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Economy in the green Biorefinery

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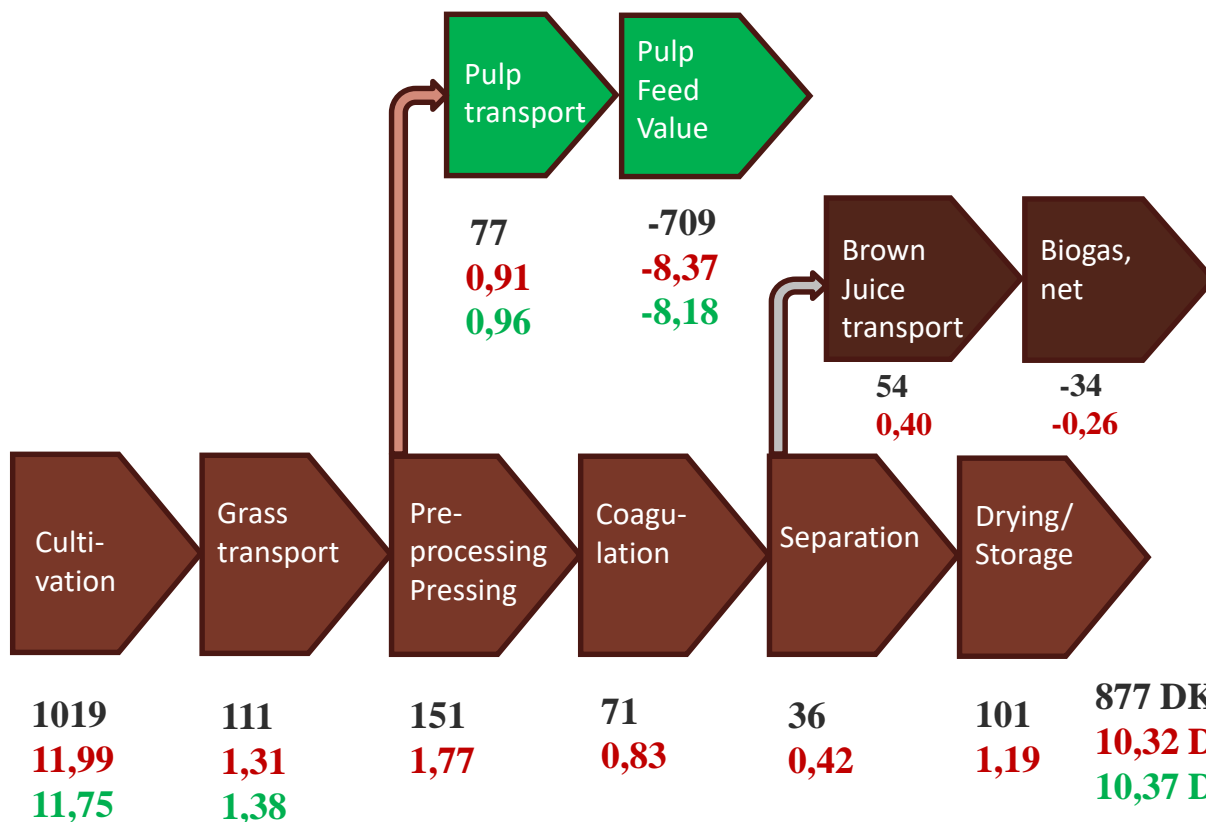
Outline

- Production system
- Prerequisites
- Economic results
- Sensitivity – transport distance
- Effects on different farm types





The production system





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Decentralized facility–prerequisites

In:

Capacity: 20.000 tonnes DM Clover grass
(+/- 2.000 hectares)

Investment : 20.000.000 DKK

Maintenance : 5% of facility investments

Depreciation : 10 - 15 years

Operating time facility: 3.000 hours/year

Out :

