



# POULTRYNSECT

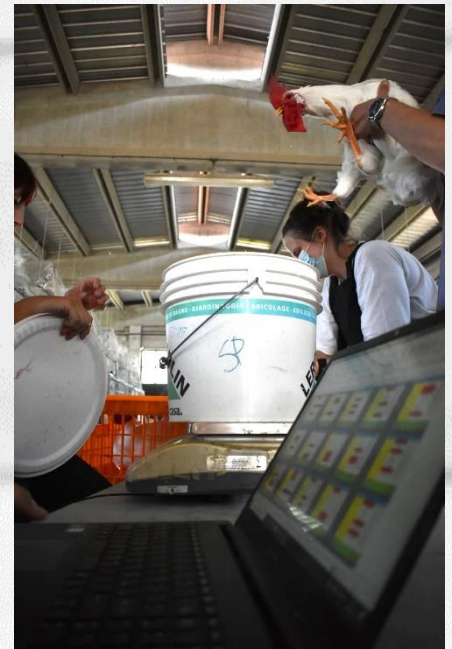
**THE USE OF LIVE INSECT LARVAE  
TO IMPROVE SUSTAINABILITY  
AND ANIMAL WELFARE OF  
ORGANIC CHICKENS  
PRODUCTION**

**(2021-2023)**

**Newsletter #5  
June**



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# GREETINGS FROM THE PROJECT COORDINATOR (DR. FRANCESCO GAI)



Dear Readers and friends of POULTRYNSECT,  
the 5<sup>th</sup> POULTRYNSECT newsletter is ahead of you.

During this semester, our project partners carried out several scientific initiatives and activities. Consequently, we're thrilled to share with you the various initiatives focused on communication and dissemination that have taken place during this period of time.

At the end of May, Poultrynsect contributed to the organization of a workshop about the Italian framework on insect in food/feed, largely appraised by the audience and the invited speakers.

In June and August, members from CNR, UNITO, partners presented some of the first results, achieved in the framework of the second poultry trial carried out last Autumn, at two European and worldwide important events, the **23rd European Symposium on Poultry Nutrition** (Rimini) and the **69th International Congress of Meat Science and Technology** held both in Italy at Rimini and Padua, respectively.

Last but not least, we are working for the organisation of the **final project event is this 27<sup>th</sup> October, in Rome, at CNR headquarter !!**

I wish you will enjoy the read 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

**Frass** is the excrement of insects and other arthropods, which can be used as a soil amendment or fertilizer in agriculture. Frass has the potential to be an excellent source of plant nutrients, as it contains high levels of nitrogen, phosphorus, potassium, and other micronutrients. Research has shown that frass can improve plant growth and yield, increase soil fertility, and enhance plant resistance to pests and diseases. Frass also contains beneficial microorganisms that can help promote soil health and nutrient uptake by plants.



During one of the **WP 1** trials BSF frass was used with the purpose of being a bio-stimulant for cauliflower to protect against cabbage root fly infestation. The larvae of this fly eats the roots of the young cauliflower plants, causing major losses when left untreated. Chemical protection is possible, but alternatives are needed in organic farming. During this trial none of the treatments tested were able to adequately control the damage caused by the cabbage root fly. However, previous and parallel trials have shown that applying 80 g of BSF frass per plant at planting tends to decrease the damage caused by CRF to the plant roots.

## CHICKENS FEEDING TRIALS (by UNITO)

WP2



The month of October marked the end of the second in vivo trial.

Within this period the second paper about the first poultry trial had also been published, thanks to the author and UNITO PhD Student Valentina Bongiorno, about the effects of live black soldier fly larvae (BSFL) (*Hermetia illucens*) on the growth, slaughtering performance, and blood parameters of medium-growing chickens.

This study has revealed, for the first time, the potential of the provision of live BSFL on the performance and blood traits of medium-growing chickens, without negative effects on birds performance or the health. Concerning growth performances, chickens benefitted from this supplementation, with more advantages observed in males than in females.

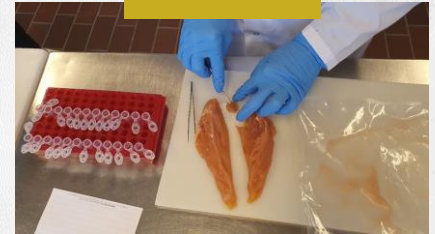
Valentina had the occasion to deepen her studies on animal welfare and behaviour thanks to her PhD abroad period at UCLA Davis, USA.

