

XX INTERNATIONAL SYMPOSIUM ON FISH NUTRITION AND FEEDING

Towards Precision Fish Nutrition and Feeding

FINAL
PROGRAMME

5th - 9th June 2022
Sorrento, Italy



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COMMITTEES

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- *Concetta Messina*, [University of Palermo](#)

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- *Dr. Genevieve Corraze*, [Institut Nationale de Recherche Agronomique, France](#)
- *Prof. Delbert Gatlin III*, [Texas Agricultural and Medicine University, United States of America](#)
- *Prof. Brett Glencross*, [Institute of Aquaculture, University of Stirling, United Kingdom](#) (Chair)
- *Prof. Marisol Izquierdo*, [Grupo Investigaciones Aquacultura, University of Las Palmas de Gran Canaria, Spain](#)
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- *Prof. Luisa Valente*, [CIIMAR, University of Porto, Portugal](#)
- *Dr Rune Waagbo*, [Institute of Marine Research, Norway](#)
- *Prof. Seunghyung Lee*, [Korea](#)

KEYNOTE SPEAKERS



LOUISE BUTTLE

Louise has been working in the aquaculture industry for over two decades, for much of this time with EWOS-Cargill in the salmon feed industry with expertise in R & D, Product Innovation and Sustainability.

Today, Louise is part of the DSM Aqua team; delivering science-based solutions to further drive sustainable aquaculture.



AUDUN LEM

Audun Lem is the Deputy Director of the FAO Fisheries and Aquaculture Division where he is responsible for aquaculture activities and post-harvest issues.

Audun has a Ph.D. in Agricultural Sciences from Poland's Sea Fisheries Institute, an MBA from Harvard, and a Bachelor in Economics from the Norwegian School of Economics.



NIKOS ZAMPOUKAS

Nikos Zampoukas is a policy officer in the European Commission developing research and innovation policy for aquaculture, fisheries and marine biotechnology. He studied biology in the University of Athens where he also obtained an MSc and a PhD in biological oceanography doing research on fish biology, benthic ecology and ecotoxicology. He served as a scientific officer in the European Commission Joint Research Centre where he worked on the intercalibration and harmonisation of national ecological assessment methods for transitional, coastal and marine waters for the implementation of the water framework directive and the marine strategy framework directive.

PROGRAMME AT A GLANCE

Time	Sunday 5 th	Monday 6 th	Tuesday 7 th	Wednesday 8 th	Thursday 9 th
8.30 9.00		Opening Ceremony			
9.00 9.30		Lecture 1	Lecture 2	Session 7 Feed additives and functional feeds	Lecture 3
9.30 11.00		Session 1 Physiology and nutritional requirements	Session 4 Alternative lipid sources	Nutritional and feeding strategies	Session 9 Nutrition and fish health
11.00 11.30		Coffee Break			
11.30 13.15		Session 2 Physiology and nutritional requirements 2	Session 5 Alternative protein sources	Session 8 Nutritional and feeding strategies	Session 10 Nutrition and fish health 2
13.15 14.45		Lunch		TOURS	Lunch
14.45 16.30		Session 3 Selective breeding and larval nutrition	Session 6 Alternative protein sources 2		Session 11 Feed additives and functional feeds 2
16.30 17.00		Coffee Break			Coffee Break
17.00 18.00	Registrations	Poster Session 1	Poster Session 2		Session 12 Feed technology and product quality
18.15					
18.15 18.45		Closing Ceremony			
19.00	Welcome Cocktail				
20.00					Symposium Dinner

SUNDAY 5 JUNE

16.30-19.00

REGISTRATION OPEN

19.00 - 20.00

WELCOME COCKTAIL

Location: Agrumeto, Hilton Sorrento Palace

MONDAY 6 JUNE

8.30-9.00

OPENING CEREMONY - *Brett Glencross, Alessio Bonaldo*

9.00-9.30

LECTURE 1

Fish is more than food: the importance of fisheries and aquaculture for livelihoods, nutrition and food security.
Audum Lem

9.30-11.00

SESSION 1 PHYSIOLOGY AND NUTRITIONAL REQUIREMENTS

Chairs: Brett Glencross, Alessio Bonaldo

9.30

Reevaluation of the dietary methionine requirements for gilthead seabream (*Sparus aurata*) juveniles using hydroxy methionine and DL-methionine. *Aires Oliva-Teles*

9.45

What does our research say about potential specific roles of EPA and DHA in Atlantic salmon? *Marta Bou*

10.00

Lysophospholipids improve active nutrient transport in the gut epithelium of gilthead seabream. *Rocio Robles-Arozarena*

10.15

Effects of bioactive peptides on growth performance, gut health and stress resistance of gilthead sea bream and European sea bass. *Serena Busti*

- 10.30 The omega-3 retention in larvae of black soldier fly (*Hermetia illucens* L.) reared in a substrate of brewers' spent grains supplemented with an oleaginous microbial biomass. *Chiara Ceccotti*
- 10.45 Choline requirement of Atlantic salmon (*Salmon salar* L) depends on dietary lipid level and environmental temperature. *Åshild Krogdahl*

11.00 Coffee Break

11.30 - 13.15

SESSION 2 PHYSIOLOGY AND NUTRITIONAL REQUIREMENTS 2

Chairs: Rune Waagbo, Marco Saroglia

- 11.30 Differences in energy utilisation between a lean and fat strain of rainbow trout (*Oncorhynchus mykiss*). *Ruben Groot*
- 11.45 Effect of temperature on energy utilization efficiencies of digested protein, fat and carbohydrates in Nile tilapia (*Oreochromis niloticus*). *Kumar Dey Bipul*
- 12.00 Effects of thiamin, folic acid and cobalamin levels in diets low in fishmeal on gilthead seabream (*Sparus aurata*) juveniles. *David Dominguez*
- 12.15 Intestinal transport of methionine sources in rainbow trout (*Oncorhynchus mykiss*). *Thi Ha To Van Pham*
- 12.30 Re-evaluating the dietary requirement of EPA and DHA in Atlantic salmon and its complexity. *Esmail Lutfi*
- 12.45 Towards a free wild fish and soy diet for european seabass using by-products from fishery and aquaculture. *Arianna Marchi*
- 13.00 Water temperature affects differently the gut transit of successive meals and the gastrointestinal luminal pH in *Seriola dumerili*. *Manuel Yúfera*

13.15 Lunch

14.45 - 16.30

SESSION 3 SELECTIVE BREEDING AND LARVAL NUTRITION

Chairs: Luis Conceição, Ivar Rønnestad

- 14.45 The importance of body composition for genetic variation in feed efficiency in atlantic salmon. *Bjarne Hatlen*
- 15.00 Nutritional innovations in superior european seabream (*sparus aurata*) genotypes: implications in fish performance. *Daniel Montero*
- 15.15 Effects of dietary docosahexaenoic acid (DHA) and vitamin E on skeletal development, bone mineralisation and oxidative stress on meagre, *Argyrosomus regius* larvae. *Leticia Luján Amoraga*
- 15.30 Plant extracts supplementation impacts robustness of marine fish at early life stages. *Xavier Maria João*
- 15.45 Joining forces for functional hatchery feeds: Micro- and macroalgae blend boosts disease resistance in Senegalese sole post-larvae. *Ana Teresa Gonçalves*
- 16.00 Effects of dietary selenium on growth, fatty acid composition, expression of bone-related genes and skeletal anomalies in gilthead seabream (*sparus aurata*) larvae. *Yiyen Tseng*
- 16.15 An overview on the dietary requirement of vitamin D3, vitamin K3 and its interaction on gilthead seabream larvae (*Sparus aurata*) growth, skeletal development, and bone biomarker gene expression. *Sivagurunathan Ulaganathan*

16.30 Coffee Break

17.00 - 18.00 POSTER SESSION 1

9.00 - 9.30

LECTURE 2

EU research and innovation policy for sustainable aquaculture. *Nikos Zampoukas*

9.30 - 11.00

SESSION 4 ALTERNATIVE LIPID SOURCES

Chairs: Genevieve Corraze, Brian Small

9.30

Production of omega-3 enriched and refined oil, from mediterranean aquaculture by-products, to reach the “zero waste” and circular economy goals. *Concetta Maria Messina*

9.45

Full replacement of fish oil with algae oil in farmed atlantic salmon (*salmo salar*) – debo. *Kyla Zatti*

10.00

Replacement of fish oil by a high-DHA microbial oil in salmon diets: effect on growth performance, lipid composition and gene expression. *Christopher Parrish*

10.15

Evaluation of dietary selenium and methylmercury interactions on growth, digestibility and retention in rainbow trout (*Oncorhynchus mykiss*). *Marius Bidon*

10.30

Diet containing Schizochytrium-derived oil offered to Atlantic salmon (*Salmo salar*) during smoltification. *Nathaniel W. Farris*

