

2nd European Zebrafish Husbandry Association Meeting

Final Program

Wednesday - 16th October, 2024.

**12.00 – 14.00 Meeting Registration + facility tours + exhibition hall opening
+ sandwich lunch**

12.30 – 13.00 facility tour – group 1 (max 15 people)

13.00 – 13.30 facility tour – group 2 (max 15 people)

13.30 – 14.00 facility tour – group 3 (max 15 people)

14.00 – 14.30 Welcome session by Organizing Committee, MATE, and ZHA

14.40 – 15.55 Opening session (part I)

Main Chair: Claire Allen

Co- Chair: Anita Rácz

14.40 – 15.00 ENVIRONMENTAL ENRICHMENT

Lynne Sneddon

*Department of Biological and Environmental Sciences,
University of Gothenburg, Gothenburg, Sweden*

15.00 – 15.05 Discussion

15.05 – 15.25 REDUCING THE ENVIRONMENTAL IMPACT OF ZEBRAFISH FACILITIES

J-P Mocho

DanioVet, Potters Bar, UK

15.25 – 15.30 Discussion

15.30 – 15.50 GENETICALLY ALTERED ZEBRAFISH AT THE CROSSROAD BETWEEN SCIENCE
AND LAW

Livia D'Angelo^{1,2}

*¹Dept Veterinary Medicine and Animal Production,
University of Naples Federico II, Italy*

²Federation of European Laboratory Animal Science Associations – FELASA

15.50 – 15.55 Discussion

15.55 – 16.30 Coffee break at exhibition hall

16.30 – 18.30 Opening session (part II)

Main Chair: Ana Borges

Co- Chair: László Orbán

16.30 – 16.55 USING ENVIRONMENTAL DATA TO DRIVE IMPROVEMENTS IN WELFARE,
MANAGEMENT, AND REPRODUCIBILITY

*Christian Lawrence– remote
SmartLabs, Boston MA USA*

16.55 – 17.00 Discussion

17.00 – 17.20 SEEKING TO BETTER ALIGN THE REGULATION OF ZEBRAFISH RESEARCH WITH WELFARE GOALS

Gregory Paull

University of Exeter, Geoffrey Pope Building, Stocker Road, Exeter, Devon, UK

17.20 – 17.25 Discussion

17.25 – 17.35 Presentation by IDEXX GmbH

17.35 – 17.50 Break

17.50 – 18.00 Presentation by Zebrabase – remote

18.00 – 18.05 Presentation by Aquaneering LLC

18.05 – 18.10 PHYSICAL AND SENSORIAL ENRICHMENT IN ZEBRAFISH AND MEDAKA: EVALUATION OF PREFERENCES, IMPACTS, AND WELFARE CONSIDERATIONS

Evgenia Dunaevskaya

The Faculty of Veterinary Medicine,

Norwegian University of Life Sciences, Ås, Norway

18.10 – 18.15 PAIN IN ZEBRAFISH BEYOND FIN CLIPPING: THE CASE OF THE TRAUMATIC BRAIN INJURY MODEL

Ana Valentim- remote

i3S Institute for Research and Innovation in Health,

University of Porto, Porto, Portugal

18.15 – 18.20 ZEBRAFISH HEALTH MANAGEMENT - THE VETERINARY SIDE OF THE STORY

^{1,2}*Márton Hoitsy*

¹*Department of Exotic Animal and Wildlife Medicine,*

University of Veterinary Medicine, Budapest, Hungary

²*Vet4Fish Ltd., Szada, Hungary*

18.20 – 18.30 Discussion (collective discussion for the short talks)

18.30 – 20.30 Welcome reception and poster session at exhibition hall

Thursday - 17th October, 2024.

08.00 – Gate opening + Exhibition area + registration at site

08.30 – 10.30 EU Regulation Session

Main Chair: Mollie Millington

Co- Chair: Zsolt Csenki-Bakos

08.30 – 09.45 IMPLEMENTING THE 3R UNDER THE AMENDED DIRECTIVE 2010/63/EU

Livia D'Angelo^{1,2}, J-P Mocho^{2,3}

*¹Department Veterinary Medicine and Animal Production,
University of Naples Federico II, Italy*

²Federation of European Laboratory Animal Science Associations – FELASA

³DanioVet, Potters Bar, UK

09.45 – 09.55 Discussion

09.55 – 10.00 EFFECTS OF SPIRULIN-SUPPLEMENTED DIET ON ZEBRAFISH: A LONGITUDINAL STUDY

Ferdinando Flagiello

*Department of Veterinary Medicine and Animal Production,
University of Naples Federico II, Italy*

10.00 – 10.10 ARE SHORT- AND MID-TERM FASTING IMPLICATED IN ZEBRAFISH WELFARE?

