



# The importance of sanitary aspects in productivity and sustainability of the Tilapia culture

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# The importance of sanitary aspects in productivity and sustainability of the Tilapia culture

## Sanitary Aspects

### Productivity

- Weight gain (GPD)
- Survival
- Uniformity
- FCR (feed conversion ratio)
- Yield in industrialization

### Sustainability

- Economic & Environmental Sustainability
- Less environmental contamination
- Better water quality
- Preservation of water resources

# Tilapia – understanding its biology.....

- **Cichlid;**
- **Territorial dispute;**
- **Nile River & Middle East;**
- **Green waters;**
- **Phytoplankton-based culture;**

# Productive System X Animal Welfare & Health

1. Extensive
2. Intensive
3. Super Intensive



# Understanding the productive model and Animal Welfare.....



X



- Destined to production of fries, juveniles and fattening;
- Better animal comfort (less crowding);
- Capability of environmental control;
- Availability of natural food;
- Less number of handling;

**- LESS SANITARY CHALLENGE !!**

- Destined to production of juveniles and fattening;
- Less animal comfort (greater crowding);
- Incapability of environmental control;
- Little availability of natural food;
- Greater number of handling;

**- GREATER SANITARY CHALLENGE !!**



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X



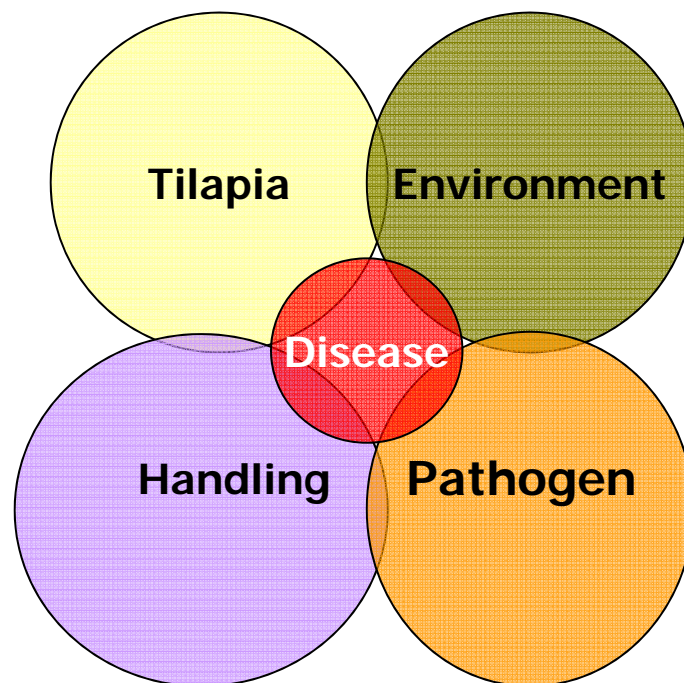
# Health & Expression Factors

## Species:

- Global production;
- Distribution;
- Perspective;

## Farm handling:

- Breeding system;
- Production volume and level of intensification;
- Biosafety and hygiene;
- Nutrition;



## Environment:

Water quality;

- Salinity
- Temperature
- Oxygen

Fluctuations;

Geographical location;

## Pathogen Status:

- Collection techniques;
- Diseases encountered;
- Prevalence;





