POULTRYNSECT

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

(2021-2023)

Newsletter #4
Christmas Edition

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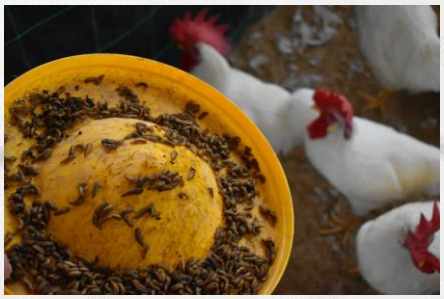


GREETINGS FROM THE PROJECT COORDINATOR (DR. FRANCESCO GAI)

Dear Readers and friends of POULTRYNSECT,

The fourth POULTRYNSECT newsletter is ahead of you. The project is almost at the end of its second year and the second nutritional trial performed on an local slow-growing breed (Bianca di Saluzzo) chicken has been successfully concluded at the end of October. In the coming months, scientific activities will be focused on laboratory analyses of the different biological samples taken at the end of this second nutritional trial. In August and September 2022, members from CNR and UNITO partners presented some of the results, achieved in the framework of the first poultry trial carried out in 2021, at two important scientific events, the 26th World's Poultry Congress and the Insecta 2022 Conference held in Paris, France and in Giessen, Germany, respectively. Last but not least, at the end of October we had the opportunity to met one of our project stakeholder, Virginia Ribeiro, technical secretary of AMIBA, a Portuguese association focused on the preservation of autochthonous breeds of cattle, sheep and poultry. Virginia visited the UNITO poultry facility and also a small poultry farm of free range chickens called "Cascina Losetta" located in our Piedmont region (NW Italy). Following a fruitful discussion between Virginia and the owner of "Cascina Losetta", numerous ideas for collaboration have emerged between the reality of Italian and Portuguese poultry farms aimed at protecting the local poultry breeds.

If you are more interested in the activity of AMIBA please read the Virginia's interview reported inside this Newsletter.

On-behalf of all the Poultrynsect team I profit to give you our best wishes for the incoming Christmas 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

WP1 — *HERMETIA ILLUCENS* REARING (by INAGRO)

WP1 main objective this period was to produce sufficient black soldier fly larvae for the poultry trial in Italy. Over a period of 20 weeks, we reared and shipped a total of 180 kg of black soldier fly larvae.

As a diet they used the Gainesville diet, a mixture of water, wheat bran, corn meal and alfalfa, which has as a drawback that it yields smaller and dirtier larvae.

The biggest challenge was the Italian summer. As the larvae are transported in closed boxes the temperature inside can easily be inhospitable for the larvae. By adding icepacks and insulation in the boxes most of the larvae survived their shipment. However, despite the precautions two shipments were lost in the process. Fortunately, this did not have major implications for the poultry trial.

WP2 — CHICKEN FEEDING TRIALS (by UNITO)

In October 2022 the second in-vivo trial has been successfully concluded. Along the trial arose the opportunity to split the animals in two different slaughtering sessions, based on the age.

- 1st one on September (150 day old animals)
- 2nd one on October (180 days old animals)

The idea behind this division was to gather as much information as possible about these autochthonous breeds, having few existing data about its meat quality.

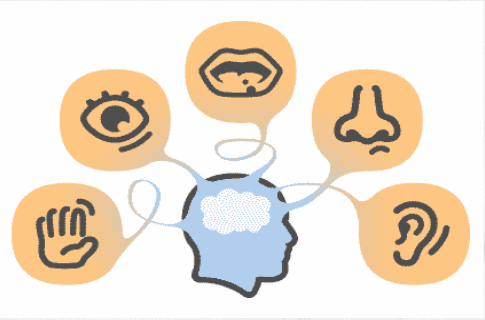
After the recording of the slaughtering parameters, breast meat samples were successfully distributed amongst the different institutes in charge of the analyses on meat quality.

- NOFIMA (Norway)
- CNR ISPA (Turin)
- CNR IBE (Bologna)

Moreover samples of blood and intestine were collected for the evaluation of the bird health and wellbeing status evaluation by means successive histological, microbiological and immunological analysis.

