Future cow barn
in relation to manure quality

State of the art and topics for further Research and Development

EAAP 28 august 2018, Dubrovnik.

Paul Galama and Wim van Dijk

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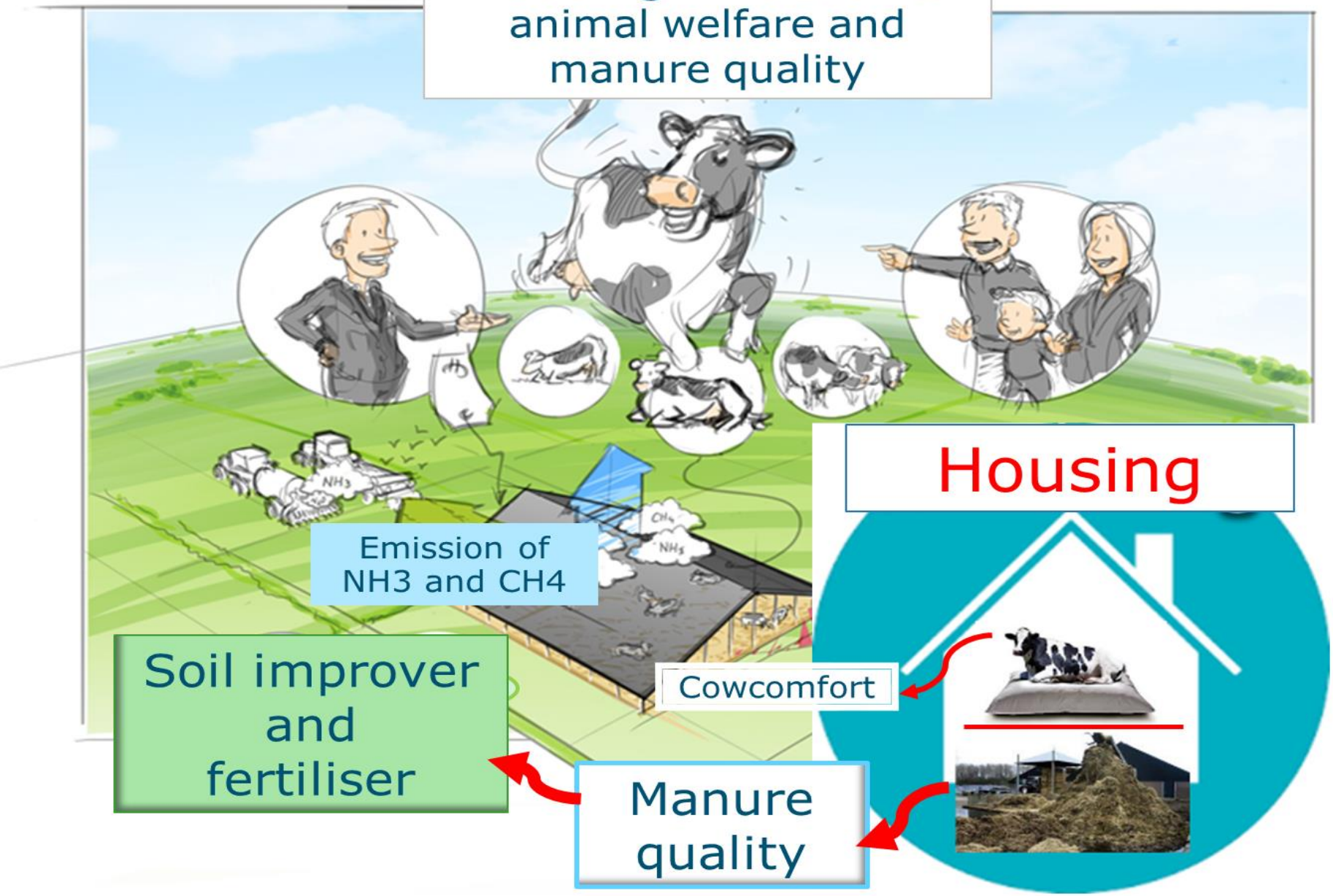
Topics