10.45

Black soldier fly (BSF) prepupal meals enriched in fatty acids as feed ingredients for Nile tilapia: effects on growth, digestive physiology and fish health. *Patrick Kestemont*

11.00

Coffee Break

11.30 - 13.15

SESSION 5 ALTERNATIVE PROTEIN SOURCES

Chairs: Luisa Valente, Laura Gasco

- 11.30 Yeast as an alternative ingredient in fish feeds: effects on nutritional and intestinal health of Atlantic salmon (*Salmo salar*) fed soybean-meal based diets in seawater.
Jeleel Opeyemi Agboola
- 11.45 Natural stable isotopes of various insect meals and their contribution to tissue construction of European perch (*Perca fluviatilis*). *Quang Hung Tran*
- 12.00 Downstream processing of black soldier fly (*Hermetia illucens*) larvae: effects on growth performance and gut microbiota of Atlantic salmon (*Salmo salar*). *Sergio Rocha*
- 12.15 *Hermetia illucens* and poultry by-product meals: growth performance and fillet chemical quality of farmed rainbow trout. *Laura Gasco*
- 12.30 High level of cottonseed protein concentrate as fishmeal alternative for largemouth bass (*Micropterus salmoides*) supplemented a yeast-based paraprobiotic: effects on growth performance, bile acid metabolism, liver and gut health.
Ge Chunyu
- 12.45 Impact of fish meal substitution with insect meals on gut physiological aspects of European sea bass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*).
Nikolas Panteli
- 13.00 A yeast product improves the efficiency of a processed animal protein diet in rainbow trout by modulating the gut response.
Laura Frohn

13.15 Lunch

14.45 - 16.30

SESSION 6 ALTERNATIVE PROTEIN SOURCES 2

Chairs: Seunghyung Lee, Satoh Shuichi

- 14.45 Effect of black soldier fly larvae meal size fractions on nutrient digestibility, nitrogen excretion, and intestinal exochitinase activity in Nile tilapia and rainbow trout. *Kyllian Manon Eggink*
- 15.00 Assessment of black soldier fly (*Hermetia illucens*) pupae meal as an alternative protein ingredient for juvenile red sea bream (*Pagrus major*) diets. *Ozan Oktay*
- 15.15 Apparent digestibility coefficients of protein and amino acids of soybean meal are more affected by the composition of the reference diet than the ones of poultry by-product meal in Nile tilapia juveniles. *Karthik Masagounder*
- 15.30 Evaluating the comparative effects of different dietary insect meals on growth performance and feed utilization in gilthead seabream (*Sparus aurata*). *Adamantia Asimaki*
- 15.45 Taste receptors regulation of feeding behavior in rainbow trout (*Oncorhynchus mykiss*) fed from first feeding with plantbased diet. *Elodie Baranek*
- 16.00 Effect of dietary insect meals on metabolism of gilthead sea bream (*Sparus aurata*). *Maria Mastoraki*
- 16.15 Growth response, gut health and welfare of farmed Gilthead sea bream (*S. aurata*) and European sea bass (*D. labrax*) juveniles are improved by inclusion of processed animal proteins in fishmeal-free diets. *Gloriana Cardinaletti*

16.30 Coffee Break

17.00 - 18.00 POSTER SESSION 2

9.00 - 11.00

SESSION 7 FEED ADDITIVES AND FUNCTIONAL FEEDS

Chairs: Delbert Gatlin, Luca Parma

- 9.00 Beneficial effects of a marine probiotics bacillus multi-strains consortium encapsulated in algae on growth performance, mucosal microbiota modulation, density stress resistance and immunity gene expressions of atlantic salmon *salmo salar*.
Fanny Giudicelli
- 9.15 Immunomodulatory effect of heat-killed *Lactobacillus plantarum* L-137 in Atlantic salmon (*Salmo salar*). *Peng Lei*
- 9.30 Inclusion of a hydrolyzed *Debaryomyces hansenii*-based product in functional feeds for Atlantic salmon: From the in vitro model to a *Moritella viscosa* outbreak in seawater.
Byron Morales-Lange
- 9.45 Modulation of body adiposity in gilthead seabream by the dietary inclusion of bile salts. *Alberto Ruiz Hernández*
- 10.00 Functional additives in practical diets for european sea bass (*dicentrarchus labrax*) as stress protectors. *Antonio Serradell*
- 10.15 Potential of shrimp and insect exuviae as a source of chitin for sustainable aquaculture feeds. *Simona Rimoldi*

NUTRITIONAL AND FEEDING STRATEGIES

- 10.30 Optimizing nutrition and feeding of ballan wrasse for better welfare and survival in salmon pens. *Sæle Øystein*
- 10.45 Omega-3 for Atlantic salmon reared under Arctic conditions – seasonal adjustment of EPA and DHA and effects on fish health and fillet quality 2. *Trond M. Kortner*

11.00 Coffee Break

11.30 - 13.15

SESSION 8 NUTRITIONAL AND FEEDING STRATEGIES

Chairs: Monica Betancor Quintana, Christopher Parrish

- 11.30 Energy evaluation for fish: from digestible to net energy 3.
Johan Schrama
- 11.45 Assessing early utilisation of vegetable-based feed and its possible interaction with genotype and epigenetics in Atlantic salmon (4). *Karla Fernandez Quiroz*
- 12.00 Broodstock nutrition in Atlantic salmon (5).
Anne-Catrin Adam
- 12.15 A new generation of phytase enzymes for improving the sustainability and profitability of fish farming. *Ester Santigosa*
- 12.30 Demonstrating the importance of nutritional modelling for precision feeding in gilthead seabream aquaculture.
Andreia Raposo
- 12.45 Development of a static in vitro feed digestion model in rainbow trout, *Oncorhynchus mykiss* (II) — in vitro feed digestion, characterization and validation for the development of an artificial fish intestine. *Marcelo A. Chacon*
- 13.00 Prediction of the short and long-term effects of novel dietary formulations on the performance of gilthead sea bream (*Sparus aurata*). *Marta Carvahlo*

AFTERNOON SOCIAL ACTIVITIES

9.00 - 9.30

LECTURE 3

Sustainable nutrition for Aquaculture. How are we doing? *Louise Buttle*

9.30 - 11.00

SESSION 9 NUTRITION AND FISH HEALTH

Chairs: Daniel Montero, Trond M. Kortner

9.30

Influence of dietary astaxanthin on lipid and glucose metabolism in liver of rainbow trout.

Carmen Tatiana Kalinowski

9.45

Optimal Vitamin Nutrition to foster sustainable salmonid aquaculture. *Andre Dumas*

10.00

Rainbow trout (*Oncorhynchus mykiss*) intestinal mucosa de-differentiate to restore its absorptive ability when challenged by a vegetable-rich diet. *Nicole Verdile*

10.15

Micro- and macroalgae blend modulates European seabass (*Dicentrarchus labrax*) systemic and local immune responses upon infection with *Tenacibaculum maritimum*.

Mariana Ferreira

10.30

The effects of different levels of dietary phosphorus in freshwater on the skeleton of Atlantic salmon at harvest. A study based on individually tagged animals and repeated radiology. *Lucia Drábiková*

10.45

Dietary zinc supplementation improves post-smolt Atlantic salmon (*Salmo salar*) feed performance, protein retention and wound healing pathways. *Torunn Forberg*

11.00

Coffee Break

11.30 - 13.15

SESSION 10 NUTRITION AND FISH HEALTH 2

Chairs: Margarida Barros, Enric Gisbert

- 11.30 Impact of new dietary oils rich in EPA and DHA on Atlantic salmon health marker. *Daniel Gonzalez-Silvera*
- 11.45 Exploring the potential in using locally sourced low-trophic resources in fish feed – can Atlantic salmon handle sugar kelp? *Sahar Sartipiyarahmadi*
- 12.00 Incorporation of carbohydrates in a 100% plant-based diet has a strong effect on the gut microbiota and metabolism of rainbow trout (*Oncorhynchus mykiss*). *Raphaël Defaix*
- 12.15 An initial evaluation of fishmeal replacement with soy protein sources on growth and immune responses of burbot (*Lota lota maculosa*). *Kenneth Cain*
- 12.30 Detection and modulation of olfactory sensing receptors in rainbow trout (*Oncorhynchus mykiss*) fed from first feeding with plant-based diet. *Jerome Roy*
- 12.45 Effects of supplementing a plant protein-rich diet with insect, crayfish or microalgae meals on Gilthead sea bream (*S. aurata*) and European seabass (*D. labrax*) growth, welfare, gut health and microbiota. *Basilio Randazzo*
- 13.00 Establishment of optimal dietary inclusion levels of phosphatidylcholine from krill towards reducing lipid malabsorption syndrome in Atlantic salmon. *Kiran Kaur*

