Toolset for validating the utility of feed additives to improve intestinal health

AQUAEXCEL^{2020} brokerage event

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Aquaculture Europe 2017

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CSIC
Consejo Superior de Investigaciones Científicas

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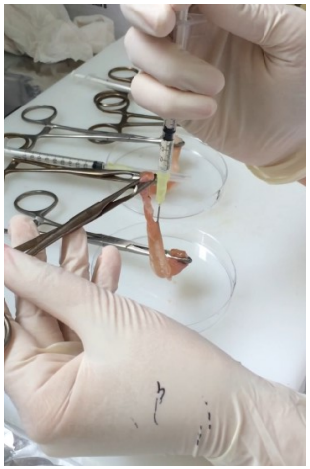
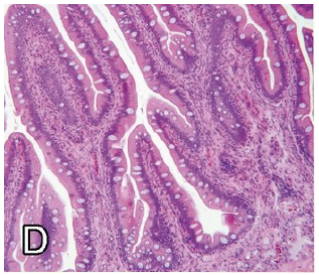
Industry Need

There is a constant need to find feed additives that improve health and nutrition of farmed fish and lessen the intestinal inflammation induced by plant products or other alternative ingredients





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Solution: Holistic approach

BENEFITS

Integration of conventional methodologies with recent advances in ‘omic' technologies that gives an holistic approach to i) minimise non desired effects of alternative diets and ii) to incorporate intestinal health as a core component of production management

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Underlying Magic

Integration of knowledge arising from high-throughput transcriptomics, including pathway-focused PCR-arrays, microarrays and RNA-seq, but also from *metabolomics, electrophysiology, histology, proteomics and metagenomics*

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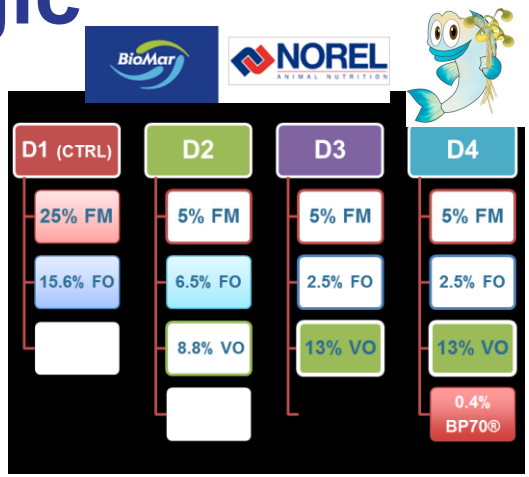
Underlying Magic

Robust approach for monitoring the reversion of drawback effects of plant-based diets



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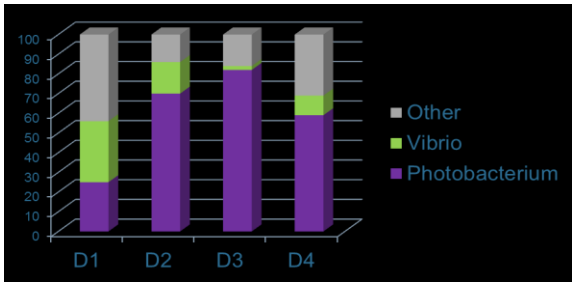
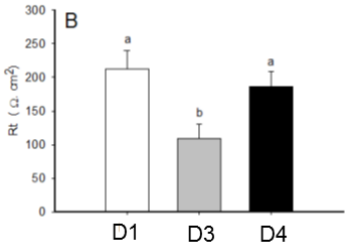
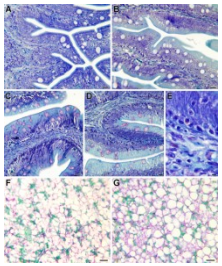


Trans-epithelial electric resistance & histology architercture

2





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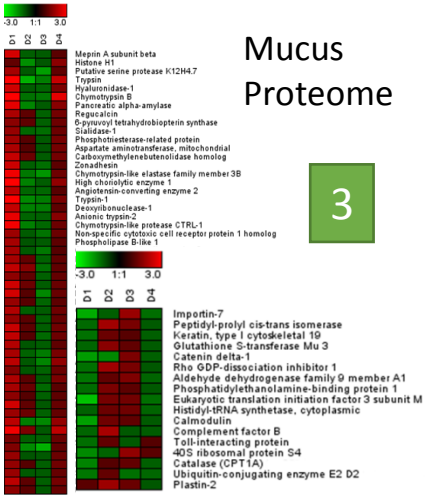
Intestine Transcriptome

Mucus Proteome

3



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Competitive Analysis

- The toolset is supported by powerful genomic resources in sea bream and secondly sea bass (www.nutrigroup-iats.org)
- Long-term expertise on physiology, nutrigenomics and pathology allow us to fill the gaps on fish biomarker research, combining massive and targeted approaches "ALL in ONE"

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Target Market

END-USERS

- Aquaculture feed producers
- Veterinarians/fish farmers
- Fish physiologists & pathologists