3.600 ton DM Dried protein concentrate

14.000 ton DM Pulp

2.500 ton DM Brown juice

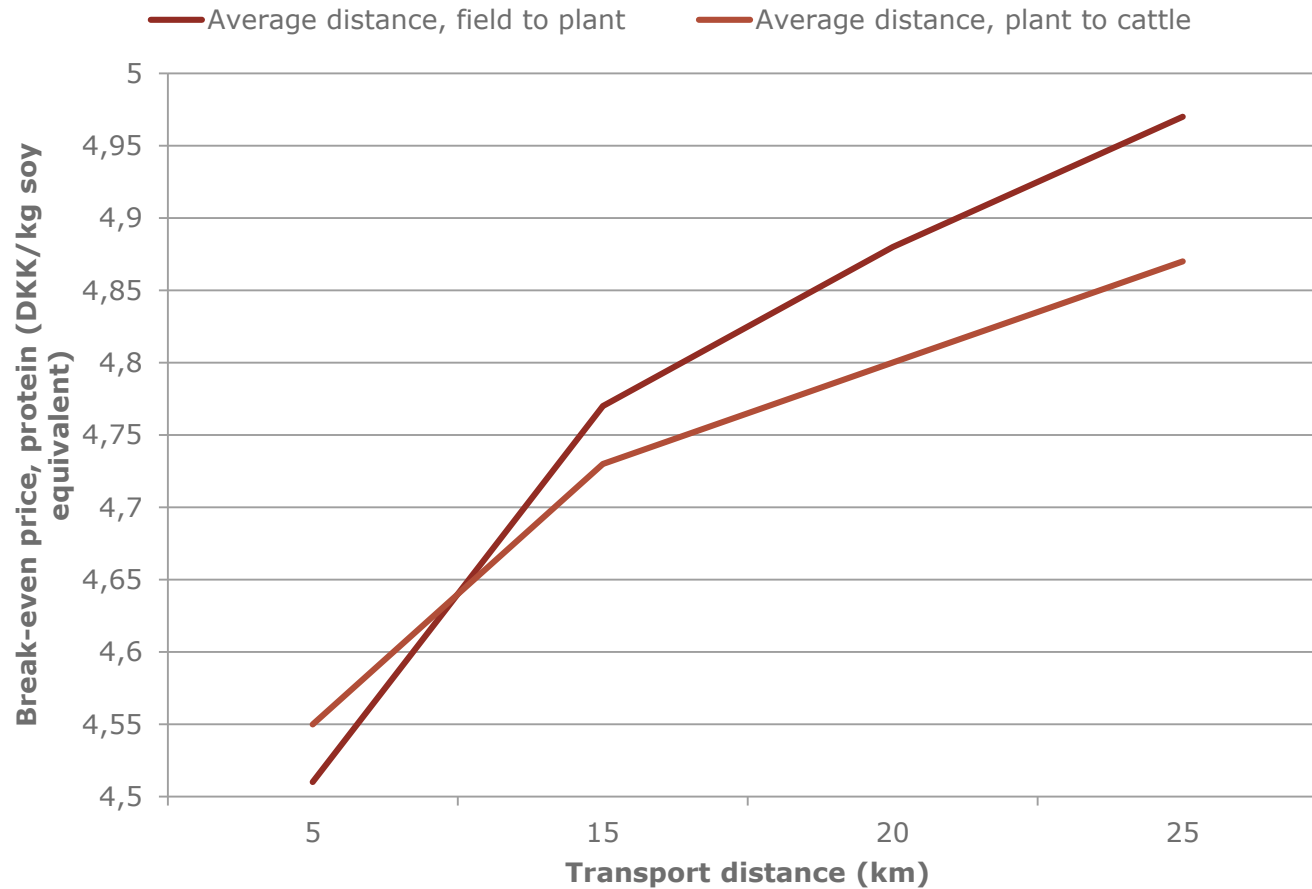
Economic result

	Conventional (k.DKK/year)	Non-GMO (k.DKK/ton)	Organic (k.DKK/ton)
Income			
Dried protein (Soy equivalent)	9.445,0	13.789,7	18.889,0
Pulp	12.633,0	12.633,0	12.206,0
Brown juice	-396,0	-396,0	-396,0
Total income	21.682,0	26.026,7	30.699,0
Costs			
Biomass	22.601,0	22.602,0	22.551,0
Energy, auxiliary mat.	2.871,0	2.871,0	2.871,0
Labour	1.474,0	1.474,0	1.474,0
Cost of capital	2.834,0	2.834,0	2.834,0
Total costs	29.780,0	29.781,0	29.730,0
Result	-8.098,0	-3.754,3	969,0

