



# AQUACOMBINE

Final conference, Esbjerg, Denmark, November 21, 2023



Funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 862834. Any results of this project reflect only this consortium's view and the European Commission is not responsible for any use that may be made of the information it contains.

# Panel Session III:



# Aquacultural Trials

Co-funded by:



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**Aquacombine final conference, 21 November 2023**

# Panel Session III: Aquacultural Trials

- Moderation



✓ Rui Rocha, CEO at RIASEARCH

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- ✓ **Lourenço Ramos Pinto, Researcher at CIIMAR**



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- ✓ Jiwan Chettri, R&D project manager at Alpha Aqua



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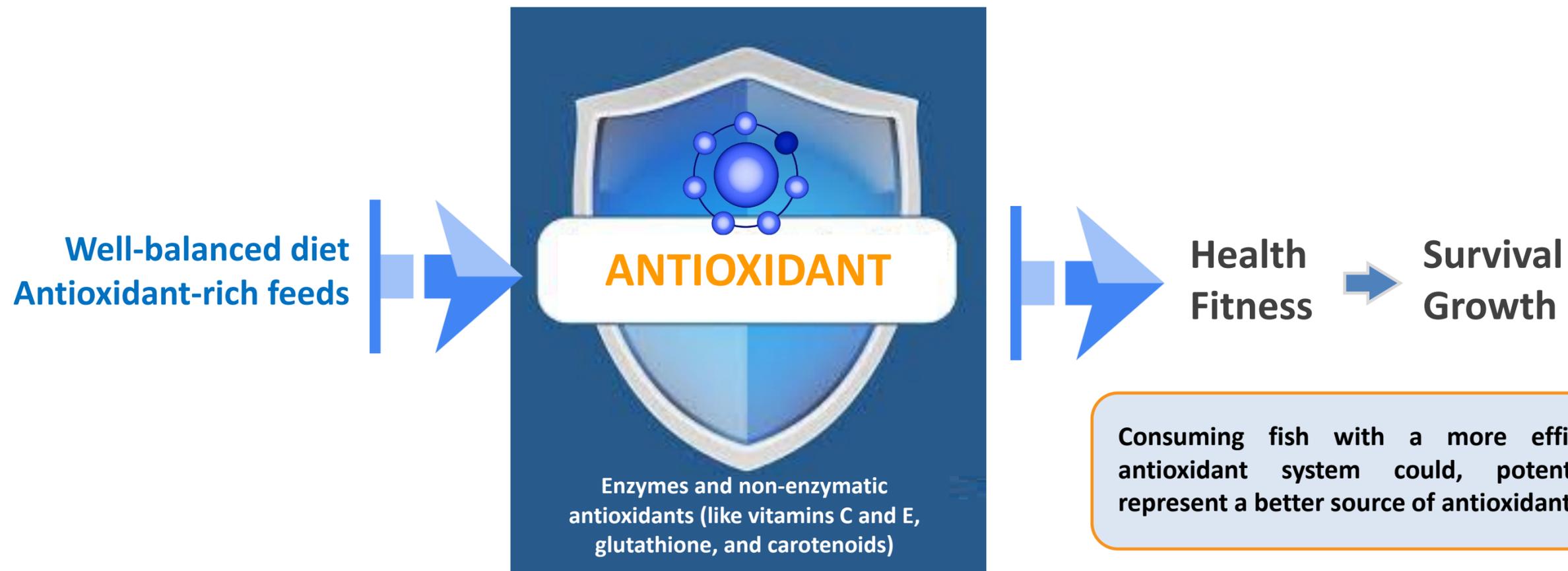
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# Why antioxidant system is relevant in aquatic farmed species?

## Antioxidant system can be modulated by dietary factors



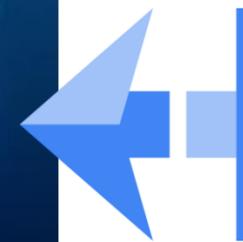
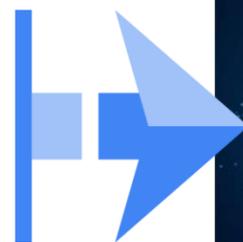


