Non-ablation improves shrimp robustness to diseases

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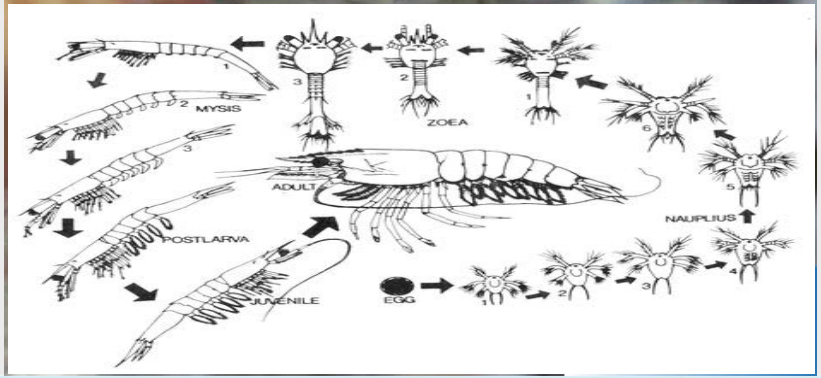
1. Main global challenge in the shrimp Industry

DISEASES

WSD (Virus)
EHP (Parasite)
AHPND (Bacteira)

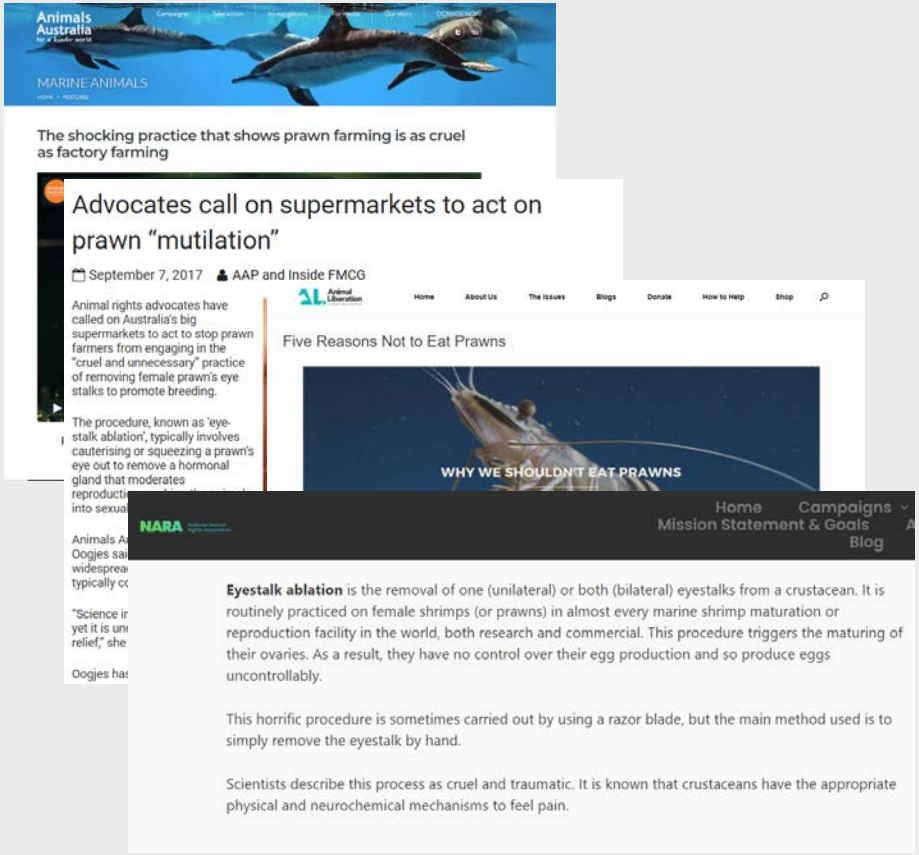
Financial Losses

2. Eyestalk ablation



Why ablate?