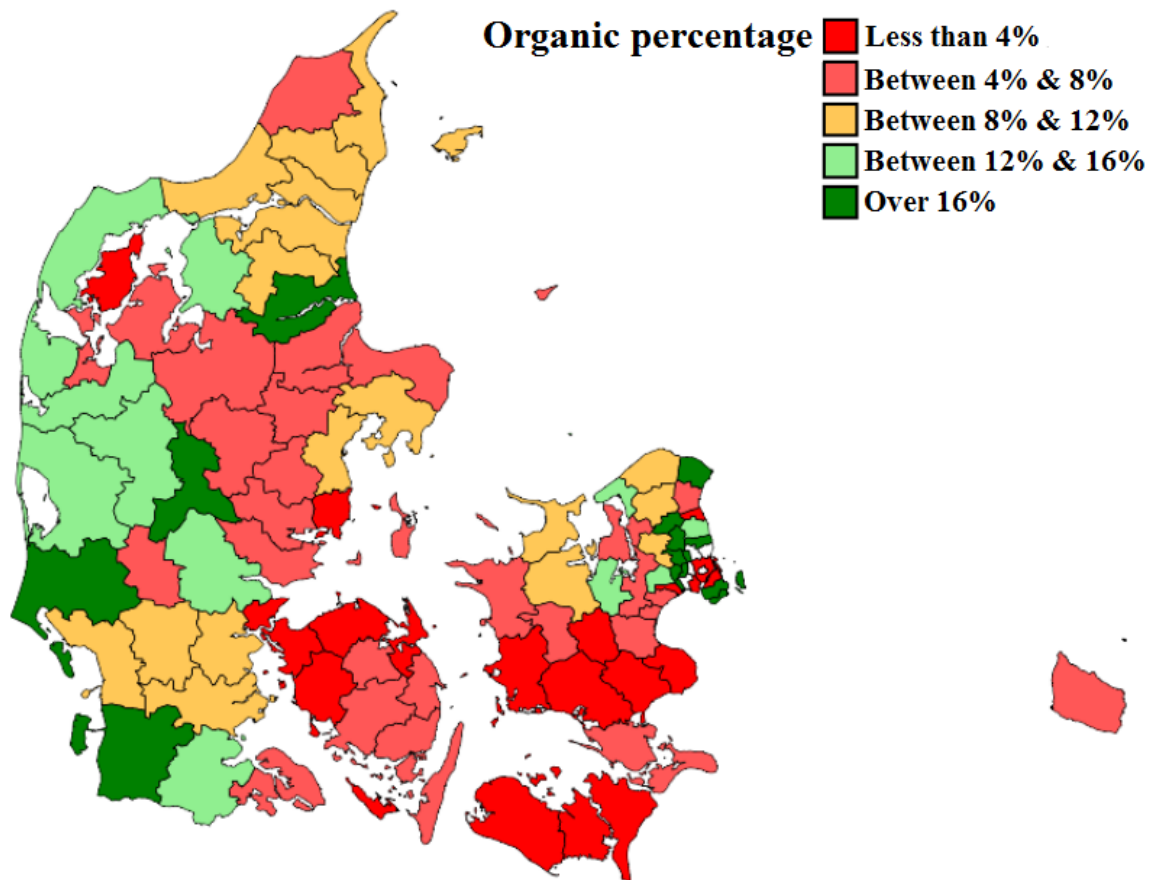
Economic result

	Conventional (k.DKK/year)	Non-GMO (k.DKK/ton)	Organic (k.DKK/ton)
Income			
Dried protein (Soy equivalent)	9.445,0	13.789,7	18.889,0
Pulp	12.633,0	12.633,0	12.206,0
Brown juice		0	0
Total income	22.078,0	26.422,7	31.095,0
Costs			
Biomass	22.601,0	22.602,0	22.551,0
Energy, auxiliary mat.	2.871,0	2.871,0	2.871,0
Labour	1.474,0	1.474,0	1.474,0
Cost of capital	2.834,0	2.834,0	2.834,0
Total costs	29.780,0	29.781,0	29.730,0
Result	-7.702,0	-3.358,3	1.365,0

Sensitivity – transport distance



Percentage of organically grown area (31. May 2017) in relation to the total agricultural area pr. municipality



Biorefinery – economic effect on different farm groups

Farm groups	Conventional, DKK/ha	Organic, DKK/ha
Crop, grain, clay	-1165	-877
Crop, grain, sand	11	270
Dairy, < 1.4 AU/ha	-799	-531
Dairy, > 1.4 AU/ha	-795	-528
Pig, < 1.4 AU/ha	-206	74
Pig, > 1.4 AU/ha	-42	234
Poultry	47	322



- 1. Organic soybean meals can be produced at
4,64 DKK./kg Soy equivalent
(market price ca. 5,40 DKK./kg organic soybean
meal)**
- 2. Next goal should be 3,70 DKK/kg soy equivalent
(Non GM-soy)**



Recap

- Raw material (grass) production is the most essential cost in production of green protein. (about 50% of the costs)
- Annual variation in yield will also have an influence on the production costs.
- Transport is another major cost item (about 10-15%)
- Economic utilization of brown juice must be found
- The organic biorefinery is most competitive followed by non-GMO production. Conventional production at the moment is not economic competitive.
- It is important with an optimized and robust production chain.
- All year utilization of plant
- Optimization of the green protein chain as first priority, in the longer run, it might be possible to produce new high value products.