# Why DNA integrity is relevant in aquatic farmed species



## Genome integrity can be modulated by dietary factors

**Desmutagen factors**  
Acting before the mutagenic attack,  
through the partial or full inactivation of the  
agent



**Antimutagen factors**  
Suppress the mutation process after  
the, improving the repair and  
replication processes

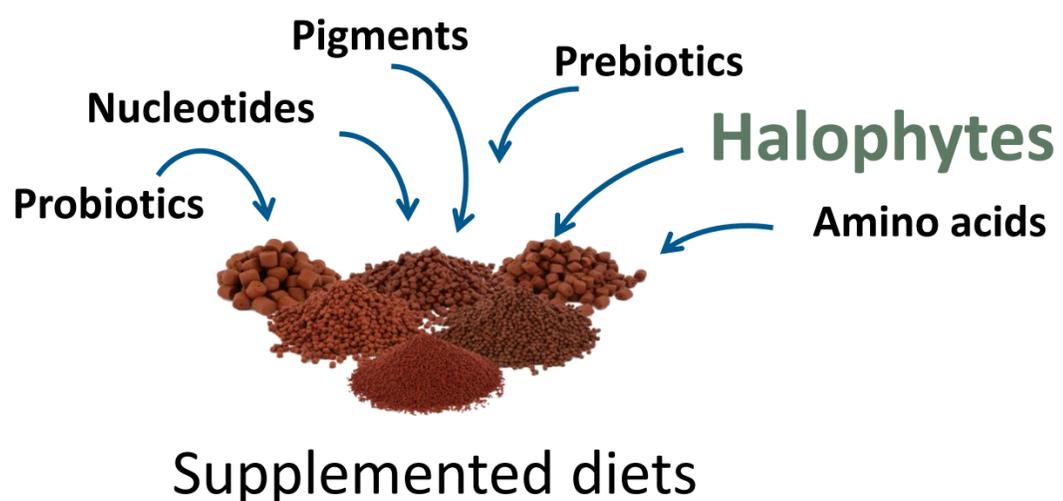
Complex pathways that can involve a **genotoxic trigger** (pro-genoprotective mechanism)

# Why immunestimulation is relevant in aquatic farmed species



## Immune system can be modulated by dietary factors

### Functional feeds in aquaculture



feeds that **go beyond** satisfying the basic nutritional requirements of fish



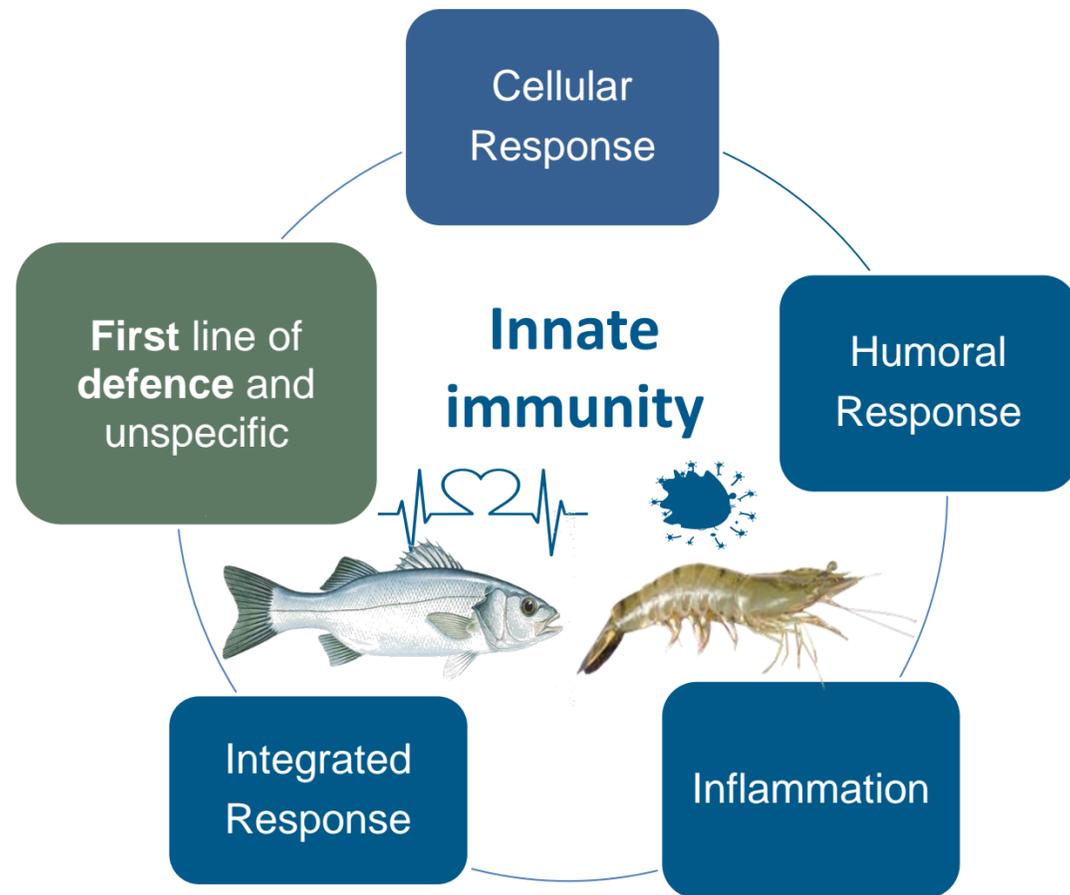
**improve** aquatic health and **reduce susceptibility** to disease and stress