13.15 Lunch



14.45 - 16.15

SESSION 11 FEED ADDITIVES AND FUNCTIONAL FEEDS 2

Chairs: Alessandra Roncarati, Ester Santigosa

- 14.45 The effects of probiotic *Lactococcus lactis* strain on Gilthead sea bream (*Sparus aurata*) gut microbiota and transcriptional response. *Federico Moroni*
- 15.00 Effect of humic substances as feed additive on performance and immunological response of rainbow trout, *Oncorhynchus mykiss* (Walbaum, 1792) juvenile. *Prokešová Markéta*
- 15.15 Fast-tracking and integrative approach based on histomorphological and molecular biomarkers to evaluate intestinal health in fish fed functional ingredients. *Mariana Ferreira*
- 15.30 Fish hydrolysates as mitigators of adverse effects of no-fishmeal diets in seabream juveniles. *Cláudia Aragão*
- 15.45 Fucoidan from brown seaweed as functional ingredient in aquafeeds: effects on gut health and immune response in Atlantic salmon pre-smolts. *Sérgio Rocha*
- 16.00 Hot topic: potential of spices to enhance performance, reduce adiposity and improve flesh n-3/n-6 polyunsaturated fatty acid ratio in seabream (*Sparus aurata*) fed diets with fish oil replacement by saturated mammal's fat. *Sofia Morais*
- 16.15 Impact of synbiotic diet on growth, gut health and microbiome of Atlantic salmon during antibiotic treatment. *Anusha K.S. Dhanasiri*

16.30 Coffee Break

17.00 - 18.15

SESSION 12 FEED TECHNOLOGY AND PRODUCT QUALITY

Chairs: Katerina Kousoulaki, Naoki Kabeya

- 17.00 A comprehensive study regarding the effects of temperature on the radical-scavenging potential of natural antioxidants in aquafeeds. *Ricardo Pereira*
- 17.15 The impacts of physical properties of extruded feed on the kinetics of nutrient digestion, gastrointestinal emptying and stomach water fluxes of Spotted seabass (*Lateolabrax japonicus*). *Shujuan Xing*
- 17.30 A study on the influence of processing parameters on the physical qualities of low-starch extruded feed with *Clostridium autoethanogenum* protein inclusion. *Shifeng Ma*
- 17.45 High content of plant proteins in freshwater diets for Atlantic salmon increased mortality in seawater and deteriorated fillet quality at harvesting. *Katerina Kousoulaki*
- 18.00 Bioactive compounds in newly isolated freshwater microalgae strains: impact to the flesh quality of rainbow trout (*Oncorhynchus mykiss*). *Zsuzsanna J. Sandor*

18.15 - 18.45

CLOSING CEREMONY - Brett Glencross, Alessio Bonaldo

20.00

SYMPOSIUM DINNER

Location: Agrumeto, Hilton Sorrento Palace



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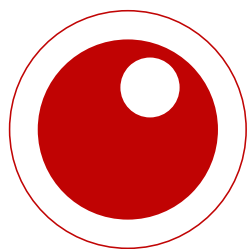


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POSTER SESSIONS

Posters are displayed inside the Congress Centre and they will be properly indicated by signposting.

Posters are arranged by topic and displayed on the following days:

Monday 6th June 2022 8.00 - 18.00

Tuesday 7th June 2022 8.00 - 18.00

Posters are numbered and must be on display on the day that the Organising Secretariat assigned the authors, according to the following schedule only:

set-up 8.00 - 9.00

removal 18.00 - 19.00

Posters differ by topic every day and the Organising Secretariat declines any responsibility for posters left on display afterwards.

In order to encourage discussions about posters, the poster Presenter must be available at the assigned poster panel from 17:00 to 18:00

BEST ORAL COMMUNICATION AWARD

The Best Oral Communications Award aims to recognize a scientific paper of exceptional quality delivered as oral presentation at the ISFNF2022.

The best oral communication award will be granted based on a combination of excellent research and innovation.

Panel of judges will evaluate all oral presentations and select the winner.

The best oral communication award will be recognized publicly at the end of the conference.

The winner will receive a certificate and a monetary award.

Thanks to:



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MONDAY 6 JUNE

- M01** Trained immunity and nutritional programming for resilient salmon («RESILIENT SALMON»).
- Øverland Margareth, Djordjevic Brankica, McLean Press Charles, Mydland Liv Torunn, Morales-Lange Byron*
- M02** Effect of dietary potassium diformate on hematological parameters and serum hepatic enzymes in Sterlet sturgeon (*Acipenser ruthenus*).
- Shekarabi Seyed Pezhman Hosseini, Mehrgan Mehdi Shamsaie, Lückstädt Christian, Kakavand Mansore*
- M03** Influence of stress in voluntary feed intake of gilthead seabream (*Sparus aurata*) and its amenability to modulation through a feed palatability enhancer.
- Gonçalves Rui A., Leal Esther, Puebla Marina, Angotzi Anna Rita, Cerdá-Reverter José Miguel, Morais Sofia*
- M04** Effect of a Phytogenic Feed Additive on the Growth Performance, Immune Response and Resistance against *Streptococcus agalactiae* of Nile Tilapia, *Oreochromis niloticus*.
- Gruber Christina, Kesselring Jutta, Standen Benedict, Bui Chau Truc Dan, Wein Silvia*
- M05** Microencapsulated organic acids and essential oils as feasible feed additive for salmonid farming.
- Souza Valente Cecilia, Servin Arce Kurt, Huyben David, Chiasson Marcia, S. Lumsden John, H. Pham Phuc, A. Kabir Chowdhury Mohiuddin*
- M06** Myo-inositol improves growth performance and regulates lipid metabolism of juvenile Chinese mitten crab (*Eriocheir sinensis*) fed different percentage of lipid.
- Bu Xianyong, Wang Xiaodan, Chen Liqiao*
- M08** Prebiotics affect the host metabolism in rainbow trout fed with a 100% plant-based diet.
- Lokesh Jep, Defaix Raphael, Reyrolle Marine, Ghislain Mylène, Le Behec Mickael, Pigot Thierry, Terrier Frédéric, Roy Jérôme, Panserat Stéphane, Ricaud Karine*

- M09** Polyphenols: a nutraceutical approach for sustainable aquaculture.
Paolucci Marina, Hoseinifar Seyed Hossein, Ashouri Ghasem, Pancioli Nicola
- M11** Interaction between tannins administration and intestinal inflammation in Zebrafish (*Danio rerio*), effects on intestinal integrity, expression of pro-inflammatory marker and gut microbiota.
Scicchitano Daniel, Fronte Baldassare, Orso Graziella, Marchese Maria, Mero Serena, Licitra Rosario, Candela Marco, Imperatore Roberta, Paolucci Marina
- M12** Additive effects of poly- β -hydroxybutyrate on growth and immune responses of juvenile nile tilapia *oreochromis niloticus*, hybrid striped bass *morone chrysops* \times *m. saxatilis*, and red drum *sciaenops ocellatus* based on in vivo and in vitro approaches.
Suehs Blaine A., Yamamoto Fernando Y., Asiri Fahad, Older Caitlin, E. Gatlin, III Delbert M.
- M13** Growth performance parameters and antioxidant capacity of whiteleg shrimp (*penaeus vannamei*) and nile tilapia (*oreochromis niloticus*) boosted by a phytogenic feed additive.
Makol Alex, Aumiller Tobias, Wendler Karola
- M14** *Rhodotorula mucilaginosa*, an alternative for organic selenium production in fish nutrition.
Díaz Paola, Marileo Luis, Hernández Adrian J, Orellana Paola, Dantagnan Patricio
- M15** Tryptophan dietary supplementation – a strategy to ensure health in farmed fish.
Azeredo Rita, Machado Marina, Aragão Cláudia, Mancera Juan Miguel, Conceição Luís Eugénio Castanheira, Dias Jorge, Costas Benjamín
- M16** Dietary supplementation with osteogenic extracts during the pre-ongrowing phase improves skeletal quality of gilthead seabream at the ongrowing phase.
Carletti Alessio, Dellacqua Zachary, Rosa Joana, Kumar Navdeep, Tarasco Marco, Marques Cátia, Barata Marisa, Pousão-Ferreira Pedro, Cancela Leonor, Gavaia Paulo, Laizé Vincent

