Antimicrobial use and control in the aquaculture in Chile

Alicia Gallardo Lagno
National Director
National Fisheries and Aquaculture Service
Animal Health control programs

Terrestrial

Acuatics
SERNAPESCA
Government agency

It is the competent authority in Biosecurity and AAH in aquaculture
Also in environmental aquaculture issues and fisheries matters

Responsible of food safety of aquaculture and fisheries products for exports

150 veterinarians inspectors

1100 employees
Salmon production in Chile

3 species:
- *Salmon del Atlántico*
- *Trucha arcoiris*
- *Salmon del Atlántico*

Fresh Water

- Sea sites are located in chilean Patagonia.
Impact in production

It took four years to recover the same production
Strategy:
Implementation of Biosecurity Plan

Key points
1. Immediate establishment of a working group
2. Risk assessment
3. Identification of critical control points of control
4. Implementation of biosecurity plan national and farm level
5. Legislation modification
6. Increase capabilities in Sernapesca
7. Active international cooperation (OIE/FAO)
8. Specific public-private research
Número de brotes de Anemia Infecciosa del Salmón (ISAv), año 2007 - 1° semestre 2018
List of diseases

List 1
- Epizootic Hematopoietic necrosis
- Infectious haematopoietic necrosis
- Viral haemorrhagic septicaemia
- Spring viraemia of carp
- Infection with *Gyrodactylus salaris*
- Red sea bream iridoviral disease
- Infection with salmonid alphavirus
- Koi herpesvirus disease
- Epizootic ulcerative syndrome
- Infection with Totivirus

List 2
- Infectious Pancreatic Necrosis
- Piscirickettsiosis
- Bacterial Kidney Disease (BKD)
- Infection with infectious salmon anaemia virus
- Sea lice (*Caligus rogercreseyi*)

List 3

Exotic diseases
• During 2018, total monthly mortality averaged 0.9%, with a maximum of 1.57% in February (FAN event).

• A downward trend in the mortality rate associated with SRS is identified.

• The mortality classified by infectious causes in marine centers decreased by 2.5% from 2015 to 2017.

• In 2018 there is a decrease in infectious mortality in rainbow trout (2%) and coho (1%), and similar in Atlantic salmon, with respect to the same period of 2017.
Control of use of Antimicrobials
Control throughout the aquaculture value chain

- Fish farms
- Processing plant
- Animal Health
- Wellness
- Environment
- Food safety
- Human health

Control of veterinary medicines use
Control of veterinary medicines control residues

Gobierno de Chile | Ministerio de Economía Fomento y Turismo | Servicio Nacional de Pesca y Acuicultura
INTERNATIONAL GUIDELINES TO PREVENT AMR
Capítulo 6.1. Introducción a las recomendaciones para controlar la resistencia a los agentes antimicrobianos

Capítulo 6.2. Principios para el uso responsable y prudente de los agentes antimicrobianos en los animales acuáticos

Capítulo 6.3. Seguimiento de las cantidades y patrones de utilización de agentes antimicrobianos en animales acuáticos

Capítulo 6.4. Desarrollo y armonización de los programas nacionales de vigilancia y seguimiento de la resistencia a los agentes antimicrobianos en los animales acuáticos

Capítulo 6.5. Análisis del riesgo asociado a la resistencia a los agentes antimicrobianos como consecuencia de su uso en animales acuáticos
National Regulatory Framework:
Control of veterinary medicines use.

General Law of Fisheries and Aquaculture.
- **Information**: treatment statement
- **Responsible use**: prohibition of prophylactic use
- **Transparency**: publication of periodic reports

D.S. No. 319/2001. Control of use in fish farms:

Use of registered or authorized products
Use with Veterinary Medical Prescription
Diagnosis
General Sanitary Program for use of antimicrobial agents in salmon and fish farming.

The program covers four areas and sets specific actions to be taken in the veterinary field.

