

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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DATE TO FOCUS ON

ONLINE REGISTRATION closes

20th May 2022

COMMITTEES

LOCAL ORGANIZING COMMITTEE

- *Alessio Bonaldo*, [University of Bologna](#) (Chair)
- *Luca Parma*, [University of Bologna](#)
- *Marco Candela*, [University of Bologna](#)
- *Emilio Tibaldi*, [University of Udine](#)
- *Francesca Tulli*, [University of Udine](#)
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- *Concetta Messina*, [University of Palermo](#)

INTERNATIONAL SCIENTIFIC COMMITTEE

- *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](#)
- *Prof. Kangsen Mai*, [Ocean University of Qingdao, China](#)
- *Prof. Shuichi Satoh*, [Fukui Prefectural University, Japan](#)
- *Prof. Shi-Yen Shiau*, [Department of Food Science, National Taiwan Ocean University, Taiwan](#)
- *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, a 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

Detection and modulation of olfactory sensing receptors in rainbow trout (*Oncorhynchus mykiss*) fed from first feeding with plant-based diet. *Jerome Roy*

10.00

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

10.15

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*

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

10.45 Choline requirement of Atlantic salmon (*Salmon salar* L) depends on dietary lipid level and environmental temperature
Ashild 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 Taste receptors regulation of feeding behavior in rainbow trout (*Oncorhynchus mykiss*) fed from first feeding with plant-based diet. *Elodie Baranek*

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

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*

10.30

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. *Kylian 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 Towards a free wild fish and soy diet for european seabass using by-products from fishery and aquaculture. *Arianna Marchi*
- 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. *Joana Silva*

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 Effects of bioactive peptides on growth performance, gut health and stress resistance of gilthead sea bream and European sea bass. *Serena Busti*
- 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 What does our research say about potential specific roles of EPA and DHA in Atlantic salmon? *Marta Bou*
- 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



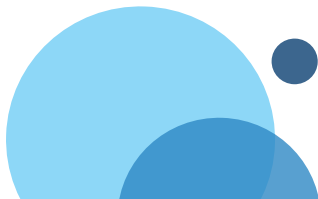
14.45 - 16.15

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. *Turid Mørkøre*
- 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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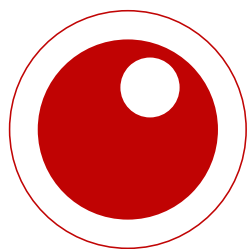


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POSTER SESSIONS

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

Posters are arranged by topic and displayed on two different 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 at the assigned poster panel from 17:00 to 18:00

AWARD BEST ORAL COMMUNICATION

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

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

The winner will receive a certificate and 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.
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- M26** Effect of green seaweed meal (*Ulva* sp., *Caulerpa* sp., and *Enteromorpha* sp.) as a quality enhancer in juvenile´s diets of *Litopenaeus vannamei*.
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- 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.
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- 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*).
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- 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*)
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- 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*.
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- 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.
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- 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).
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- 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
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- M70** The Theory of Relativity: As Applied to Essential Fatty Acid Requirements in Atlantic salmon.
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- 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.)
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- 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
Gilannejad Neda, Gharbi Naouel, Lal Pradeep, Takvam Marius, Nilsen Tom Ole
- 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, Psoufakis 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., Psfakis 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 *Litopenaeus 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, Psoufakis 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, Vizcaino 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
Vizcaino 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.
Vizcaino 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
Løkka Guro, Gamil Amr A. A., Evensen Øystein, Krogdahl Åshild, Kortner Trond M.
- 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, Cavois-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
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We strongly believe in sustainable food systems and that the livestock and aquaculture industry can transform itself from within to be a part of the solution. We want to play a key role in this transformation and work at species and country level, with our partners, to provide tangible and actionable solutions to create brighter lives for all.