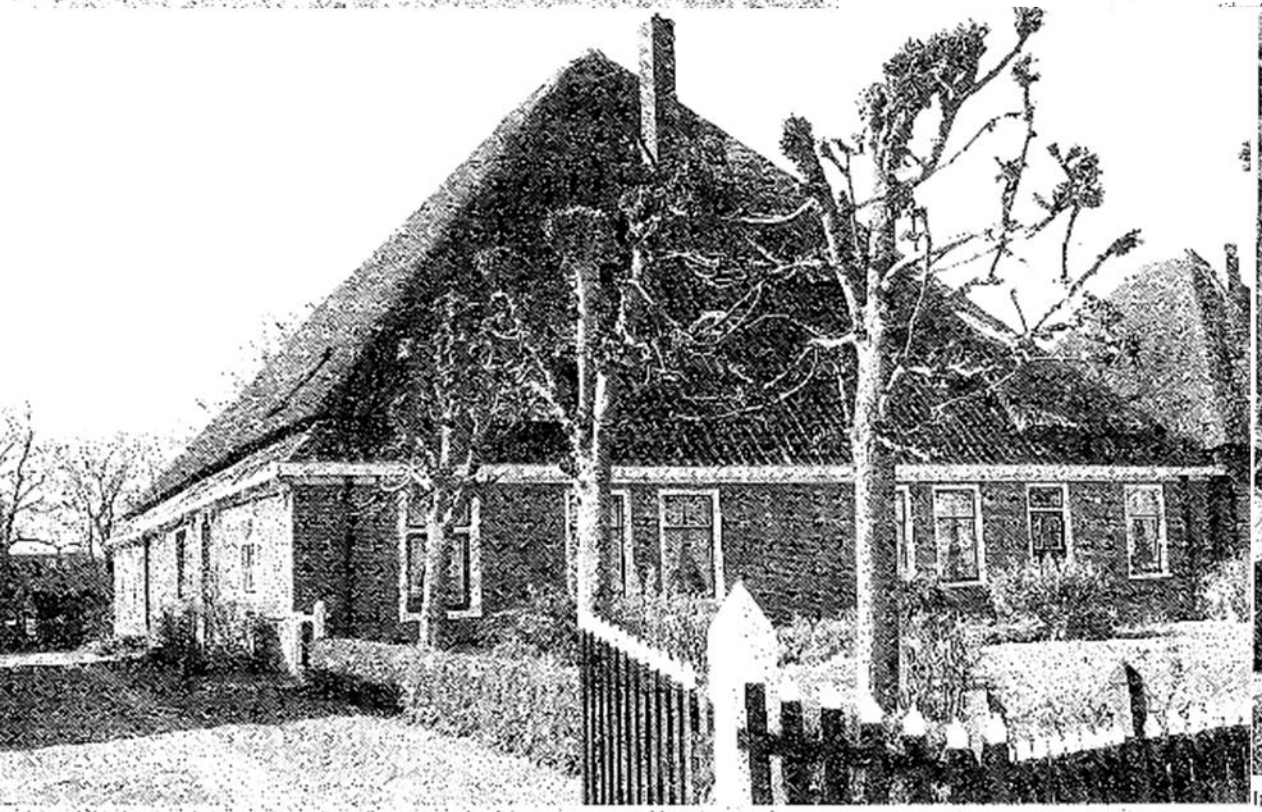
- Past, Present and Future of manure quality in relation to housing systems
- Results and conclusion of a scenario study from the point of view of dairy and arable farmer
- Research & Development (FreeWalk)

Housing in relation to animal welfare and manure quality

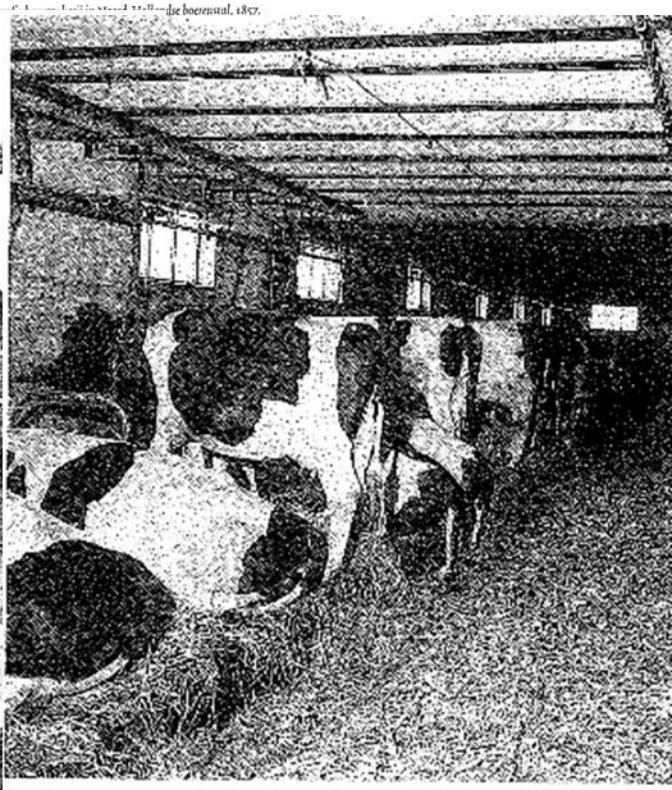


All under one roof

PAST



De stolp van Arie Kraakman in Warmenhuizen.



Interieur van een gemademiseerde Noord-Hollandse koeienstal met melkleidingen.

Past

Past

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Present

7 months manure storage

Injection to prevent emissions

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8

Present and future



Artificial floor separates faeces and urine



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Artificial floor at research station Dairy Campus

Present and future

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What is the best manure for Dairy and Arable farmer?

A scenario study with Wim van Dijk (WUR)

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What is the best manure for Dairy and Arable farmer?