# UPDATES ON PROJECT WORK PACKAGES

## LABORATORY AND SENSORIAL ANALYSES (by ISPA CNR & UNITO)

Chicken fillets from the 2nd in vivo trial have been analyzed for meat quality. The frozen and thawed fillets were tested for thaw loss, instrumental tenderness (Warner-Bratzler method), content of lipid oxidation products and in vitro protein digestibility. No influence of slaughter time or diet on thaw loss, instrumental tenderness or protein digestibility was found. Thaw loss was generally very low (<4%) and in vitro protein digestibility high (> 91%). The content of lipid oxidation products was low in raw fillets but increased with heat treatment. Currently fillet samples are analyzed by Proteomic to identify potential differences in protein composition between samples.

WP3



WP4



## SUSTAINABILITY ASSESSMENTS (by DIL)

The Food Data Group from DIL e.V. assessed the life cycle costing (LCC) of Label Naked Neck chickens, partially fed on live black soldier fly larvae (BSFL). The LCC was modeled on the basis of the information obtained from the project partners and the current prices of goods and services. The model included a 240-chicken farm, rearing regional, organic, slow-growing chickens, which corresponds to what was done within the experiment, but excluded the labor necessary for the research and scientific activities.

The profit of the bird-rearing company was not included in the analysis. The production price of modeled 1 kg of male birds' packed ready-to-cook organic chicken carcass was 13.56€ for birds with BSFL substitution, and 12.68€ for birds without. For female birds, it was 17.41€ for birds with BSFL substitution, and 15.71€ for birds without. By far the highest single contributor to the price was labor, followed by feed. The addition of larvae to the chicken feed increased the chicken meat price by almost 10%, and the difference between the sexes reached 20%. However, if compared with the average price for 1kg of organic poultry in Italy, (9.9€), the price of all the chicken used in the research is relatively high. It can be concluded that the high prices of regional, organic, small-scale slow-growing chicken originate largely from high production costs, and the production price might decrease with upscaling and associated improvement in efficiency.

## WP5 COMMUNICATION &amp; DISSEMINATION

WP5

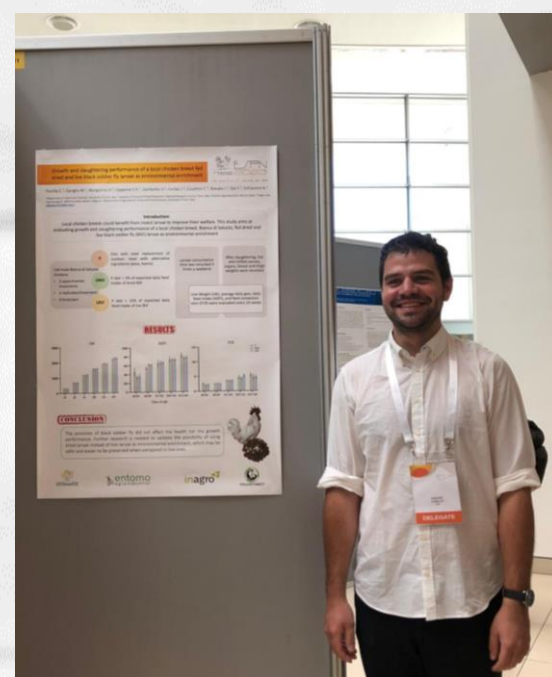


Conferences period is coming to an end for Poultrysect project members. A lot of data has been recovered from the two poultry trials. The following months will be dedicated to performing the latest analyses and results interpretation. We can't wait to share what we have accomplished so far! Stay tuned!

Some preliminary results regarding our second in-vivo were presented during the The 23rd European Symposium on Poultry Nutrition - ESPN 2023, held from June 21 – 24 in Rimini (Italy)

PhD student Edoardo Fiorilla, University of Turin team member, will present a poster titled:

**“Growth and slaughtering performance of an autochthonous chicken breed fed with dried and live Black soldier fly larvae as environmental enrichment”.**



This conference is one of the most important events about present and future of poultry nutrition and poultry industry in Europe. It provides a unique point of view about scientific and technical achievements in these sectors thanks to leading poultry scientists contribution.

# Workshop “Uso degli insetti nel settore agricolo ed alimentare: il punto della situazione in Italia” | 26 Maggio 2023 |



On May 26th 2023, Poultrynsect worked side by side with **ADVAGROMED** and **Sustavianfeed** projects for the organization of an exciting workshop: “Utilizzo dei derivati da insetti nei prodotti cerealicoli ed in generale negli alimenti: opportunità o problema?»  
The event was held in presence, at AgroVet campus, Grugliasco (TO) .