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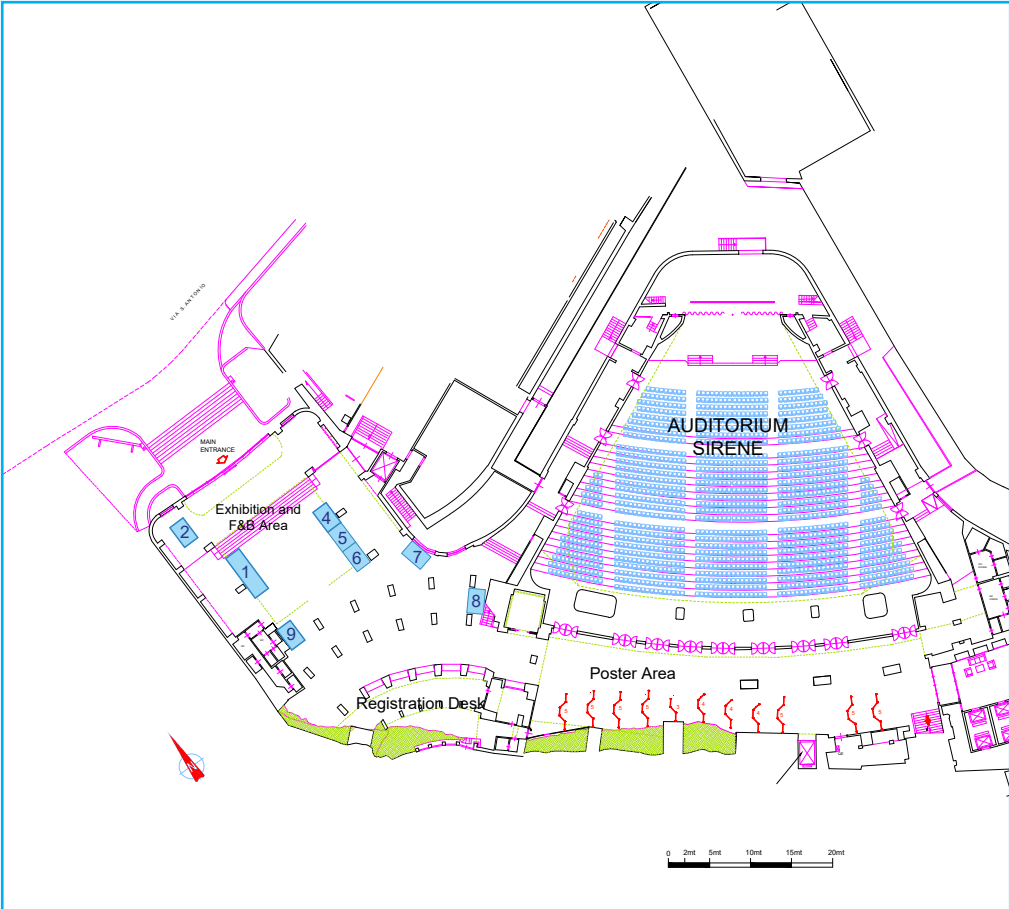
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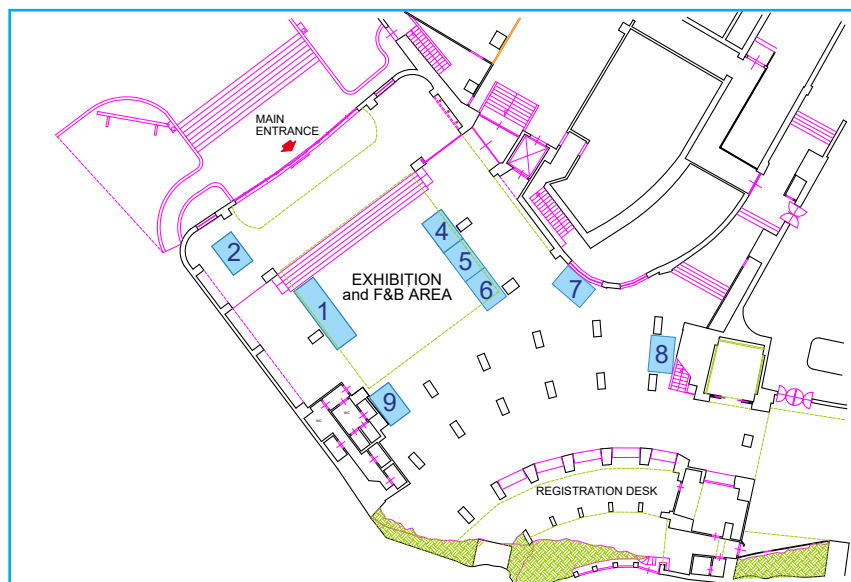


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CONGRESS CENTER MAP





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REGISTRATIONS

All delegates must register for the congress. Registration fees are as follow:

UNTIL 15th APRIL 2022

Delegate € 500,00

Student* € 350,00

FROM 16th APRIL 2022 TO 20th MAY 2022

Delegate € 600,00

Student* € 450,00

ON-SITE REGISTRATION

Delegate € 600,00

Student* € 450,00

VAT 22% included

* Students and PhD students benefit from a discounted fee. To register as a Student please provide a certification from an University supervisor.