- M17** Inclusion of salicornia ramosissima inedible residues in diets for juvenile pacific white shrimp (*penaeus vannamei*) seems to modulate the immune response.
Ramos-Pinto Lourenço, Machado Marina, Fernández-Boo Sérgio, Teixeira Carla, Dias Jorge, Barreto André, Serradeiro Renata, Rocha Rui, Costas Benjamin
- M18** Effects of high starch and supplement of olive extract on the growth performance, hepatic antioxidant capacity and lipid metabolism of largemouth bass (*Micropterus salmoides*).
Liang Xiaofang, Chen Pei, Wu Xiaoliang, Xing Shujuan, Sofia Morais, He Maolong, Xue Min
- M19** Effect of dietary supplementation with a microalgae liquid extract on growth and performance of Asian sea bass (*Lates calcarifer*) at two different salinities.
Cusimano Giovanni Marco, Deguara Simeon, Prescott Steven George, De Prisco Joseph, Nagel Florian, Balsells Claramunt Sandra, Kleinegris Dorinde, Bardocz Tamas
- M20** Supra-requirement supplementation with various selenium sources in gilthead seabream (*Sparus aurata*) needs a careful assessment of its efficacy and environmental burden.
Dias Jorge, Rocha Rui, Guimaraes Barbara, D'Adamo Sarah, Barbosa Maria, Bruckner Christian, Santos Andre, Viegas Michael, Conceicao Luis, Goncalves Ana Teresa
- M21** DL-Methionyl-DL-Methionine as an efficient methionine source for whiteleg shrimp (*Litopenaeus vannamei*)- zootechnical performance, antioxidant response and methionine-related pathways.
Machado Marina, Fernández-Boo Sergio, Teixeira Carla, Veigas Michael, Serradeiro Renata, Dias Jorge, Costas Benjamin, Masagounder Karthik
- M22** Potential of Codium sp. and Osmundea sp. as dietary supplements for European sea bass (*Dicentrarchus labrax*).
Enes Paula, Fontinha Filipa, Monteiro Marta, Guerreiro Inês, Magalhães Rui, Soula Mohamed, Oliva-Teles Aires, Couto Ana
- M23** The Effect of OXIFISH on Growth and Health Performance in White Leg Shrimp (*Litopenaeus vannamei*).
Riley William, Jintasataporn Orapint

- M24** Novel weakened whole cell form of *Haematococcus pluvialis* as a source of astaxanthin for rainbow trout.
Colombo Stefanie, Hart Bailey
- M25** Boosting gut homeostasis with optimized microalgae for precision functional nutrition.
Gonçalves Ana Teresa, Jacinto Rita, Ribeiro Tiago, Pereira Hugo, Navalho João, Dias Jorge
- M26** Effect of green seaweed meal (*Ulva* sp., *Caulerpa* sp., and *Enteromorpha* sp.) as a quality enhancer in juvenile´s diets of *Litopenaeus vannamei*.
Vargas Cárdenas Jessie, Brito da Silva Octavio, Soto Ivan, Peixoto Silvio, Olivera Gálvez Alfredo
- M27** Marine dinoflagellate *Durusdinium glynii* (Dinoflagellata, Symbiodiniaceae) as a promising protein source for aquafeeds
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- M28** Distinct yeast cell wall from *Saccharomyces cerevisiae* elicits contrasted innate immune and mucosal tissue responses - A Zebrafish Screening Model.
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- M29** Carotenoid profile of *tetraselmis striata* grown under optimal cultivation conditions in a pilot scale bioreactor.
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- M30** Sustainable aquaculture: Roles of functional feed additives and biofloc technology.
Van Doan Hien, Hosenifar Seyed Hossein, Einar Ringø, Tran Quang Hung, Stejskal Vlastimil
- M31** Polyphenols as natural antioxidants in Atlantic salmon feeds
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- M32** Prebiotic potential of Cellobiose in rainbow trout (*Oncorhynchus mykiss*)
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- M33** Effects of exogenous enzymes (phytase and protease) in diets on growth, feed utilization, apparent digestibility and nutrient retention of juvenile white shrimp *Litopenaeus vannamei* reared in high performance conditions.
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- M34** Effect of an encapsulated product based on a combination of spice oleoresins on *Sparus aurata* gut microbiota and potential relationship with fish adiposity.
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- M35** Applications of macroalgae (*Padina pavonica*) extracts in early weaning diets for gilthead sea bream (*Sparus aurata*).
Torrecillas Silvia, Montero Daniel, Monzón-Atienza Luis, Sarih Samira, Djellata Adnane, Roo Javier, Coz-Rakovac Rozelindra, Acosta Félix, Izquierdo Marisol
- M36** Supplementation with nutraceutical compounds in plant protein-based diets: a physiological story in the gilthead sea bream (*Sparus aurata*).
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- M37** A new single-cell protein from *Clostridium autoethanogenum* as a functional protein for largemouth bass (*Micropterus Salmoides*)
Ma Shifeng, Liang Xiaofang, Chen Pei, Wang Jie, Xue Min
- M38** Critical issues to draft national and regional policy framework for supply chain of feeds and seeds in Africa.
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- M39** Evaluation of an ecological diet as a sustainable solution for meagre production in earthen pond
Matias Ana Catarina, Quental-Ferreira Hugo, Dias Jorge, Saavedra Margarida, Bandarra Narcisa, Soares Florbela, Araújo Ravi Luna, Gamboa Margarida, Pousão-Ferreira Pedro

- M40** Attitudes towards sustainable aquaculture products: Evidence from a consumer survey of European countries.
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- M41** Novel dietary ingredients do not affect growth but alter the quantity and quality of fecal waste produced by rainbow trout.
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- M42** Utilization of feed resources in Norwegian farming of salmon and rainbow trout in 2020
Aas Turid Synnøve, Ytrestøl Trine, Åsgård Torbjørn
- M43** Growth performance of european sea bass (*dicentrarchus labrax*) juveniles fed brewer's spent grain after solid state fermentation with *aspergillus ibericus*.
Estevão-Rodrigues Tássia, Fernandes Helena, Moutinho Sara, Filipe Diogo, Magalhães Rui, Salgado José, Oliva-Teles Aires, Peres Helena, Castro Carolina
- M44** Can seabass benefit from microdiets with high lipid and dha levels at early developmental stages?
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- M45** Estimated qualitative amino acid requirements for the early life-stages of purple sea urchin.
Engrola Sofia, Dias Diogo, Colen Rita, Santos André, Pinto Wilson, Conceição Luis Eugénio Castanheira
- M46** The effects of live food reduction during larval rearing of the gilthead seabream (*sparus aurata* L.): influence on survival rate and growth parameters.
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- M47** The effects of different dietary sources of medium-chain fatty acids (mcfas) on growth performance of gilthead seabream larvae (*Sparus aurata* L).
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- M48** Effect of different frequencies of the addition of *Brachionus plicatilis* on the performance of *Litopenaeus vannamei* in a nursery biofloc system with rice bran (anaerobic and aerobic) as an organic carbon source.
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- M49** Is the origin of dietary protein hydrolysates important for fish larval development?
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- M50** Use of *Hermetia illucens* larvae in formulated diets for rainbow trout fry.
Arnautov Maksim, Artemov Roman, Gershunskaya Valery
- M51** Survival and Biochemical profile alteration depending on food source in the calanoid copepod *Acartia tonsa* (Dana, 1848).
Martino Andrea, Montero Daniel, Roo Javier, Holt William V., Narizzano Riccardo, Lavorano Silvia, Otero-Ferrer Francisco
- M52** Reduction of digestible protein for Nile tilapia juveniles by maintaining the balance among essential amino acids.
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- M54** Growth and fatty acid composition of flathead grey mullet juveniles cultured at different salinities using feeds with brewery by-products and low and high fish meal fish oil content.
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- M55** Physiological effects of partial substitution of fishmeal with *Hermetia illucens* meal in Gilthead sea bream (*Sparus aurata*)
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- M56** Water temperature and feeding modulate dynamics in gut microbiota in greater amberjack juveniles (*Seriola dumerili*)
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- M57** Mitochondrial fatty acid β -oxidation inhibition promotes glucose utilization and protein deposition through energy homeostasis remodeling in fish.
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- M58** Calcifediol supplementation in salmonid diets apparently sufficient for cholecalciferol raises vitamin D status ensuring this endocrine system can mediate its diversity of physiological functions.
Rider Sebastien, Yamashita Eduardo, Constant Denis, Chenal Elodie, Tschambser Anaëlle
- M59** Optimum Omega Nutrition to improve fish health, welfare, and performance in Atlantic Salmon aquaculture.
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- M60** Impact of dietary vitamin D3 supplementation on growth, molting, antioxidant capability and immunity of juvenile Chinese mitten crab (*Eriocheir sinensis*) by metabolites and vitamin D receptor.
Liu Shubin, Wang Xiaodan, Chen Liqiao
- M63** Dietary vitamin A affects growth performance, immunity, antioxidant capacity, and lipid metabolism of juvenile Chinese mitten crab *Eriocheir sinensis*.
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- M65** Genomic based innovation platform to overcome the metabolic and nutritional bottlenecks of poor use of plant and animal based ingredient sources in African aquaculture.
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- M66** A marine harpacticoid copepod, *Tigriopus californicus* can produce docosahexaenoic acid (DHA, 22:6 ω 3) from oleic acid (OA, 18:1 ω 9).
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- M67** Effects of live food in the early rearing of the gilthead seabream (*Sparus aurata* L.) on larval intestinal morphology and transcriptional profiles.
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- M68** Quantitative histological analysis as a tool to measure requirements for sulphur amino acids and optimal organ functioning in giant grouper (*Epinephelus lanceolatus*)
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- M69** A new insight into the underlying adaptive strategies of euryhaline marine fishes to low salinity environment: Through the regulation of cholesterol nutrition authors
Bao Yangguang, Shen Yuedong, Li Xuejiao, Wu Zhaoxun, Jiao Lefei, Li Jing, Zhou Qicun, Jin Min
- M70** The Theory of Relativity: As Applied to Essential Fatty Acid Requirements in Atlantic salmon.
Huyben David, Matthew Chessor, Bou Marta, Ruyter Bente, Glencross Brett
- M71** Optimalization of macronutrient composition for Atlantic halibut grow-out.
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- M72** The effects of dietary amino acid profiles and energy levels on the performance of striped catfish.
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- M73** Effects of dietary lipid quality and fish size on choline requirement in Atlantic salmon (*Salmo salar* L).
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- M74** Evaluation of chitinolytic activities in the digestive tract of european seabass (*Dicentrarchus labrax*).
Messina Maria, Pascon Giulia, Daniso Enrico, Tibaldi Emilio, Tulli Francesca
- M76** Leucine's dietary supplementation effect on the regulation of stress in farmed Atlantic salmon (*Salmo salar* L.)
Lai Floriana, Comesana Sara, Gomes Ana S., Flatejord Daniel, Tolås Ingwill, Espe Marit, De Santis Christian, Hartviksen Marit B., Soengas Jose L., Rønnestad Ivar