Maria Raggio

*Department of Veterinary Medicine and Animal Production,
University of Naples Federico II, Italy*

10.10 – 10.15 Presentation by Bionomus

10.15 – 10.30 Discussion (collective discussion for the short talks)

10.30 – 11.00 Coffee break at exhibition hall

11.00 – 12.45 3Rs Session

Main Chair: László Orbán

Co- Chair: Joana Monteiro

11.00 – 11.15 THE 3RS IN ZEBRAFISH RESEARCH

Kamar Ameen-Ali

*School of Health and Life Sciences,
Teesside University, Middlesbrough, UK*

11.15 – 11.20 Discussion

11.20 – 11.35 WELFARE ASSESSMENT, PAIN AND ANALGESIA

Lynne Sneddon

*Department of Biological and Environmental Sciences,
University of Gothenburg, Gothenburg, Sweden*

11.35 – 11.40 Discussion

11.40 – 11.55 HARMONISING RESEARCH FOR THE 3RS: TAILORING ZEBRAFISH HUSBANDRY FOR THEIR PURPOSED RESEARCH

Gregory Paull

University of Exeter, Geoffrey Pope Building, Stocker Road, Exeter, Devon, UK

11.55 – 12.00 Discussion

12.00 – 12.15 REDUCING SEVERE SUFFERING IN REGULATORY TOXICOLOGY TESTING USING FISHES

Chloe Stevens

*Animals in Science Department,
RSPCA, Parkside, Chart Way, Horsham, UK*

12.15 – 12.20 Discussion

12.20 – 12.35 SCORE SHEETS AND HUMANE ENDPOINTS

Linda Andersen

Stiftelsen Industrielaboratoriet (ILAB), Bergen, Norway

12.35 – 12.40 Discussion

12.40 – 12.45 Presentation by PLEXX B.V.

12.45 – 13.45 Lunch at exhibition hall

13.45 – 13.50 Presentation by RandW Associates (Armis) - remote

13.50 – 14.35 Workshop introductory talks

Main Chair: István Szabó

Co- Chair: Ana Borges

13.50 – 14.00 WORKSHOP1:

APPLYING 3RS TO GENOTYPING TECHNIQUES (EMBRYO, LARVAE)

Lisa Van Hateren

The University of Sheffield, UK

SKIN SWABBING: A REFINEMENT FOR DNA SAMPLING OF LABORATORY FISH

^{1,2}*Ceinwen Tilley*

¹*Genetics and Genome Biology,*

University of Leicester, Leicester, UK

²*Neuroscience, Psychology and Behaviour,*

University of Leicester, Leicester, UK

14.00 – 14.05 Discussion

14.05 – 14.15 WORKSHOP2:

VIE TAGGING WORKSHOP

^{1,2}Anita Rácz

¹Department of Genetics,

Eötvös Loránd University, Pázmány P.s. Budapest, Hungary

²Institute for Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences Szent István Campus,

Gödöllő, Hungary

14.15 – 14.20 Discussion

14.20 – 14.30 WORKSHOP3:

IMAGING AND BEHAVIOUR WORKSHOP

¹Karishma Chhabria – remote, ²Claire Allen

¹Department of Physics,

University of California San Diego, USA

²Biological Services Aquarium (BSA) Faculty of Science,

University of Sheffield, UK

14.30 – 14.35 Discussion

14.35 – 15.00 Coffee break and posters at exhibition hall

15.00 – 17.00 HANDS-ON WORKSHOPS

Main Chair: István Szabó

Co- Chair: Ana Borges

15.00 – 15.40 APPLYING 3RS TO GENOTYPING TECHNIQUES (EMBRYO, LARVAE, SKIN SWAB)

15.40 – 16.20 VIE TAGGING WORKSHOP

16.20 – 17.00 IMAGING AND BEHAVIOUR WORKSHOP

18.30 Transfer to Gala dinner

**19.00 – 22.00 Gala dinner – Lázár Equestrian Park
(Hungarian horse show + Traditional Hungarian dishes)**

22.00 Transfer to the hotels

Friday - 18th October, 2024.

