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The Paths to Viable Shrimp Non-Ablation Adoption

Simão Zacarias, PhD

Postdoctoral Research Fellow and Consultant

simao.zacarias1@stir.ac.uk

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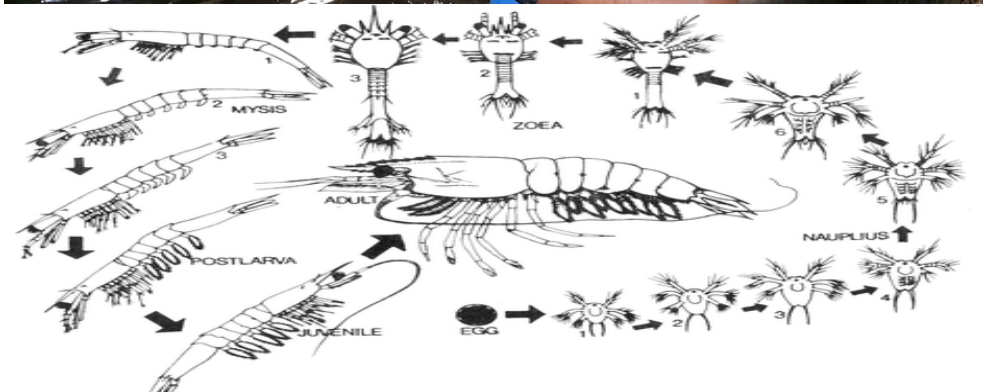
BE THE DIFFERENCE

1. Shrimp Hatcheries: Unilateral Eyestalk Ablation

Rapid egg production

Meet commercial demand



1.1. Eyestalk ablation impact in Shrimp

Positive	Negative (e.g. Welfare issues)
Reduce gonad inhibiting hormone	Physiological imbalance
Induce rapid maturation and spawn	Reproductive exhaustion
Meet commercial demand	Stress
	Reduction of shrimp hyperglicemic and molt inhibiting hormones
	High energy demand
	Activation/reduction of immune related genes
	Influence on metabolism of macronutrients
	Alteration of biochemical pathways
	Drop of hemocyanin and glucose in hepatopancreas
	High broodstock mortality
	Compromise offspring quality (e.g. decrease robustness to diseases)

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1.2. Eyestalk Ablation vs Welfare concerns

BAP CERTIFIED

LABEYRIE FINE FOODS

FARMED RESPONSIBLY asc CERTIFIED ASC-AQUA.ORG TM

ASDA

Sainsbury's

GLOBALG.A.P.

TESCO Every little helps

ALTERNATIVE (S)

2. What is the pathway to adoptions?

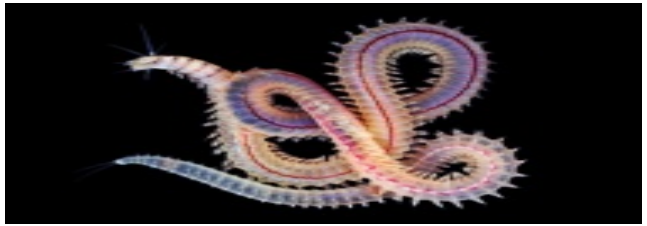
MOVING FROM
EYESTALK ABLATION

TO

NON-ABLATION
ADOPTION

"Improving" some key Hatcheries and Breeding Practices/Protocols.

2.1. Broodstock Feeding and Nutrition



- Feed your female broodstock with high quality broodstock diets as early as possible (e.g. Pre-maturation tanks, quarantine tanks, breeding centers).
- Essential fatty acids such as EPA and DHA play key role on rapid maturation and spawn on non-ablated females
- Reconsider feeding frequency and improve your male sperm quality.

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2.2. Sex Ratio Manipulation (Male:Female)

- May require to change male to female ratio (1:1) to (1:1.25 - 2) while maintaining same broodstock density or add any additional capacity (e.g. tanks) if required.

- This allows "some strains" of the non-ablated female broodstock to perform similarly to ablated animals under commercial conditions.

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2.3. Broostock strains, domestication and selective breeding

- Broodstock Genetic or Strain: different response to non-ablation.
- Domestication: More domesticated animals respond better to non-ablation.
- Selective breeding program: Increase selection frequency, specially with new DNA tools.

2.4. Other Hatcheries practices are still important

- Maintain very good and stable water quality.
- Photoperiod.
- Hatchery design and system.
- Selection of mated female strategy.
- Staff training.
- Etc.

3. Global examples: Pacific white shrimp

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Honduras

Vietnam

HUY THUAN®
Mang hiệu quả – Trả thành công

Ecuador

AQUAGEN
MEJORAMIENTO GENÉTICO MARINO

4. Global examples: Black Tiger Shrimp

Madagascar

EST. 1965

unima

LA CREVETTE DE MADAGASCAR

We can do it. Thank You!