- M77** Dietary supplementation with glutamine during *Solea senegalensis* metamorphosis, influences growth performance, intestinal morphology and protein metabolism.
Matias Ana Catarina, Viegas Ana Rita, Couto Ana, Marques Cátia, Aragão Cláudia, Soares Florbela, Castanho Sara, Gamboa Ana Margarida, Mendes Ana Candeias, Modesto Teresa, Pousão-Ferreira Pedro, Ribeiro Laura
- M78** Effect of different smolt and post-smolt rearing protocols in RAS on appetite and metabolism in Atlantic salmon
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- M79** Effect of dietary protein and calcium inclusion on the interplay between water balance and digestive functioning along the gastrointestinal tract of freshwater rainbow trout (*Oncorhynchus mykiss*).
Ciavoni Elisa, Rooijackers Jaimy, Nederlof Marit, Sæle Øystein, Prabhu Philip Antony Jesu, Schrama Johan W.
- M80** Solid-state fermented brewer's spent grain extract improves the oxidative status of European seabass (*Dicentrarchus labrax*)
Fernandes H, Castro C, Filipe D, Salgado J.-M, Ferreira P, Moyano F, Oliva-Teles A, Belo I, Peres H
- M81** Solid-state fermentation of orange peel fragment generates a potential feed additive for aquafeeds
dos Santos Xavier William, Stefani Pereira Milene, Damasceno Rodrigues Edgar Junio, Gardim Guimarães Matheus, Incane Ito Paulo, Pucci-Figueiredo de Carvalho Pedro Luiz, Francisco Fleuri Luciana, Edivaldo Pezzato Luiz, Barros Margarida Maria
- M82** Functional feeds to reduce *Sparicotyle chrysophrii* in gilthead sea bream (*Sparus aurata*). Identification and selection of natural dietary compounds with potential antiparasitic effects
Parma Luca, Pelusio Nicole Francesca, Marchi Arianna, Di Biase Andrea, Cerri Roberto, Fioravanti Marialetizia, Gustinelli Andrea, Dondi Francesco, Bignami Giorgia, Morsiani Lorenzo, Mariani Lorenzo, Gatta Pier Paolo, Bonaldo Alessio

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- T01** Soy lecithin supplementation promotes growth and increases lipid digestibility in Nile tilapia raised at suboptimal low temperature
Batista Rosana Oliveira, Banze Jorge Filipe, Richter Bianca Leticia, Nobrega Renata Oselame, Schleder Delano Dias, Pettigrew James Eugene, Lyons Philip, Fracalossi Débora Machado
- T02** Effects of cell disruption on the apparent digestibility coefficient of aurantiochytrium acetophilum biomass in atlantic salmon pre-smolts.
Ruiz Joceline, Corraze Geneviève, Márquez Lorenzo, Orellana Paola, Hernández Adrián J., Dantagnan Patricio
- T03** The Future of Sustainable Aqua Feeds? Assessment of a Genetically Modified Oil on the Phospholipid Composition of Atlantic Salmon
Broughton Richard, Tocher Douglas, Betancor Monica
- T04** Development of a unicellular biomass rich in polyunsaturated fatty acids (PUFA) obtained from microalgae-bacteria co-culture.
Marileo Luis, Acuña Jacqueline, Viscardi Sharon, Díaz Paola, Dantagnan Patricio
- T05** Regulation of growth, lipid metabolism and endoplasmic reticulum stress by dietary lipid source in juvenile black seabream (*Acanthopagrus schlegelii*)
Shen Yuedong, Zhu Tingting, Li Xuejiao, Bao Yang'guang, Wu Zhao'xun, Jiao Lefei, Zhou Qicun, Jin Min
- T06** Dietary fish oil and fishmeal replacement by a blend of schizochytrium sp. and microchloropsis gaditana produced with waste streams derived by biofuel industry in european seabass (*dicentrarchus labrax*)
Gkalogianni Elli-Zafeiria, Karaskou Maria, Katouni Aikaterini Maria, Psafakis Pier, Bouras Sofoklis, Kountrias Georgios, Katsoulas Nikolaos, Papapolymerou Georgios, Zarkadas Ioannis, Karalazos Vasileios, Karapanagiotidis Ioannis T.

- T07** Dietary fish oil and fishmeal replacement by a blend of schizochytrium sp. and microchloropsis gaditana produced with waste streams derived by biofuel industry in gilthead seabream (*Sparus aurata*)
Gkalogianni Elli-Zafeiria, Psafakis Pier, Asimaki Adamantia, Neofytou Marina C., Bouras Sofoklis, Kountrias Georgios, Antoniadis Dimitrios, Katsoulas Nikolaos, Papapolymerou Georgios, Lagos Panos, Karapanagiotidis Ioannis T.
- T08** Effects of dietary inclusion of *Hermetia illucens* larvae oil on growth performance and plasma metabolites of gilthead seabream (*Sparus aurata*) juveniles
Moutinho Sara, Oliva-Teles Aires, Monroig Óscar, Peres Helena
- T09** Fillet's quality traits and fatty acid profile of gilthead seabream (*Sparus aurata*) juveniles fed diets with *Hermetia illucens* larvae oil
Moutinho Sara, Pulido Lina, Peres Helena, Oliva-Teles Aires, Monroig Óscar, Parisi Giuliana
- T10** New protein sources, pea protein and seaweed, for seabream and rainbow trout organic production
Estevez Alicia, Vasilaki Phelly
- T11** Fishmeal substitution with novel ingredients in organic diets for European sea bass
Vasilaki Antigoni, Nengas Ioannis, Mente Elena, Kousoulaki Katerina, Fountoulaki Eleni, Nikoloudaki Chrysanthi
- T12** Effect of protinova™ replacement of fishmeal in the diets on growth performance of rainbow trout, *Oncorhynchus mykiss*, and survival after challenge with *Aeromonas salmonicida* and *Flavobacterium psychrophilum*
Richardson Andrew, Walraven Maye, Cusimano Giovanni Marco, Deguara Simeon, Bergoug Hakim
- T13** Chemical and microbiological characteristics of *Hermetia illucens* meal as fish meal replacement for *Sparus aurata* L. on farm. Part I.
Di Rosa Ambra Rita, Oteri Marianna, Armone Rosangela, Nalbone Luca, Toscano Giovanni, Lo Presti Vittorio, Chiofalo Biagina

- T14** Hermetia illucens meal as a partial substitute for fishmeal in the diet for Sparus aurata L. farmed offshore: Chemical and microbiological investigations on feed quality. Part II.
Oteri Marianna, Di Rosa Ambra Rita, Armone Rosangela, Nalbone Luca, Toscano Giovanni, Lo Presti Vittorio, Chiofalo Biagina
- T15** Effect of cottonseed protein concentrate on the physical quality of low-starch extruded floating aquatic feed
Wang Hao
- T16** Performance of diets based on alternative protein sources for rainbow trout (Oncorhynchus mykiss) in recirculating aquaculture systems
Fanizza Cecilia, Trocino Angela, Stejskal Vlastimil, Prokěšová Markéta, Zare Mahyar, Tranc Hung Quang, Grigolo Simone, Brambilla Fabio, Bordignon Francesco
- T17** First step of utilizing Euglena gracilis powder in diet for red seabream (Pagrus major)
Seong Taekyoung, Waki Kentaro, Yamamoto Yoshimasa, Suzuki Hideyuki, Nawata Toshihiro, Kabeya Naoki, Haga Yutaka, Satoh Shuichi
- T18** A blend of insect meals provides a suitable protein for dietary fishmeal replacement in Sparus aurata
Asimaki Adamantia, Neofytou Marina C., Psoufakis Pier, Gkalogianni Elli-Zafeiria, Fountoulaki Eleni, Henry Morgane, Karapanagiotidis Ioannis T.
- T19** Evaluation of novel ingredients supplementation in low fish meal diets for juvenile european sea bass (dicentrarchus labrax); preliminary results
Fountoulaki Eleni, Nikoloudaki Chrysanthi, Vasilaki Antigoni, Barkas Dimitris, Papaioannou Nikos, Henry Morgane, Cotou Efthimia, Nengas Ioannis
- T20** Valorisation of ensilaged discards and unavoidable-unwanted catches in Greece, as alternative protein source for aquafeed.
Roussos Efstratios, Triantaphyllidis George, Kanakis Dimitrios, Kampantais Dimitrios, Ilia Vassiliki, Kotzamanis Yannis

