



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 !!



X





X



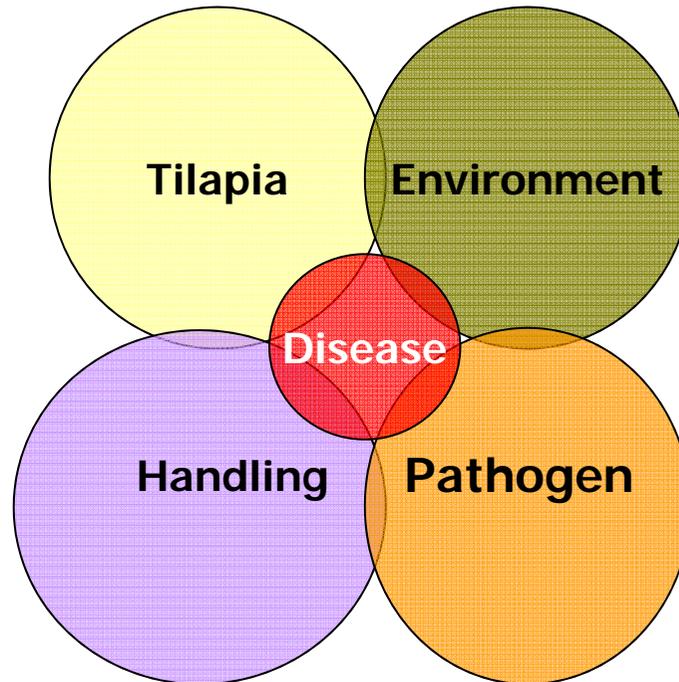
Health & Expression Factors

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;