- **Promote its rational use**
- **To secure the availability and prolong the effectiveness of antimicrobial agents**
- **Promote animal welfare and the economic need to control diseases that affect salmon farming, especially SRS.**
- **Monitor and prevent AMR.**
- **Strengthen control of antimicrobial residues**
CONTROL OF ANTIMICROBIAL USE IN SALMON FARMING

ENFORCEMENT

- ONLY for a disease
- 3 inspections per year
- ONLY Registered antimicrobials
- USE with Veterinary Prescription
- 100% Sea sites inspected
All fish farms (sea and freshwater) report monthly to SERNAPESCA the antimicrobials use and other veterinary medicines through SIFA.
Information about antimicrobial use: transparency.

Publication of Antimicrobial Use Reports for salmon farming since 2005.
**Global amount remains stable in relation to the previous year, considering biomass increase.**

- Compared to 2016, the national ACI showed a decrease of 5.3%.
- Percentage distribution (sea / fresh water) similar to 2016.
- In relation to 2016, the ACI for sea farms presented a decrease of 8.3%.
Situación Uso de Antimicrobianos

**ANTIMICROBIAL USE**

- **Antimicrobials:** Oxytetracycline greater use in fresh water. Florfenicol greater use in sea.

- **Species:** Atlantic salmon concentrates the greatest use in both water sources.

- **Disease:** Flavo and BKD concentrate the treatments in fresh water. SRS explains the greatest use at sea.

- **Regions:** Antimicrobials use in fresh water is concentrated in Los Lagos, Araucanía and Los Ríos. The use at sea is concentrated in Aysén and Los Lagos (96%)
Américas: reported antimicrobial classes (n: 9 countries)
Comparative: Grow promoters use

<table>
<thead>
<tr>
<th>Region of the OIE</th>
<th>% of Countries Members who Submitted the Formulario</th>
</tr>
</thead>
<tbody>
<tr>
<td>ÁFRICA</td>
<td>n = 44</td>
</tr>
<tr>
<td>AMÉRICAS</td>
<td>n = 19</td>
</tr>
<tr>
<td>ASIA</td>
<td>n = 26</td>
</tr>
<tr>
<td>EUROPA</td>
<td>n = 36</td>
</tr>
<tr>
<td>ORIENTE MEDIO</td>
<td>n = 5</td>
</tr>
</tbody>
</table>

Legend:
- Agentes antimicrobianos promotores de crecimiento no autorizados
- Agentes antimicrobianos promotores de crecimiento autorizados
## Development of National Action Plans

### Progress in the development of a national plan on antimicrobial resistance (May 2017)

<table>
<thead>
<tr>
<th>OIE Regions</th>
<th>% Percentage of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>24%</td>
</tr>
<tr>
<td>Americas</td>
<td>14%</td>
</tr>
<tr>
<td>Asia and the Pacific</td>
<td>7%</td>
</tr>
<tr>
<td>Europe</td>
<td>4%</td>
</tr>
<tr>
<td>Middle East</td>
<td>4%</td>
</tr>
<tr>
<td>Total</td>
<td>42%</td>
</tr>
</tbody>
</table>

- **A**: No national AMR plan
- **B**: National AMR action plan under development or plan involves only one sector or ministry
RESIDUES CONTROL PROGRAM

Objective: ensure the food safety.

System audited and validated by Competent Authorities (European Union, Brazil, UEE (Russia), among others.

