

# Baltic Manure

Baltic Forum for Innovative Technologies for Sustainable Manure  
Management

## Project recommendations

Knud Tybirk, Agro Business Park, Sari Luostarinen and Johanna Logren MTT  
- based on most project workers 😊  
[kt@agropark.dk](mailto:kt@agropark.dk)

# Did you know that...

Clear Sky – 'low emission'



Green Fields – optimal agricultural production



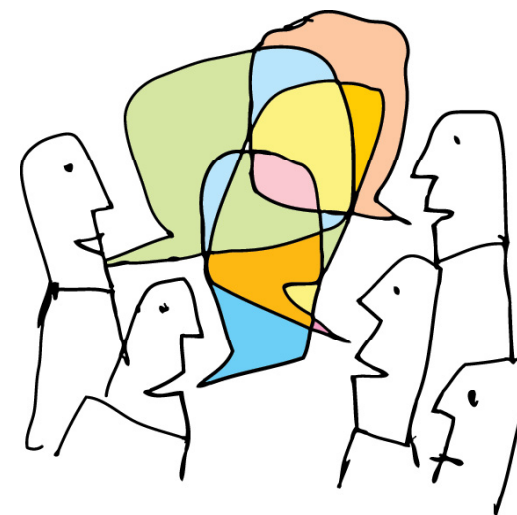
Amber of manure - rediscover the values

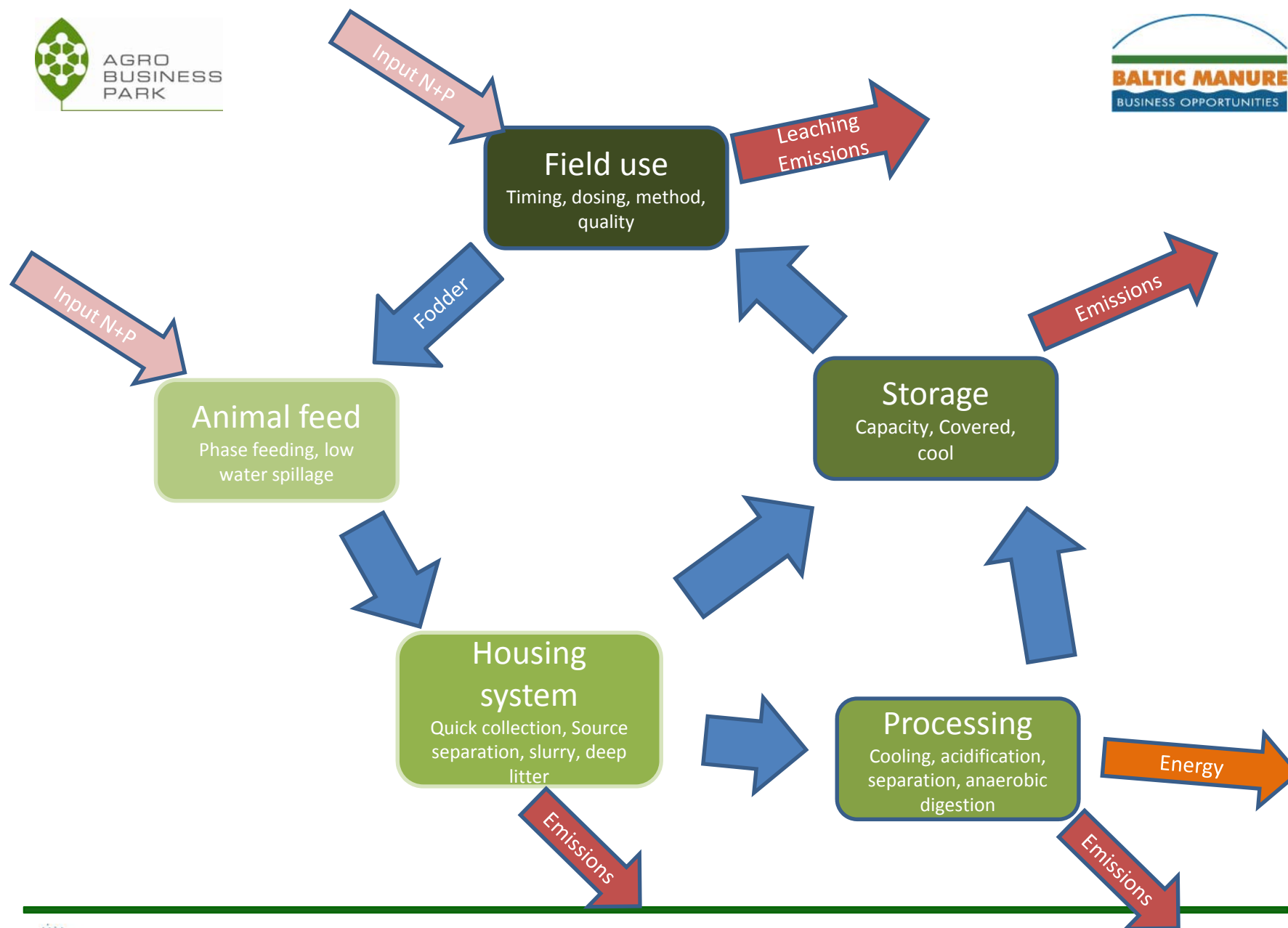


Blue Ocean – business opportunities in the Baltic Sea Region

# From research to policy

- Much research in Baltic Manure – and some business focus
- ---and we promised policy recommendations
- Preliminary recommendations...
  - For discussion