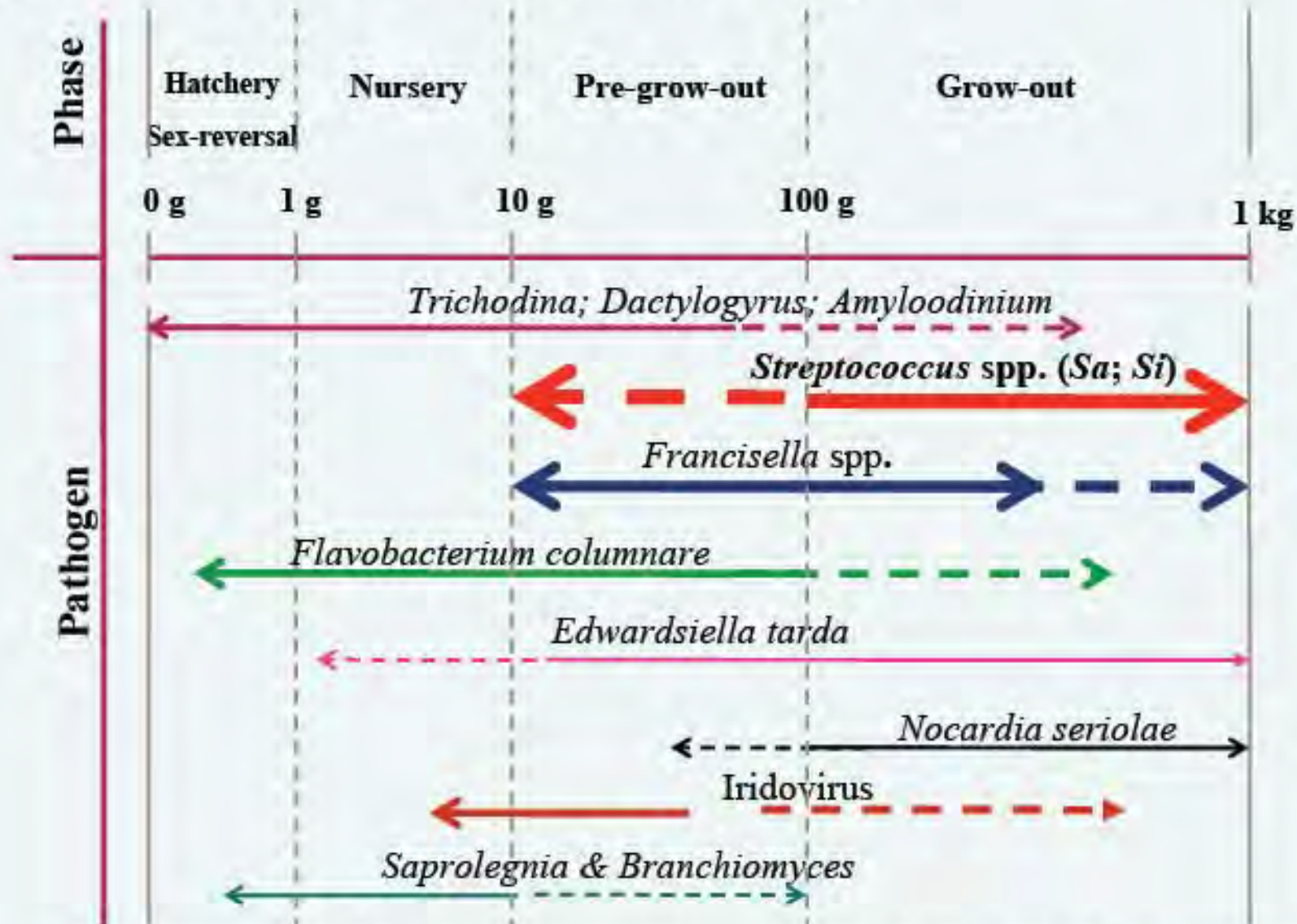
# Increase of population X Protein Demand



## Production system intensification:

- 2<sup>nd</sup> to 5<sup>th</sup> year >>> diseases;
- 6 to 10 specific diseases for every animal production (poultry, pigs, bovines etc..);

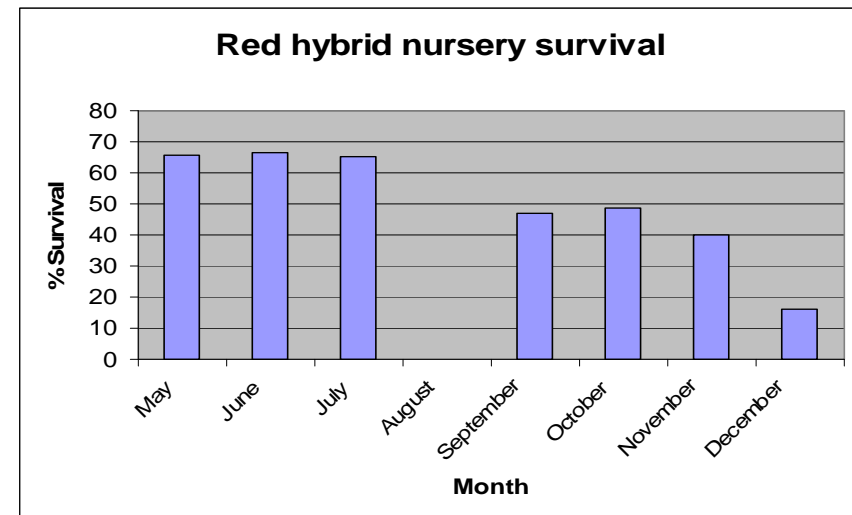
# Major Diseases Affecting Tilapia



Note: importance of the disease is roughly in proportion to the size of the arrow bars