08.30 – Gate opening and exhibition

09.00 – 11.30 Husbandry Session

Main Chair: László Orbán

Co- Chair: Mollie Millington

09.00 – 09.15 THE REPRODUCIBILITY CRISIS IN ZEBRAFISH RESEARCH – WHY NOT TELLING IS ONLY AN OPTION IN LAS VEGAS

Karin Finger-Baier

Department Genes – Circuits – Behavior, Max Planck Institute for Biological Intelligence, Martinsried, Germany

09.15 – 09.20 Discussion

09.20 – 09.30 ROLE OF WATER CHEMISTRY IN ZEBRAFISH WELFARE AND REPRODUCIBILITY OF RESEARCH STUDIES

Rodney Wilson – remote

University of Exeter, Exeter, UK

09.30 – 09.35 Discussion

09.35 – 09.45 DIETARY REQUIREMENTS FOR ZEBRAFISH

Joana Monteiro

Champalimaud Foundation, Lisbon, Portugal

09.45 – 09.50 Discussion

09.50 – 10.05 RUNNING A ZEBRAFISH CRYOPRESERVATION AND REDERIVATION SERVICE

Helen Horsler

The Francis Crick Institute, London, UK

10.05 – 10.10 Discussion

10.10 – 10.15 Presentation by ScienceTrack (Scientific Software Solutions)

10.15 – 10.20 Presentation by Tecniplast S.P.A.

10.20 – 10.50 Coffee break at exhibition hall

10.50 – 11.00 AGEING

Claire Allen

Biological Services Aquarium (BSA) Faculty of Science, University of Sheffield, UK

11.00 – 11.05 Discussion

11.05 – 11.15 DEVELOPING ADVANCED ANALYSIS TOOLS FOR ZEBRAFISH FACILITY MANAGEMENT

Ana C. Borges

Model Organisms Facility

Gulbenkian Institute of Science (IGC), Oeiras, Portugal

11.15 – 11.20 Discussion

11.20 – 11.25 HOW STANDARDISING LIGHTING IN ZEBRAFISH FACILITIES CAN IMPROVE WELFARE AND REPRODUCIBILITY IN ZEBRAFISH RESEARCH

¹Paul Tyson, ¹Dave Maley - remote

¹University of Exeter, Geoffrey Pope Building, Stocker Road, Exeter, Devon, UK

11.25 – 11.30 Discussion

11.30 – 11.40 Break

11.40 – 12.30 Global Updates on Zebrafish Research and Resource Centres

Main Chair: Claire Allen

Co- Chair: Zsolt Csenki-Bakos

11.40 – 11.45 ARCHIVING OF ZEBRAFISH LINES AT THE EUROPEAN ZEBRAFISH RESOURCE CENTER (EZRC)

Robert Geisler¹, Nadine Borel¹, Nathalie Decker¹, Sabine Kaba¹

¹Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany

11.45 – 11.50 BYPASSING HUSBANDRY: CRYOBANKING OF ZEBRAFISH GERMPLOASM – A HUSBANDRY TOOL FOR EVERYONE

Zoltán M. Varga – remote

*Zebrafish International Resource Center, Institute of Neuroscience,
University of Oregon, Eugene, USA*

11.50 – 11.55 REPORTS FROM THE ANTIPODES. A QUICK ROUNDUP FROM AUSTRALIA & NEW ZEALAND

^{1,2}Bruce Newell – remote

¹Deakin University, Victoria Australia

²Australian New Zealand Association of Aquarium Professionals Inc.

11.55 – 12.00 DEVELOPMENT OF ZEBRAFISH RESEARCH AND THE ZEBRAFISH RESOURCE CENTER IN CHINA

Luyuan Pan¹- remote, Kuoyu Li¹, Yonghua Sun¹

*¹China Zebrafish Resource Center, National Aquatic Biological Resource Center,
Institute of Hydrobiology, CAS, China*

12.00 – 12.05 WHAT ZEBRAFISH CAN TELL US ABOUT WATER QUALITY OF RIVERS?

