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# New Perspectives in Fish Feeds

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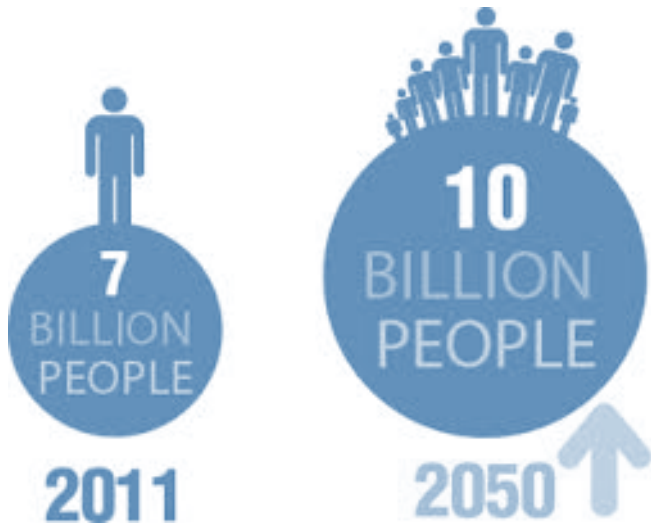
**Strandbúnaður 2018**, Grand Hotel Reykjavík 19-20 March



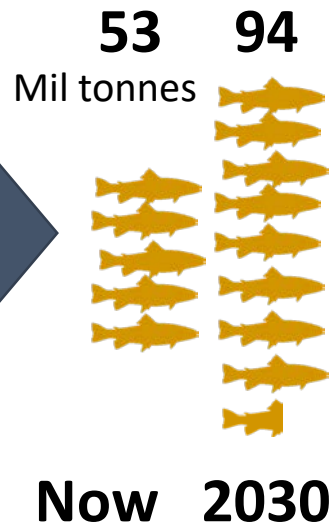
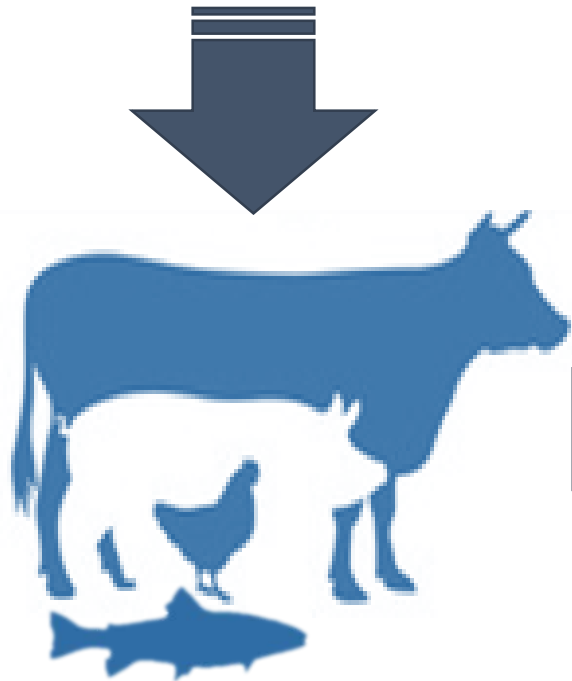
# Presentation Outline

- **Background**
- **Insects as aquafeed proteins**
- **Enhancing insects**
- **Aquafeeds and the Gut**
- **Aquafeeds and behaviour**
- **Summary**