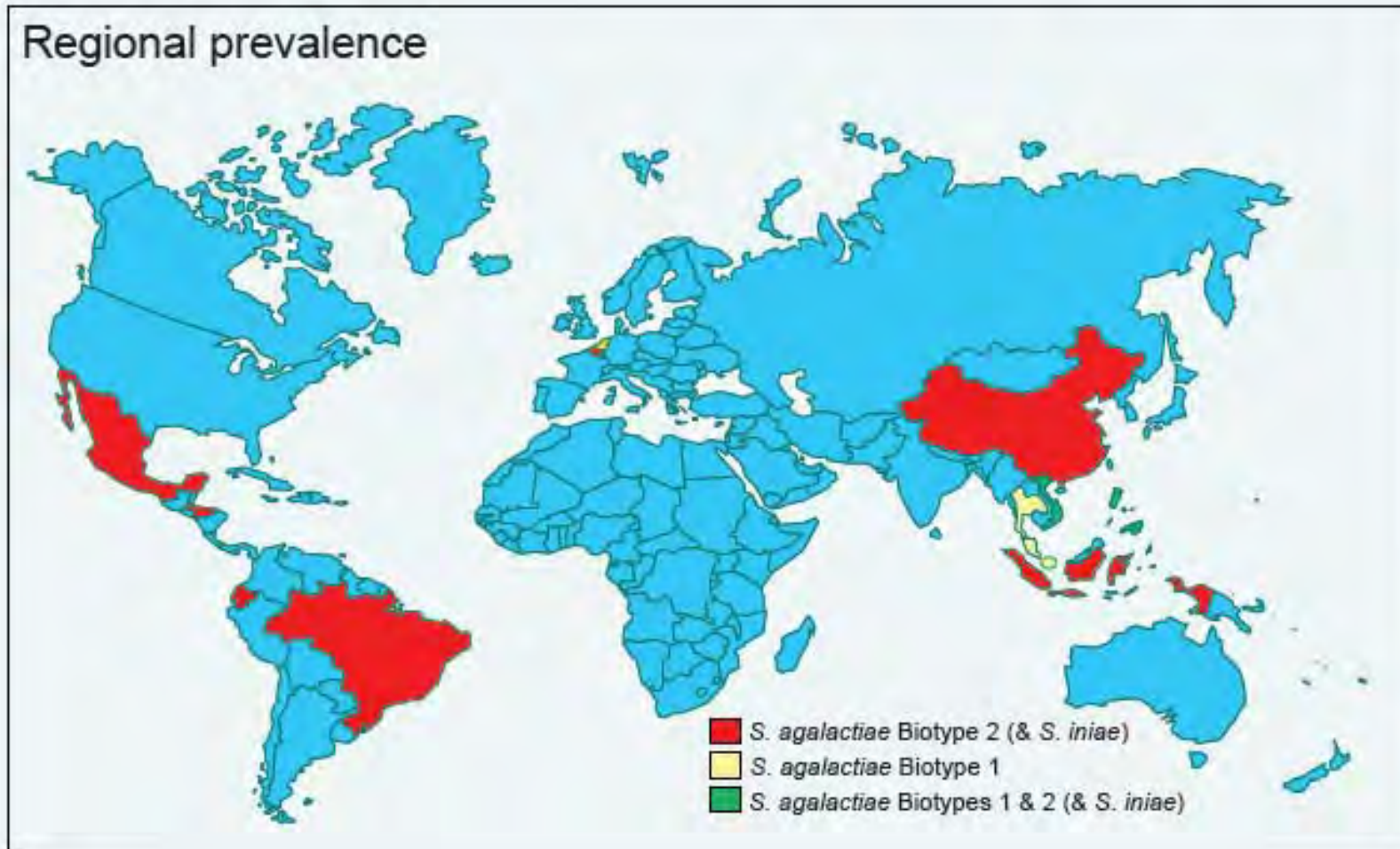
# Investigating the disease

- Clinical observation of the animals and overall health condition;
- Analysis of production and historical data;
- Remittance of samples to specialized laboratories;
- Identification of current challenges and diseases;
- Biosecurity programs;