(**reduce reliance** on antibiotics, improve economic returns, reduce environmental impacts)

# Why immunestimulation is relevant in aquatic farmed species



## Immune system can be modulated by dietary factors



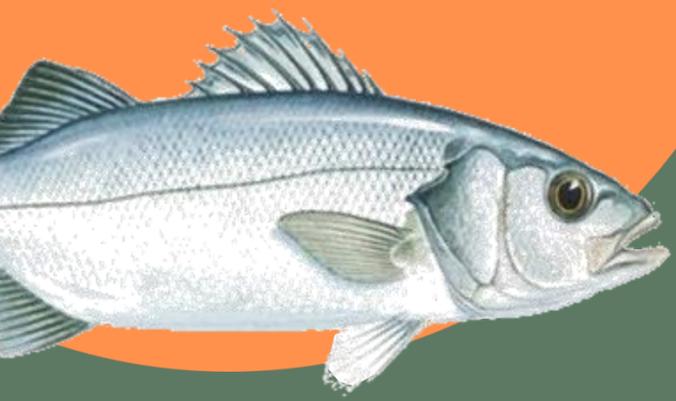
**Disease Prevention**

**Stress Reduction**

**Vaccination Enhancement**

**Environmental Challenges**

**Reduced Dependency on Antibiotics**



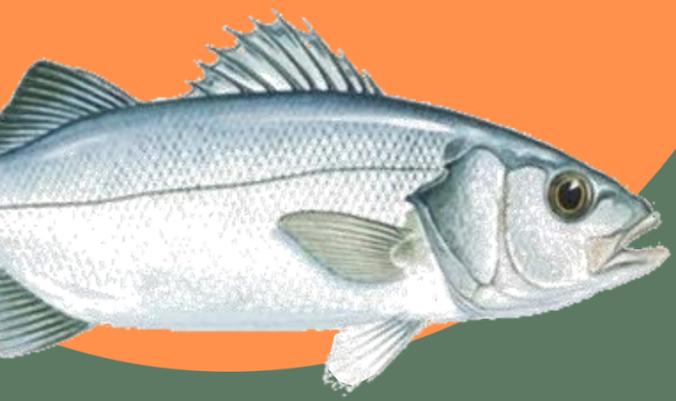
## European seabass (*Dicentrarchus labrax*)

- **Inclusion of Salicornia biomass in aquafeeds for juveniles**

Replacing wheat meal - up to 10%.

- ✓ No effects on growth, survival or feeding efficiency
- ✓ Economically feasible
- ✓ Salicornia aerial by-products can be valorized up to wheat meal market prices
- ✓ Antioxidant system reinforcement and genoprotection
- ✓ Immunostimulatory effects on fish





