Fiskeldisseyra

Aquaculture sludge

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The main objective of Accelwater is to **optimise freshwater consumption** in the food and beverage industry increasing the use of reclaimed water in the manufacturing processes of food and beverages and through that supporting valorisation of sides streams from the water.

AccelWater

This project received funding from the European Union‘s Horizon 2020 research and innovation programme under grant agreement ID 958266.

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Demonstrations in:

- Tomato processing
- Meat processing
- Fisheries and aquaculture
- Dairy industry
- Brewery

AccelWater

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- **Fisheries and aquaculture**
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Partnership

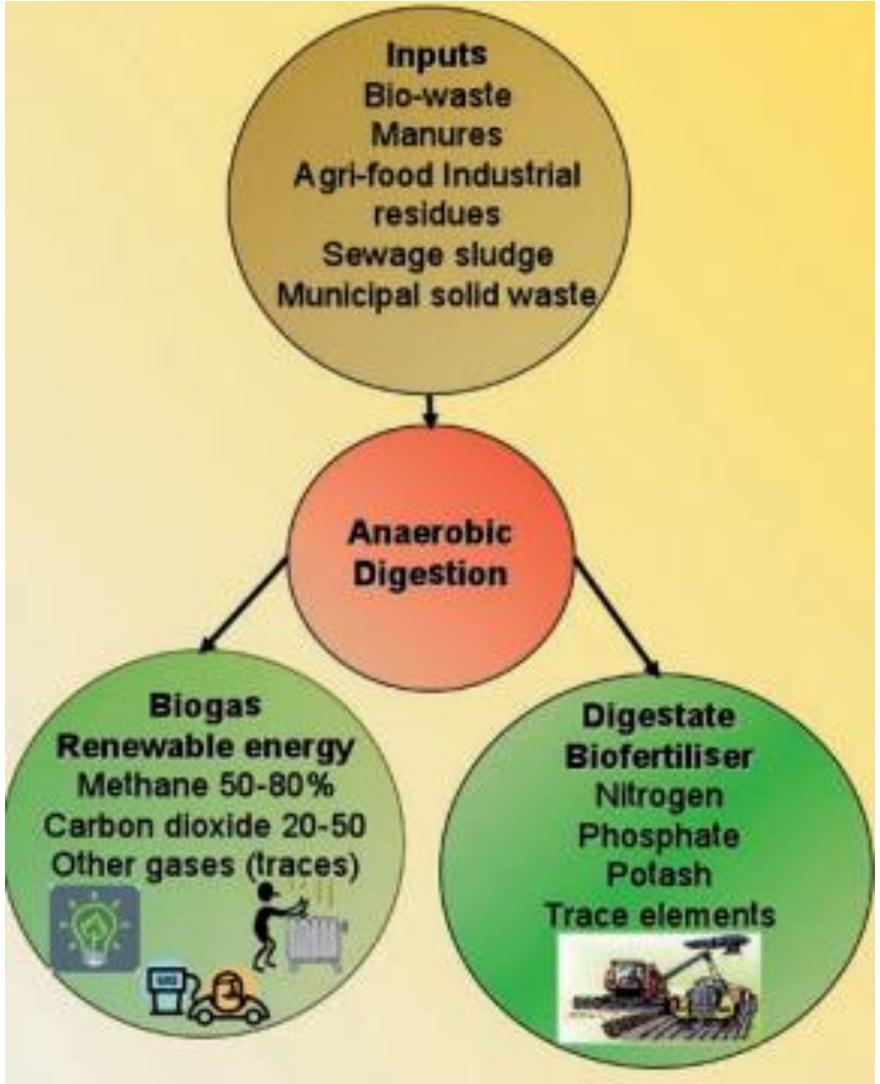
Icelandic demonstration:

Other partners

Aquaculture sludge utilisation

- Proximate composition
- Collection methodologies
- Preservation methodology/need
- Chemical contaminants

Can we use it as a fertiliser?