- T21** Variability in the digestible nutrient and energy value of corn and wheat glutens to Atlantic salmon is affected by feed processing method
Glencross Brett, Grobler Teresa, Huyben David
- T22** Evaluation of sustainable protein sources in whiteleg shrimp *Litopenaues vannamei*
Hamidoghli Ali, Choi Wonsuk, Lee Seunghyung, Bai Sungchul C.
- T23** Feeding gilthead sea bream (*Sparus aurata*) with increasing dietary bacterial single cell protein level: implication on growth, plasma biochemistry, gut histology and gut microbiome
Parma Luca, Marchi Arianna, Pelusio Nicole Francesca, Brini Elisa, Morsiani Lorenzo, Mariani Lorenzo, Sabetti Maria Chiara, Dondi Francesco, Mazzoni Maurizio Lattanzio Giulia, Clavenzani Paolo, Scicchitano Daniel, Candela Marco, Falciglia Salvatore, Gatta Pier Paolo, Bonaldo Alessio
- T24** Defatting processing improves the nutritional profile of black soldier fly (*Hermetia Illucens*) larvae meal and overcomes grinding process issues
Roussos Efstratios, Kampantais Dimitrios, Kanakis Dimitrios, Kotouzas Dimitrios, Milonas Panagiotis, Triantaphyllidis George, Kotzamanis Yannis
- T25** Digestibility acclimation to bacterial protein by Atlantic salmon (*Salmo salar*) is affected by both time and inclusion level
Glencross Brett, Munoz-Lopez Pedro, Matthew Chessor, Powell Adam, Medina-Sanchez Javier, Leblanc Allan, Mackenzie Simon
- T26** Impact of different inclusion levels of fish meals made from farmed bluefin tuna (*Thunnus thynnus*) and anchovy (*Engraulis encrasicolus*) offal on growth and performance of European sea bass, *Dicentrarchus labrax*.
Cusimano Giovanni Marco, Bardocz Tamas, Massa-Gallucci Alexia, Deguara Simeon, Busuttil Iman, Cutajar Karl, Gambin Maria Dolores, Arizza Vincenzo
- T27** Apparent digestibility coefficients in spent brewer's yeast meal for atlantic salmon (*salmo salar*) juveniles
Orellana Paola, Márquez Lorenzo, Ruiz Joceline, Dantagnan Patricio, Hernández Adrián

- T28** The effects of fishmeal replacement by *Zophobas morio* on the muscle and liver fatty acid profiles of gilthead seabream (*Sparus aurata*)
Asimaki Adamantia, Gkalogianni Elli-Zafeiria, Psofakis Pier, Neofytou Marina C., Tsihlis Ilias, Fountoulaki Eleni, Henry Morgane, Karapanagiotidis Ioannis T.
- T29** Effects of different inclusion level of *Hermetia illucens* larvae meal on growth, plasma biochemistry and fillet quality of gilthead sea bream (*Sparus aurata*).
Busti Serena, Parma Luca, Dondi Francesco, Sabetti Maria Chiara, Brini Elisa, Morsiani Lorenzo, Brambilla Fabio, Badiani Anna, Magnani Martina, Petracci Massimiliano, Baldi Giulia, Soglia Francesca, Gatta Pier Paolo, Bonaldo Alessio
- T30** Effects of high substitution of conventional protein sources with hydrolysed fish proteins in feeding for gilthead sea bream in pre-growing phase
Cappuccinelli Roberto G., Sanna Manuela, Fiordelmondo Elisa, Magi G. Enrico, Mariotti Francesca, Roggio Tonina, Roncarati Alessandra
- T31** Growth performance of meagre (*argyrosomus regius*) juveniles fed with brewer's spent grain after solid state fermentation with *aspergillus ibericus*
Estevão-Rodrigues Tássia, Fernandes Helena, Moutinho Sara, Filipe Diogo, Magalhães Rui, Salgado José, Oliva-Teles Aires, Peres Helena, Castro Carolina
- T32** Valorisation of Northern shrimp shells meal of *Pandalus borealis* (Krøyer, 1838) as partial substitution for Fish meal in diet for European seabass *Dicentrarchus labrax*: Effects on growth and feed efficiency
Ouaach Abderrahim, Ennayer Ikram, Akharbach Houda, Chebbaki Kamal, Idhalla Mohamed, Chadli Housni, Nhhala Hassan, Chairi Hicham
- T33** Digestibility and nutritional value of various insect meals for European perch (*Perca fluviatilis*)
Stejskal Vlastimil, Nguyen Thi Tram, Doan Van Hien, Tran Quang Hung
- T34** Nutritional evaluation of an aqueous-processed oilseed in diets of post-smolt Atlantic salmon
Dumas Andre, Dzisiak David, Brennan John, To Van

- T35** Evaluation of potential use of different algal biomasses for practical diets in juvenile turbot (*Scophthalmus maximus*)
Galafat Alba, Rodriguez Cristina, Sáez María Isabel, Vizcaíno Antonio Jesús, Martínez Tomás Francisco, Martínez Juan Manuel, Castro María del Carmen, Alarcón Francisco Javier, Hernández de Rojas Alma
- T36** In vitro protein digestibility of different novel ingredients by trout digestive enzymes
Galafat Alba, Sáez María Isabel, Vizcaíno Antonio Jesús, Paolacci Simona, Markou Giorgos, Rossi Giacomo, Martínez Tomás Francisco, Alarcón Francisco Javier
- T37** Influence of dietary inclusion of nanochloropsis gaditana biomass cultivated in agro-industrial wastewater on the intestinal morphology in gilthead seabream (*sparus aurata*) juveniles
Vizcaíno Antonio Jesús, Galafat Alba, Sáez María Isabel, Martínez Tomás Francisco, Buongiorno Tiziana, Proietti Lorenzo, Foglio Luciano, Castillo-Cascino Federico, Di Biase Andrea, Acién-Fernández Francisco Gabriel, Morillas Ana, Parati Katia, Alarcón Francisco Javier
- T38** Evaluation of chlorella fusca biomass as potential ingredient for feeding thick-lipped grey mullet (*chelon labrosus*) juveniles: effect on digestive functionality.
Vizcaíno Antonio Jesús, Galafat Alba, Sáez María Isabel, Pascual Isidro, García-Marquez Jorge, Abdala Roberto, Arijo Salvador, Martínez Tomás Francisco, Alarcón Francisco Javier
- T39** Digestibility of fishmeals when fed to Atlantic salmon (*Salmo salar*) can be predicted by near infrared (NIR) spectroscopy
Glencross Brett, Karydas Annalena, Marin Para Claudia, Auchterlonie Neil, Strachan Fiona
- T40** Variation in the digestibility and palatability values of fishmeals when fed to Atlantic salmon (*Salmo salar*) is affected by both processing and raw material origins
Glencross Brett, Karydas Annalena, Marin Para Claudia, Auchterlonie Neil, Strachan Fiona
- T41** Timing-related effects of polyphenols on intestinal inflammation
Imperatore Roberta, Orso Graziella, Facchiano Serena, Scarano Pierpaolo, Guarino Carmine, Paolucci Marina