Manure products

From housing

Slurry

feces

urine

Separation in Cubicle and Freewalk housing

Straw bedding

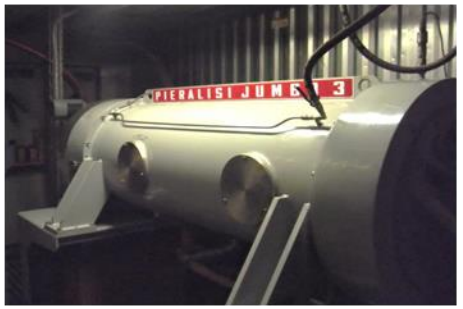
Straw

Mechanical seperator

solids

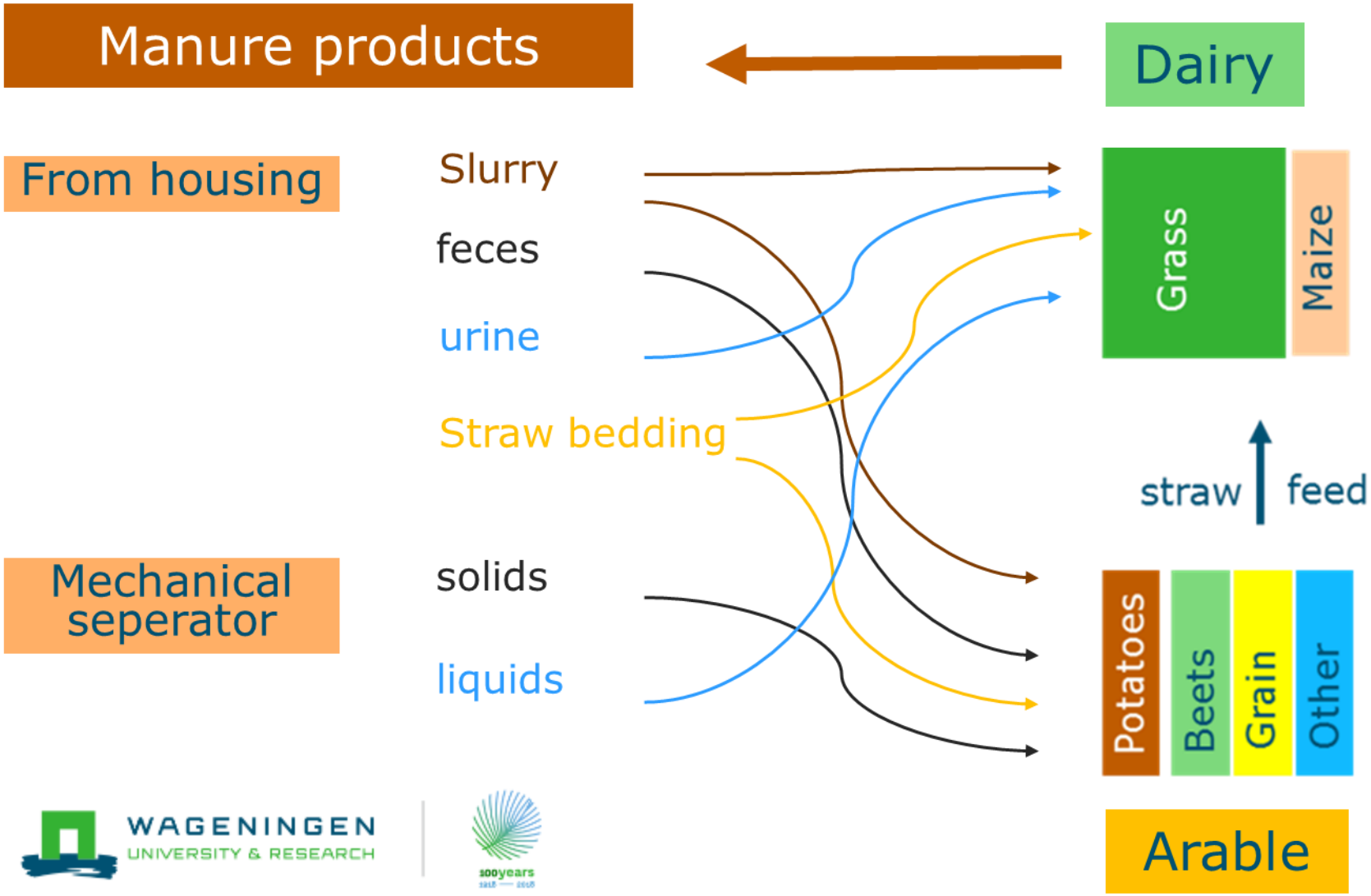
liquids

Screw press



Centrifuge[13]