Contributions from the projects

ORGANIFINERY

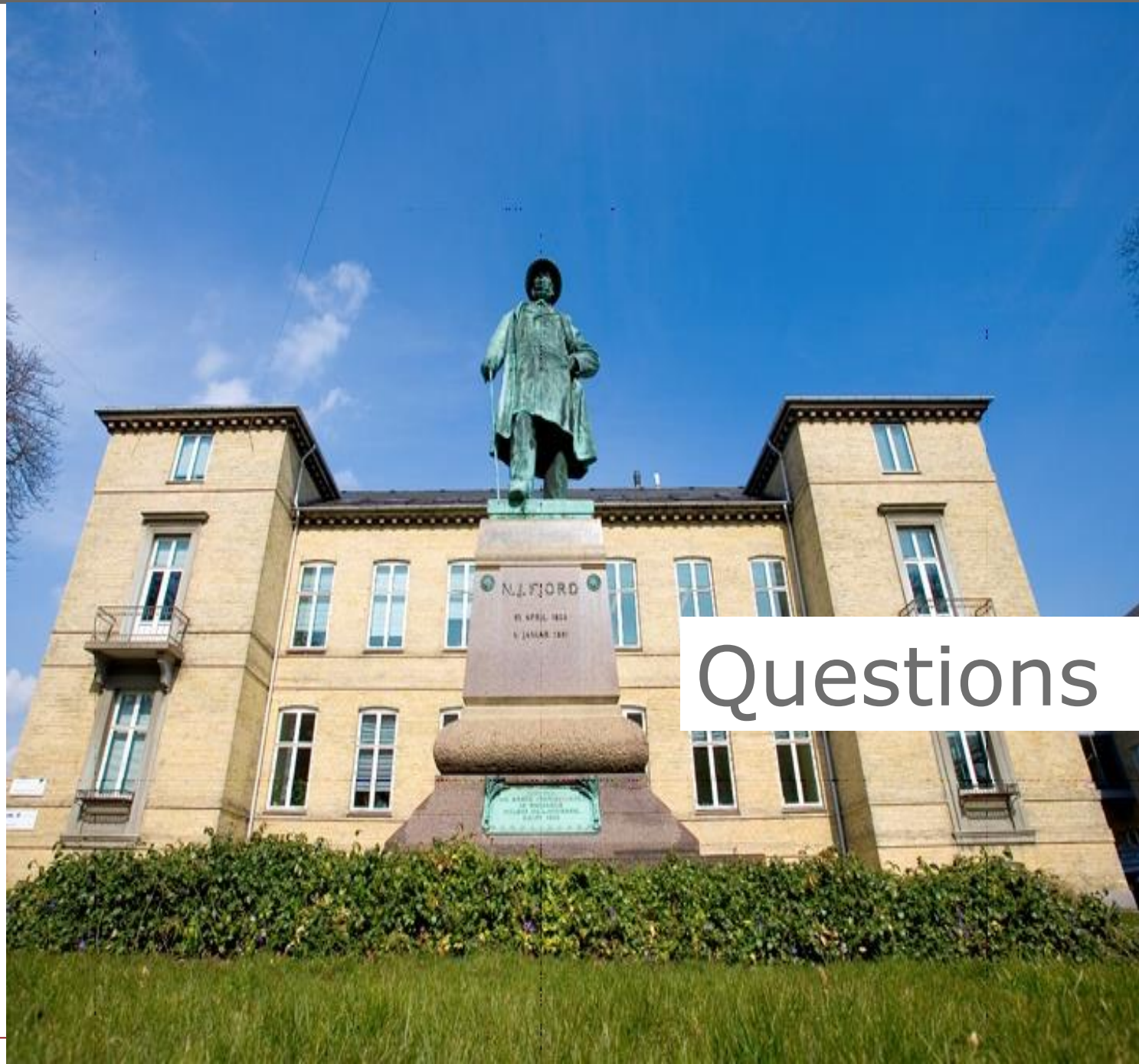
BIOVALUE

Super Grass Pork

Økonomiske vurderinger i forhold til værdikæden for
Grøn Bioraffinering, Jørgen Dejgaard Jensen & Morten
Gylling.

IFRO Documentation 2018/3





Questions