Economics of Trout Grow-out Systems
- A qualitative Benchmarking of Typical Farms

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Naturland Association

All participating fish farmers
All Colleagues from Thünen-Institutes of Sea Fisheries and Farm Economics
(1) Background
The *agri benchmark* network

- Network of scientists, consultants, farmers and suppliers
- Global comparison on farm-level
- Discovering farm economics of beef&sheep, cash crops, pig, diary, horticulture and organic agriculture
- Started to include aquaculture 2013
- Pilot study on trout farms
Why global farm-level comparisons?

- Farms are all directly or indirectly linked via markets and product flows
- Decision making is done by millions of producers every day
- It needs an approach in close cooperation with producers
- On global scale there is a lack of comparable farm data
- Collecting and comparing this data and information assists in understanding agriculture worldwide
(2) Method
The *Typical Farm Approach*

Originate in agricultural economics and already applied by

- International Farm Comparison Network, Dairy Research Center (Germany)
- Representative Farms, Texas A&M University (USA)
- Brazilian national agency for supply (Brazil)
- *agri benchmark* network, Thünen-Institute (Germany)

Aim at engineering theoretical farm models, which are empirical grounded and represent “typical farms” of regions concerned

Typical farms – three sources of data

- **Statistics** available to determine
  - important regions
  - farm sizes and distribution

- **Focus groups** of producers and advisors to
  - define prevailing production systems
  - collect data in a standardised way

- **Expertise** of researchers + advisors + farmers
  - Production system knowledge
  - Explore adjustments to changes in framework conditions (forward looking results)
The *Typical Farm Approach*

**agri benchmark** Network
- Thuenen-Institute
- Research partners
- Consultants
- Fish farmer

**Discursive Validation**
- Proofing plausibility
- Focus group (Panel)

**Grounded Theory**
- Focus groups (Pre-panel)
- Interviews
- Observations
- Statistics
- Literature

Sources: own according to Deblitz and Zimmermann 2005
(3) Selected results
Production

Fig. 1: Production of rainbow trout in Turkey, Denmark and Germany 2004-2013 in tons

Sources: Danmarks Statistik 2015, Destatis 2015, Turkstat 2015, FEAP 2014

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Our current datasets

Nine farms. Five regions. Three countries.

1. DK_700 RAS M3
2. DK_270 RAS M1
3. DK_150 ponds
4. DK_55 organic
5. DE_500$^{\text{top}}$ raceway
6. DE_100$^{\text{top}}$ RAS raceway
7. DE_10 organic
8. TR_500 ponds
9. TR_100 netcage

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Focus on Grow-out

**Fig. 3:** Productions systems of trout aquaculture

<table>
<thead>
<tr>
<th>Production System:</th>
<th>Hatchery &amp; Broodstock</th>
<th>Nursery</th>
<th>Grow-out</th>
<th>Processing and Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundaries:</td>
<td>Keeping spawners up to fry weighing about 0.5 to 5 g per piece up to fingerlings weighing about 10 to 25 g per piece</td>
<td>Fry weighing about 0.5 to 5 g per piece up to fingerlings weighing about 10 to 25 g per piece</td>
<td>Fingerlings weighing about 10 to 25 g per piece up to fish weighing at minimum about 200 g per piece and plus 200+ g/piece</td>
<td>Fish weighing 200+ g per piece up to the final processed product and plus product e.g. frozen fillet</td>
</tr>
<tr>
<td>Final Size:</td>
<td>0.5-5 g/piece</td>
<td>10-25 g/piece</td>
<td>Fish weighing 200+ g/piece up to the final processed product</td>
<td></td>
</tr>
</tbody>
</table>

Economics of Trout Grow-out Systems – *agri benchmark*
Fig. 4: Cash and non-cash cost, total returns of different grow-out systems in 2013 (EUR per kg LW added)
**Cash costs** in *agri benchmark* are defined as

Direct + indirect costs for feed, stocking, oxygen, veterinary, diesel... rent for buildings/land, maintenance equipment, accounting, farm insurances, control costs... etc. (excl. VAT)

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**Depreciation** in *agri benchmark* is defined as

Linear depreciation on machinery, buildings and aquaculture systems, calculated on replacement values

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**Opportunity costs** in *agri benchmark* are defined as

Calculated costs for using own production factors like labour, land and capital
Profitability

A) Cash Costs
B) Depreciation
C) Opportunity costs
D) Market returns

Long-term = D – (A + B + C)
Mid-term = D – (A + B)
Short-term = D – A
Profitability

**Fig. 4:** Cash and non-cash cost, total returns of different grow-out systems in 2013 (EUR per kg LW added)
Fig. 5: Physical and Economic Labour Productivity in Trout Grow-out
- kg LW added per h labour input and EUR returns per EUR labour costs in different regions and farms 2013
(4) Conclusions
Conclusions

- No representative statistical data
- Dependence on expert knowledge selected
- Qualitative approach
  - Cooperation with farmers and consultants ensures valid data
  - Supplement of current production information and DCF data
  - Reduction of costs and time for the data collecting
  - In-depth data analyses of farm economics
- Standard operating procedure allows international comparable benchmarking
- Integration into *agri benchmark network* enables intersectional comparison
THANK YOU!

Visit www.agribenchmark.com or www.ti.bund.de for more information.