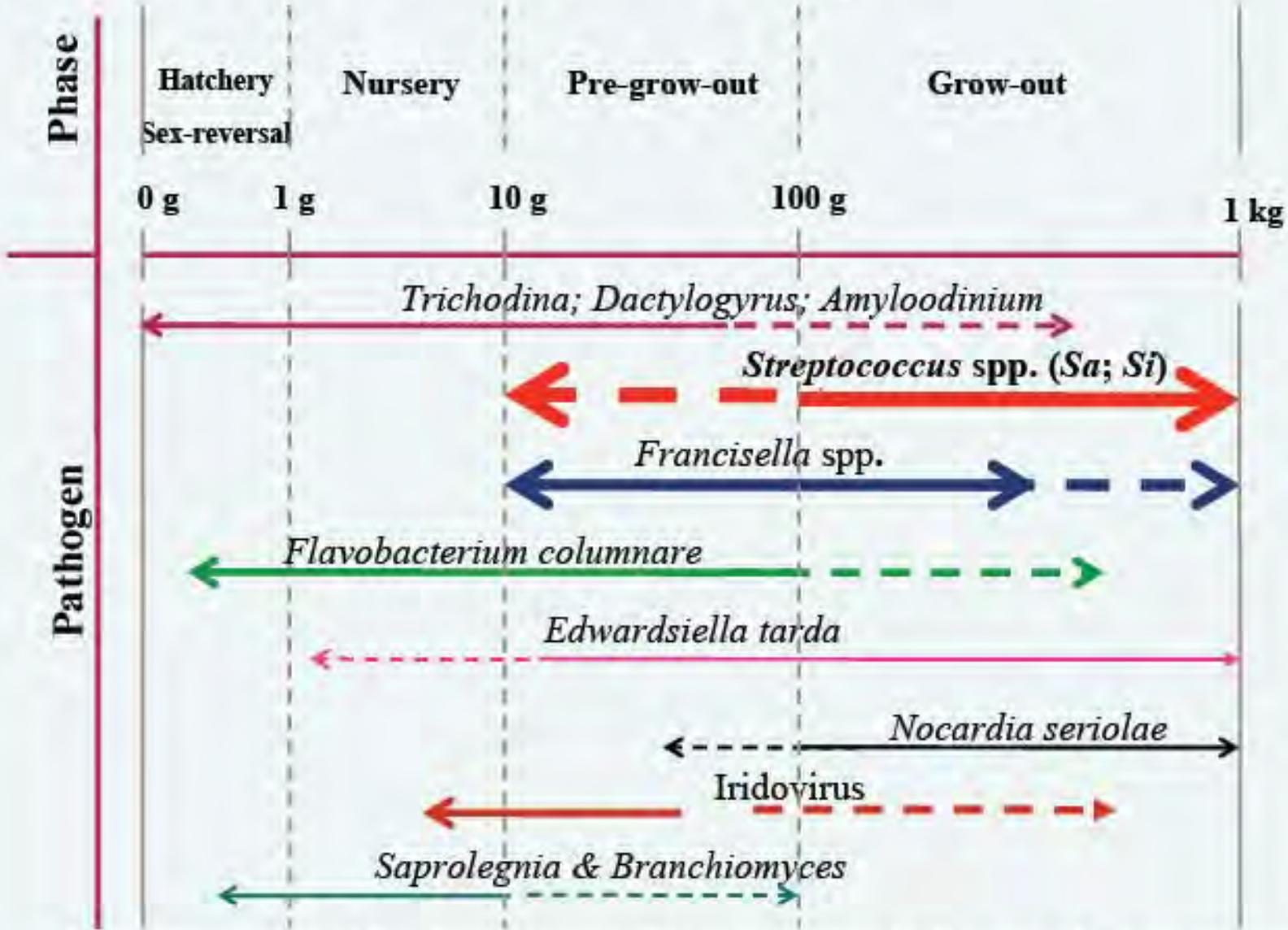
Increase of population X Protein Demand



Production system intensification:

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

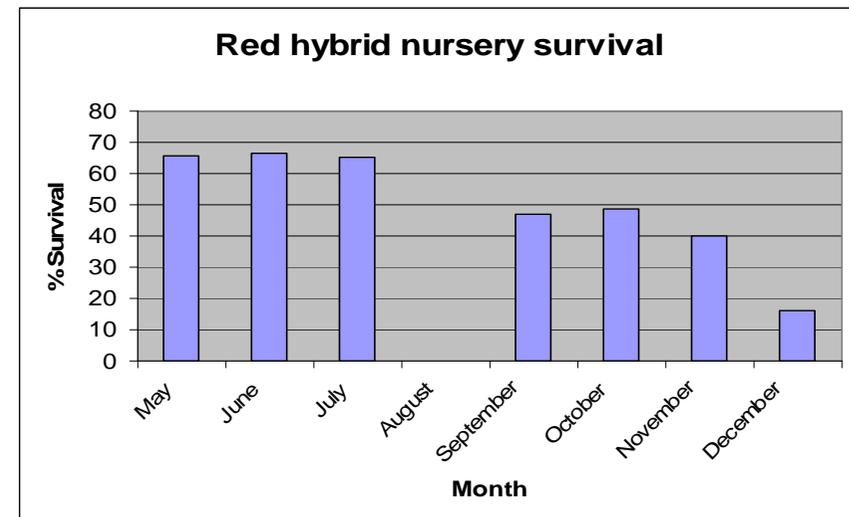
Major Diseases Affecting Tilapia



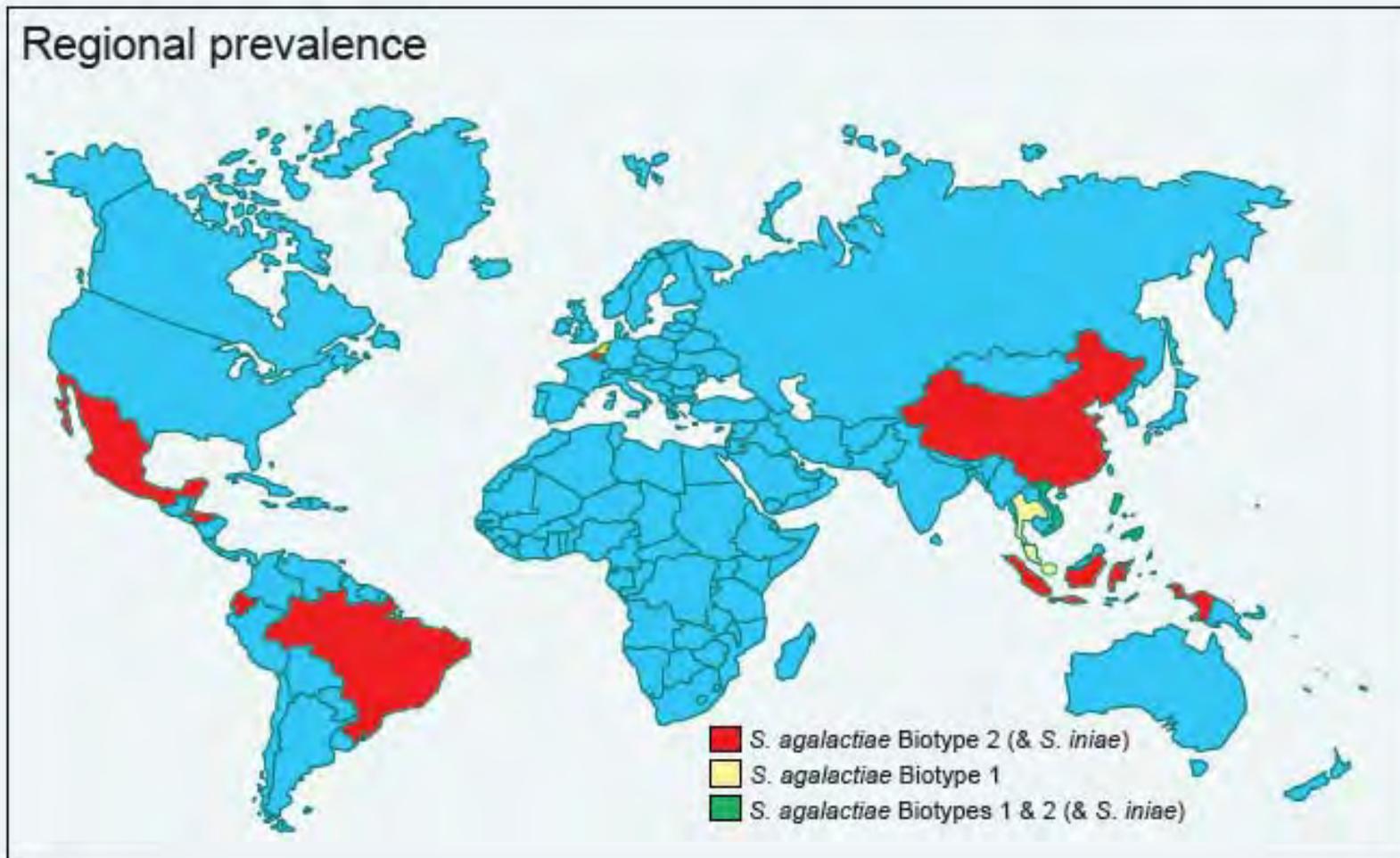
Note: importance of the disease is roughly in proportion to the size of the arrow bars

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

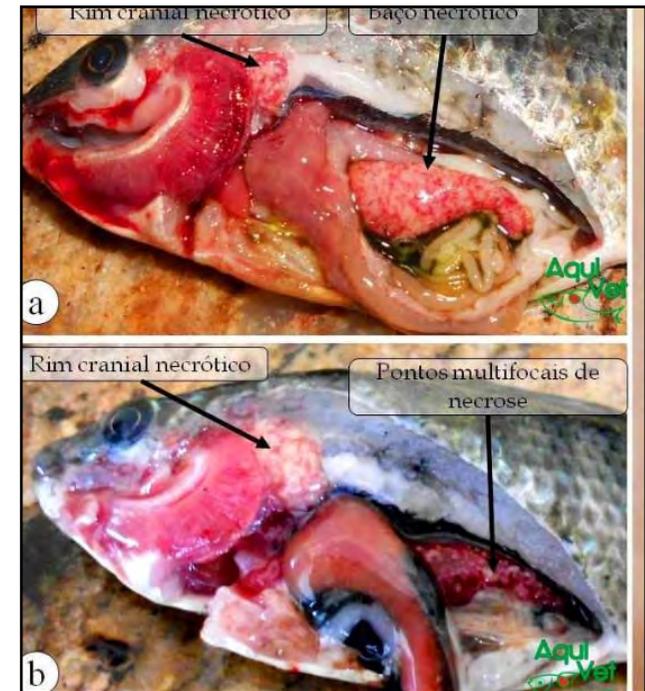
- Gram negative bacteria;
- Horizontal transmission;
- Fries and Juveniles;
- Risk Factors: Temperature oscillations; handlings and Excess Organic Matter;