UPDATES ON PROJECT WORK PACKAGES

WP3 LABORATORY AND SENSORIAL ANALYSES (by CNR & UNITO)



Only few studies have yet investigated the effects of black soldier fly (BSF) live larvae provision on chicken meat fatty acid composition, therefore researchers of ISPA CNR laboratory located in Milano and UNITO team members have performed these analyses for both trials.
In the meantime other breast samples were frozen-shipped to CNR IBE Bologna in charge of the execution of the sensorial evaluation by trained panelists.
A 2-days panel panel session was conducted on samples from all the treatments and for each of the two slaughtering times.
The next step will be the creation of a survey about consumer perception and knowledge of insect-fed chicken meat, that will be launched next year.

WP4 SUSTAINABILITY ASSESSMENTS (by DIL)

The Food Data Group from DIL e.V. estimated the environmental impact of the first in-vivo trial (on Label Naked Neck chickens) of the produced chicken meat using the life cycle assessment (LCA). They used the data from the partnering companies and with the help of the software SimaPro, calculated the results. From the preliminary results, the midpoint categories are the most interesting part.

It was shown that global warming, land occupation, and respiratory inorganics had the most significant impacts, while non-carcinogens, terrestrial ecotoxicity, and non-renewable energy followed.
Interestingly, per 1kg of chicken meat, male chickens contributed more to the environmental impacts than female chickens, overall and across all categories. This is mostly because male chickens consume more feed, which is responsible for a major share of the impacts, than female chickens. So overall, the sex of the chickens, not the insect supplementation in chicken feed, proved to be the decisive factor for differences in the sustainability of our experimental chicken meat.

WP5 COMMUNICATION & DISSEMINATION

WP5

Dr. Valentina Bongiorno, on behalf of Poultrynsect, took part at the **26th World's Poultry Congress (WPC) 2022** with a poster containing more results from our first trial titled **"BSF live larvae as environmental enrichment in medium-growing chicken diet".**

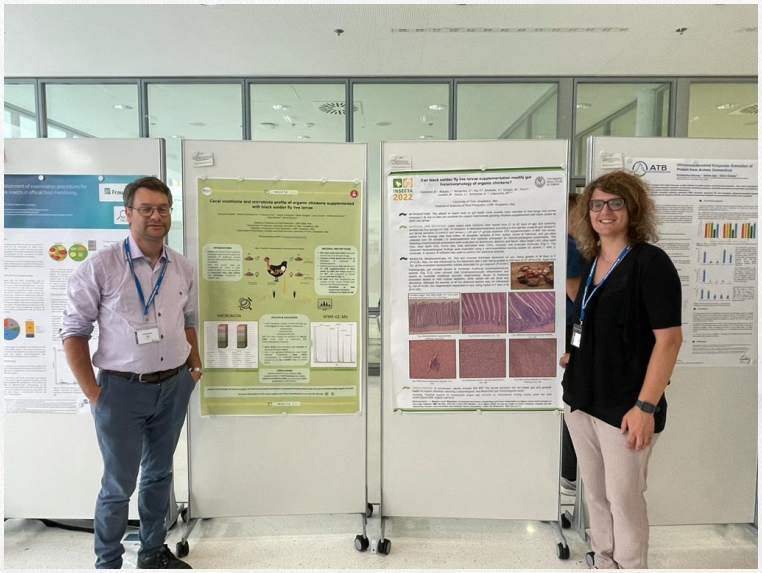
WPC is know for its highly interactive an interdisciplinary Scientific program.

You can find her poster at the following link: https://poultrynsect.eu/wp-content/uploads/2022/09/Poster-WPC-2022-Bongiorno.pdf

POULTRYNSECT AT INSECTA CONFERENCE

INSECTA 2022

Dr. Francesco Gai (Poultrynsect project coordinator) and Dr. Ilaria Biasato attended INSECTA Conference, in Gießen (Germany), in September 14-16, 2022.