# Circular Protein Population Requirements

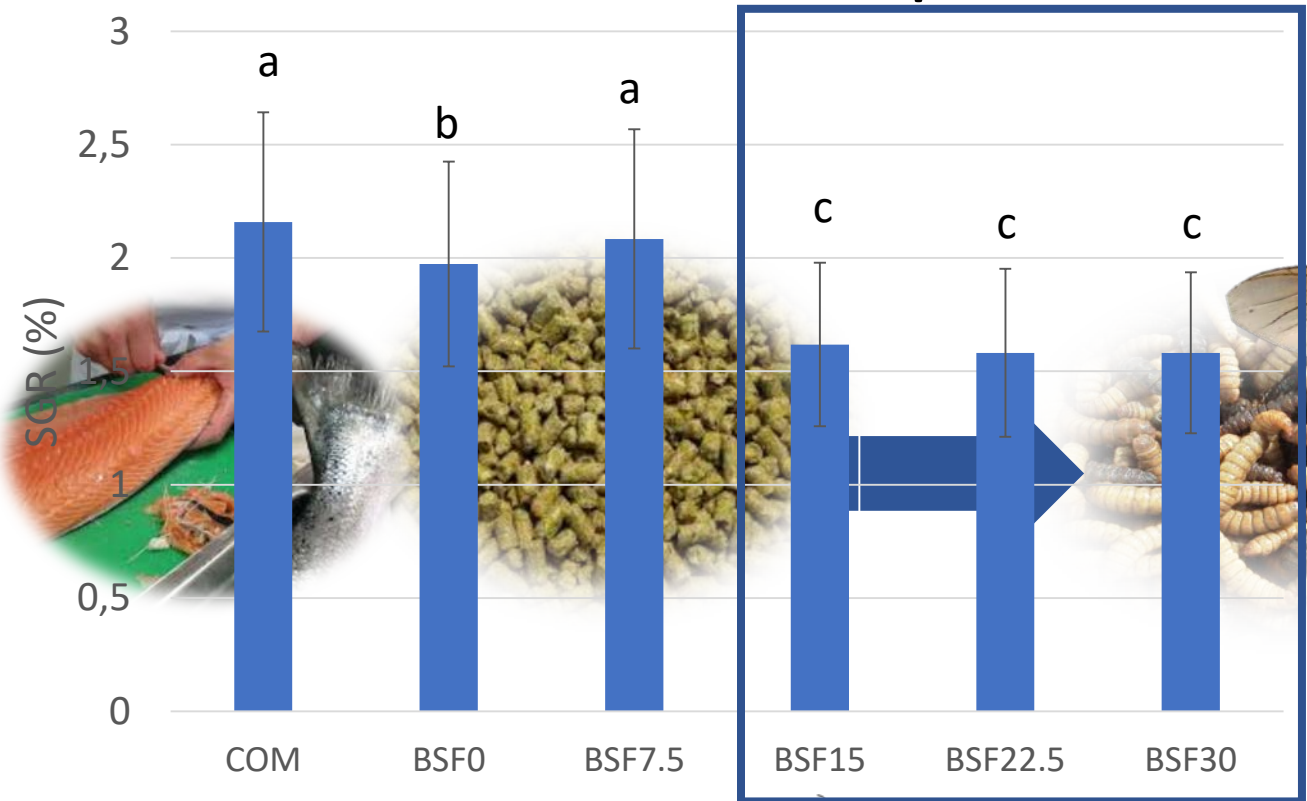


Insect Proteins

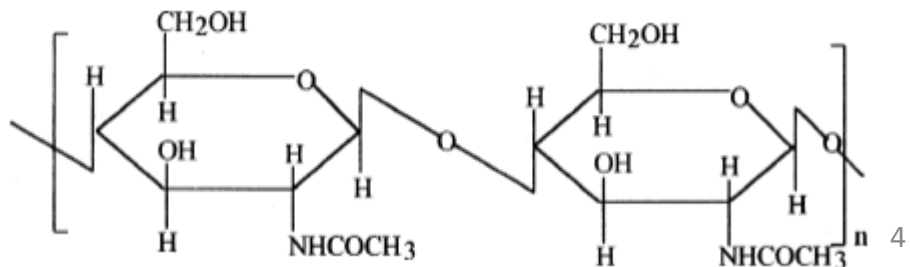