Mônica Machado¹-remote, Laura Lopes¹, Matheus Barcellos¹, Paula Nakamura¹, Aiyra Oliveira², Sarah Eibdalla², Isadora Figueiredo², Isabella Sousa², Giovanna Fantin³, Caroline Porto³

¹Animal Biociencia Pos Graduate Program, Federal University of Jataí, Jataí, Brazil

²Medicine Veterinary Graduation student, Federal University of Jataí, Jataí, Brazil

³Biomedicine Graduation, Federal University of Jataí, Jataí, Brazil.

12.05 – 12.10 Zebrafish in the African Biomedical Research: An Update

Patrick Amoateng – remote

University of Ghana, Ghana

12.10 – 12.15 Update on the Scandinavian zebrafish community
Lars Brautigam – remote
Karolinska Institute, Stockholm, Sweden

12.15 – 12.20 Updates to ZFIN: Increased support for Toxicology and Environmental
Exposure Data
Yvonne Bradford – remote
Zebrafish Information Network, Eugene, Oregon, USA

12.20 – 12.30 Discussion

12.30 – 13.20 Career session

Main Chair: Joana Monteiro

Co- Chair: István Szabó

12.30 – 12.45 STRATEGIES FOR RECRUITING AND RETAINING ANIMAL TECHNOLOGISTS IN A
POST-PANDEMIC WORLD
Mollie Millington
Biological Research Facility (BRF), Francis Crick Institute, London, UK

12.45 – 12.50 Discussion

12.50 – 13.00 HARMONISATION OF EDUCATION AND CAREER PATHWAYS FOR LABORATORY
ANIMAL CARETAKERS, TECHNICIANS AND TECHNOLOGISTS
Klas Abelson – remote
Department of Experimental Medicine,
University of Copenhagen, Denmark

13.00 – 13.05 Discussion

13.05 – 13.15 HOW TO DEVELOP A TRAINING AND COMPETENCY PROGRAMME
ENCOMPASSING AQUATIC SPECIES
Helen Bailey – remote
Biological Research Facility (BRF), Francis Crick Institute, London, UK

13.15 – 13.20 Discussion

13.20 – 14.30 Lunch at exhibition hall

14.30 Closing session + Quiz tombola + facility tours

15.30 – 16.00 facility tour – group 4 (max 15 people)

16.00 – 16.30 facility tour – group 5 (max 15 people)

16.30 – 17.00 facility tour – group 6 (max 15 people)

Posters

1. ESSENTIAL GUIDANCE FOR LARGE-SCALE MANAGEMENT OF THE AFRICAN TURQUOISE KILLIFISH, NOTHOBRANCHIUS FURZERI

Elena De Felice¹, Daniela Giaquinto², Chiara Attanasio², Antonio Palladino³, Paolo de Girolamo², Livia D'Angelo²

*¹School of Biosciences and Veterinary Medicine,
University of Camerino, Camerino, Italy*

*²Department of Veterinary Medicine and Animal Production,
University of Naples Federico II, Italy*

*³Department of Agricultural Sciences,
University of Naples Federico II, Italy*

2. ARE SHORT- AND MID-TERM FASTING IMPLICATED IN ZEBRAFISH WELFARE?

Maria Raggio¹, Daniela Giaquinto¹, Chiara Attanasio¹, Antonio Palladino², Elena De Felice³, Paolo de Girolamo¹, Livia D'Angelo¹

*¹Department of Veterinary Medicine and Animal Production,
University of Naples Federico II, Naples, Italy*

*²Department of Agricultural Sciences,
University of Naples Federico II, Portici, Italy*

*³School of Bioscience and Veterinary Medicine,
University of Camerino, Camerino, Italy*

3. DETERMINING THE LINK BETWEEN HORMONES, OPIOIDS AND TASTE PERCEPTION IN ZEBRAFISH: A PILOT PROJECT WITH IMPLICATIONS IN AQUACULTURE.