Please send the certificatin to the Organising Secretariat:

registrations@isfnf2022.org

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)

REMITTANCE

Registration fees shall be paid by credit card or bank transfer through the on-line system available. When paying by bank transfer, a copy of the transfer receipt must be sent to the Organising Secretariat:

registrations@isfnf2022.org

Registrations without proof of payment will not be accepted.

Please be sure your e-mail address is filled in correctly.

PERSONAL INVITATION FOR VISA PURPOSES

To facilitate congress attendance a personal invitation can be sent on request.

This invitation does not exempt the recipient from registering and paying the proper congress fee. Please inform the congress secretariat if you need a personal invitation letter.

Registration fees and charges for all events related to the ISFNF2022 Congress as well as hotel cost must be paid in euros.

CANCELLATION AND REFUND

Cancellations must be sent to registrations@isfnf2022.org

The amount equal to 50% of the fee paid will be refunded for cancellations received by 6th May 2022.

After 6th May 2022 no refunds will be issued.

All refunds will be paid in euros after the congress.

If for reasons beyond the control of the Organisers the Congress is cancelled, registration fees will be refunded following deduction of unavoidable expenses. No refund will be given in case of no-show, regular arrival, unused services, unattended events or early termination of attendance.

* Should the Organisers decide to transform the Congress into a virtual/hybrid event for reasons beyond their control, the same cancellation and refund policy for registrations will be applied.

CANCELLATION OF THE CONGRESS

The congress secretariat reserves the right to cancel the congress, shift venue or change dates in case of “force majeure”.

Neither VET International nor the Congress Organising Committee shall be liable for any damage claims.

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 effects.

TOURS

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

Russo Agency is the official agency in charge to organize the tours.

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 |

HOW BOOK A TOUR

Please linked to the congress website.

Click on REGISTRATION and then on TOURS.

You will find the booking form at the bottom of the page.

For any further information you can contact Russo Agency:
annarita@russoagency.it - sales@russoagency.it

HOTELS

HILTON SORRENTO PALACE

Via Sant 'Antonio 13,

80067 Sorrento, Italia

Phone: +39 081 8784141

Email: sorrento.reservations@hilton.com

RUSSO AGENCY

Via S. Antonio, 13

80067 Sorrento (NA) - ITALY

Phone: +39 081 8071845

Email: annarita@russoagency.it; sales@russoagency.it

HOW BOOK A ROOM

Please linked to the congress website.

Click on INFO and then on HOTELS.

You will find the booking forms.

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 minutes' 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.



BY AIRPLANE

Naples International Airport is 55 km from Sorrento.

All the main airlines companies operate flights from/to Naples International Airport: Over 50 charter airlines operate flights from more than 40 European cities. All of the most important European Tour Operators offer package tours to the Campania area known for the hospitality of the local residents and the quality of the services for tourists.

From the Naples Capodichino International Airport to Sorrento by Bus

The Curreri bus departs from the Naples Capodichino airport terminal and arrives in Sorrento in a little over 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 departs, 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 when your flight lands.

From the 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 STAZIONE CENTRALE 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.



BY CAR

From Highway A3 Napoli - Pompei - Sorrento (Naples - Pompeii - Sorrento), exit at Castellammare di Stabia and continue straight following the signs to "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 from Naples. The Naples - Sorrento line is active all year long, and the routes depart from the Molo Beverello pier. You can reach the 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 info@russoagency.it

GENERAL INFORMATION

CONGRESS LANGUAGE

The congress' official language is English.

NAME BADGE

A name badge will be required for access to 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.

INVITATION LETTER

An official letter of invitation will be sent to you upon request. The invitation letter may be used by visitors to raise travel funds or to obtain a visa, but is not a commitment on the part of the organisers to provide any financial.

Please contact the Organizing Secretariat, registrations@isfnf2022.org, to request a letter of invitation.

MOBILE PHONES

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

ELECTRICITY

In Italy the electrical current is 220 volts AC (50 Hz). Electrical sockets comply with European regulations. In most hotels you will find adaptors for different types of plugs.

CURRENCY

What currency is used in Italy?

Since 2001, the currency used in Italy is the euro. One euro is divided up into 100 euro-cents. There are eight different coins (1, 2, 5, 10, 20 and 50 euro-cents) and seven notes (5, 10, 20, 50, 100, 200 and 500 euros).

CREDIT CARDS

As well as in cash, purchases can be paid for using the most common credit cards. This payment system is common in Italian shops, which generally display the symbols of the credit cards they accept on the outside door.

If you pay by credit card you will be asked to show an identity document.

Travellers cheques (in USD or Euros) can also be cashed in Italian banks.

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