# Matís Case Study: Insect Protein

## 2017: ProffAqua –Nordic Innovation

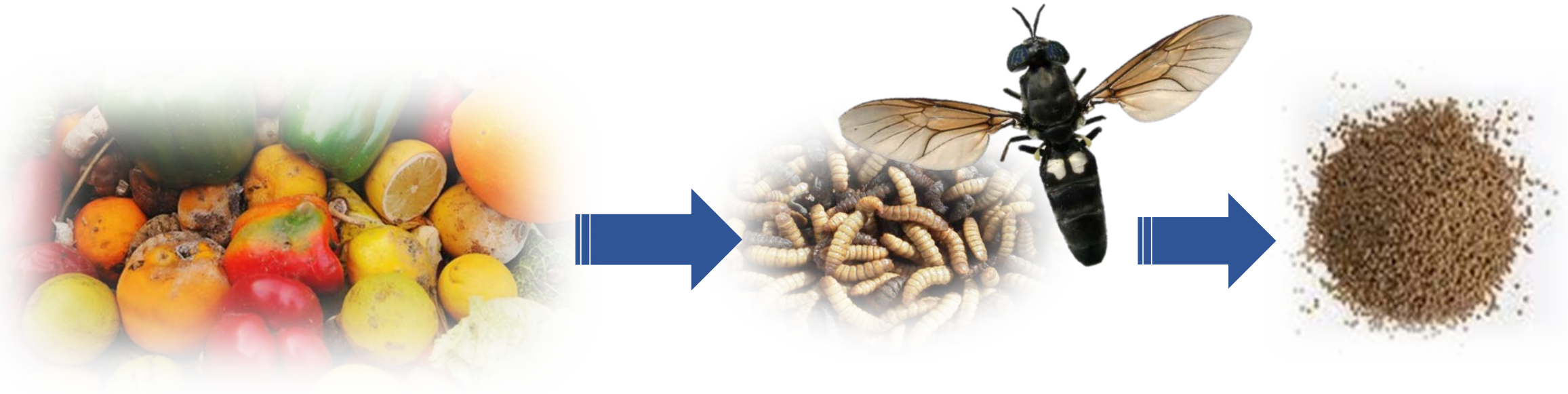


Specific Growth Rate (%)