Partitioning of manure products between Dairy and Arable farm

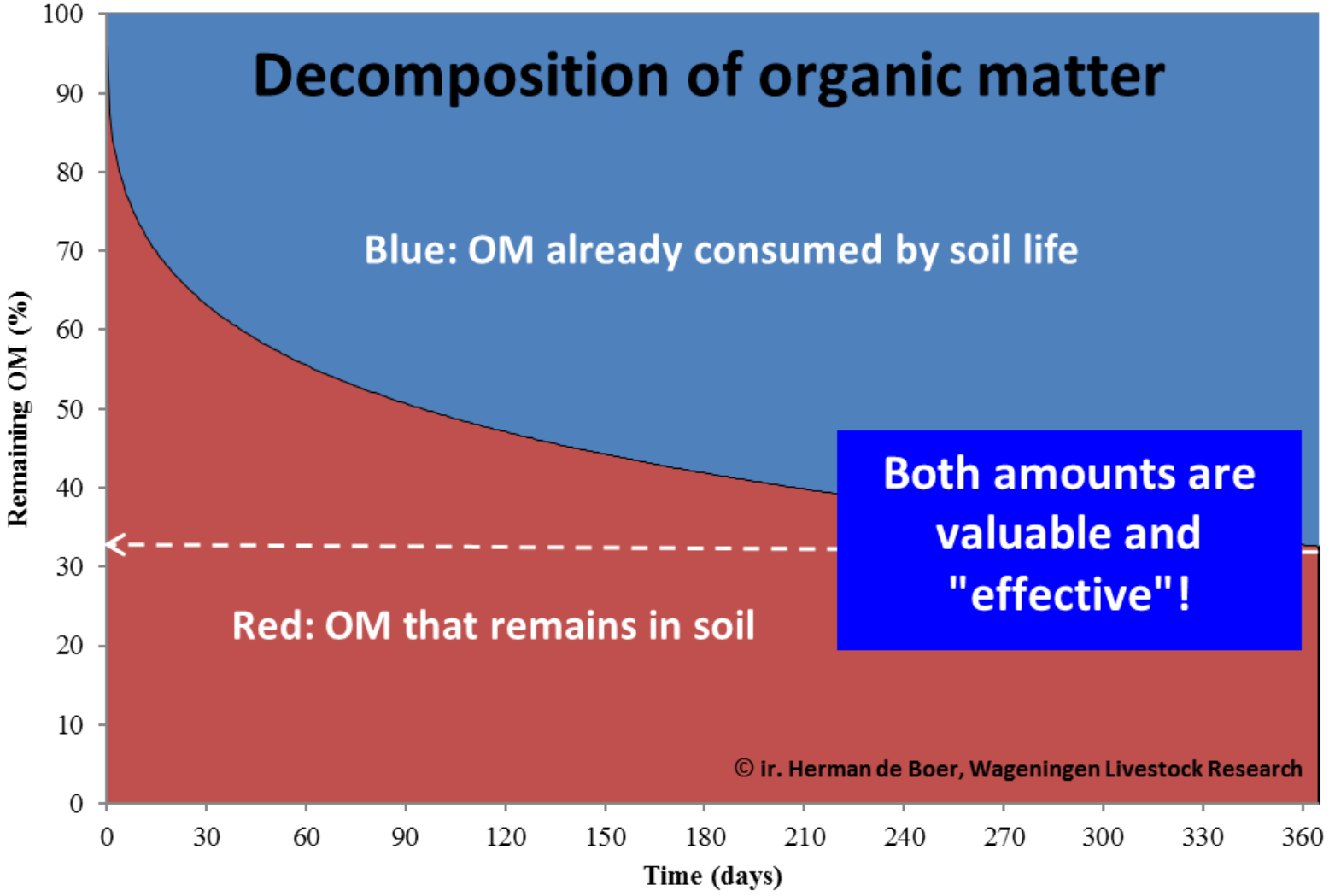


Classification, based on

(Source: EIP-AGRI Focus group Nutriënt recycling)

- Fertilising value Nitrogen (N), Phosphate (P) and Potassium (P)
- Effective Organic Matter (remaining after one year)

Value of Organic Matter (OM)