The event gathered several participants from about 30 countries, getting the chance to know each other better while discussing about different topics and inspiring keynotes about insect farming:

- Insect Rearing and Production Systems
- Insect Processing for Food and Feed
- Safety and Environmental Aspects
- Non-food Application of Insects

You can find their posters at the following links:

- GAI: https://orgprints.org/id/eprint/44480/
- BIASATO: https://orgprints.org/id/eprint/44482/

POULTRYNSECT AT LCA FOODS

LCA FOODS
13th International Conference on Life Cycle Assessment of Food

Dr. Dusan Ristic presented some of Poultrynsect project data at the **13th International Conference on Life Cycle Assessment of Food - LCAFoods2022** taking place from the 11 to 14th of October 2022, in Lima, Peru, with the presentation titled "**Chicken: from soy and insects to eggs and meat**"

Sustainability is one of the main drivers of todays agrifood/feed sector. This conference was a great opportunity to discuss how dietary patterns should continue their transition to low carbon choices, not only in the developed world but also in developing and emerging nations.

MID-TERM PROJECT SEMINAR IN BRUSSELS

On 16-17 of November Carl Coudron (INAGRO), on behalf of Poultrynsect project, took part at the mid-term project seminar in Brussels organized by SusFood and Core-Organic board, Poultrynsect project funders!
Next to insights about the progress of the 12 SF-CO projects, five projects from the SF/FOSC joint call (2021) joined as well to have their kick-off meeting.

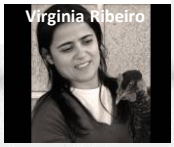
Photo credits : @Susfood

The meeting was mainly focused on the presentation of the funded projects.
Regarding the 12 projects from the SUSFOOD2-CORE Organic call, including Poultrynsect, Carl proceeded to present our mid-term results in an extended and detailed presentation followed by a joint discussion.
In addition, an interactive session followed the presentations, with the following observations emerging from the audience about Poultrynsect project:

- **chemical safety** of insects fed with "wastes“ and how the implementation rate of larvae was determined
- **business opportunities** for the of use larvae in organic poultry farming
- **ethical aspects** about feeding live animals to chickens and if thePoultrynsect project will ever investigate this topic.

POULTRYNSECT INTERVIEWS: AMIBA

Today we proudly introduce you one of the latest additions to our stakeholder panel: **AMIBA**.
AMIBA is a Portuguese association focused on the preservation of autochthonous breeds, like cattle, sheep and poultry. In particular, the association is in charge of the management and preservation of all four Portuguese chicken breeds**: Preta Lusitânica, Amarela, Branca and Pedrês Portuguesa**. AMIBA's role is of utmost importance to promote genetic biodiversity while preserving national breeds.
Thanks to **Dr. Virgínia Ribeiro**, **technical secretary of AMIBA, poultry section**, we got to know better the activity of a foreign association. Can insects and autochtonous poultry breeds work together to build a better future for animal farming? Let's find out with this interesting interview.



Welcome Virginia, please tell us more about yourself and the organization you work for!

My name is Virgínia Ribeiro, I've started working for AMIBA (Barrosã cattle breeders association) in 1997 in the area of genetic resources of Barrosã cattle. In 2017 I became the technical manager of the Portuguese Autochthonous Chicken Breeds, and since then I have been the responsible for this task.
AMIBA, or " the mother house of the autochthonous breeds" as people like to call us the due to the work developed over the years to protect the animal genetic resources in Portugal, is currently responsible of the management of the 7 herdbooks.
In 1990, a group of breeders founded AMIBA with the intention to develop strategies to contrast the declining number of animals of Barrosã cattle, followed by the "Bordaleira de Entre Douro e Minho" and the "Churra do Minho" sheep breeds.

The Portuguese General-Directorate for Food and Veterinary Medicine officially recognized the chicken breeds (picture on the right) of **"Pedrês Portuguesa"** (Portuguese Pedrês breed) and **"Preta Lusitânica"** (Black Lusitanian breed) in 2003, **"Amarela"** or "Galinha do Minho" (Yellow breed or Chicken of the Minho region) in 2004, and **"Branca"** or "Pescoço Pelado" (White breed or naked-neck breed) in 2014 and assigned the management of the breeding book to AMIBA.


AMARELA


BRANCA


PEDRÊS PORTUGUESA


PRETA LUSITÂNICA

Which breeds are currently being reared and how their perception has changed since AMIBA foundation?