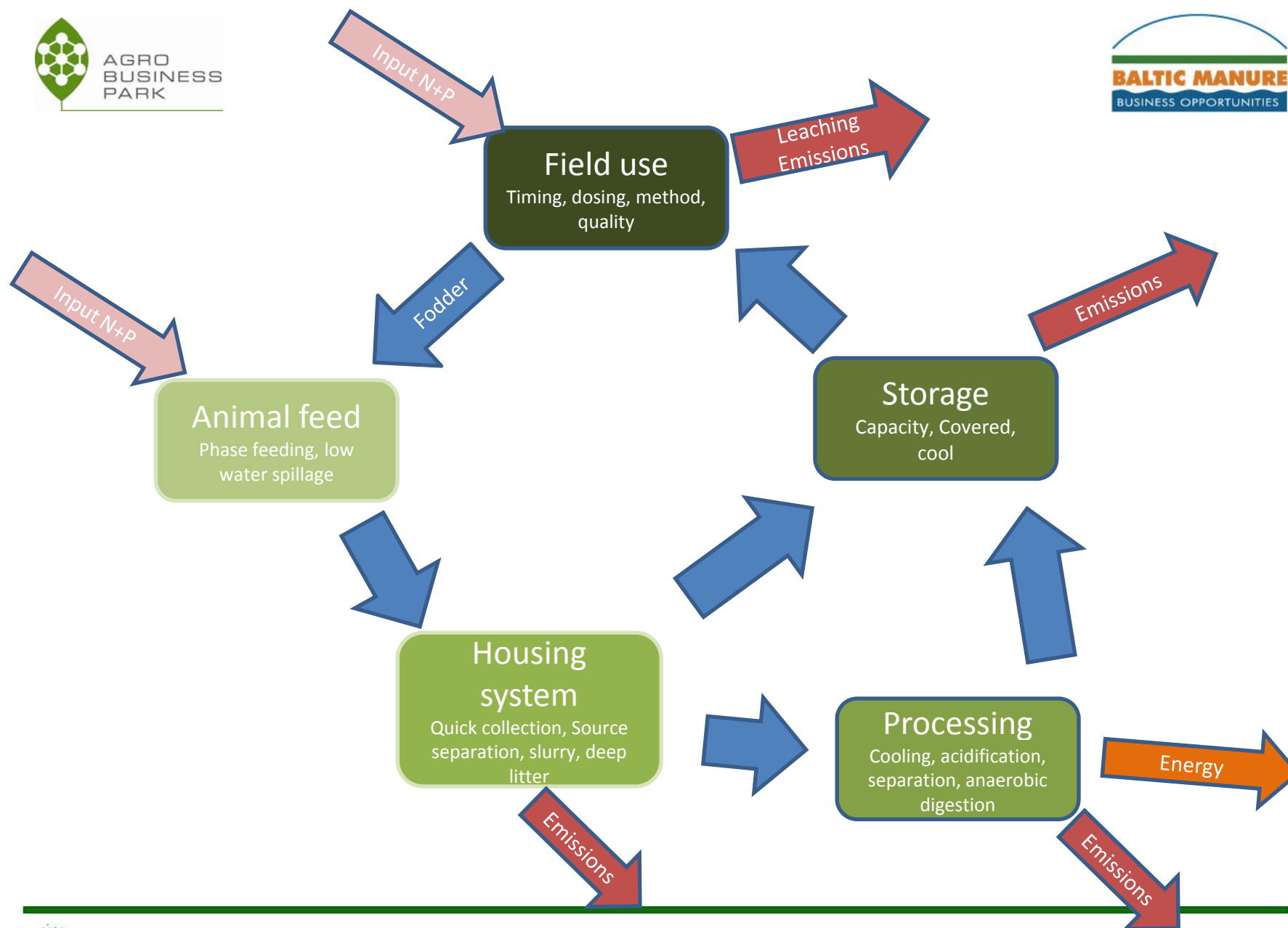




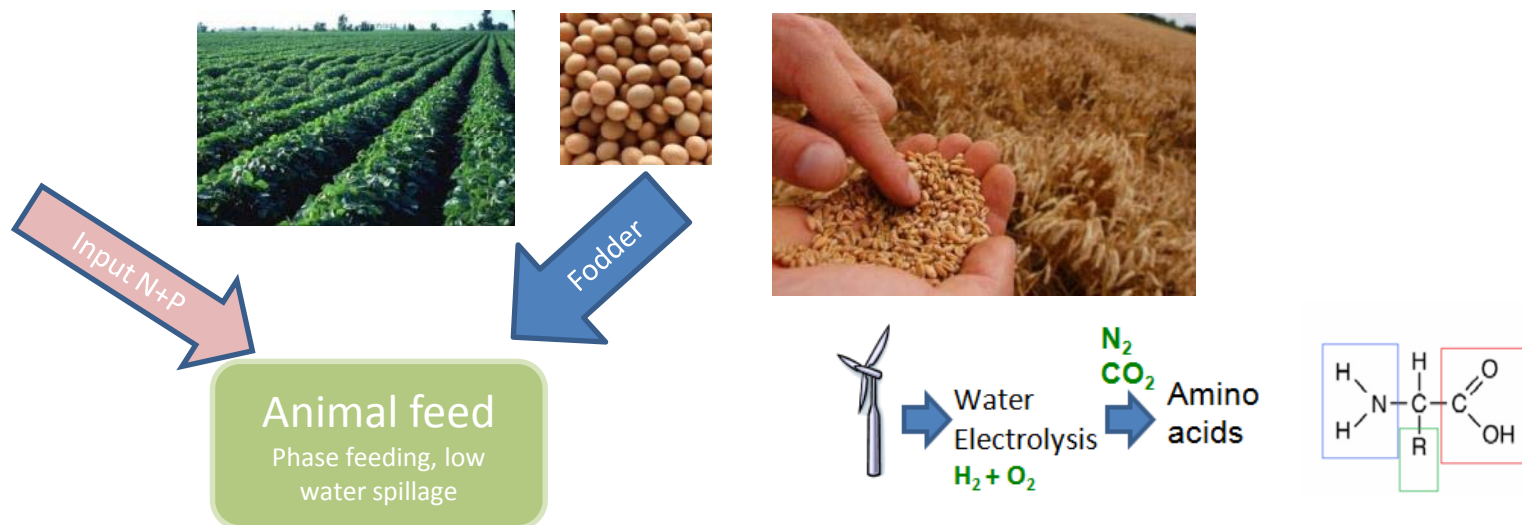
# Overall

- Improve the use and recirculation of nutrients
  - regulations (e.g. norms and quality criteria) - whip
  - incentives at international and national levels - carrot
- In-depth knowledge of manure nutrient content
  - standardized, approved methods for measuring or
  - calculating manure quality
- Manure technologies should be communicated to advisors and farmers
  - manure handling technologies should be a mandatory part of the education



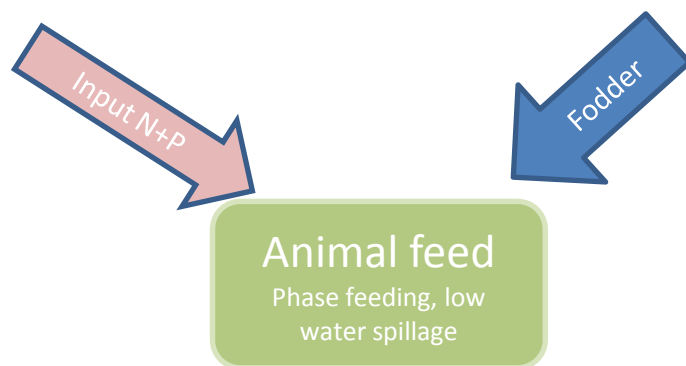


# Animal Feeding



Largest impact of Baltic Agriculture in Life Cycle Analysis – induced land use changes