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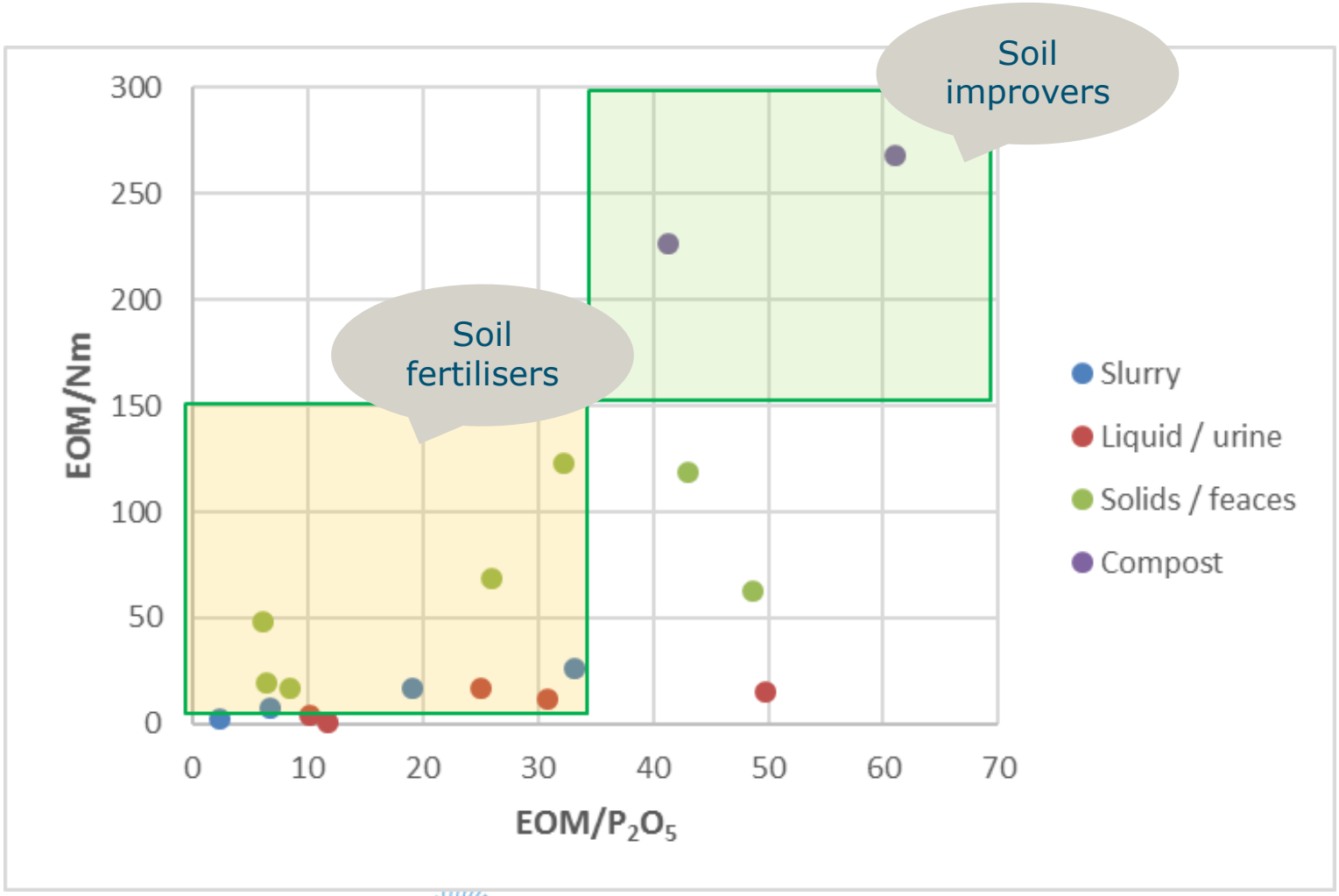
Classification of soil fertilisers and soil improvers

(Source: EIP-AGRI Focus group Nutriënt recycling)



Value of manure products

Costs

- Separator
- Straw / housing
- Transport
- Sampling and analysing
- Application on field

Benefits

- Value as fertiliser NPP
  Nitrogen: 1,05 per kg N
  Phosphate: 1,0 per kg P2O5
  Potassium: 0,64 per kg P
- Value of EOM
  € 0,20 per kg EOM