# Matís Case Study: Insect Protein

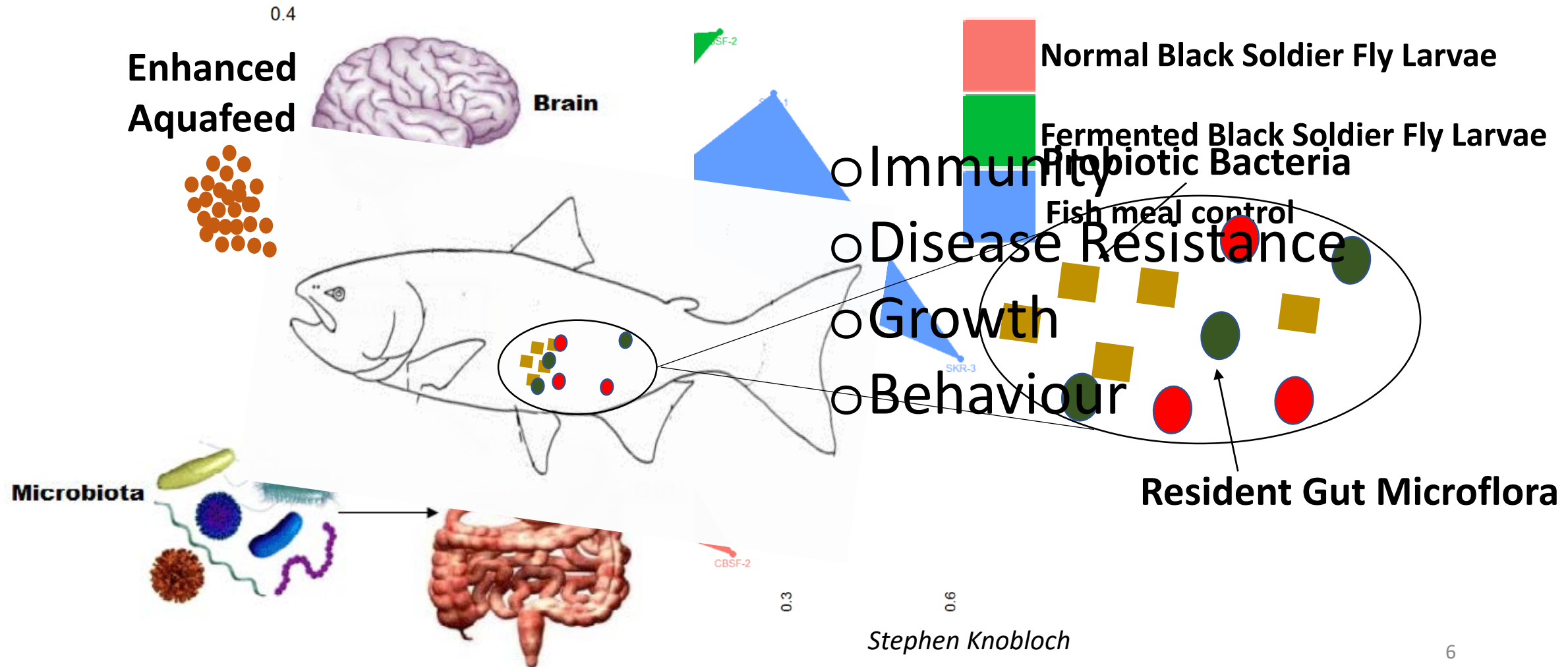
## 2018: Metamorphosis –EIT Food



- Removal of chitin
- Addition of probiotics

# Aquafeeds and The Gut

- Alterations to aquafeed composition diversifies the diversity of the gut microbiome

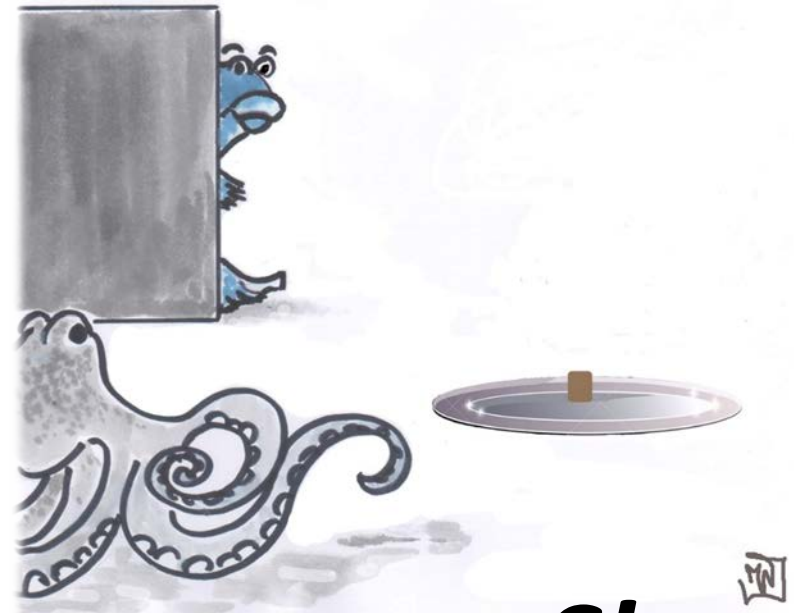


# Matís Case Study: Protein source and behaviour

- Juvenile Atlantic Salmon with high levels of soy protein in their diet behaved differently to those fed black soldier fly larvae:



**Bolder**



**Shy**



Fed insect & fish protein

Fed soy protein

# Summary

- Insect proteins reared on organic industry by-products present a sustainable ingredient source
- Current projects are exploring techniques to optimise insect proteins for aquafeeds.
- How aquafeeds interact with the gut microbiome could have important biological and behavioural consequences.



Potential Questions:

(Nutrition)

- Dietary formulations
- other proteins that we have/will work with in a similar context.
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(Behaviour)