# European seabass (*Dicentrarchus labrax*)

- Inclusion of Salicornia biomass in aquafeeds for juveniles



✓ Antioxidant system reinforcement



✓ Genoprotection



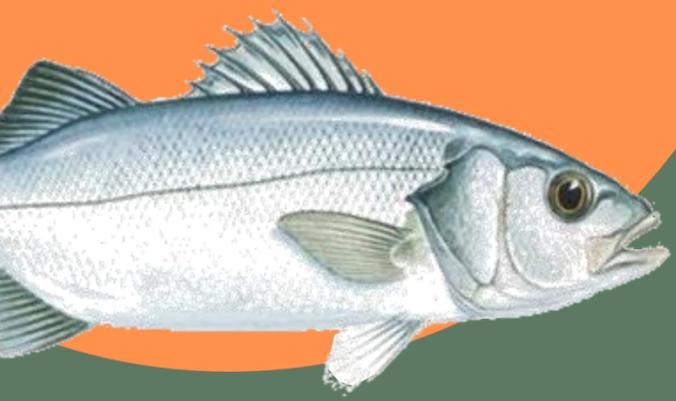
✓ Immunostimulatory effects

**Recommendation:**  
2 months of dietary  
supplementation

ST10

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10%  
inclusion of  
Salicornia



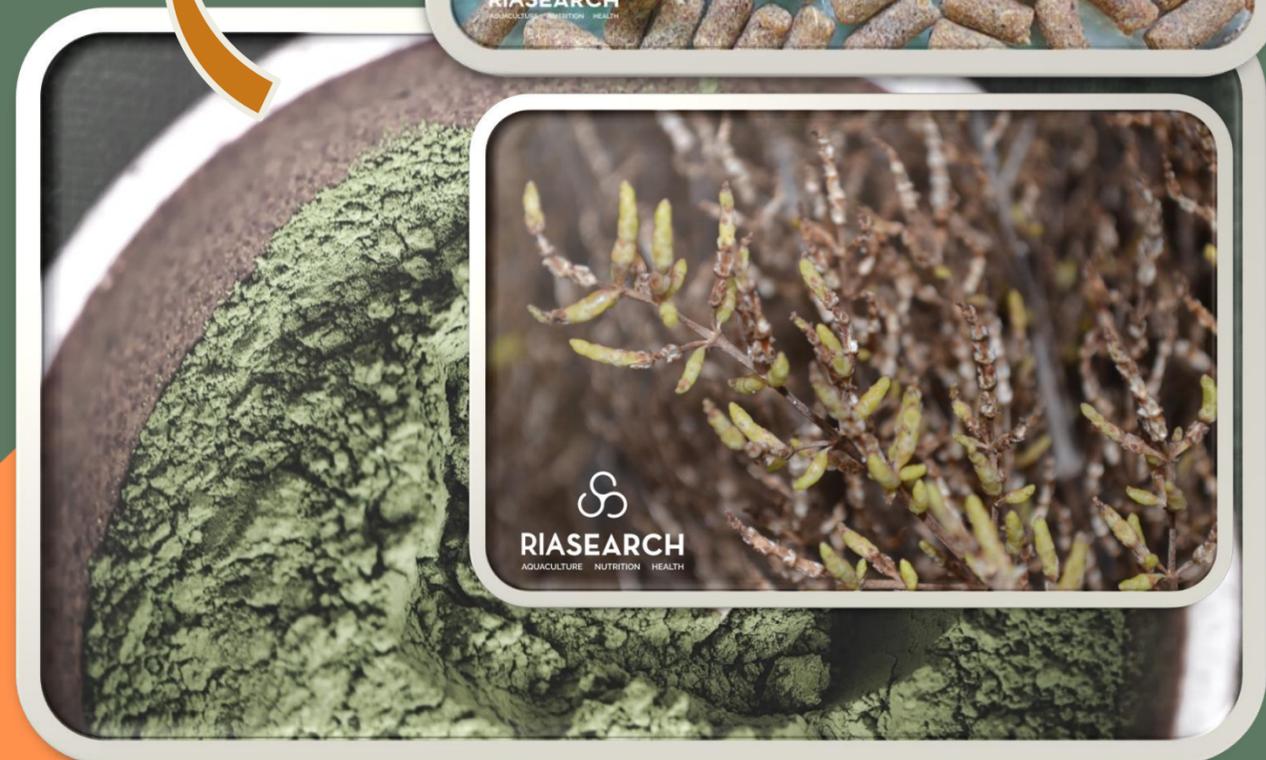
# European seabass (*Dicentrarchus labrax*)