Calculation value per ha

Costs (C) and Benefits (B) per ha

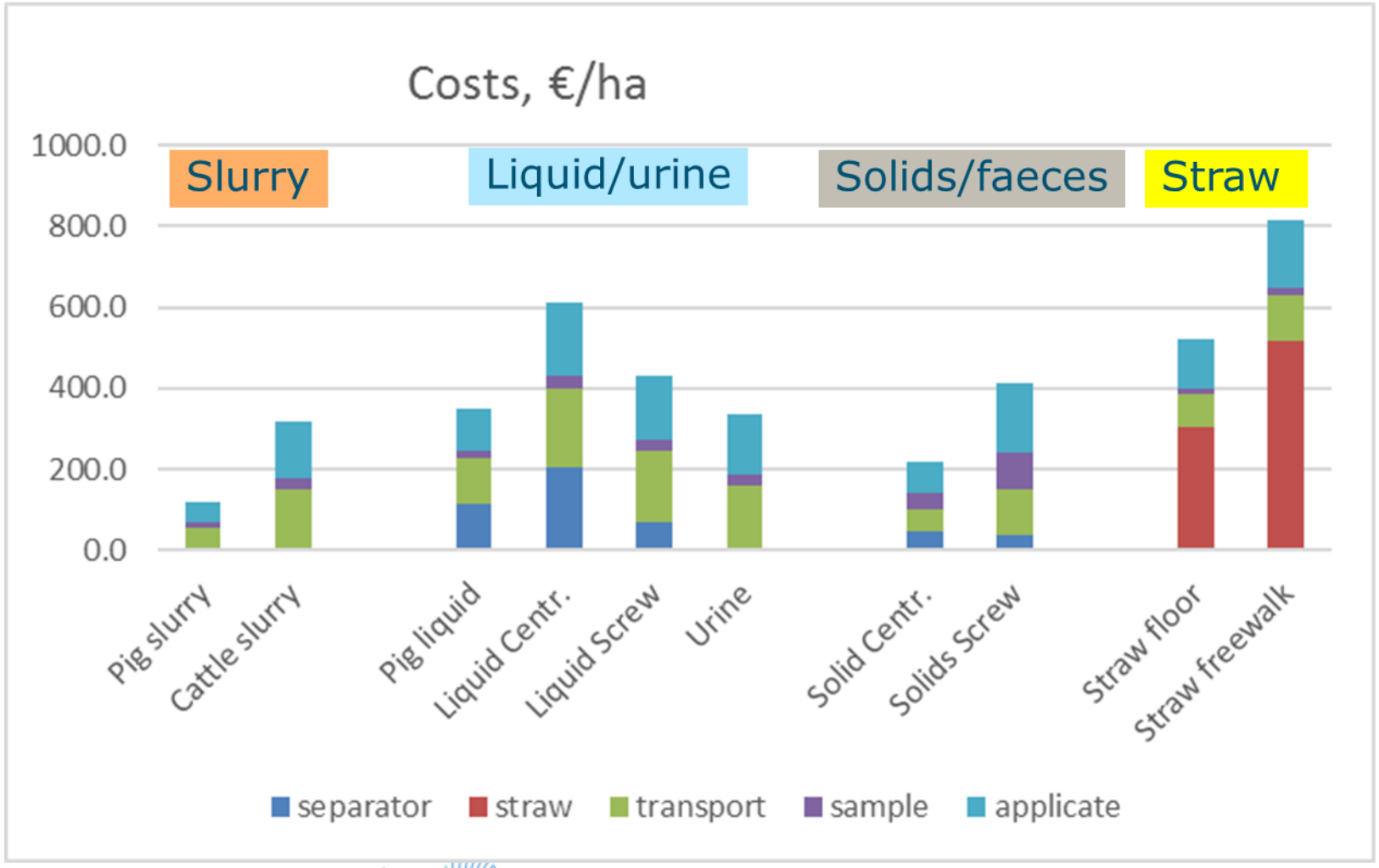
=

C or B / ton product X ton product per ha

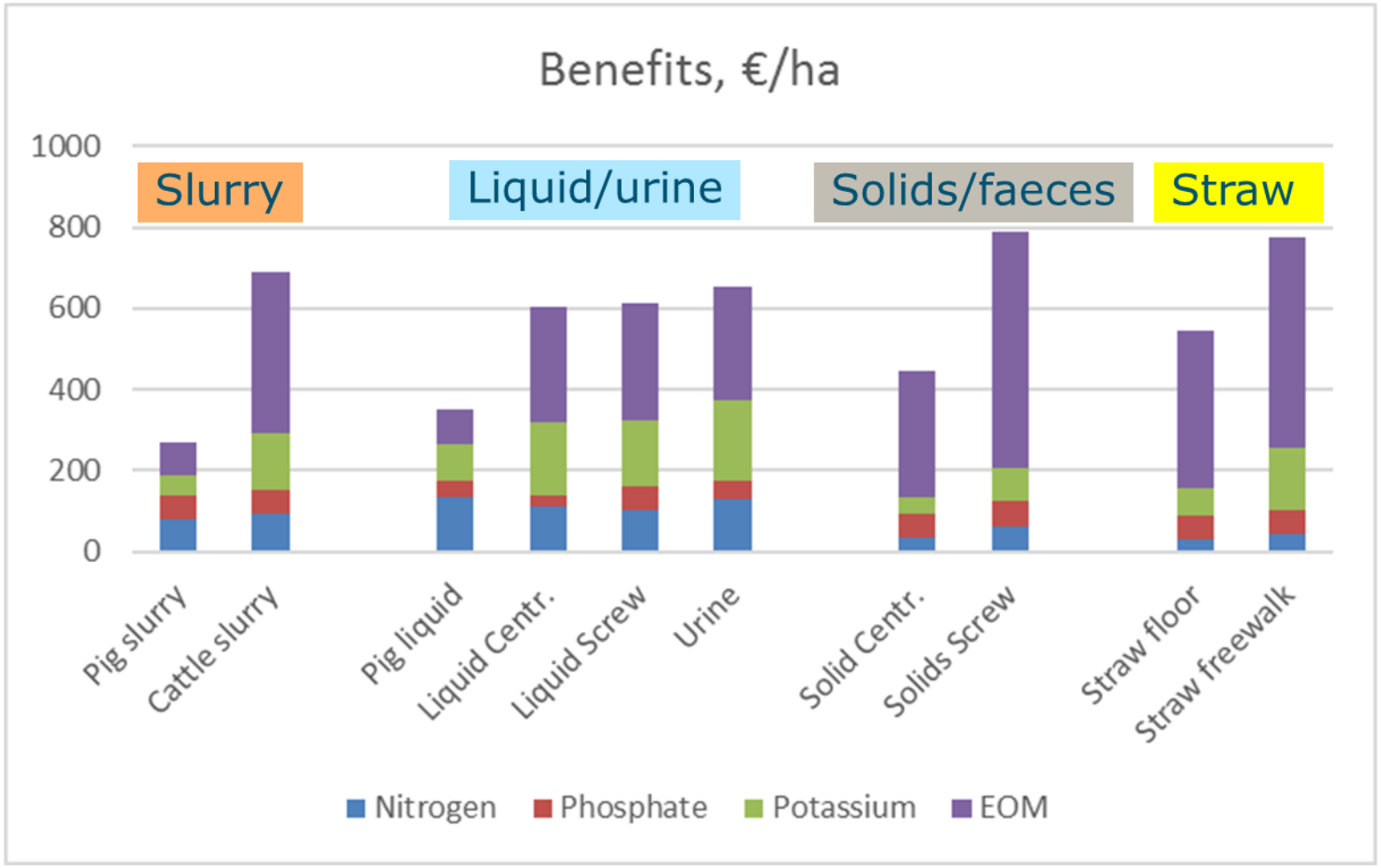
Based on fertilising standards per ha (N and P)

