



CORE organic



POULTRYNSECT

**THE USE OF LIVE INSECT LARVAE
TO IMPROVE SUSTAINABILITY
AND ANIMAL WELFARE OF
ORGANIC CHICKENS
PRODUCTION**

(2021-2023)



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June**



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GREETINGS FROM THE PROJECT COORDINATOR (DR. FRANCESCO GAI)



Dear Readers and friends of POULTRYNSECT,
the third POULTRYNSECT newsletter is ahead of you.

In the last six months a lot of events as well scientific activities involving the different project partners were done and therefore we would like to inform you about the different initiatives related to the communication and dissemination activities performed in this period of time.

At the end of May, Poultrynsect teams finally met each other in person, for the mid-term meeting at DIL headquarter in Quakenbruck, Lower Saxony (Germany). A fruitful day, full of updates and interesting discussions with all the members. The meeting was followed by a technical visit to DIL infrastructures and DIL insect farm, focused on *Hermetia illucens* rearing.

In June, members from CNR, UNITO, DIL and Inagro partners presented some of the first results, achieved in the framework of the first poultry trial carried out last Autumn, at two European and worldwide important events, the **7th Mediterranean Poultry Summit** and the **4th Insects to Feed the World Conference** held in Cordoba, Spain and in Quebec City, Canada, respectively.

I hope you will enjoy reading the newsletter and on-behalf of all the Poultrynsect team I profit to wish you relaxing Summer holidays!

Francesco Gai, coordinator of POULTRYNSECT.

For more information on the POULTRYNSECT project and its research topics, the Project Coordinator invites you to visit our website:

<https://poultrynsect.eu/>

UPDATES ON PROJECT WORK PACKAGES

HERMETIA ILLUCENS REARING (by INAGRO)

WP1

At the end of February, Dr. Valentina Bongiorno & Dr. Sara Bellezza Odon, PhD students of the UNITO team, started their training internship at INAGRO insect rearing facility in Belgium.



During this period they worked side by side with **INAGRO** insect team in order to learn the latest techniques about insect farming at a semi-industrial level, in particular a second mass rearing cycle of *Hermetia illucens* (HI) utilising the Gainesville diet as a rearing substrate for the second poultry trial has been setup.



According to the estimation of the amount of larvae consumed by chickens a shipment, on a week basis, to the poultry facility in Italy has been planned. In the meantime Inagro partners are going to perform some field trials on the utilisation of HI frass in organic cauliflower cultivation, looking for some additional benefits, like suppressing cabbage root fly, of this insect byproducts.

WP2

CHICKENS FEEDING TRIALS (by UNITO)

In the framework of this WP, **UNITO** team members have dedicated a lot of time to organize the experimental design of the second nutritional trial planned in the project. A local chicken breed, named Bianca di Saluzzo, that is a slow-growing breed is used in this trial.

During spring season a massive number of eggs arising from the breeding stock managed at the Animal Facility Centre of the UNITO partner were incubated and successfully hatched around Easter days. Male chicks, the most suitable for meat purposes, were selected and housed at the UNITO poultry facility until they will reach 20 days of age.



At the beginning of June, the *in vivo* experimental trial started and half of the birds are receiving a daily supplementation (15% of the estimated daily feed intake) with black soldier fly live larvae provided by INAGRO partner and produced in the framework of WP1. At the age of 150 days, a representative number of chickens/group will be slaughtered and the different slaughtering performance parameters calculated. Moreover samples of blood and intestine will be collected for the bird health and wellbeing status evaluation by means successive histological, microbiological and immunological analysis.

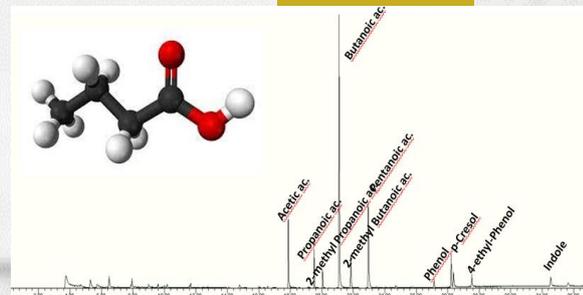


UPDATES ON PROJECT WORK PACKAGES

LABORATORY AND SENSORIAL ANALYSES (by ISPA CNR & UNITO)

WP3

Only few studies have investigated the effects of black soldier fly (BSF) live larvae provision on volatilome [short-chain fatty acids (SCFAs) production] and microbiota composition in chicken's gut, therefore In the framework of this WP, researchers of **ISPA CNR** laboratory located in Milan and UNITO team members have performed these analyses.



