Key to success: Trout production with Troutlodge eggs

Central Fish Producer’s Association Seminar
Antalya, Turkey

February 2020
Our mission

Supporting the global food challenge with high quality animal genetics
Operations in 26 countries with >3,500 employees
We have leading market shares in markets of different size.
Organisation structure

Research & Technology Centre

Hendrix Genetics Innovations

Corporate Services

Turkeys
Layers
Traditional Poultry
Swine
Aquaculture
Research & Technology Centre

Genetics and genomics research

• Data collection
• Data storage
• Data management
• Soft- and hardware development

New technologies

Science network

Breeding IT
Hendrix Genetics Aquaculture: Our brands

- Landcatch
- Troutlodge
- Kona Bay
- MacroBio

Genetic Support Collaboration

- Aqachile
- Native Hebridean Scottish Salmon
- Aysén
Troutlodge History

• 1945 – Ed McLeary acquires first stocks
• Year round availability: Unique!
Troutlodge Egg Sales

450 M Eggs
>45 Countries

Many Different Environments
Industry Preferences – 2010

Balanced Breeding Goals:
1) Grow Fast
2) Don’t Die
3) Processing Traits

Representative Customer Base
- USA & Canada
- Europe
- Asia
- South America
Our balanced products

- Family based selection
- BLUP
- Multipliers
- Genetic diversity in breeding stock
- Latest Genomic Selection tech & QTL’s
- Info from commercial environments
- Disease Challenges
- Processing characteristics
Independent Growth Comparison

15 months on feed

Weight (g)

Date

Troutlodge
Europe 1
Europe 2

1943.89
1544.16
1376.99
Impact of genomic selection

• Trout: BCWD
• Lab challenge survival increased from 33% to nearly 80%
• Simultaneous increase in bacterial concentration.
Products

• All-Female Eggs
  • Avoids precocious males
  • More uniform growth and better flesh characteristics

• Triploids
  • AF 3N: higher price, slower growth early, but larger sizes without egg development

• Enhanced Resistance to Bacterial Cold Water Disease
P = G + E
1: Environmental factors

- Genetics: part of the key to success
- Environment strong influence

\[ P = G + E \]

30%  70%
2: Interactions Genetics with Environment

- Genetics behave differently under different environments!
Interactions Genetics with Environment

- Salmon in Chile, Region XI vs XII (ca 700km)

- + 615 g (but -150 in XI)

- + 795 g (but -187 in XII)
Interactions Genetics with Environment

• Trout: Ideal vs Tough water quality

- + 298 g in Ideal (but 170 in Tough!)
- + 252 g in Tough (but 242 in Ideal!)
$P = G + E$

• Influence on Performance
  1. Genetics
  2. Environmental Factors
  3. Interactions Genetics with Environment

• How to optimise Performance:
  • Genetics for specific Environment (use interactions)
  • But ALWAYS CONTROL ENVIRONMENT

Best practices!
Best practices!

- High quality feed
- Good feed management
- Good fish stocks
- Good environmental conditions
- Good fish health

Good growth, low FCR, and Survival
## Major Factors Influencing Growth, FCR and Survival

<table>
<thead>
<tr>
<th>Fish</th>
<th>Environment</th>
<th>Feed</th>
<th>Operation</th>
<th>Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Temperature</td>
<td>Energy content</td>
<td>Fish numbers</td>
<td>Feed type</td>
</tr>
<tr>
<td>Sex</td>
<td>Light</td>
<td>Protein/energy balance</td>
<td>Fish biomass</td>
<td>Spread</td>
</tr>
<tr>
<td>Maturation</td>
<td>Salinity</td>
<td>Amino acid profile</td>
<td>Density</td>
<td>Intensity</td>
</tr>
<tr>
<td>Life stage</td>
<td>Site</td>
<td>Technical quality</td>
<td>Grading</td>
<td>Time of day</td>
</tr>
<tr>
<td>Fish weight</td>
<td>Season</td>
<td>Storage</td>
<td>Handling</td>
<td>Feed amount</td>
</tr>
<tr>
<td>Disease</td>
<td>Weather</td>
<td></td>
<td>Net fouling/changing</td>
<td>Equipment</td>
</tr>
<tr>
<td>Genetics</td>
<td>Current</td>
<td></td>
<td>Biosecurity</td>
<td>Feed management</td>
</tr>
</tbody>
</table>

- **Fish:** Age, Sex, Maturation, Life stage, Fish weight, Disease, Genetics
- **Environment:** Temperature, Light, Salinity, Site, Season, Weather, Current
- **Feed:** Energy content, Protein/energy balance, Amino acid profile, Technical quality, Storage
- **Operation:** Fish numbers, Fish biomass, Density, Grading, Handling, Net fouling/changing, Biosecurity, Monitor pathogens
- **Feeding:** Feed type, Spread, Intensity, Time of day, Feed amount, Equipment, Feed management
Check out our manuals!

- www.troutlodge.com/tr/kaynaklar
- Also in Turkish
Troutlodge - Key to Success

• Troutlodge: selected for optimum performance under various environments

• Top performance in growth

For your orders or questions:
www.troutlodge.com

Or
Tolga Sepetoglu - 0 (532) 453 80 63
Thank you

Better Breeding Today. Brighter Life Tomorrow.
Genomic Selection

Training Population

Selection Candidates

Markers

Phenotype

Markers

Selection Decision
Maturation

• Trends in trout industry toward large harvest size.
  • Long grow out periods
  • Fish mature before harvest

• Opportunities:
  • Photoperiod manipulation – delay spawning in salmon
  • Sterility
    • Triploids
    • Other sterility methods - Big Troutlodge R&D effort in coming years