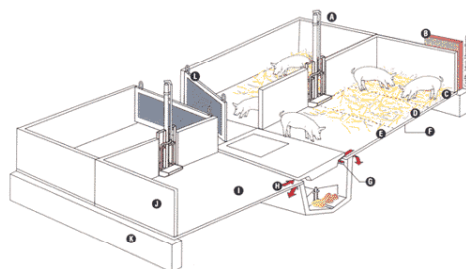
# Feeding recommendations



- Phase feeding of livestock
  - Feeding efficiency
  - limit nutrient excretion
- P recommendations for poultry and pigs
  - based on “available P” and not “total P”
  - Liquid feeding systems improves P utilization
- Cattle should generally not have additional P supply in fodder



# Manure handling



**Housing system**  
Quick collection, Source separation, slurry, deep litter

**Storage**  
Capacity, Covered, cool

**Processing**  
Cooling, acidification, separation, anaerobic digestion

**Emissions**

# Housing and handling

- Reduce water addition in stable and storage
  - by right choice of drinking facility,
  - re-use of cleaning water etc.
  - Covered storage
- Make a farm specific business plan
  - for investment in processing/ storage
  - Should be economically feasible/ incentives are needed
- Look at the whole manure handling chain



# Processing



Cooling

Separation



Acidification

Air cleaning



## Processing

Cooling, acidification,  
separation, anaerobic  
digestion

Energy

Emissions

# Manure energy

- Deep litter/solid manure/fibers can be gasified/incinerated
- Biogas is the best developed and recommended technology
  - Slurry needs co-substrates and pretreatments



## Processing

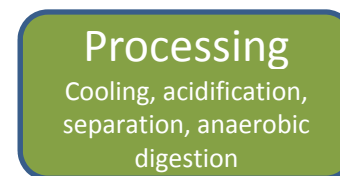
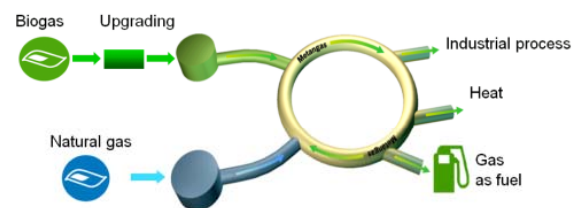
Cooling, acidification,  
separation, anaerobic  
digestion

Energy



# Biogas recommendations

- Beware of ammonia and GHG emissions!
  - Digestate better fertilizer if injected in the soil/acidified
- Serial digesters/post digester
- Gas usages depends on national conditions
  - CHP
  - Gasgrid
  - Transport





# Processing recommendations

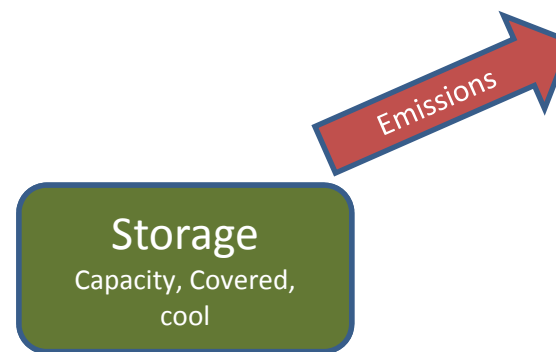
- Use environmentally friendly technologies where appropriate
  - Acidification, cooling, source separation
    - Slurry separation can often be recommended for larger swine production units
  - Generate energy from the manure by anaerobic digestion, and after due economical calculations.

