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Demonstrating the sustainability and raising awareness for the possibility of crustacean production in RAS systems in Pomerania (InnoAquaTech Pilot 2)

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Activity 5.2

Growth and nutritional value of *Litopenaeus vannamei* from the small-scale laboratory culture

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Aim of the case study (Pilot 2/Activity5.2)



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to evaluate potential of crustacean production in RAS in Poland:

✓ study the socio-economic issues regarding:

- consumer perception

- confidence issues

- identification of scientific market knowledge

- gaps in regulations associated with an innovative aquaculture systems

✓ laboratory study regarding:

- determination of growth and nutritional value of white leg shrimp *Litopenaeus vannamei* cultured in a small-scale RAS (effect of diet supplementation)

Step 1 (February-May 2017)



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1. Market analysis and installation of small-scale laboratory RAS (two setups); selecting and purchasing of necessary materials (salt, feed, shrimps, etc.);

mini-scale RAS will consist of:

- ✓ polyethylene culture tank (400 l, bottom 1 m²) and retention tank (200 l)
- ✓ water pumps
- ✓ three filters (mechanical, biological, UV)
- ✓ heating and aeration units
- ✓ temperature, salinity, oxygen, pH and nutrient content control units

2. Study visit to the shrimp farm „Garnelenfarm Grevesmühlen” in Germany;

Step 2 (June-August 2017)



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Sub-trial 1.1.: Growth and nutritional value of *Litopenaeus vannamei* fed non-supplemented diet

experimental conditions:

- ✓ post-larvae 12 (PL12) or juvenile shrimps, ca. 1.5 g fresh weight (imported from US), 120-150 per tank
- ✓ temperature: 28-30° C, salinity: 34-37 ‰, light : dark cycle 14 h : 10 h
- ✓ diet: high protein feed
- ✓ feeding frequency: 5 times per day

analyses which will be performed:

- ✓ mortality (every day)
- ✓ growth rate (based on total length and fresh weight measurements)
- ✓ elemental composition (carbon, hydrogen and nitrogen contents)
- ✓ calorific value (combustion calorimetry)
- ✓ nutritional value and level of chemical contaminants (**Trial 2**)



Sakhivel et al. (2014)
J. Aquac. Res. Development 5 (4).

Step 3 (September-November 2017)



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Sub-trial 1.2: Growth and nutritional value of *Litopenaeus vannamei* fed supplemented diet

experimental conditions:

- ✓ juvenile shrimps, ca. 1.5 g fresh weight (imported from US), max. 40-50 per tank
- ✓ temperature 28-30° C, salinity 34-37‰, light : dark cycle 14 h : 10 h
- ✓ diet: high protein feed supplemented with *Spirulina*
- ✓ feeding frequency: 5 times per day

analyses which will be performed:

- ✓ mortality (every day)
- ✓ growth rate (based on total length and fresh weight measurements)
- ✓ elemental composition (carbon, hydrogen and nitrogen contents)
- ✓ calorific value (combustion calorimetry)
- ✓ nutritional value and level of chemical contaminants (**Trial 2**)



Sakthivel et al. (2014)
J. Aquac. Res. Development 5 (4).

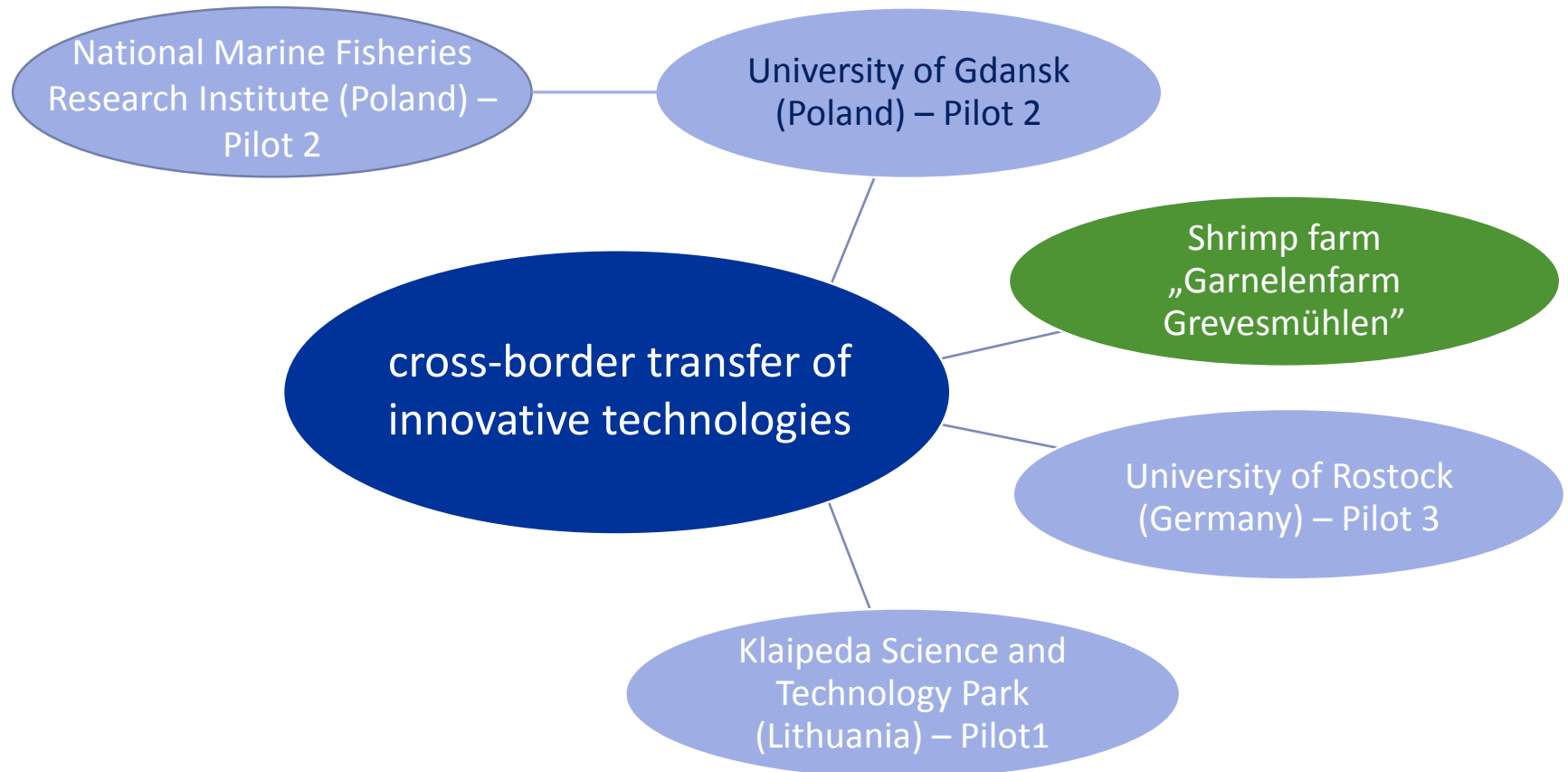
Step 4 (January-December 2018)



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Repetitions of sub-trials 1 and 2

Co-operation





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