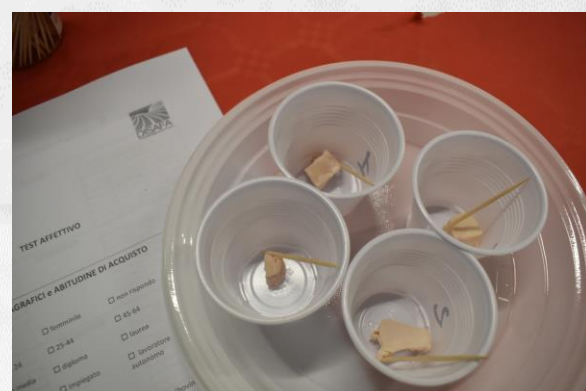
The purpose of these interventions was to spread scientific knowledge about this novel sector in Italy and to stimulate a constructive debate around it.

In the afternoon a roundtable about “Applicazioni pratiche dei prodotti derivati da insetti, le diverse filiere a confronto” , led by experts of the entire supply chain sector.

Between this two engaging sessions, presents were involved into an experimental consumer panel test of chicken meat fed with different insect meal inclusion levels.

The workshop saw, for its first half, the participation of 6 experts, dealing with different issues related to the challenges and opportunities of the use of **insects and derivatives in feed/food**:

- Normativa fiscale per le aziende produttrici di insetti: **Dott.ssa Filomena Maio** (Confagricoltura)
- Il Diritto Alimentare nel Novel Food: regolamentazione ed esempi Relatore: **Avv. Dario Dongo** (Wiise Srl)
- La normativa sanitaria veterinaria negli allevamenti di insetti Relatore: **Dott. Fabrizio Grifoni** (ASL To3 Piemonte)
- Filiera novel food con insetti commestibili 100% made in Italy Relatore: **Dott.ssa Carlotta Todaro Fila** (Alia Insect Farm Srl)



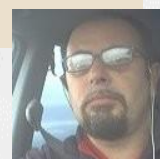
# POULTRYNSECT INTERVIEWS:



Good morning Dr. Galli and thank you again for agreeing to participate, on behalf of Ferrero Mangimi, at our interview and thus giving us the opportunity to learn more about the Italian feed industry from a professional point of view. We, and all our readers, are very curious to know more about your business and your opinion regarding the current and future challenges for the feed sector.

Before proceeding with questions, we would like to know more about you and your career path within Ferrero Mangimi.

I graduated in Animal Production Sciences in 1983 at the Statale di Milano. I worked in a large beef cattle farm as a student for a couple of years after my graduation and then for 10 years at the feed mill of the agricultural consortium of Milan as a commercial technician. After this experience I worked for 5 years in a Belgian multinational (Inve) dealing with the Ruminants sector. Since 2001 I started collaborating with Ferrero Mangimi as Formulist and Quality Manager. With the growth of the Company, I abandoned the role related to Quality Control and implemented the activity of Formulation and Research and Development



Dr. Galli

**Sustainability and animal welfare are topics of fundamental importance for Ferrero Mangimi, how are they effectively addressed in your company?**



Credits to Ferrero Mangimi

Several years ago we activated a project called 3P (Industrial Production-Precision feeding- Farm Environmental Performance) which aims to develop an innovative synergistic model for feed production, feeding and management of environmental resources. This project, acting across the zootecnical supply chain, is able to include all aspects of: supply, feed formulation, production and administration by studying the knowledge between the industrial emission parameters and the nutritional and zootecnical approach to best meet the animal physiology, in order to improve the efficiency and sustainability of the whole process.

This whole system cannot stand without compliance with the regulations related to animal welfare which have a key-role for promoting our products.

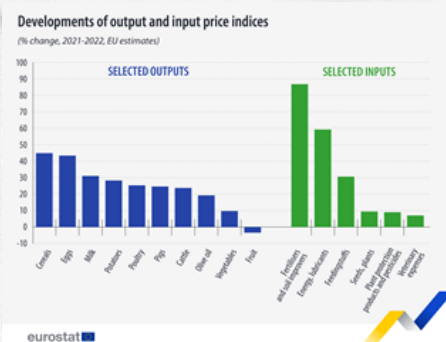
**For the national and international feed sector, 2023 was a very difficult year regarding raw materials availability and costs. What impact can such an event have on the livestock supply chain, considering Ferrero Mangimi crucial position in it as a feed facility? How long will it take to recover from events like this?**

2023 will surely be remembered as an "*annus horribilis*" not only for the escalation of energy and raw material costs, to which was added an unprecedented drought in our latitudes compromising in quantity and, above all, in quality. Instead of just accepting the consequences of these events, we tried to react by making the best of this difficult situation, by improving the efficiency of our production capacities with the strengthening of investments already started in recent years for energy saving (cogenerators and solar power) and quality controls in order to offer the market products with the highest levels of quality and safety.