Antimicrobial control activities at the level of:

- **Fish farms:** pre-harvest samplings: ± 80,000 samples per year
- **Process plants:** monthly verification samples in products (in all establishments): ± 8,000 samples per year
Control in whole the chain of production

- Sernapesca inspection
- Annual Sampling by Sernapesca
- Control of Prohibited and Unauthorized Substances
- Fresh water facility
- Control in whole the chain of production
- Register of veterinary medicines (SAG-SERNAPESCA)
- Control of medicated feed Plants
- Sernapesca inspection
- Annual Sampling by Sernapesca
- Control of Prohibited and Unauthorized Substances
- Sea Sites
- Pre-harvesting samples
- Official monthly Verification Sernapesca
- Compliance with MRL
- PROCESSING PLANT
- Government of Chile | Ministry of Economy, Development and Tourism | National Service of Fishing and Aquaculture
3. LÍMITES MÁXIMOS RESIDUALES EN CARNE Y PIEL DE PESCADO

Tabla LMR PRODUCTOS FARMACÉUTICOS*

<table>
<thead>
<tr>
<th>Medicamento</th>
<th>Chile (µg/kg)</th>
<th>Unión Europea (µg/kg)</th>
<th>Japón (µg/kg)</th>
<th>Unión Económica Euroasiática (µg/kg)</th>
<th>China (µg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acido oxotilico</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Amoxicilina</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Ampicilina</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Benzilpenicilina</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Cobametilina</td>
<td>50</td>
<td>50</td>
<td>30</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Colistina</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Ciprofloxacina</td>
<td>30</td>
<td>18</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Deltametina</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Diflubenzuron</td>
<td>-</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Eritromicina</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Erythromicina</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Epsipenicilina</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Flavofosfopil</td>
<td>-</td>
<td>-</td>
<td>700</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

**Florfenicol (Suma de Florfenicol y Florfenicol-amina)**

- **Florfenicol**: MRL 1.000 µg / kg for national market and main export markets
- **Oxytetracycline**: MRLs from: 10 µg / kg: UEE (Russia) 200 µg / kg: Chile-Japan
• N° official verification samples:
  - 2015: 7,781 samples
  - 2016: 7,685 samples
  - 2017: 8,011 samples

Results first sem 2018 official verification (products):

• 325,641 ton salmonids exported

• Florfenicol: 250 samples analyzed
  - 0 detections of residues
  - 0 rejects at destination

• Oxitetraciclina: 752 samples analyzed
  - 1 case with residue detection (national MRL) Notification to MINSAL
  - 1 case with residue detection (UE MRL) Restriction of export to the UE
ANTIMICROBIAL USE REDUCTION PLAN
**Antimicrobial use reduction plan**

**Objective:** antimicrobials use reduction in salmon farming and to prevent the risk of emergence and dissemination of antimicrobial resistance
Antimicrobial use reduction plan

- Veterinary medical prescription control
- Extra-label use control
- SRS early detection training
- Free use certification
Online system for veterinary medical prescription
Free use certification.

Since 2016, 65 fish farms certified.

Process is consolidated with the certification of the first Atlantic salmon farm in the Los Lagos and Aysén region (2018).
Analyze the results of the health management platform (SRS) project.

Communicate results of the health management platform project.
Antimicrobial use reduction plan

“Health management platform”

- Focus on the disease (SRS), prevention and monitoring of the resistance and efficacy of antimicrobial agents

Results for the end of 2018
Resistance monitoring

Follow up of cases with repeated treatments.

Coordination with the National Plan against Resistance to Antimicrobials.

Antimicrobial use reduction plan

- Antimicrobial use
- Improve efficiency
- Resistance monitoring
- Strategic communication
National Plan against Antimicrobial Resistance

CONVENIO DE COLABORACIÓN
ENTRE
SUBSECRETARÍA DE AGRICULTURA,
SERVICIO NACIONAL DE PESCA Y ACUICULTURA
Y
MINISTERIO DE SALUD

PLAN NACIONAL CONTRA LA RESISTENCIA A LOS ANTIMICROBIANOS
Chile 2017
Carry out strategic communication at different levels.

Propose the strengthening of these subjects in veterinary education.
Certification of good practices in the antimicrobials use
SUMMARY MEASURES TO REDUCE THE USE OF ANTIMICROBIALS
Let’s not forget …”the human factor”…. we work with the people who manage the fish…
Thank you