

# Benefits and Challenges of an Fno Free Hatchery



Hapa Farms

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# About Hapa Farms

## *Sustainable Agriculture*

Hapa Farms strives to improve and protect Hawaii and its environment by practicing and educating in sustainable agricultural techniques.



# Commercial Hatchery

- Kahalu'u, O'ahu
- Utilizing marginal farm lands
- Custom hybrid tilapia breeding
  - Color
  - Fast-growing
  - Disease resistant
  - All male



# Aquaponics in Education

- Working with schools to design, implement, and build self-sustaining aquaponic programs



# Aquaponics in Education

- Highlands IS
- Kanoelani ES
- Manana ES
- Palisades ES
- Nanakuli HS/IS
- Waianae IS
- Keoneula ES



# What is Fno?

- *Francisella noatunensis* subsp. *orientalis*
  - Causative agent of mass die-offs in Hawaii since 1994
  - Also in Costa Rica, Taiwan, UK
  - Highly contagious pathogen

Mauel MJ et al: 2003. Characterization of a piscirickettsiosis-like disease In Hawaiian tilapia. *Dis Aquat Org* 53:249-55.

Soto E et al: 2011. *Francisella asiatica* as the causative agent of piscine francisellosis in cultured tilapia (*Oreochromis* sp.) in the United States. *J VET Diagn Invest* 23:821

# “Fno Free Hatchery”

- A misnomer...
  - No formal certification for tilapia
  - Testing is available
    - Conventional and real time PCR testing
    - Bacteria culture
- Proper terminology: “Tested Fno Free”

# Why stay Fno free?

- Regardless of your farm's business model, can provide concrete benefits





# Benefits

## Maintaining your product

- Fno can cause mass die-offs (30-60%) and sometimes must de-populate to eliminate
  - This can cause a 7-24 month delay before fish are saleable size (depending on species)
  - Can customer base be maintained with such a long delay?

# Benefits

## Live market

- Can't distinguish FNO-infected fish when whole but fish may die in display tank before being sold
- This can tarnish the tilapia market as a whole

# Benefits

## Antibiotic-free product

- Possible treatments available for FNO
  - florfenicol, oxytetracycline
  - Unsure of effectiveness
- Customers wary of antibiotic-treated foods

Klinger-Bowen, et al: 2013. Francisella in Tilapia, CTSA Publication #158.

# Benefits

Lives sales for aquaponics/aquaculture

- In theory, higher market value
- Customers are looking for Fno free stock
  - For Hapa Farms, although cost of testing is substantial, sales have increased significantly

# Staying Fno free

FNO is prevalent and contagious

- Precautions are taken to ensure that potential FNO infections (and other diseases) are not brought to hatchery



# Challenges of testing Fno free

- Clean hair, skin, clothes and shoes before arriving at hatchery
  - After visiting another site, including our own installations, all staff have to shower and change before returning to hatchery
  - Staff keep hatchery-only shoes
- No outside visitors & outside vehicles must stay on public road
  - Deliver all fish, no casual visitors

# Challenges of testing Fno free

- Regulate movement of fish and equipment
  - Fish being brought in are tested/quarantined
  - Incoming equipment/supplies are disinfected or quarantined
  - On-site vehicles don't travel off-site
  - Equipment not moved between enclosures

# Challenges of testing Fno free

- Regular testing to confirm
  - High cost for conventional and real time PCR testing
    - Chain of custody through CTAHR
    - Testing w/ 3<sup>rd</sup> party laboratory (Moana Tech)
    - Sacrifice fish for samples
  - CTAHR is researching a FNO testing protocols and requirements
    - Possibly sacrifice hundreds of fish with charges for each sample or composite sample



# Another challenge...

- FNO is not commonly known, recognized, or understood by buyers
  - Dangers of FNO are not taken seriously
- Often, dangers of FNO are not commonly recognized or avoided by tilapia community
  - Due to number of infected fish, need joint effort by community to eliminate on island

# OIE

- International Office of Epizootics
  - World Organization for Animal Health, responsible for improving animal health worldwide
- OIE reportable diseases may legally require depopulation upon notification
  - Spring Viremia of Carp (SVC)
  - White spot disease (shrimp)

# Working together

- Work strongly as an aquaculture community to raise awareness of and eliminate Fno