AMIBA currently works in technical counseling services to breeders of local animal breeds. Technical staff visits the farms, identifies the animals, assesses the breeding conditions, and registers the productive and reproductive performances of each flock.
Technical support is also provided and the visits of technical staff to farms lead to an increasing concern of breeders, regarding the protection of the local breeds and the awareness of consumers regarding this type of production that is characterized by extensive production using pastures. Indeed the consumers considers the production of local breeds as environmental-friendly and an important asset to preserve the animal genetic resources. The added-value of products from local breeds leads to an increase of farm profit, while increasing the interest of farmers to maintain the production of local breeds. It is the case, for example, of the Barrosã breed cattle that acquired the PDO certification in 1996, leading to the increase of value and reputation of the Barrosã products.

AMIBA manages the reproduction center for each of the 4 local Portuguese chicken breeds in the association's headquarters. In our reproduction center, we develop research in reproduction and genetic selection of males for breeders, we study performance, egg count, reproduction indexes. We also provide external technical services such as flock vaccination, artificial incubation and others.
The services developed by the Technical Secretary of the Autochthonous Chicken Breeds lead to an expansion of the local breeds beyond the regions of origin. In fact, flocks of Autochthonous Chicken Breeds are found throughout Portugal, including the Azores archipelago.
The interest for the Portuguese local breeds is impressive mainly due to the distinguished quality of its products (eggs and meat) and given by the fact that Portuguese Chicken Breeds are robust and very adaptable to different environments, and easily bred in either free or semi-free range extensive production systems.

What working with this breeds has taught you so far? What about sustainability?

When we talk about Autochthonous or Local Breeds, our first thought goes to forgotten and abandoned rural areas, where these animals are well adapted, evidencing the robustness and resistance to illness that characterizes these breeds. They are raised in production systems that are environmental-friendly, using natural resources in perfect balance with nature and leading to the production of specialty and high-quality eggs and meat. Environment, social and economic sustainability characterize this production system because it is based on the association of three fundamental factors, animal, environment and populations (breeders).
These Autochthonous breeds are perfectly adapted to the territory given the flocks' current distribution, territorial dimension and flock size, but also considering the perfect adaptation to the natural resources, local climate, feeding systems, production facilities. Our previous studies revealed differences in laying and growth performances, as well as physical, chemical and organoleptic attributes of eggs and meat between each genotype.
Feeding and production systems influence greatly the quality of products of local breeds. Nevertheless, we observed that physicochemical and organoleptic characteristics of eggs and meat of local breeds clearly distinguish the four breeds and thus we have concluded that Local breed genotypes should be further explored.

What must be taken into account before starting with an autochthonous breed?

From far Left to Right: Francesco Gai (Poultrynsect project coordinator), Ileana & Ferdinando Trogolo-got (Cascina Losetta owners and Bianca di Saluzz farmers), Viriginia Ribeiro, Joana Nery (Department of Veterinary Sciences of Turin)

Whenever potential breeders contact us to start a project, the first question that they address us is "where to buy" the animals, whereas they should be asking "what would be necessary to become a breeder" of Autochthonous Portuguese breeds. It is necessary to understand if potential breeders have appropriate infrastructures to raise autochthonous breeds, while minimizing the risk of losing the genetic heritage that was so far regained, thanks to the work and resilience of breeders and technical staff.

It is important that potential breeders are also informed about the legal framework of this sector, the company and the animal breeding registration in the national database of the General-Directorate for Food and Veterinary and the regulation of the Breeding Book of each local breed. Usually potential breeders aim to raise all the four breeds but following the technical counseling sometimes they change their production plans to focus on only few of them. There is always a great aspiration to contribute to the preservation of local breeds and the will to do things the right way. This always helps the counseling work of the technicians assigned to the farms.

What working with this breeds has taught you so far? What about sustainability?


Credits to: AMIBA

Disciplines such as Genetics and animal breeding become fundamental when working in this field. Studying breeds, their history, the objectives that were considered during domestication allows us to understand the wisdom, although empirical, of our ancestors that aimed to meet certain needs such as food supply, traction, production of raw material for clothing, and economic gain. This gave me the opportunity to face my job as an ideal or a "cause". I grew up in a region characterized by small landholdings, where 1m² of land was the food sustain of a family, and half dozen chicken provided economic independence to women in a patriarchal society. Here we very deeply feel the meaning of concepts such as desertification, low population density regions, resistance, and resilience.
Our mission, not just as technicians but mainly as citizens, is to support as much as possible the breeders for the preservation of the local breeds and their productions.