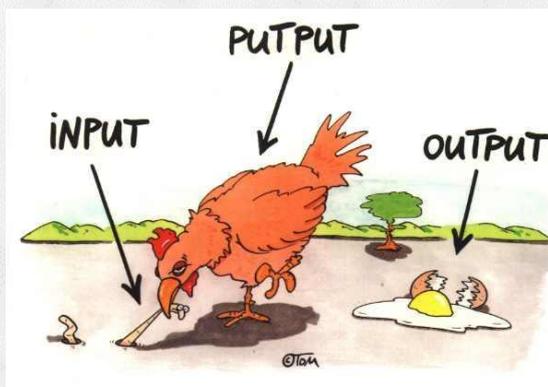
At the end of the first nutritional trial, samples of caecal digesta were collected from 60 animals (15 birds/treatment), frozen and stored at -80°C until to be analyzed by SPME-CG-MS and DNA sequencing techniques, respectively. Volatilome results showed that seven SCFAs were identified, with butyrate as the most abundant while caecal microbiota analyses of birds fed BSF live larvae showed a higher incidence of *Coprobacillus*, *Synergistaceae* and *Christensenellaceae* bacterial strains. Detailed results of these interesting investigations will be showed during the next INSECTA Conference that will be held in September in Giessen, Germany <https://insecta-conference.com/>

WP4

SUSTAINABILITY ASSESSMENTS (by DIL)



The **DIL** team members of the Food Data Group studied the environmental impact of the different experimental groups in order to calculate the effect of the larvae supplementation on LCA assessment. UNITO partner provides all data to take into account the inputs (electricity, water, feed, heat, litter type) for poultry production while the INAGRO partner provides data about direct emissions in terms of CO₂ and NH₃ for the insect production.



WP5 COMMUNICATION & DISSEMINATION

WP5

This summer Poultrysect team members will participate to several conferences across the world. Since the pandemic has started, all the meetings were cancelled or at least online without being postponed, causing great damages to the scientific community. Before the results themselves the most important accomplishment so far was to being finally able meet in person with all the other researchers and colleagues. These are some experiences that cannot be done through a screen.



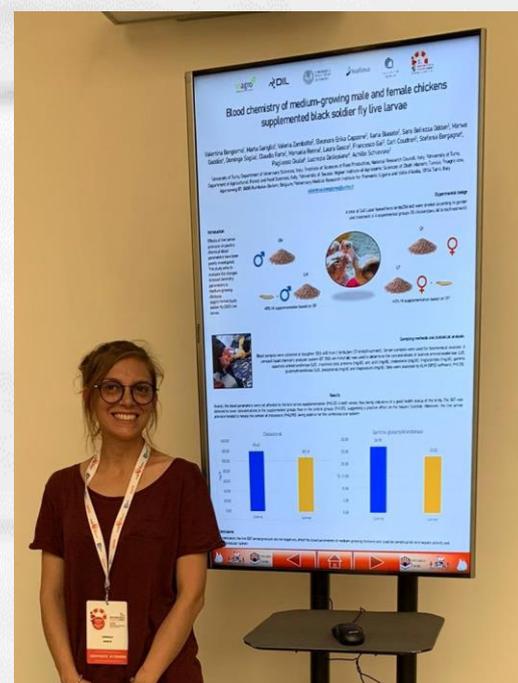
The first conference Poultrysect team took part was the **7th Mediterranean Poultry Summit** held in Cordoba, Spain (8-10 June)

<http://www.mpn-wpsa.org/spain2020/index.php/en/>

Industry, producers, researchers, universities and students were present at the summit.