- T45** High-fat diet promotes the adaptation to low salinity in mud crab *Scylla paramamosain*
Luo Jiaxiang, Jin Min, Zhu Tingting, Guo Chen, Xie Shichao, Yang Zheng, Zhao Wenli, Fang Fang, Zhang Xiangsheng, Jiao Lefei, Zhou Qicun
- T46** New in vitro assays for the study of interactions between virus infections and functional feed ingredients in the salmonid intestine
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- T47** Effects of dietary silkworm (*Bombyx mori*) pupae, mealworm (*Tenebrio molitor*), superworm (*Zophobasmorio*) and black soldier fly (*Hermetia illucens*) larvae on the haematology, immunity and resistance to stress of gilthead seabream (*Sparus aurata*).
Henry Morgane, Asimaki Adamadia, Psoufakis Pierre, Fountoulaki Eleni, Negas Iannis, Karapanagiotidis Iannis
- T48** Soft Bone Due to Low Dietary Phosphorus Intake: The Response to Exercise
Di Biagio Claudia, Cotti Silvia, Huysseune Ann, Boglione Clara, Witten Paul Eckhard
- T49** Alternative feed formulations for ballan wrasse juveniles
Henriques João, Cavares-Rogacki Thomas, Jiménez-Fernández Eduardo, Conceição Luís, Dias Jorge
- T50** Alternative protein sources change the interplay between fish gut microbiota and host performance
Vale Pereira Gabriella, Gonçalves Ana Teresa, Poletto Tatiana, Teixeira Carla, Couto José, Dias Jorge, Rema Paulo
- T51** In vivo and in vitro differences between intestinal and dermal Rainbow trout (*Oncorhynchus mykiss*) fibroblasts: possible consequences for the assembly of an in vitro intestinal model.
Pasquariello Rolando, Verdile Nicole, Camin Federica, Brevini Tiziana A.L., Gandolfi Fulvio
- T52** Early feeding has long term effects on bone morphology and mechanical strength of Atlantic salmon
Jiménez-Guerrero Raúl, Bæverfjord Grete, Mørkøre Turid

- T53** Ontogeny of the thymus and T cell-like receptors in Ballan wrasse (*Labrus bergylta*) and the effect of diet
Etayo Angela, Lie Kai Kristoffer, Neuenkirchen Gresset Ania, Bjelland Reidun, Sæle Øystein
- T54** Dietary inclusion of *Halobacterium salinarum* in the diet of *Sparus aurata*, positively modulates immune and health responses, indicating its potential utilization, as probiotic, in aquaculture.
Messina Concetta Maria, Madia Manfredi, Espinosa-Ruiz Cristobal, Esteban María Angeles, Santulli Andrea
- T55** Effect of krill meal dose and phospholipid source on growth performance and gill health in Atlantic salmon smolts
Kvingedal Renate, Vigen Jannicke, Nanton Dominic, Ruohonen Kari, Kaur Kiranpreet
- T56** Impact of dietary γ -aminobutyric acid (gaba) on immune status of common carp (*Cyprinus carpio*) fingerlings
Biró Janka, Ardó László, Szűcs Anita, Farris Nathaniel Wesley, Sándor Jakabné Zsuzsanna
- T57** Effect of health-promoting additives on Senegalese sole (*Solea senegalensis*) juveniles submitted to acute stress and bacterial challenge
Costas Benjamin, Pereira Susana, Pinto Wilson, Blanquet Isidro, Conceição Luis
- T58** Metabolic and hormonal response of European seabass juveniles fed tryptophan supplemented diets under crowding conditions and during response to an acute inflammation
Peixoto Diogo, Martos-Sitcha Juan Antonio, Machado Marina, Azeredo Rita, Costas Benjamin, Mancera Juan Miguel
- T59** Effects of *Salicornia ramosissima* bioactive extracts in metabolic and immune pathways of interest on European seabass – an in vitro study
Garcia Ana, Machado Marina, Fernández-Boo Sergio, Rocha Rui, Thomsen Mette, Costas Benjamin
- T61** Electronic eye to evaluate skin pigmentation of *Sparus aurata* fed with different level of *Hermetia illucens* meal.
Di Rosa Ambra Rita, Chiofalo Biagina

- T63** Consumers appreciate European seabass when fed innovative diets committed to a circular economy
Pulido Rodriguez Lina Fernanda, Bruni Leonardo, Secci Giulia, Lira de Medeiros Adja Cristina, Parisi Giuliana
- T64** Is it safe to consume GSB and ESB from aquaculture? A mercury level assessment.
Magalhães Sara, Aires Tiago
- T65** Proximate, amino acid, fatty acid and elemental composition of Atlantic salmon (*Salmo salar* L.) and Rainbow trout (*Onchorhynchus mykiss*) at harvest size from commercial farming in Norway 2019.
Ytrestøl Trine, Åsgård Torbjørn, Aas Turid Synnøve
- T66** Exploring the long term physiological responses to an alternative plant-based diet in *Sparus aurata*
Angelakopoulos Rafael, Fitsili Alexia, Tsingene Anthi, Dimitroglou Arkadios, Papaharisis Leonidas, Mamuris Zisis, Moutou Katerina
- T67** Black gram (*Phaseolus mungo*) leaf meal with supplemented exogenous enzyme can replace de-oiled rice bran (DORB) in the feed of *Labeo rohita* (Hamilton, 1878) juveniles
Kumar Shivendra, Verma Dolly, Kumar Pravesh, Ram Roshan Kumar, Srivastava Prem Prakash
- T68** Dietary discrimination of positive and negative organoleptic cues in gilthead seabream (*Sparus aurata*) in relation to its physiological state
Morais Sofia, Puchol Sara, Leal Esther, Angotzi Anna Rita, Cerdá-Reverter José Miguel
- T69** Freshwater gammarids as novel omega-3 long-chain polyunsaturated fatty acid sources for aquaculture: investigating the de novo biosynthesis capacity
Ribes-Navarro Alberto, Alberts-Hubatsch Hilke, Kabeya N., Hontoria Francisco, Navarro Juan Carlos, Monroig Óscar
- T70** Faecal waste characteristics and production of yellowtail kingfish (*Seriola lalandi*) fed with pelleted and natural feed.
Horstmann Peter, Maas Roel M., Kokou Fotini, Staessen Thomas W. O., Schrama Johan W.

- T71** Towards the identification of a suitable commercial diet for carpione, *Salmo carpio* L.: a multidisciplinary study on fish performances, quality traits and animal welfare
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- T73** Do effects of nutritional programming in freshwater continue during seawater rearing of Atlantic salmon (*Salmo salar*)?
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- T74** An assessment of the impact of variation in key parameters of a nutrient-demand model on the outcome on idealised iterative diet designs: A comparison of four aquaculture species
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- T75** Biofabricated organ-on-chip devices: limitless applications in nutritional modelling and precision feeding
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- T76** Development of a static in vitro feed digestion model in rainbow trout, *Oncorhynchus mykiss* (L) — in vivo feed digestion and characterization
Li Yanxian, Løkka Guro, Chacon Marcelo A., Tandler Amos, Koven Bill, Bitan Amir, Pavlovic Radmila, Panzeri Sara, Gandolfi Fulvio, Peggs David, Fontanillas Ramon, Krogdahl Åshild, Kortner Trond M.
- T77** Development of gelatin-based biomaterial inks towards fish intestinal tissue engineering
Szabó Anna, Pasquerillo Rolando, Pavlovic Radmila, Costa Pedro, Gandolfi Fulvio, Van Vlierberghe Sandra
- T78** Non-specific immune response and disease resistance of Nile tilapia fed an immunonutrient-rich diet for different periods and subjected to bacterial infection
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- T79** First insight into diversity and structure of the gut microbiota of flathead grey mullet (*Mugil cephalus*) fed very low fishmeal diet
Bertini Andrea, Concu D, Natale S, Indio V, De Cesare A, Parma L, Berardinelli A, Bonaldo A