- Organs controlling reproduction are located in the eyestalk
- Removal increases rate of production of eggs/nauplii to commercial level



Shrimp welfare

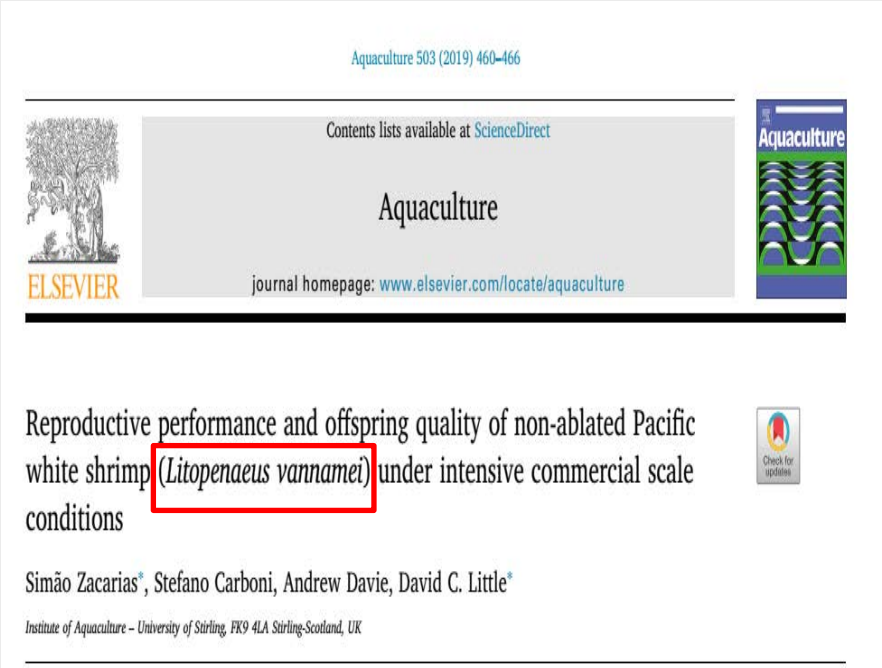
- Animal welfare organizations attack ablation as a cruel practice
- Retailers and certification bodies want to eliminate ablation
- Many producers have taken steps to eliminate eyestalk ablation but the practice remains widespread
- Need more positive reasons to end the practice

Therefore the Industry:

New practices to improve the tolerance or resistance of shrimp to disease

Stop unilateral eyestalk ablation in commercial hatcheries

3. Baseline work for the INNOVATIVE RESEARCH



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Reproductive performance and offspring quality of non-ablated Pacific white shrimp (*Litopenaeus vannamei*) under intensive commercial scale conditions

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3.1. Commercial shrimp egg production can be done without eyestalk ablation

Pre-maturation

Sex ratio manipulation

3.2. Non-ablated shrimp broodstock produced ROBUST OFFSPRING

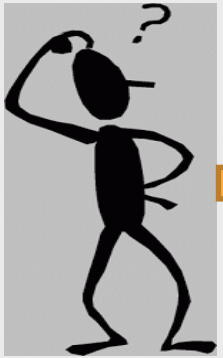
Salinity stress test

Salinity stress test: Non-ablated shrimp broodstock produced ROBUST OFFSPRING

Focus of the innovation:

Is there a link between eyestalk ablation and the “fitness” of the offspring?

Is there a difference in fitness between PL produced from ablated and non-ablated animals?