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;

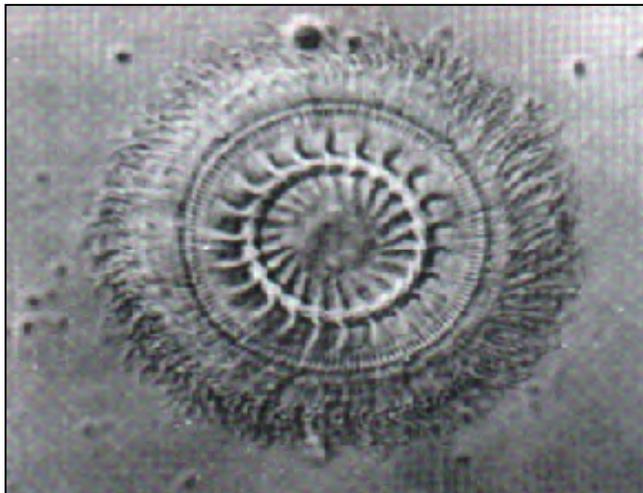
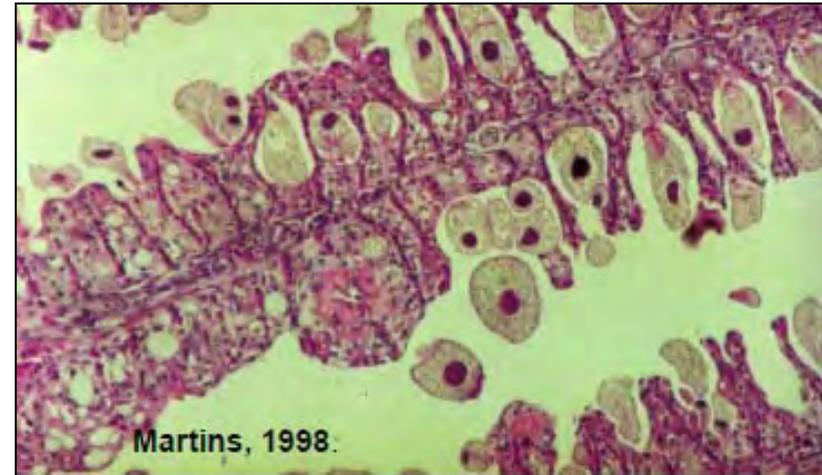
Impact in FCR and other productive parameters;



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;



X
24

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.

Pecieras 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. No usar Guantes de Goma Común Natural. NO usar guante quirúrgico	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:

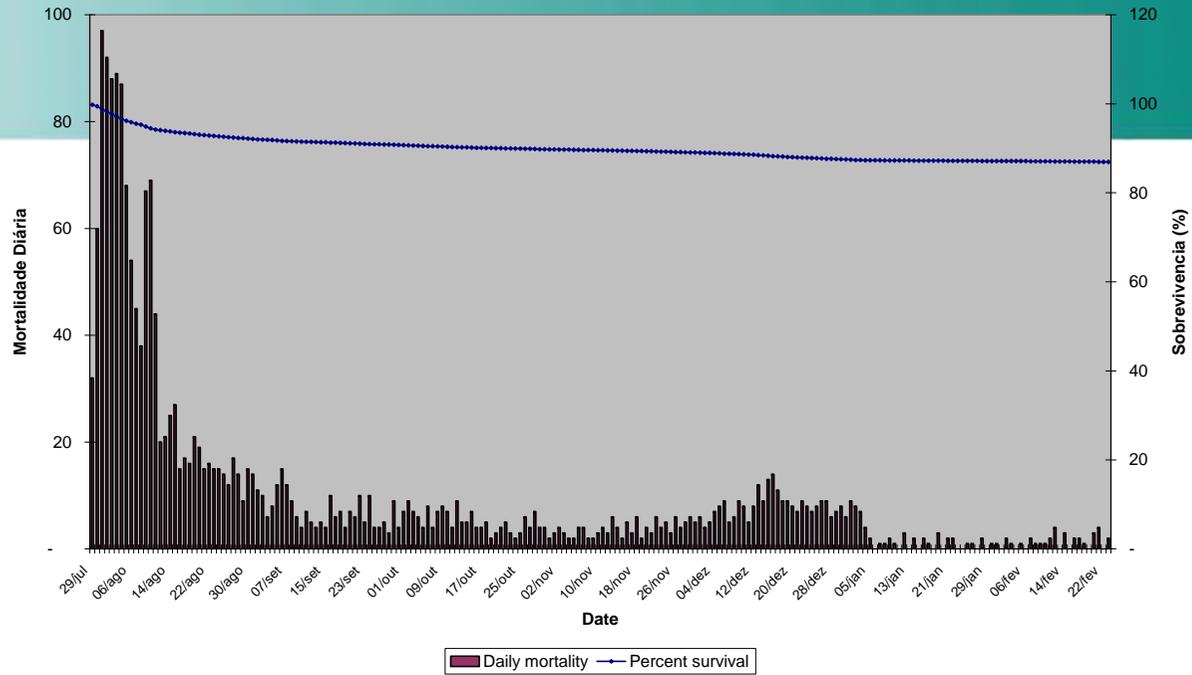
- Use of specific and safe Antibiotics;
- Grace period in target species, safety, efficacy;
- HCPP – export to European & American market;