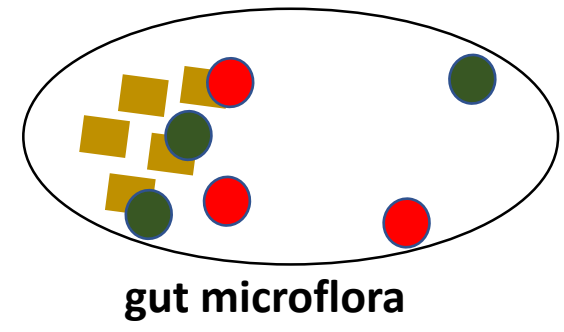
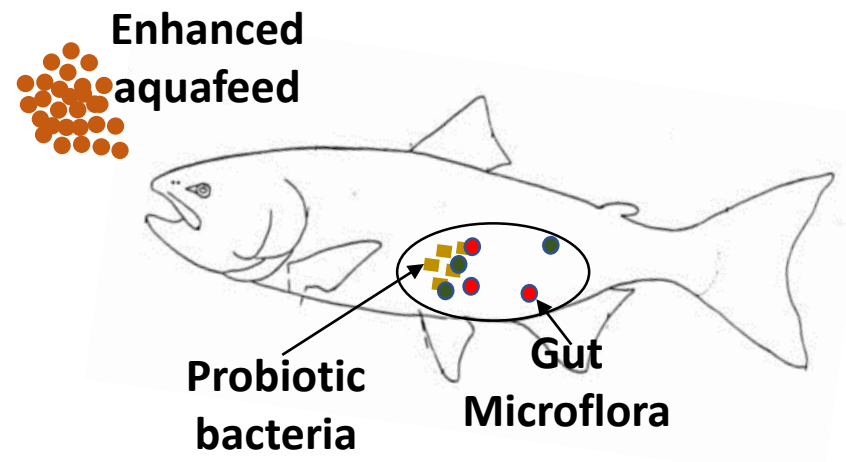
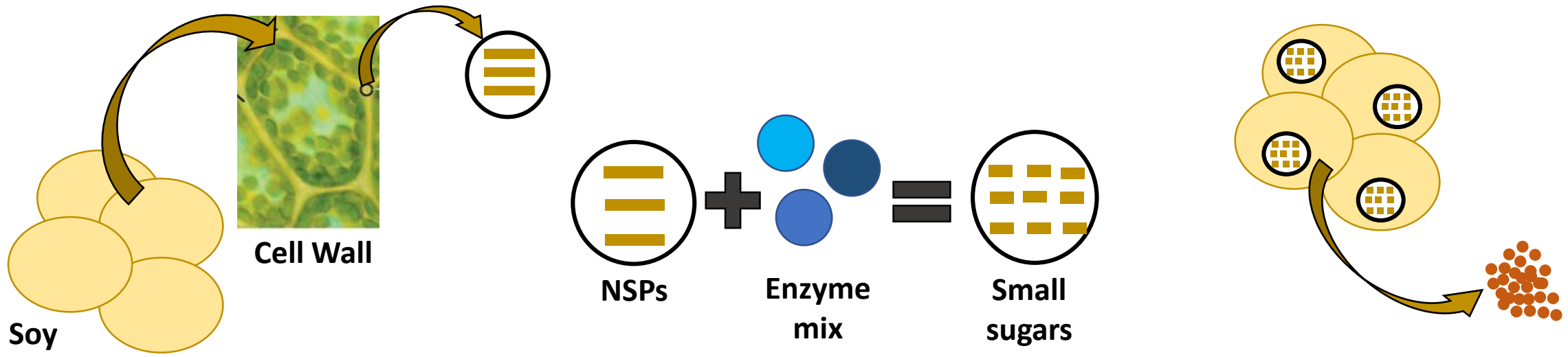
- How was behaviour assessed in a standardised way
- What do we mean practically when we say shy or bold individuals