Antonio Palladino¹, Katayoon Karimzadeh², Chinelo Uju², Paolo de Girolamo³, Suraj Unniappan², Livia D'Angelo³

*¹Department of Agricultural Sciences,
University of Naples "Federico II"*

*²Western College of Veterinary Medicine,
University of Saskatchewan*

*³Department of Veterinary Medicine and Animal Productions,
University of Naples "Federico II"*

4. POTENTIAL TOXICOLOGICAL EFFECTS OF FUNGICIDES MIXTURES IN ZEBRAFISH EARLY LIFE STAGE

Annamaria Iannetta¹, Tommaso Silvestrini¹, Gabriele Lori², Irene Masciola², Sabrina Tait², Monia Perugini¹

*¹Department of Bioscience and Agro-Food and Environmental Technology,
University of Teramo, Teramo, Italy.*

²Center for Gender-Specific medicine, Italian National Institute of Health, Rome, Italy

5. EFFECTS OF SPIRULIN-SUPPLEMENTED DIET ON ZEBRAFISH: A LONGITUDINAL STUDY

Ferdinando Flagiello¹, Antonio Palladino², Stefano Mazzoleni², Marcello Diano³, Maria Raggio¹, Livia D'Angelo¹ Paolo De Girolamo¹

¹*Dept. Of Veterinary Medicine and Animal Production, University of Naples Federico II, Naples, Italy;*

²*Dept. of Agricultural Sciences, University of Naples Federico II, Portici, Italy;*

³*M2M Engineering sas, Science Center, 80124 Naples, Italy.*

6. PHYSICAL AND SENSORIAL ENRICHMENT IN ZEBRAFISH AND MEDAKA: EVALUATION OF PREFERENCES, IMPACTS, AND WELFARE CONSIDERATIONS

Evgenia Dunaevskaya¹, Marco A. Vindas¹, Ian Mayer¹, Romain Fontaine¹, Anthony Peltier¹, Arturas Kavaliauskis¹, Eirill Ager Wick¹

¹*The Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Ås, Norway.*

7. ARCHIVING OF ZEBRAFISH LINES AT THE EUROPEAN ZEBRAFISH RESOURCE CENTER (EZRC)

Robert Geisler¹, Nadine Borel¹, Nathalie Decker¹, Sabine Kaba¹

¹*Karlsruhe Institut of Technology (KIT), Eggenstein-Leopoldshafen, Germany*

8. ENGINEERED BACTERIOLYTIC ENZYMES AS AN ALTERNATIVE TO ANTIBIOTICS FOR TREATING INFECTIONS IN AQUACULTURE

Malgorzata Korzeniowska¹, Michal Zarod¹, Izabela Sabala¹, Elzbieta Jagielska¹

¹*Laboratory of Protein Engineering, Mossakowski Medical Research Institute, Polish Academy of Sciences, 5 Pawinskiego Str., 02-106 Warsaw, Poland*

9. PAIN IN ZEBRAFISH BEYOND FIN CLIPPING: THE CASE OF THE TRAUMATIC BRAIN INJURY MODEL

Ana Valentim¹, Beatriz Custódio^{1,2}, Elena van Os^{1,3}, Sofia Guimarães¹, Anna Olsson¹

¹*i3S Institute for Research and Innovation in Health*

University of Porto, Porto, Portugal

²*Abel Salazar Biomedical Sciences Institute (ICBAS),*

Universidade do Porto, Porto, Portugal

³*School of Engineering and Applied Science,*

Rotterdam University of Applied Sciences, Rotterdam, The Netherlands

10. ZEBRAFISH HEALTH MANAGEMENT - THE VETERINARY SIDE OF THE STORY

Márton Hoitsy^{1,2}, Krisztina Bali³, János Gál¹, Árisz Ziszisz¹

¹*Department of Exotic Animal and Wildlife Medicine, University of Veterinary Medicine, Budapest, Hungary*

²*Vet4Fish Kft., Szada, Hungary*

³*Department of Microbiology and Infectious Diseases, University of Veterinary Medicine, Budapest, Hungary*

11. OPTIMIZING ZEBRAFISH HUSBANDRY: ENHANCING EMBRYONIC SURVIVAL AND POPULATION HEALTH IN THE LABORATORY

Martina Böhmová¹, Andrea Benčeková¹, Peter Fabian¹

¹Department of Experimental Biology, Faculty of Science, Masaryk University

12. ADDRESSING SEX BIAS IN ZEBRAFISH POPULATIONS: A PRACTICAL ATTEMPT TO BALANCE SKEWED RATIOS

Liliana Vale¹, Maysa Franco¹, Inês Santos¹, André Barros², Tiago Paixão², Ana Cristina Borges¹, Manuel Rebelo¹