## Regional Prevalence *S. agalactiae* & *S. iniae*



# Main Diseases of Economic impact associated to Intensive Tilapia Culture

Bacterial \$\$\$\$

Parasitic \$\$\$

Viral \$\$

Fungal \$



# Bacterial diseases

## *Flavobacterium columnare*

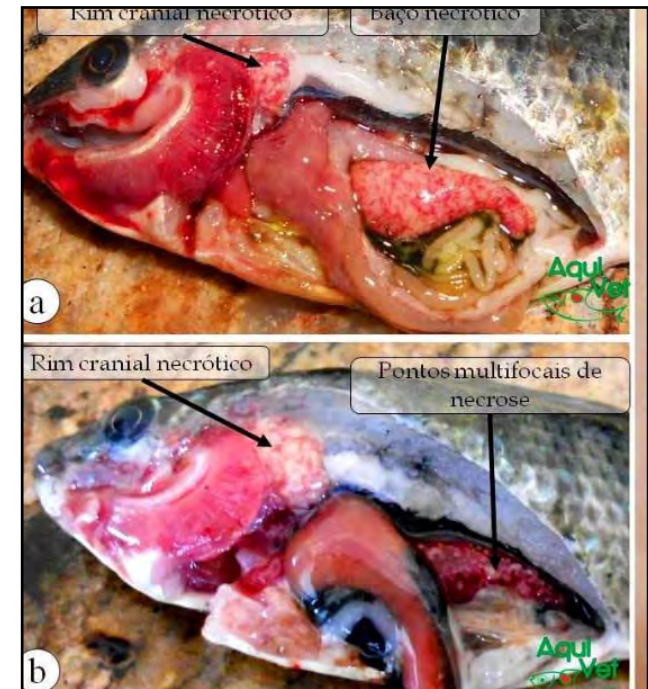
- Gram negative bacteria;
- Horizontal transmission;
- Fries and Juveniles;
- Risk Factors: Temperature oscillations; handlings and Excess Organic Matter;



# Bacterial diseases

## Francisella sp.

- Intracellular gram negative bacteria;
- Horizontal transmission;
- Fries; Juveniles;
- Risk factors: mild temperatures (< 24°C);
- Elevated mortality (high pathogenicity);



# Bacterial diseases

## Moving *Aeromonas* induced Hemorrhagic Septicemias

- Extracellular gram negative bacteria - *A. hydrophila*; *A. caviae* e *A. sobria*;
- Horizontal transmission;
- Fries; Juveniles and Adults;
- Risk factors: low environmental quality;





# Bacterial diseases

## Streptococcosis

- Extracellular gram positive bacteria (intracellular presence in macrophages);
- *Streptococcus agalactiae* Ia ; Ib & III ; *S. iniae*;
- Horizontal transmission;
- Fries; Juveniles & Adults;
- Risk factors: high temperatures & crowding in intensive system;
- Elevated mortality (high pathogenicity);



# Streptococcus in Tilapias

- Ascites
- Splenomegaly / Pericarditis; adhesions
- Meningoencephalitis / Inflammation of kidneys
- Hemorrhages and pale livers
- Necrosis in muscle close to the tail;





# Streptococcus in Tilapias

- ✓ Indirect losses due to chronic clinical and subclinical manifestations;