As a consumer, I have developed the consciousness to look for local breed products, supporting the local animal production. "Consume to preserve" is a quote that I completely embrace and usually apply to describe the conscious consumer, because the preservation of our breeds depends also on product commercialization.

Speaking of sustainability, it is well known that the market is looking for alternative and low-impact products, even in animal nutrition. For example, insects have been recently approved in poultry (one of the species that AMIBA works on). Do you think that insects could be an alternative feed source for poultry? What about your breeds?

In a certain way, insects are already a part of the diet of our chicken. Free range pasturing allows animals to access worms and insects. Clearly the ingestion level is not sufficient to fulfil the nutritional requirements of protein and therefore it is always necessary to include protein sources in the diets of chicken. Are insects a sustainable protein source in our production systems? Well it would be very interesting to understand the actual impact of this protein source in the health, reproductive and performance indexes of our breeds, including the assessment of the cost/benefit ratio of this source and the current expectations in diet supplementation. Although it would be fundamental to find alternative protein sources, and insects being pointed as one of the most promising, it is still difficult to have access to these products in Portugal. Clearly, there is still a lot of work to do in this field and we can all help.

The pillars of AMIBA are its farmers, what are their thoughts and perceptions about this novel feed?

As referred previously, there is still a lot of work to do to on Portuguese Autochthonous chicken breeds like: feeding, use of by-products of agriculture and agri-food industry and impact of insect meal supplementation on health and production performance of animals. This is regularly, and probably the most requested information by farmers. They are curious about the use of insects in chicken feed and it would be necessary to develop further research in this area. Studies concerning the use of insects could support and encourage progress in this field but the feed industry would have to keep up with the development and market demand.
Considering the current difficulties and the cost of the raw feeds used in animal nutrition, the use of alternative protein sources could lead to an important development in Autochthonous breeds production. This would be of utmost importance to preserve biodiversity, to maintain social and economic cohesion, to promote tradition and gastronomy, and ultimately lead to Rural Development.

Thanks to Virginia Ribeiro for such a interesting interview and sharing her work with us.
Visit AMIBA page https://www.amiba.pt/ to know more about their activity!

MEET THE POULTRYNSECT TEAM

ANNE RIEDER

Anne is a research scientist at the Norwegian Institute of Food, Fisheries and Aquaculture Research (Nofima), department of Food Health , focusing on the food industry sector with project across Norway and Sweden.

After her master thesis in Food Sciences Engineering at the University of Hohenheim in Stuttgart (Germany), pursued her career winning a PhD. position at the Department of Nutrition, at the University of Oslo, Norway.

She then completed her post-doc at Nofima, the same institute where she's currently working.

CARL COUDRON

Carl earned his degree in 2016 as a master of science in Bioscience Engineering: Agricultural science. Soon after, he started working as a researcher on sustainable protein production at Inagro, a research and development institute for agriculture. Initially this involved research to cultivate duckweed on wastewater, but as of 2017 he got more and more involved in the development and start-up of the Inagro insect research centre.

There he is involved in several international research projects where he has since been specialising in optimising the production process for insects as food and feed.

PARTNERS
Discover teams involved in the project

POULTRYNSECT

Consiglio Nazionale
delle Ricerche

Nofima

DIL

UNIVERSITÀ
DI TORINO

inagro
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STAKEHOLDERS

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Controllo e Certificazione

Amiba
Associação dos Criadores de
Bovinos de Raça Barrosã

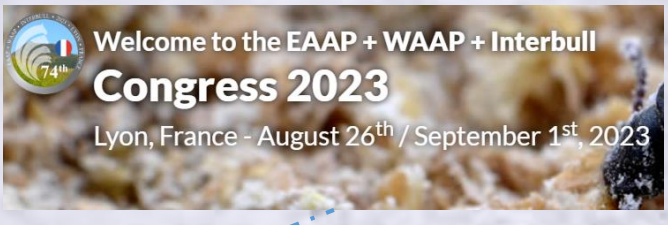
TEDALDI

NEXT ON THE AGENDA

Poultrynsect team will participate at the following upcoming events:

INSECTA International CONFERENCE

Sept 14-15, 2023 in Magdeburg, Germany



CONTACTS

For more information about Poultrynsect project follow us on:

https://poultrynsect.eu/

https://susfood-db-era.net/main/

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POULTRYNSECT TEAM WISHES YOU