Example: More product per ha with low P / ton product

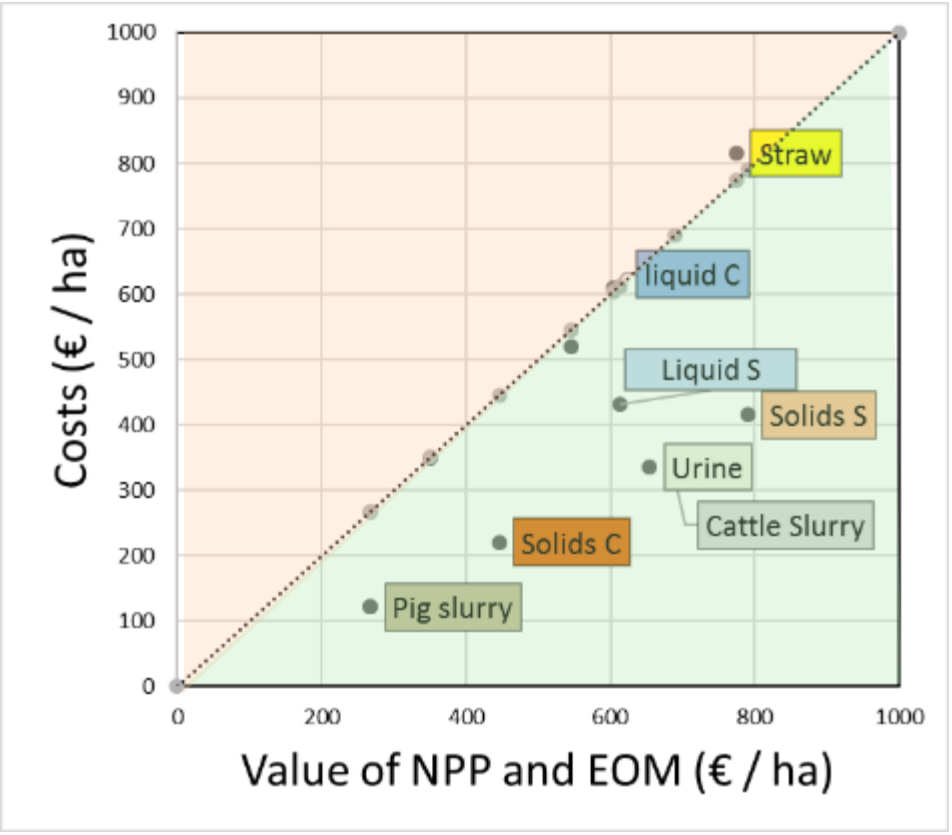
Costs manure products

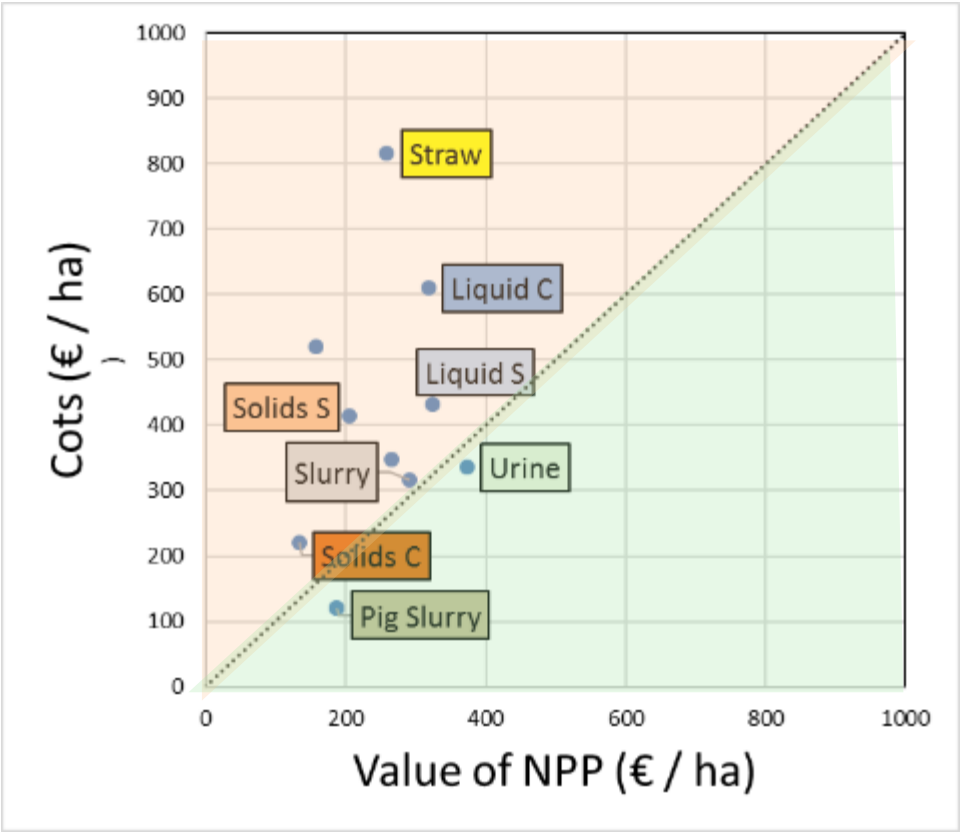


Benefits manure products



Value of different manure products





Conclusions

- Slurry and liquid / urine fraction highest value as soil fertiliser
- Solids / feces and straw bedding highest value as soil improver
- Taking into account benefits of EOM strongly affects value of manure products
- Straw bedding is interesting for arable farmer, but expensive for dairy farmer
- Cattle slurry separation is too expensive
- Cattle slurry is a good soil fertiliser and soil improver

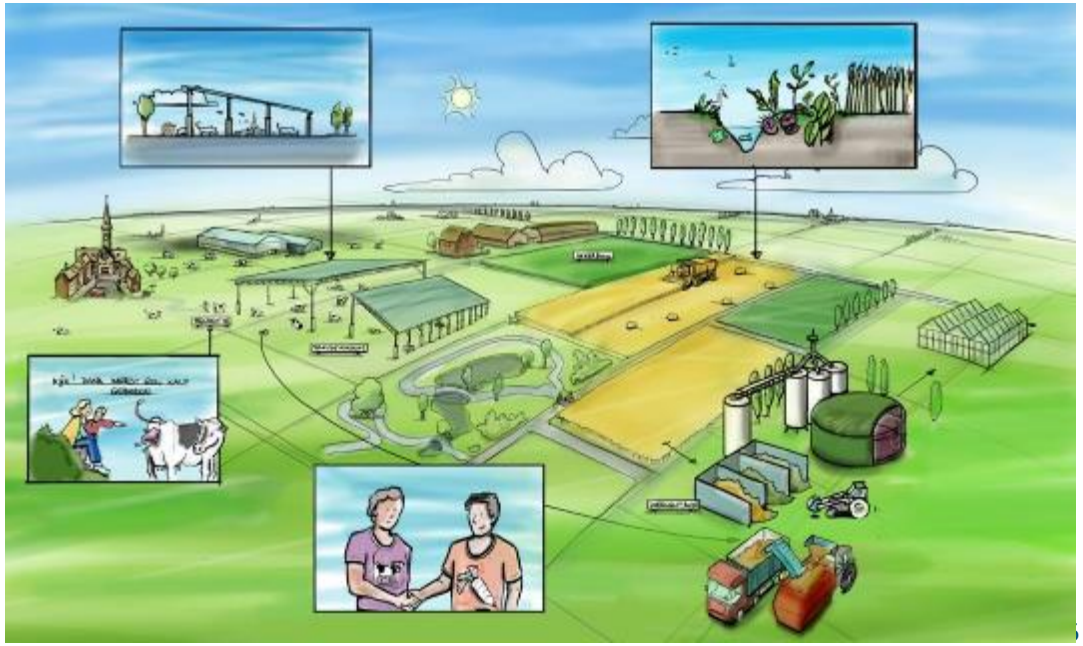
Discussion points (1)

- Organic matter
  - Economic evaluation of EOM for Dairy and Arable farming
  - Re-evaluation of decomposition of OM

- Manure quality is only a part of the evaluation of housing systems
  - Emissions, welfare

Discussion points (2)

- Manure is often a minor factor in the coöperation between dairy and arable farmers
  - Land exchange
  - Feed production
  - Regional feed and manure centre?



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- Research & Development points (Freewalk)

Free Walk
Holistic View

Economics

Animal welfare

Society

Environment

Quality

Multiple use

Cow

Crop

NPC balance Farm

Manure 'Compost'

Soil

Thanks

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