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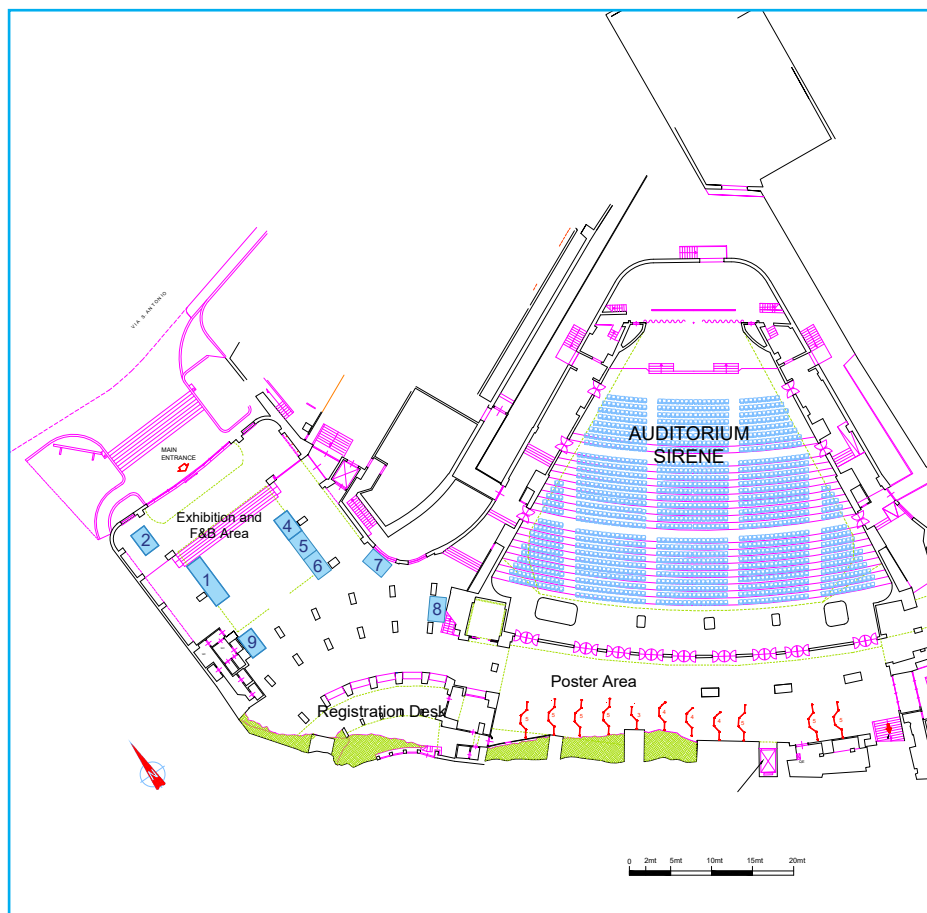
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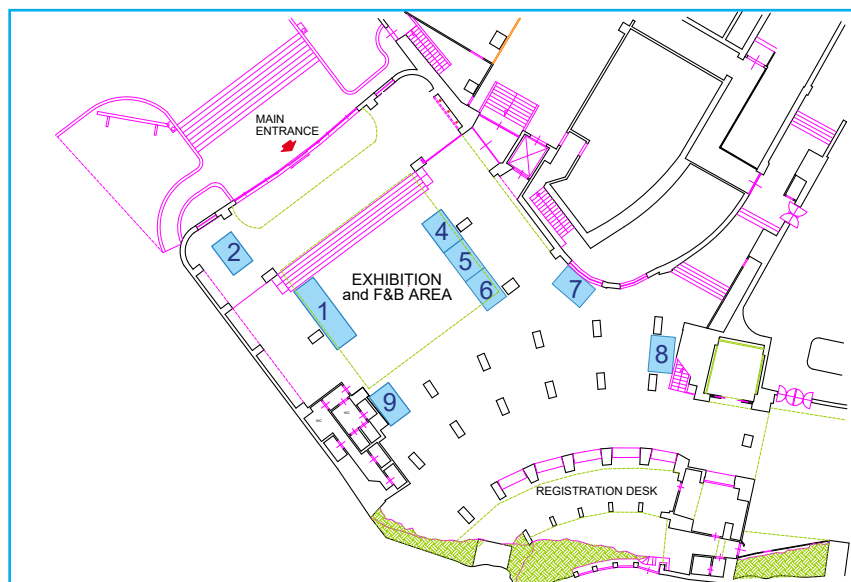
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CONGRESS CENTER MAP



The congress center is located on level C of Hilton Sorrento Palace Hotel.



EXHIBITORS

- | | |
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| 1 | DSM |
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| 7 | IRIDA |
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GENERAL INFORMATION

CONGRESS VENUE

Hilton Sorrento Palace Hotel
Via Sant' Antonio 13,
80067 Sorrento, Italia
Phone: +39 081 8784141

Hilton Sorrento Palace Hotel is located on the north coast of the Sorrentine Peninsula overlooking the city of Sorrento and the Bay of Naples. The hotel is just ten minute walk from the town center, all the historical and cultural attractions of Sorrento Town.



HOW TO REACH SORRENTO

Sorrento is perfectly connected to Naples International Airport and Central Station.



FROM THE AIRPORT

From Naples Capodichino International Airport to Sorrento by Bus

Curreri bus departs from the Naples Capodichino airport terminal and arrives in Sorrento in less than an hour. You can purchase your ticket on board for EUR 10. The bus stop is opposite the airport arrivals gate; buses arrive about ten minutes before every scheduled departure and there is ample space for luggage on board. Buses run daily. The bus service is comfortable and safe; sit on the right side to enjoy the beautiful views of the Sorrentine peninsula along the way.

If your flight arrives after the last bus departure, your only alternative is to reach Sorrento by private transfer or taxi. The average rate for transfers from Naples to Sorrento is between EUR 80 and EUR 100. We recommend booking a transfer rather than taking a taxi, as you will have a driver waiting to meet you at your arrival.

From Rome Fiumicino Airport to Naples by Bus

A convenient option for those flying into Rome's Fiumicino airport is the direct bus from the Rome airport to Naples. The bus stops near the Circumvesuviana station in Naples, where you can catch the train to Sorrento.



BY TRAIN FROM THE NAPLES CENTRAL TRAIN STATION

High speed trains from Milan, Florence, and Rome arrive at Naples' Centrale train station.

From Naples Central Train Station the Circumvesuviana train line takes about 1 hour ride to reach Sorrento. Trains from 6.00 am to 9.00 pm every 30 minutes.

The Circumvesuviana train station is downstairs. Tickets cost less than EUR 4.

The train station in Sorrento is a 10-minute walk or 5-minute taxi ride from the Hilton Sorrento Palace hotel.



BY CAR

From Highway A3 Napoli - Pompei - Sorrento (Naples - Pompeii - Sorrento), exit at Castellammare di Stabia and continue straight following the signs "Sorrento".

After passing through three tunnels and a few kilometers of curvy, scenic road, you'll pass through the towns of Meta, Piano, and Sant'Agnello and arrive in Sorrento.



BY HYDROFOIL

One of the most scenic and relaxing ways to reach Sorrento is by ferry boat from Naples. The Naples - Sorrento line is active all year long and the ferries depart from the Molo Beverello pier.

You can reach Naples port via the Alibus bus route which leaves from the Naples' Capodichino Airport.



PRIVATE TRANSFER

If you need to book a private transfer to reach Sorrento and the Hotel you can contact Russo Agency at Annarita@russoagency.it - sales@russoagency.it.

Russo Agency is located in the lobby of Hilton Sorrento Palace Hotel.



TAXI

You can dial +39 081 878 2204 for the local taxi service.

REGISTRATION DESK

The registration desk is open as follows:

5 June 16.30 - 19.00

6 June 7.30 - 18.00

7 June 8.00 - 18.00

8 June 8.30 - 13.30

9 June 8.30 - 19.00

CONGRESS LANGUAGE

The congress official language is English.

NAME BADGE

A name badge will be required to access the congress area.

Participants will receive a name badge when they check in at the registration desk. It must be worn at all times.

CERTIFICATE OF ATTENDANCE

A certificate of attendance will be issued to properly registered attendees.

Certificates of attendance will be sent by email after the congress.

MOBILE PHONES

All participants are asked to switch their mobile phones off or put them in silent mode during the scientific sessions.

SLIDE CENTER

Speakers are kindly requested to save their presentation on a USB and take it to the slide center at least two hours before the presentation is scheduled.

Personal laptops cannot be connected to the system.

ABSTRACT BOOK

All abstracts are published in the abstract book.

You can find it in the USB in the Congress Kit.

CLOAKROOM

The cloakroom is not provided.

PHOTO AND VIDEO

We inform you that during the event photos and videos will be taken.

We kindly ask those who do not want to be photographed to inform the organizing secretariat.

REGISTRATIONS

ON-SITE REGISTRATION

Delegate	€ 600,00 (VAT 22% included)
Student	€ 450,00 (VAT 22% included)

The registration fee for Delegate and Student includes:

- Participation in all sessions;
- Welcome Cocktail on Sunday;
- Coffee breaks and lunches as per scientific programme;
- Congress kit;
- Abstract book on USB pen drive support;
- Certificate of attendance

Extra Social Program Fee (per person):

Welcome cocktail for accompanying person € 30,00 (VAT 10% included)
Symposium Dinner on Thursday € 60,00 (VAT 10% included)

Delegates can pay registration fees in euros only.

Cash or credit card (American Express, MasterCard and Visa) accepted.

LIABILITY AND INSURANCE

Registration fees do not include the insurance of participants against personal accidents, sickness and cancellations by any party, theft, loss or damage to personal possessions. Participants are advised to take out adequate personal insurance to cover travel, accommodation, cancellation and personal belongings.

TOURS

Tours are planned on Wednesday, 8th June 2022 in the afternoon to discover the Costiera Sorrentina and Costiera Amalfitana.

Russo Agency is the official agency in charge to organize the tours. Russo Agency is located in the lobby of Hilton Sorrento Palace Hotel.

Reservation are accepted until Monday, 6th June 2022 at 13.00.

The tours available are:

- | | |
|----------------------------------|---------|
| • Sorrento walking tour half day | € 42,50 |
| • Pompeii half day | € 57,50 |
| • Positano half day | € 48,50 |
| • Napoli half day | € 45,00 |
| • Capri half day | € 95,00 |

For any tourist information you can contact Russo Agency.

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ORGANIZING SECRETARIAT

VET INTERNATIONAL SRL

Via Carlo Farini, 81 – 20159 Milano

Tel: +39 344 0886035

Info: francesca.mazzucchelli@vetinternational.eu

Registrations: registrations@isfnf2022.org

Abstract: abstract@isfnf2022.org

Website: www.isfnf2022.org