**Speaking of raw materials, among the alternative protein sources, insects seem to be one of the most promising sources... in your opinion to what extent and form (live larvae, defatted/non-defatted flour, fat/oil) insects could be a valid candidate as protein source of the future in the feed sector? And specifically in the organic sector?**

Surely the challenge of the future will be to increase the availability of proteins for human nutrition and I believe that this will lead to an ever greater demand for animal and vegetable proteins. Insect protein is indeed an interesting protein source, but I think that it will not have a great impact on food for various reasons, both sociological and related to the not so distinctive and recognizable "taste" such as meat or certain vegetables. On the other hand, it could become a considerable resource to be transformed into animal protein since the biological value is certainly interesting.



Even more interesting would be if it were possible to use, as insects growth substrates, food-origin materials that are still considered and treated as waste. In this insects could take part in a circular economy chain which would probably help to lower its costs and help improving the sustainability of productions. Regarding the use of live larvae in the poultry sector, these could be interesting for small/medium-sized farms in which poultry farming can be combined with larvae production.

The benefits are interesting both in terms of nutrition and above all in terms of behavior, as they significantly reduce the stress associated with the great concentration of animals, typical of intensive farming. The same consideration applies to organic farming which, however, holds a marginal share of production in Italy. As far as large numbers are concerned, I find the use of live larvae hard to imagine due to the logistical difficulties such as transport, inclusion in the feed and distribution in the supply lines.

**Your attention to your customers allows you to have a first-line point of view regarding the perception of farmers against insects in feed, could tell us more about it?**

I believe that farmers have no particular issues with using insect meal. Nowadays farmers mainly delegate to the experts of the industry the choice of raw materials and the balance of nutrients to meet the needs and obtain the best performance. The availability of the product on the market, its competitiveness in terms of quality/price/sustainability ratio will determine the success of insect meal and other products deriving from it, among which oil, that could play an equally interesting role. For some typical Italian products (like cured meats - meats - cheeses) subject to production regulations, there is also the obstacle of breaking down traditions like it happened in the past for other raw materials.

**On 26 May we had the pleasure of seeing you among the stakeholders participating in a round table on the use of insects in the agricultural and food sector in Italy. Do you believe that these events can be a good starting point to generate stimulating discussions and opportunities for training on the subject?**

I am profoundly convinced that knowledge is the primary condition for any innovation to be accepted by the general public and not just by specialists. Unfortunately, we are witnessing unnecessarily obstructionist public positions not only by the media but, which is even more serious, also by members of our ruling class dictated by absolute ignorance about this topic. Allow me to conclude by quoting Hippocrates "There are only two things: Science and opinion; the first generates knowledge, the second ignorance". I believe that it is not only appropriate but I would say mandatory to ensure that users know how things really are.

**Thanks to Dr. Alessandro Galli for such an interesting point of view, giving us insights about a renovated Italian feed mill like Ferrero Mangimi**

<https://ferreromangimi.it/it>

# MEET POULTRYNSECT TEAM

## MARTA CIANCIABELLA



Marta is a Food Technologist, with a Master's degree in Food Control and Safety at the University of Modena and Reggio Emilia - Faculty of Agriculture. She is an expert in food quality, sensory analysis and consumer science. She is Sensory Project Manager, Panel Leader and she's in charge of the Sensory Analysis Laboratory of the CNR Institute of BioEconomy (IBE) in Bologna (**WP3**). Has experience in the use of specific software (FIZZ, Biosystems, France) for the acquisition and processing of data relating sensory tests for food and no-food products, and the scientific reports elaboration.

## EDOARDO FIORILLA



Edoardo is a PhD student of Prof. Achille Schiavone at the Department of Veterinary Sciences of the University of Turin, focusing on poultry farming, with special attention to biodiversity, sustainable nutritional feed formulas and animal welfare. He graduated at the University of Turin in the animal nutrition and feed safety curriculum. He works on the **Work Package 2 and 3**, regarding in vivo poultry trials and laboratory analyses.

# PARTNERS

## Discover teams involved in the project



**POULTRYNSECT**



Consiglio Nazionale  
delle Ricerche



**UNIVERSITÀ  
DI TORINO**



# STAKEHOLDERS



*Controllo e Certificazione*



# NEXT ON THE AGENDA

Poultrysect 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