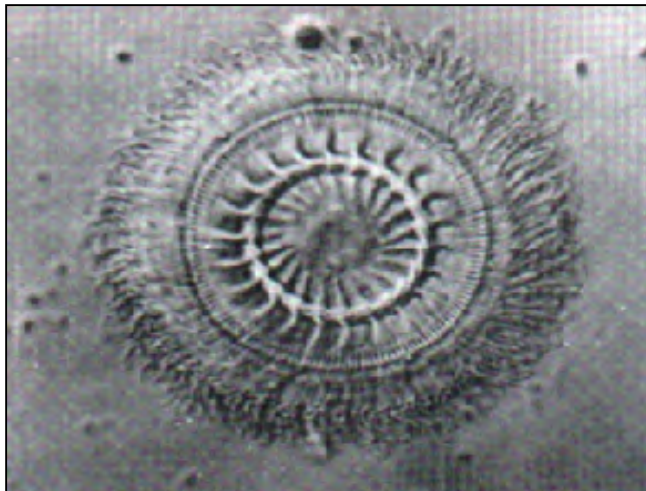
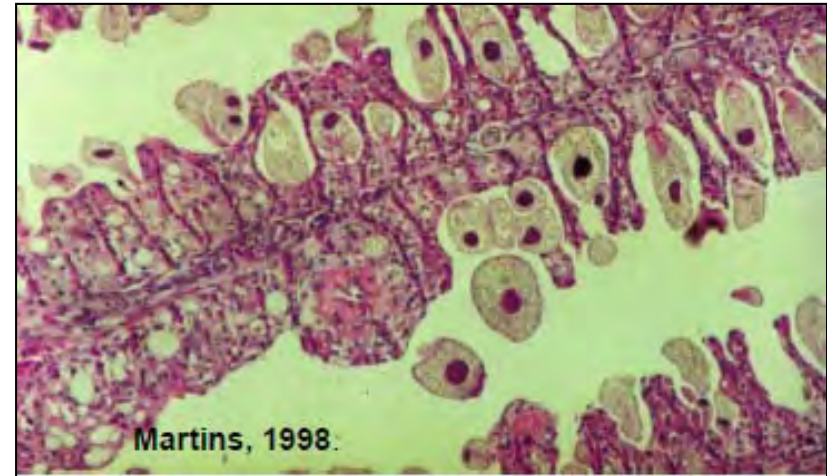
Impact in FCR and other productive parameters;



# Parasitic diseases

## Monogenean & Protozoan

- Branchial ectoparasites;
- Horizontal transmission;
- Fries and Juveniles;
- Risk factors: Temperature oscillations & excess organic matter;



M. J. Santos, 2003




# Fungal diseases

## Saprolegnia & Branchiomycosis

- External fungi;
- Horizontal transmission;
- Fries and Juveniles;
- Risk factors: temperature oscillation;



# How to manage all these Diseases?

- 
- 1. Get to know the production system & “good handling practices”;**
  - 2. Supply the nutritional requirements;**
  - 3. Obtain adequate genetics;**
  - 4. Biossecurity Programs;**
  - 5. Veterinary tools (curative & preventive);**



# 1. Get to know the production system & handling practices;

- Excavated tanks X net tanks X circular tanks (recirculation/'biofloc')
- Extensive system X Intensive system X Super intensive system;

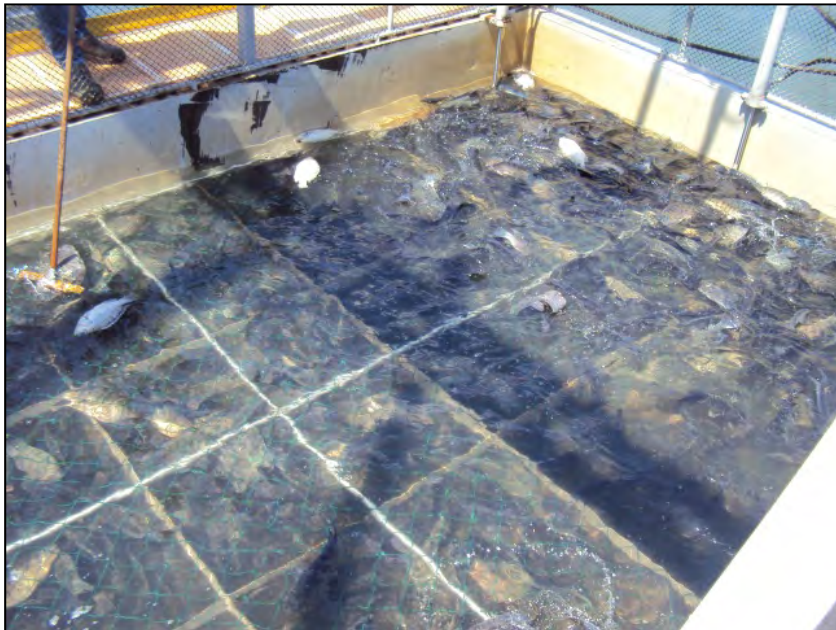


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# Good handling practices;

- Classifications;
- Transportations of live fishes;
- MAXIMUM attention to environmental temperatures – respect animal comfort.