APPLICATIONS

1 →
- Mitigate negative effects of plant -based diets

2 →
- Checking additive effects across different species and rearing conditions

3 →
- New knowledge on fish nutrition and intestinal health

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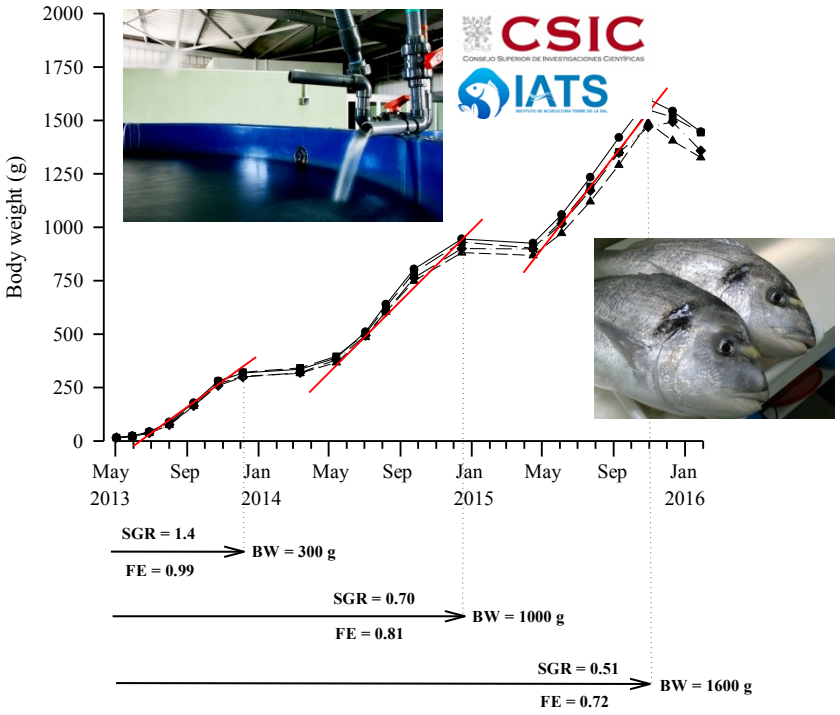
Economic Impact

- Improvement of fish performance under-suboptimal field conditions
- Improved diseases outcomes in fish challenged with systemic bacteria (*P. damsela*) or intestinal parasites (*E. leei*)



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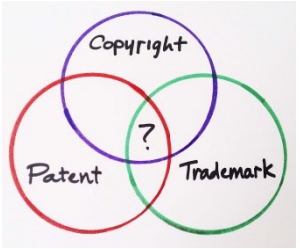
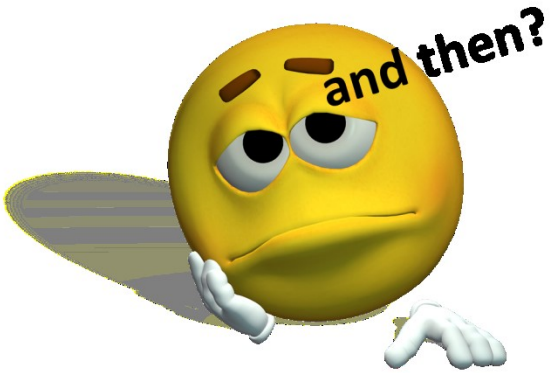
Intellectual Property (IP)



- Large scale META-ANALYSIS is underway to patent a subset of biomarkers and non-invasive procedures as a certification of quality of a given fish batch, add



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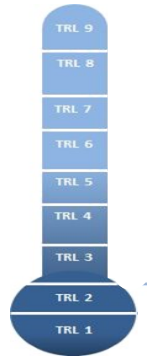
Current Status & Accomplishments



STATUS

- TRL 4. The proof of concept has been successful on sea bream and butyrate
  - Understanding how functional features are regulated by genetic or epigenetic factors is challenging for a selective fish breeding

TIMELINE

- Three years to upgrade the toolset with the use of IMPLANTED BIOSENSORS for remote fish monitoring

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Go to Market Plan

HOW TO COMMERCIALISE

- Our business is to validate and discover new and reliable biomarkers to be applied in Aquaculture
- CSIC Aquaculture Spin-off

PARTNERS NEEDED

- Partners with either commercial, biological or technological skills are welcome

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Management Team

(Fish Pathology & Nutrigenomics groups, IATS-CSIC)

EXISTING EXPERTISE

- Physiology
- Nutrition
- Parasitology
- Immunology
- Genomics

WANTED EXPERTISE

- Microbiology (gut microbiota)
- Bioinformatics (big data)
- Nanotechnology (biosensors)

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TNA Facility

- Institute of Aquaculture Torre de la sal (IATS-CSIC), Castellón, Spain
- Two types of access
  - IATS-ANA (analytical)
  - IATS-EXP (experimental)
- Main species: sea bream and sea bass
- Main topics: physiology, nutrition, reproduction, pathology, ecotoxicology

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Close – Thank you!

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If you are interested to invest/collaborate towards the further development of this OUTPUT, please come to the EATiP booth (#67)

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