Proximate composition

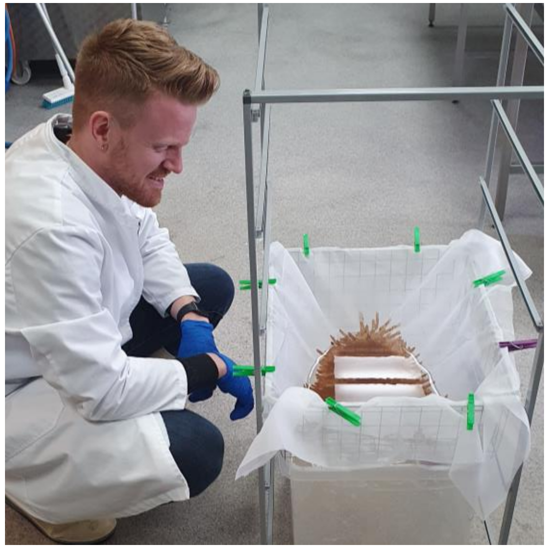
Wet weight (%)	Silfurstjarna – Sea water	Núpar – Fresh water
Water content (sample range)	90.6 - 93.1 %	90.3 - 98.1 %
Fat content (sample range)	0.3 – 0.5 %	0.1 - 1.9 %
Salt (sample range)	0.7 - 1.1 %	<0.01 %
Ash (sample range)	1.5 – 2.2 %	2.2 – 4.1 %

Dry weight (%)	Silfurstjarna – Sea water	Núpar – Fresh water
Fat content (sample range)	4.4 – 7.0 %	5.3 – 19.6 %
Salt (sample range)	7.3 – 15.8 %	(< 0.1 - < 0.5 %)
Ash (sample range)	20.5 – 23.3 %	22.8 – 50.3 %

Focus of collection solutions

- Making sure the material is accessible
- Limiting water content / increasing dry matter
    - Transporting logistics and usability

Still 90% water!



Collection methodologies

- Sediment ponds?
- Sediment tanks?
- Filtration and collection in tanks?
- Filtration and pressing?
- Centrifugation?

...or maybe something completely different

Access to the material is in some cases limited now

Do we need to think about preservation and stability?

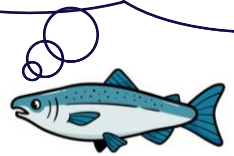
- A living biomass full of material and organisms
- Logistics say we may need to collect in batches

<u>How do we keep it „fresh“?</u>

Methodologies that can be useful to slow down/stop reactions and growth:

- Affecting pH
- Lowering water activity
  - Freezing, pressing, drying etc.

We need to choose preservation methods (if needed) based on effects on intended final use



Chemical contaminants

Possible use - Fertiliser

	Unit	Limit for organic fertiliser	Silfurstjarna (sample range)	Núpar (sample range)
Cadmium (Cd)	mg/kg DM	1.5	0.2 - 0.6	0.9 - 2.5
Chrome (Cr VI)	mg/kg DM	2	in analysis	in analysis
Mercury (Hg)	mg/kg DM	1	0.0 - 0.1	0.1 - 0.2
Nikkel	mg/kg DM	50	in analysis	in analysis
Lead (Pb)	mg/kg DM	120	0.1 – 0.5	1.2 - 1.4
Inorganic Arsenic	mg/kg DM	40	1.5 – 2.8	2.0 – 5.7
Copper	mg/kg DM	300	in analysis	in analysis
Zink	mg/kg DM	800	in analysis	in analysis
Biuret	-	0	in analysis	in analysis

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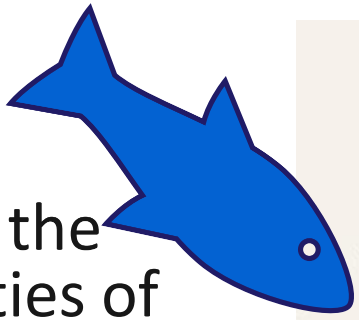
Other utilisation methods include:



Biogas production

- Tests are ongoing to evaluate the methane production capabilities of collected sludge
- Possible challenges spotted:
  - High salt concentration can hinder microbial growth
  - Carbon: Nitrogen ratio in sludge not favourable (based on literature)

Possible solutions include inoculation or supplementation if needed

Conclusion

Upcoming challenges to be solved include:

- Collection methodologies
- Solving logistics (lowering water content and preservation)
- Monitoring cadmium
- Possible risk assessment to evaluate a need for change in regulations

Now – How good is sludge as a fertiliser, Ólafur will give us insight!