens and piglets against parasitic and bacterial infections by innovative feeding strategies and optimal use of outdoor area rich in vegetation - by Ricarda M. Engberg (AU) , Marina Spinu and Vasile Cozma (USAMV)

In organic egg and pig production, parasitic and bacterial infections are considered a significant welfare issue causing gastrointestinal health problems eventually leading to production losses, increased morbidity and mortality. In order to maintain credibility of organic production, the use of drugs for therapy of parasitic and bacterial infections has to be kept to an absolute minimum. Current efforts in Denmark and Romania seek to identify alternative strategies in the treatment and prevention of diseases. The focus of this task is the use of innovative feeds, plants and plant extracts providing antiparasitic and antibacterial properties, and support immune function and disease resilience.

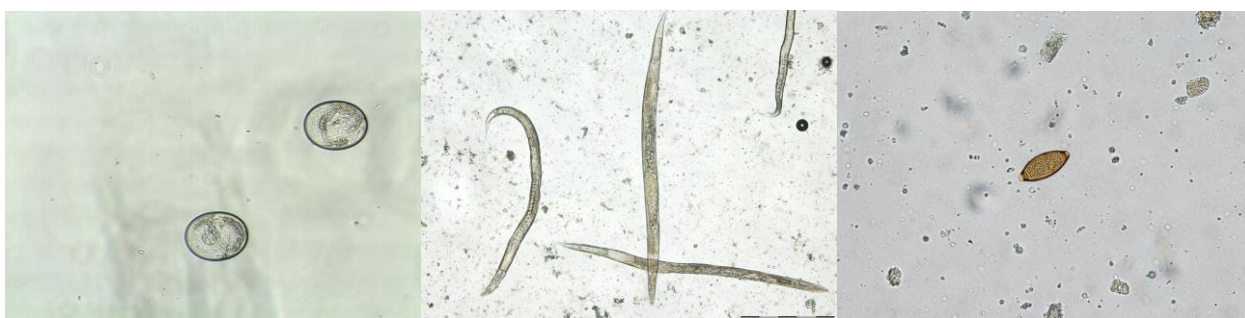


Fig. 1: *Ascaridia galli* - © AU

Fig. 2 and 3 *Strongyloides ransomi* larvae- *Trichocephalus suis* egg - © USAMV Cluj

In Denmark, the first of three planned experiments with layers challenged with the most abundant nematode (*Ascaridia galli*) has been completed as a cooperative work between Aarhus University and industry (Fermentation Experts). The experiment was conducted to evaluate whether a product based on fermented rapeseed meal and seaweed, has a potential of reducing the worm burden, supporting gastrointestinal health and the immune system. A large number of parasitological, bacteriological and immunological analyses have been conducted and a large data set is currently under evaluation. Preliminary results indicate no direct effect of the product on worm burden but it is still unclear if the product impacts gut microbiota and/or have immunomodulatory properties. During the first in vivo experiment, a number of assays were established and activities are ongoing involving a multifactorial in vitro screening platform. Another two animal experiment are planned to follow, and potential candidates to assess as dietary intervention may involve e.g. garlic (*Allium sativum*) and black chokeberry (*Aronia melanocarpa*).



Hens in experiment - © AU



Calendulas officinalis - © USAMV Cluj

At the University of Agricultural Sciences and Veterinary Medicine in Cluj-Napoca, Romania, we focus on the limitation of parasitic and bacterial infections in pigs through access to pasture or compound feed providing a variety of medicinal plants including *Asteraceae*, *Cucurbitaceae*, *Lamiacea* and *Amaryllidaceae*. The chemical analyses of the extracts show the presence of mainly polyphenols but also flavonoids and tocopherols and aliin. Screening for parasite abundance on two low input pig farms shows that parasitic infections in pigs are predominantly associated infections with single cell parasites and nematodes. Screening of faecal bacteria populations indicate that sows and piglets share a variety of bacteria species, many of them holding a potential pathogenicity. Compared to fattening pigs and sows, a higher number of different bacterial species seems to be present in suckling piglets. A moderate to high degree of antimicrobial resistance of faecal bacteria has been found. Our first *in vivo* experiments indicate that feed supplemented with garlic is active against parasitic protozoa and nematodes whereas feed supplementation with wormwood shows activity only against nematodes. Further experiments with pigs supplemented with other medicinal plants from the envisaged ones are currently in progress, and we are looking forward to obtain new results.



Fig. 1: Bazna breed pigs, Romania © USAMV Cluj



Fig. 2 and 3: Mangalita pigs, red variety Romania © USAMV Cluj

New people in the PPILOW project: Mihai Horia Băieș



Mihai Horia Băieș (USAMV, PhD student)

Mihai Horia Băieș graduated in 2019 in the Faculty of Veterinary Medicine at the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. He is a PhD student at the Department of Parasitology and Parasitic Disease, scientific coordinator, Prof. Dr. Vasile COZMA. The topic of his doctoral thesis is "The control of digestive nematodes and protozoa infections in swine from low-input production systems, with medicinal plants and their extracts, in the "one welfare" vision". His research work will be carried out as part of the research project PPILOW with tasks in WP1 and WP6. He also takes care of the assessment of the swine welfare in low-input farms in the Transylvanian area (Romania).

Upcoming events: PPILOW partners present their strategy and first results! – by Anne Collin (INRAE)

After having actively contributed to the international conferences “Life Sciences for sustainable Development” (Cluj-Napoca, Romania, September 2020) and “6th International Mediterranean Symposium on Medicinal and Aromatic Plants” (October 15-17, Izmir, Turkey), the PPILOW partners co-organized with the three other European projects OK-Net EcoFeed, POWER and FreeBirds the Joint online Conference [“Improving Sustainability and Welfare in Organic Poultry and Pig production”](#) January 25-26, 2021. This event gathered online in average 270 participants, among which policy makers, practitioners, researchers, consumers and citizens for presenting with end-users solutions helping organic farmers to implement the objectives of feeding their animals with feed produced at or near the farm while ensuring animal welfare.

In the next months, PPILOW will present its multi-actor research strategy and first achievements in several events:

- By organizing a session “Ensuring Farm Animal Welfare In Livestock Production: Consumer Expectations, Product Certification And Cost-Competitiveness” at [the Conference of the European Association of Agricultural Economists](#) (EAAE) 2021, XVI EAAE Congress, July 20-23, 2021, Prague, Czech Republic (2020 postponed)
- By organizing of a dedicated workshop at the next [Organic World Congress](#) (OWC) 2021, 6-10 September 2021 – Rennes, France, entitled “How to improve poultry and pig welfare in organic production systems?”
- By participating to the 8th International conference on the assessment of [Animal Welfare at farm and group level](#) (WAFL), 16-19 August, 2021, with the communications on the PIGLOW and EBENE welfare self-assessment applications.

Keep safe, and for more information, visit our website:

www.ppilow.eu



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