On Poultrysect behalf, **Dr. Marta Gariglio**, University of Turin team member, presented some of our first trial results with a poster titled:

“Blood chemistry of medium-growing male and female chickens supplemented with black soldier fly larvae”.



The MPS is one of the main events of the year related to the poultry sector. As Marta several delegates from all over the Mediterranean area gather every two years to participate and get in touch with their colleagues abroad.

WP5 DISSEMINATION



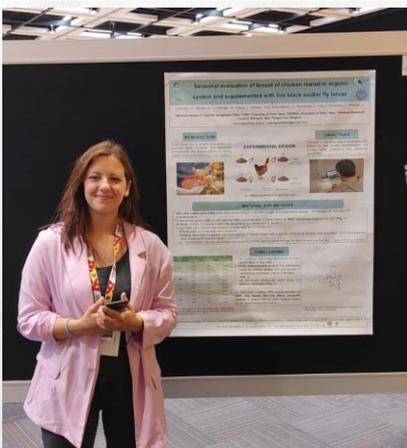
At the mid of June, some members from CNR, UNITO, DIL and Inagro partners attended the **4th Insects to Feed the World (IFW) Conference 2022** held in Quebec City, Canada.

<https://www.ifw2020.org/en>

Gathering academics and experts from all around the world, IFW is an international conference mainly focused on edible insects use in future sustainable agrifood systems.

Before the conference some participants took part to a technical tour to “**TriCycle**” a Montreal-based edible insect farm.

To deepen the experience, during the event it was possible to enjoy meals made with insects (crickets or worms) designed by chef **Joseph Yoon**, aka @brooklynbugs, himself.



Two oral presentations and one poster were presented during the IFW conference by:

- **Dr. Valentina Bongiorno (UNITO),**
- **Dr. Beatriz Silva (DIL),**
- **Dr. Valeria Zambotto (CNR)**



POULTRYNSECT MID -TERM MEETING



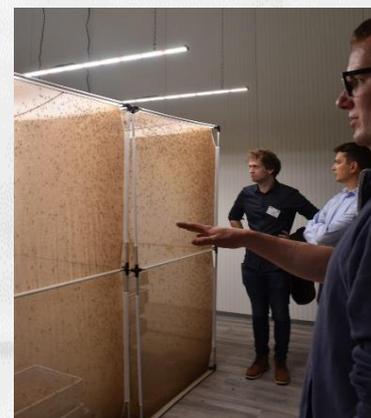
On May 24th 2022, Poultrynsect project team held its midterm meeting, in presence, at the German Institute of Food Technologies (DIL) headquarter in Quakenbrück, Lower Saxony (Germany). DIL, partner of the project, is a private, independent and non-profit research provider <https://www.dil-ev.de/en.html>



At the end of the meeting a technical tour to DIL insect farm in the proximity of Quakenbrück was carried out. During the guided tour **Mr. Clemens große Macke**, owner of the animal farm Geflügelhof gr. Macke GmbH, showed to the participants the insect rearing activities done in collaboration with DIL team members.

During the meeting speakers presented the results and updates of the different work packages obtained in these 18 months of the project. The following topics were discussed:

- ✓ **Insect rearing**
- ✓ **Poultry nutrition**
- ✓ **Meat quality**
- ✓ **Animal welfare**
- ✓ **Animal gut health**
- ✓ **Consumer acceptance**
- ✓ **Sustainability**



POULTRYNSECT INTERVIEWS:



Mr D’HULSTER, thank you for participating to our interview, giving us the opportunity to know more about organic poultry farming from a Belgian point of view. We and our readers as well are very curious to know more about your activity and position regarding organic poultry industry present and future challenges!

Can you tell us more about your business and what is like to be an organic poultry farmer nowadays?

On the farm I have 5000 organic chicken (broilers), Sasso breed, a slow growing poultry breed suitable for organic farming.