## Processing

Cooling, acidification,  
separation, anaerobic  
digestion

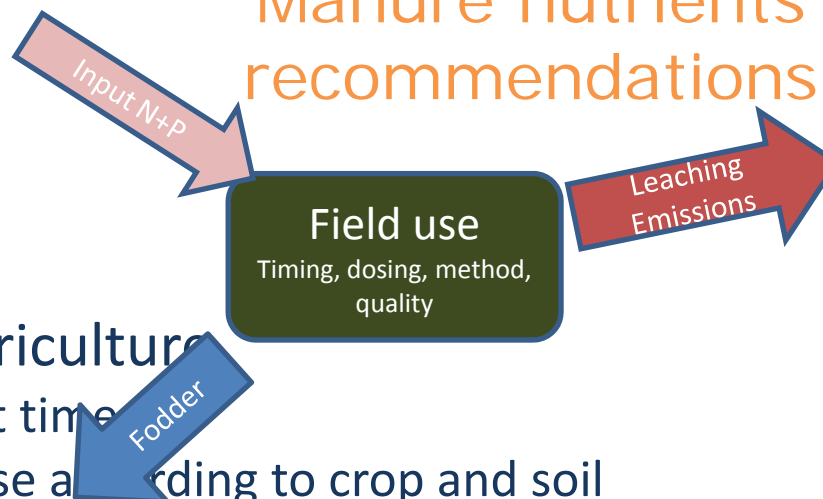
# Storage recommendations

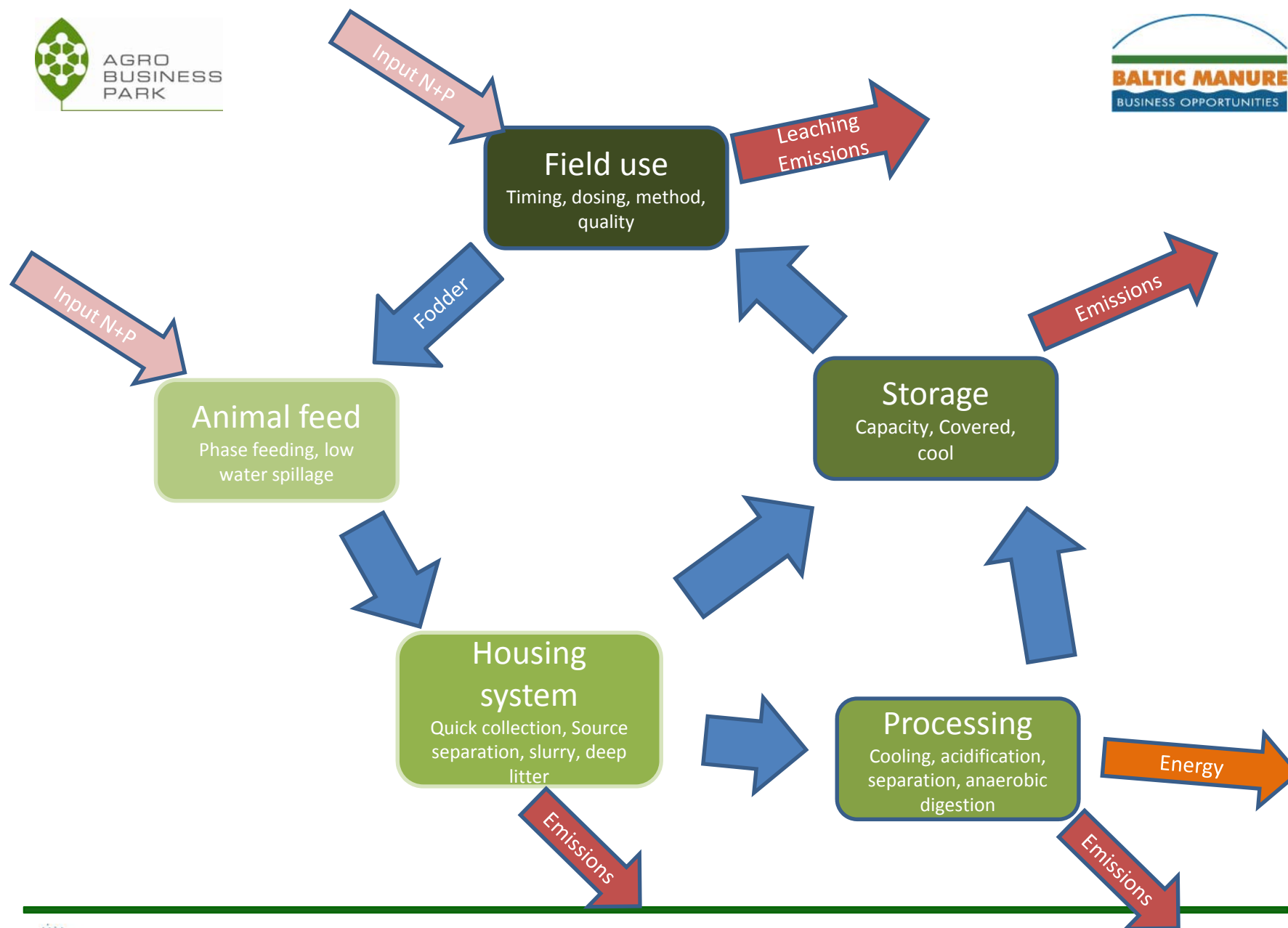
- Storage capacity
  - Covered
    - Ammonia, Methane
    - Water dilution
  - Cold and anaerobic
- Bring manure to crops in growing season