## 2. Nutritional requirements

- Intensive systems in Net tanks or Raceways are dependent on more complete feeds and higher protein and vitamin levels;
- Granulometries of adequate feeds for every production stage;
- Adequate protein and vitamin levels for every production phase;
- Discuss and ask for support from your Nutrition supplier.



### 3. Adequate genetics

- Thai lineages are more rustic;
- Improved Gift / Supreme lineages are more productive, however, more sensitive to diseases;
- The red lineages present greater versatility salt water production;



Pr Proprietary



## 4. Biosafety Programs

- URGENT !!
- There are no consistent programs in the sector both in private and government levels;



  
MAINSTREAM

**INSTRUCTIVO PARA MANIPULACION DE PRODUCTOS QUIMICOS, ELEMENTOS DE PROTECCION PERSONAL**

Al Iniciar cualquier actividad que implique la manipulación o traslado de productos químicos se debe equipar con los siguientes equipos, línea 1 o línea 2 ambos son autorizados y cumplen con protección.

Pechera de PVC, o traje de protección química.	Máscara de Protección rostro Completo, con Filtros para Vapores Orgánicos, medio rostro con filtro vapores orgánicos, fácil.	Guantes manga larga Impermeable de PVC, o nitrilo. <i>No usar Guantes de Goma Común Natural. NO usar guante quirúrgico</i>	Botas de PVC, a Goma.
			
			

Una vez bien equipado sin obviar ninguno de los antes mencionado elementos de protección se debe

- ✓ Manipular químico en lugar con buena ventilación, evitar lugares cerrados.
- ✓ No Ingerir ningún tipo de alimento.
- ✓ No Fumar
- ✓ Alejar cualquier otro producto químico de la zona de manipulación para evitar reacciones químicas negativas.



## 5. Veterinary Tools

### Curative:

- Anti-parasitic agents
- **Antibiotics\*\***
- Antifungal agents

### Preventive:

- **Vaccines\*\***
- Probiotic agents
- Functional foods

# Advancement in Animal Well Being technology.

## Vaccines:

- Streptococcus agalactiae Biotype Ia; Ib & III;
- Streptococcus iniae;
- Iridovirus;
- Francisella sp; Flavobacterium columnare; Aeromonas sp.

## Antibiotics:

- Use of specific and safe Antibiotics;
- Grace period in target species, safety, efficacy;
- HCPP – export to European & American market;