¹Model Organism Unit, Gulbenkian Institute of Science (IGC), Oeiras, Portugal

²Advanced Data Analysis, Gulbenkian Institute of Science (IGC), Oeiras, Portugal

13. HOW STANDARDISING LIGHTING IN ZEBRAFISH FACILITIES CAN IMPROVE WELFARE AND REPRODUCIBILITY IN ZEBRAFISH RESEARCH

Paul Tyson¹, ¹Dave Maley¹

¹University of Exeter, Geoffrey Pope Building, Stocker Road, Exeter, Devon, UK

14. BEHAVIORAL ANALYSIS OF ZEBRAFISH (DANIO RERIO) LARVAE EXPOSED TO ACESULFAM POTASSIUM AND FLUFENACET

Bence Ivánovics¹, István Szabó¹, Balázs Kriszt², Béla Urbányi³, Zsolt Csenki-Bakos¹

¹Department of Environmental Toxicology, Institute of Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary

²Department of Environmental Safety, Institute of Aquaculture and Environmental Safety, Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary

³Department of Aquaculture, Institute of Aquaculture and Environmental Safety, Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary

15. AUTOMATED IMAGING ROBOT - A NEW INNOVATIVE TECHNOLOGY FOR THE AUTOMATED PHENOTYPING OF ZEBRAFISH EMBRYOS

Illés Bock¹, Jan Sonnevill², Kees-Jan van der Kolk², Urbányi Béla¹, Kriszt Balázs¹, Zsolt Csenki¹

¹Institute of Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary.

²Life Science Methods BV, Leiden, The Netherlands

16. UTILIZATION OF AFLATOXIN B1 CONTAMINATED CORN BY *TENEBRIO MOLITOR* AND ECOTOXICOLOGY TEST OF BYPRODUCT FRASS BY *DANIO RERIO* EMBRYO TOXICITY TESTS

Zoltán Vajnai¹, Zsolt Csenki-Bakos¹, Cintia Volner¹, Illés Bock¹ and István Szabó¹

¹Department of Environmental Toxicology, Institute of Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences, Hungary 2100 Gödöllő, Hungary

17. OPTIMIZING ZEBRAFISH SPACE MANAGEMENT: THE ROLE OF SPERM FREEZING AND IN VITRO FERTILIZATION

Magdalena Gra¹, Magdalena Góra¹, Cecilia Winata¹

¹International Institute of Molecular and Cell Biology in Warsaw, Poland

18. INTRODUCTION OF A STEP-BY-STEP PROTOCOL FOR THE ERADICATION OF MYCOBACTERIUM HAEMOPHILUM IN ZEBRAFISH SYSTEM

Anita Rácz^{1,2}, Toni Dwyer³, Shaun S. Killen³

¹Department of Genetics,

Eötvös Loránd University, Pázmány P.s. Budapest, Hungary

²Institute for Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences Szent István Campus Gödöllő, Hungary

³Institute of Biodiversity, Animal Health and Comparative Medicine, College of Medical, Veterinary and Life Sciences,

University of Glasgow, Glasgow, UK

19. DETECTION OF MICROPLASTICS IN ZEBRAFISH HOUSING SYSTEMS: CAN MICROPLASTIC BACKGROUND CONTAMINATION AFFECT THE FINAL RESULTS OF MICROPLASTIC-RELATED TOXICOLOGICAL TESTS?

Bence Prikler^{1, 2}, Gábor Bordós¹, Balázs Kriszt², Adrienn Micsinai¹, István Szabó³, Brigitta Nyíró-Fekete¹, Zoltán Palotai¹, Edit Kaszab², Sándor Szoboszlay², Zsolt Csenki³

¹Eurofins Analytical Services Hungary Ltd., Budapest, 1045, Hungary

²Department of Environmental Safety, Institute of Aquaculture and Environmental Safety, Hungarian University of Agriculture and Life Sciences, Gödöllő, 2100, Hungary

³Department of Environmental Toxicology, Institute of Aquaculture and Environmental Safety,

Hungarian University of Agriculture and Life Sciences, Gödöllő, 2100, Hungary