Disease Challenge

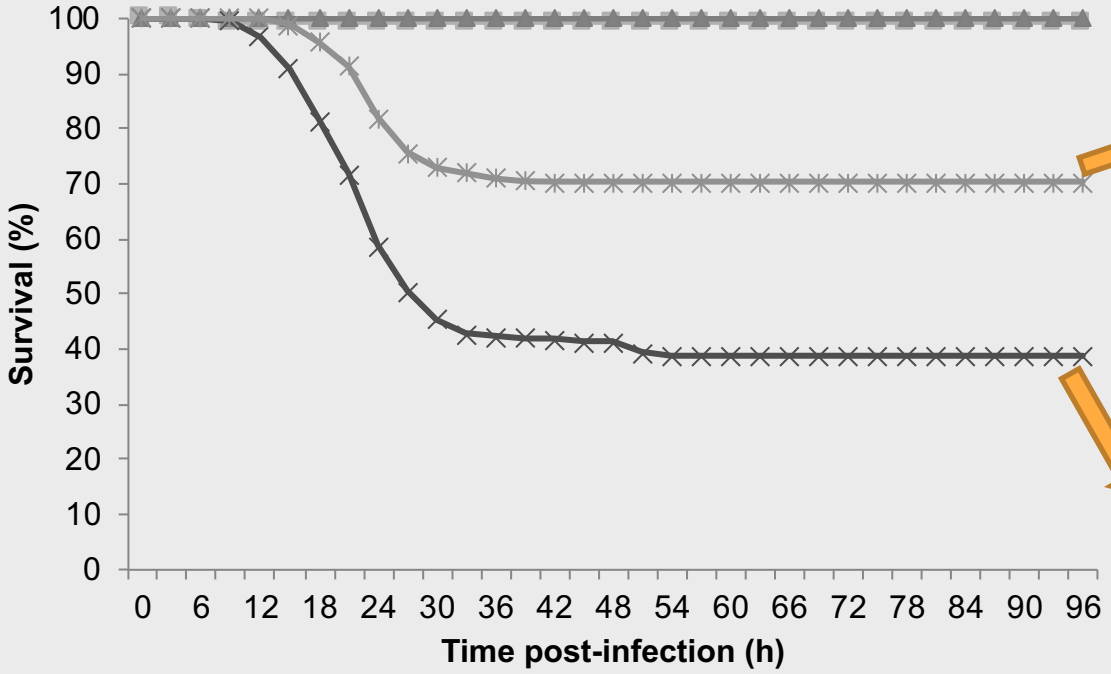
4. Innovative Research Work

4.1. Challenge *P. Vannamei* Postlarvae with AHPND/EMS

4.2. Challenge *P. Vannamei* Juveniles with WSD

Results

4.1. Survival of *P. vannamei* Postlarvae challenged with and without AHPND/EMS



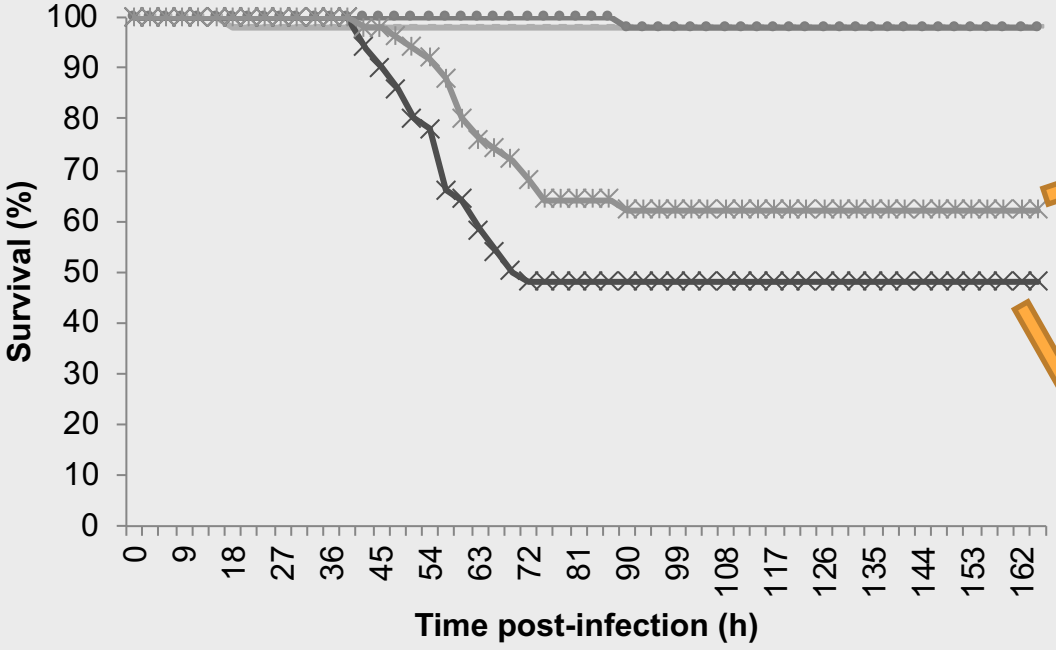
70.4% - NAF

38.8% - AF

+31.6%

AF – Ablated female
NAF – Non-ablated female

4.2. Survival of *P. vannamei* Juveniles challenged with and without WSSV



62% - NAF

48% - AF

+14%

AF – Ablated female
NAF – Non-ablated female

5. Impact of the innovation to the industry

5.1. Major welfare concern in the industry would be quickly addressed

- There is a strong positive reason for commercial hatcheries to eliminate eyestalk ablation

5.2. Shrimp hatcheries would produce high quality (robust) animals with non-ablation

- Improve marketability of their product (Postlarvae) to farmers
- Facilitate certification process on Animal Welfare Practices

5.3. Farmers would ensure good survival and productivity during disease outbreaks

- This would reduce financial losses

5.4. Farmers would produce more valuable and marketable product

- Improve marketability of their product to processors, retailers and consumers
- Facilitate certification process on Animal Welfare Practices

5.5. It would become a key health strategy in shrimp farming going forward

- Non-ablation improves shrimp robustness to disease

6. Acknowledgement

Benchmark Holdings plc

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THANK YOU!