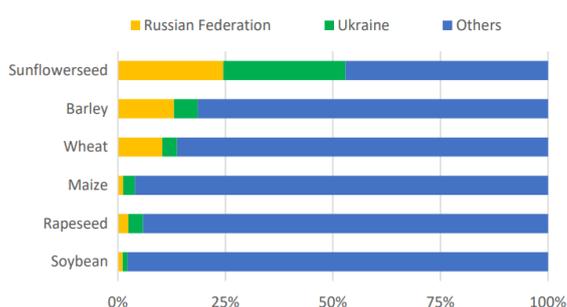
The chicks arrive at the farm at their day of birth. They remain for 10 up to 11 weeks before leaving the farm and to deliver an excellent organic poultry meat to the consumer. The first weeks, the chicks stay in a heated barn with the right air and temperature parameters, according to their needs at this stage of life. When they reach 1kg of weight, they can then access to a pasture where they can largely explore and show an even more natural behaviour rather than in the barn.



Credits to: biomijnnatuur

As we all know many countries like Italy are experiencing the lack of conventional raw materials (eg cereals, legumes, fertilizers...) due to the shortage induced by the recent conflicts.. How is the situation, related to poultry farming, in your country?

Figure 1: Share in global production of selected crops (2016/17-2020/21 Avg.)



Organic raw materials for feedstuff have a bad availability nowadays, until now there’s no lack, but I’m afraid that it could happen very soon. In case of an actual lack of raw materials, I hope that some kind of legislative derogations will be considered by each European country.

Source: FAO XCBS system <https://www.fao.org/3/cb9236en/cb9236en.pdf>



Do you think that this situation will speed-up researches for novel and sustainable feed alternatives (eg. insects)?

Of course, the lack of raw materials and skyrocket prices will speed up indeed researches for new and alternative feed sources.

Recent studies on insects use in animal nutrition have shown not only nutritional and environmental benefits (eg. lower greenhouse gas emissions) but also positive effects on animal welfare (eg. environmental enrichment properties). As an organic farmer will you ever consider their inclusion in your animals diet? And if yes, in which form (live larvae, fullfat or defatted meal , etc...)?



I'm always interested to explore new options. If insects bring benefits to the animal, the farmer and the consumer, it could be considered a valuable source. In my opinion feeding living larvae would be difficult considering the practical way of work. But all the other options, that can be implemented quite easy in managing process, are interesting and should be explored.

The new organic regulation has officially included cervids (fallow deer, deer...) to the list of species commonly reared with this method. Do you think that insects will ever reach this goal in the future?

It's difficult to say something on this aspect, it depends on further research, and how the market develops (eg. prices of raw material, optimization of the process of producing insects). Anyhow the rearing substrate of insects has to be free of contaminants such as insecticides, in this case there's a big chance that the organic way of rearing will be a big part of the farming business.

Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products



Thanks to Stefan D'Hulster for such an interesting interview and for sharing with us his particular point of view. Visit Hof ten Moenaerde page <https://hoftenmoenaerde.be/> to know more about his story and activity!

MEET POULTRYNSECT TEAM

Rune Rødbotten



Rune has a deep fascination for meat science. He is a scientist at Nofima, where his work is mainly focused on the utilization of animal proteins from muscle and byproducts. Optimizing the eating quality of meat products is important for customer satisfaction.

He studied as a chemist at the University in Oslo, and later got his Ph.D in animal science from the Agricultural University in Norway.

Sergiy Smetana



Sergiy is Head of Food Data Group at German Institute of Food Technologies (DIL), Quakenbrück, Germany, focusing on Management of Life Cycle Assessment of food and related technologies. He holds a Master of Science in Ecology and Environmental Protection at the Dnipropetrovsk National University. He then got his Ph.D in Bioeconomy and Sustainability from the University of Vechta in Germany.

PARTNERS

Discover teams involved in the project



POULTRYNSECT



Consiglio Nazionale
delle Ricerche



**UNIVERSITÀ
DI TORINO**



STAKEHOLDERS



Controllo e Certificazione



NEXT ON THE AGENDA

Poultrynsect team will participate at the following upcoming events:



CONTACTS

For more information about Poultrynsect project
follow us on:



<https://poultrynsect.eu/>



<https://susfood-db-era.net/main/Poultrynsect>

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POULTRYNSECT TEAM WISHES YOU