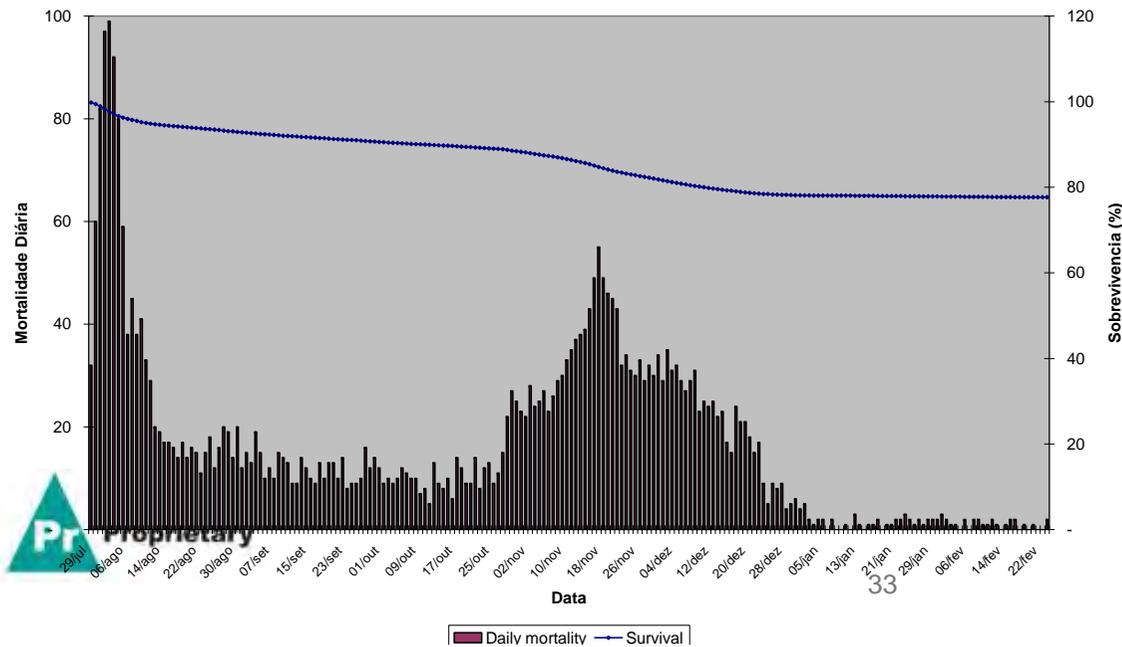
Mortalidade Diária X Sobrevivência : Grupo Vacinado



Vaccine

Improvemente Survival:
(8 % - 20 %)

Mortalidade Diária X Sobrevivência : Grupo Controle



No vaccine



STREP CONTROL



SAÚDE PARA SUAS TILÁPIAS

Thank you !!!



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