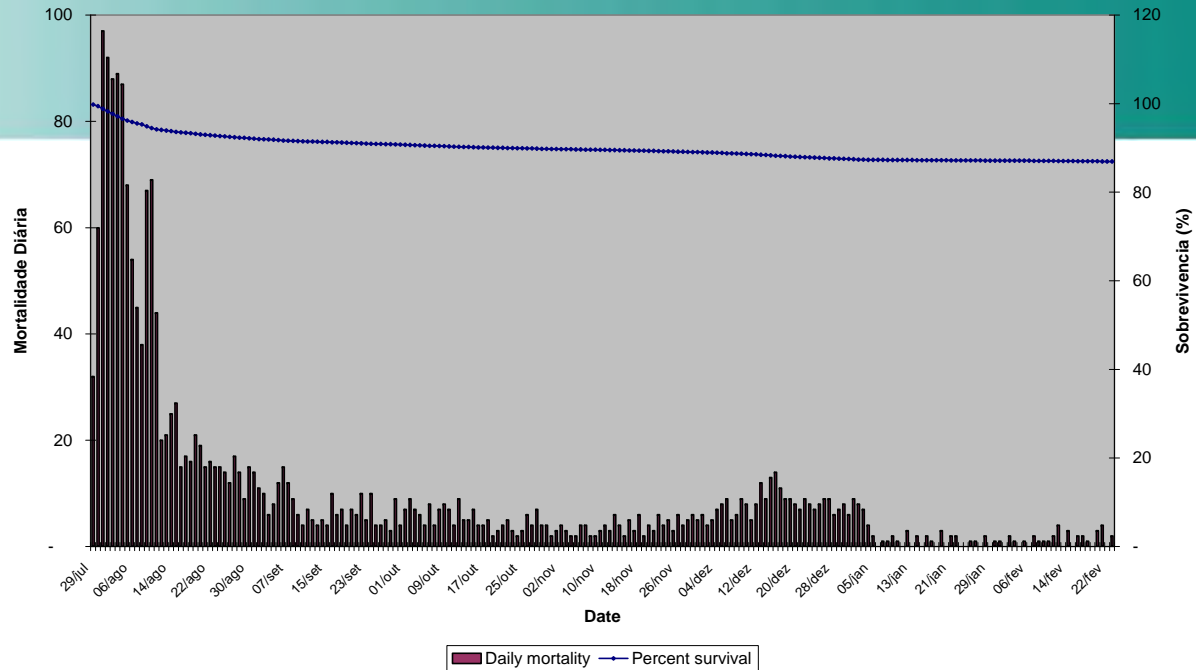








Mortalidade Diária X Sobrevivência : Grupo Vacinado

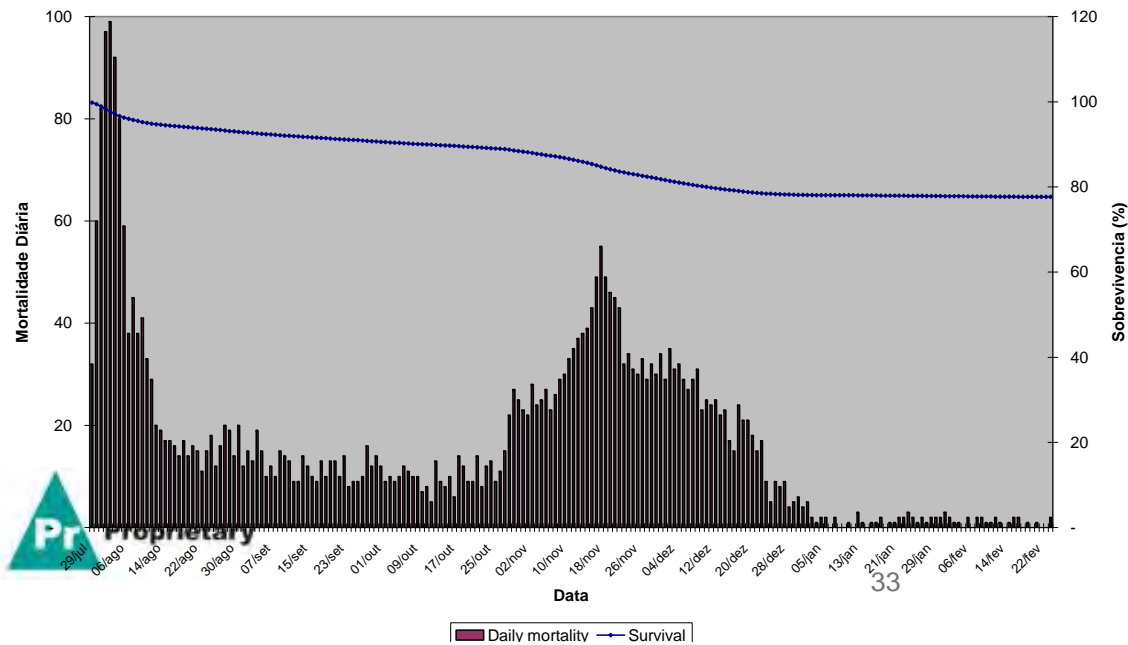


Vaccine

Improvement Survival:

(8 % - 20 %)

Mortalidade Diária X Sobrevivência : Grupo Controle



No vaccine



## ***STREP CONTROL***



***SAÚDE PARA SUAS TILÁPIAS***

Thank you !!!



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