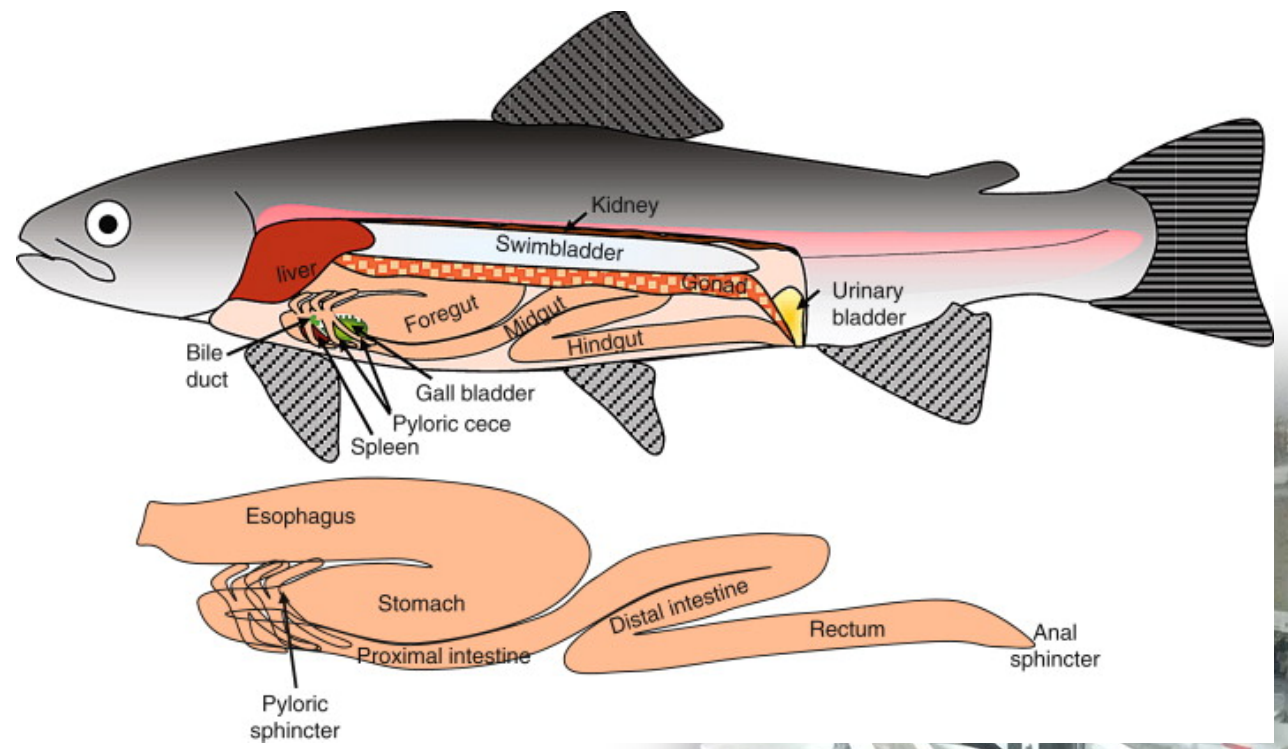
(Microbiome)

- How do we assess the gut microbiome
- How can we link gut microbiome diversity or composition to the function-for example are there specific species that if present will be indicative of for example improved immunity or a better broodstock candidate

-Make clear why all of these factors are of interest to both feed producers and farms-decrease costs, improve product quality and growth, identification of holistically ideal broodstock candidates, stress and welfare management in aquaculture related to disease resistance and

# Optimising Aquafeeds





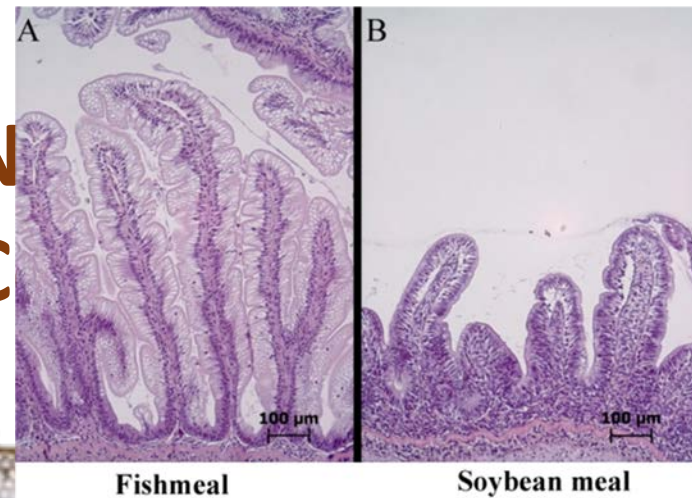
**Flesh Quality & Taste**

**Growth**

**Behaviour**

**Gut Microbiota**

**N  
C**



# A Need for New Perspectives

**Name of lecture:** New Perspectives in Feed for Fish

**Short description:** (maximum 50-70 words or 5-6 lines):  
Through examples from recent work, this presentation will discuss new perspectives in optimising feeds for sustainable growth in the aquaculture industry. This talk will highlight the promising role of circular bio-economies in feed raw material production and the emerging importance of the gut microbiome in tailoring the next generation of aquafeeds.