## Manure nutrients recommendations

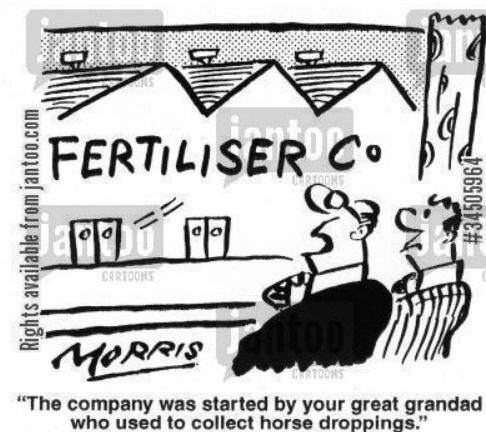
- Precision agriculture
  - at the right time
  - precise dose according to crop and soil needs and
  - with the best method: injection/acidification
- 'Manure whereabouts' should be developed.
- Agreement on norms and quality criteria for fertilizer products of different origin
- Agree on compulsory upper limits for application of phosphorus





# Manure business recommendations

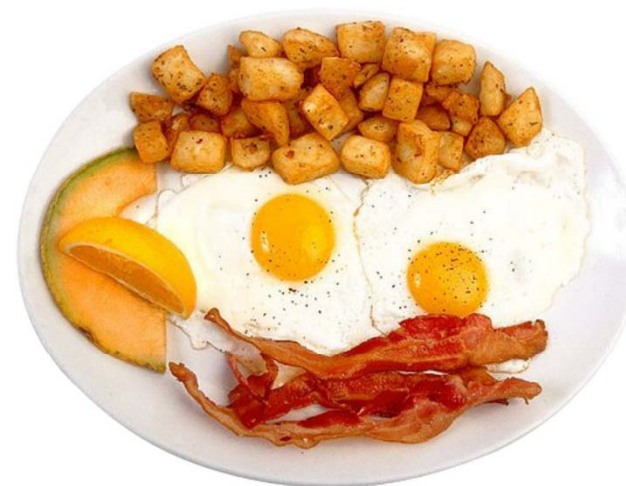
- Change the status of certified composted or digested manure
  - from waste into marketable resources / products
- Develop new incentives
  - for grain producers to cooperate with livestock producers
- Stimulate innovation
  - Research and business co-operate





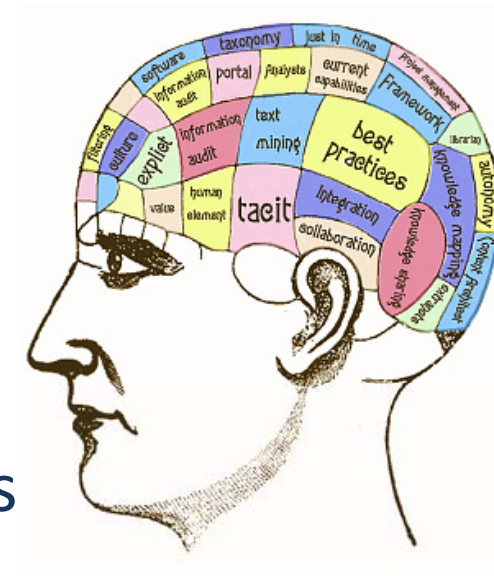
# Conclusions/ 1

- Meat/milk/egg consumption produces manure
- Manure is a valuable resource for sustainable agriculture
  - Close the nutrient cycles incl. food wastes
  - Get the energy out
  - Manure creates jobs and rural development



## Conclusions/ 2

- More knowledge needed
  - From guesstimates to knowledge
  - Will give more business innovation
- More regulations
  - Improving efficiency of nutrient cyclus
  - Will give cleaner environment
- More cooperation and dialogue
  - Farmers, advisors, research, business, policy makers





# Towards a Greener Agriculture and a Bluer Baltic Sea!



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contributors.



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