- **Supplementation of Salicornia extracts in aquafeeds**

Rich in phenolic components

- ✓ No effects on growth, survival or feeding efficiency

- ✓ Antioxidant system reinforcement



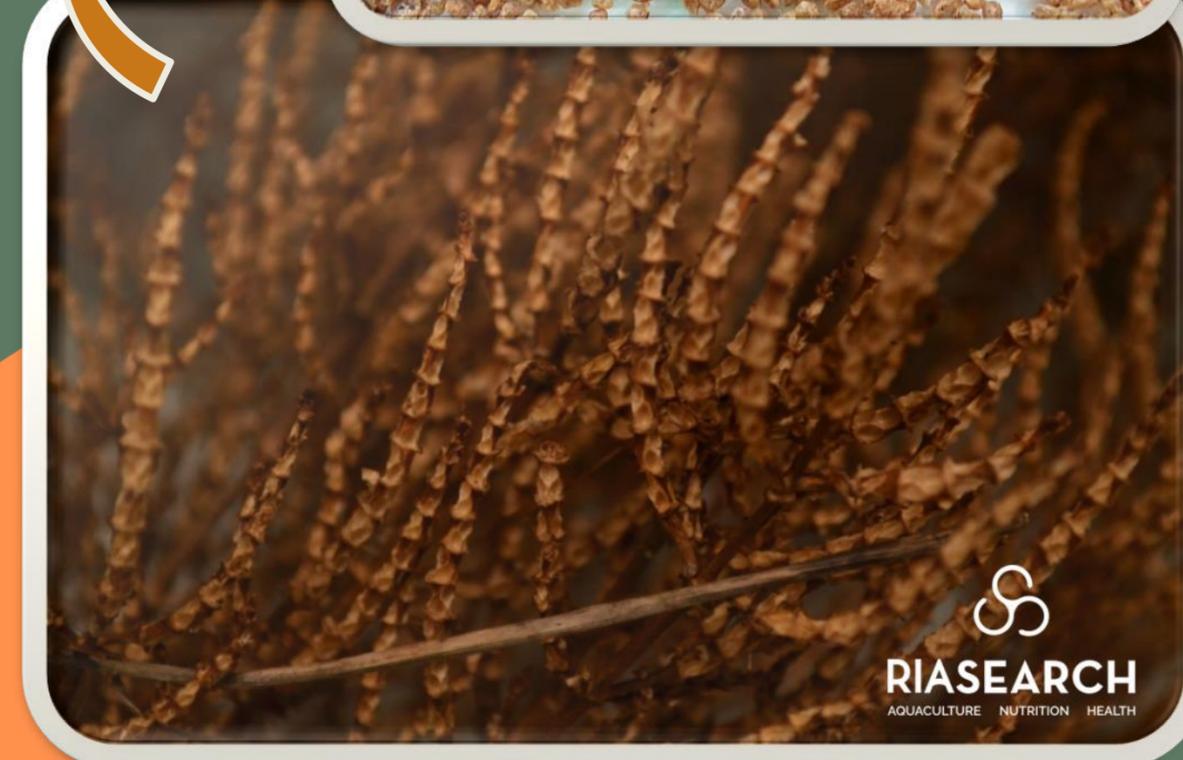


# Pacific white shrimp (*Penaeus vannamei*)

- **Inclusion of Salicornia biomass in aquafeeds for juveniles**

Replacing wheat meal - up to 10%.

- ✓ No effects on growth or survival
- ✗ Feeding efficiency was compromised
- ✗ Increased feed associated costs for producers
- ✓ Antioxidant system reinforcement 
- ✓ Immunostimulatory effects on shrimp 





# Pacific white shrimp (*Penaeus vannamei*)

- Inclusion of Salicornia biomass in aquafeeds for juveniles



## ✓ Antioxidant system reinforcement

Diets supplemented with **stems at 5% and 10%**, after 1 month

The beneficial effect **disappears after 2 months** of supplementation

**Recommendation:**  
1 month of dietary supplementation



## ✓ Immunostimulatory effects





# Pacific white shrimp (*Penaeus vannamei*)

- **Supplementation of Salicornia extracts in aquafeeds**

Green/Brown/Xylooligosaccharides rich extracts

- ✓ No effects on growth, survival or feeding efficiency
- ✓ Genoprotective effects 
- ✓ Enhancement of key metabolic pathways and microbiome diversity 
- ✓ Promising as functional additives for shrimp diets





# Pacific white shrimp (*Penaeus vannamei*)

- Supplementation of Salicornia extracts in aquafeeds



✓ Genoprotective effects



✓ Enhancement of key metabolic pathways and microbiome diversity

Recommendation:

S\_1

Inclusion  
of 1%  
Extract

