

Design of future dairy farm systems

1. Housing 2. Large scale dairy

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Netherlands

EAAP 2008



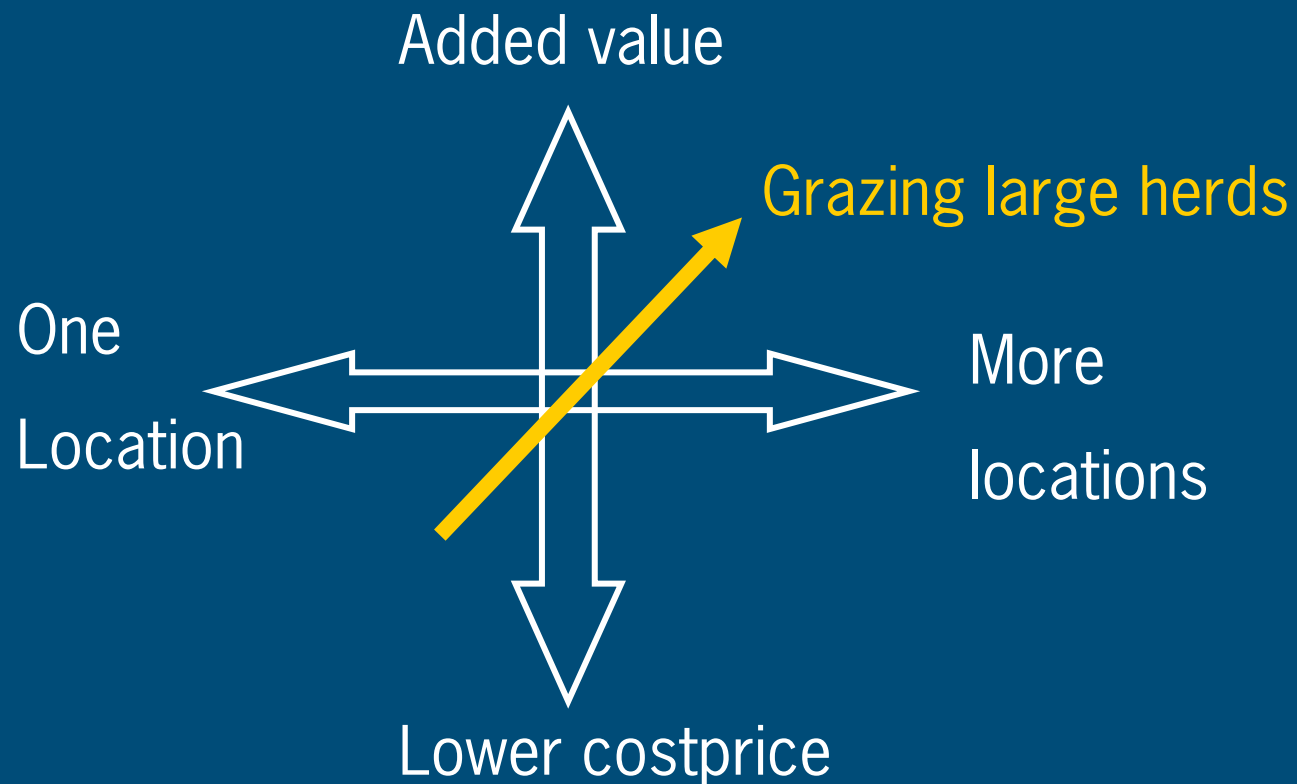
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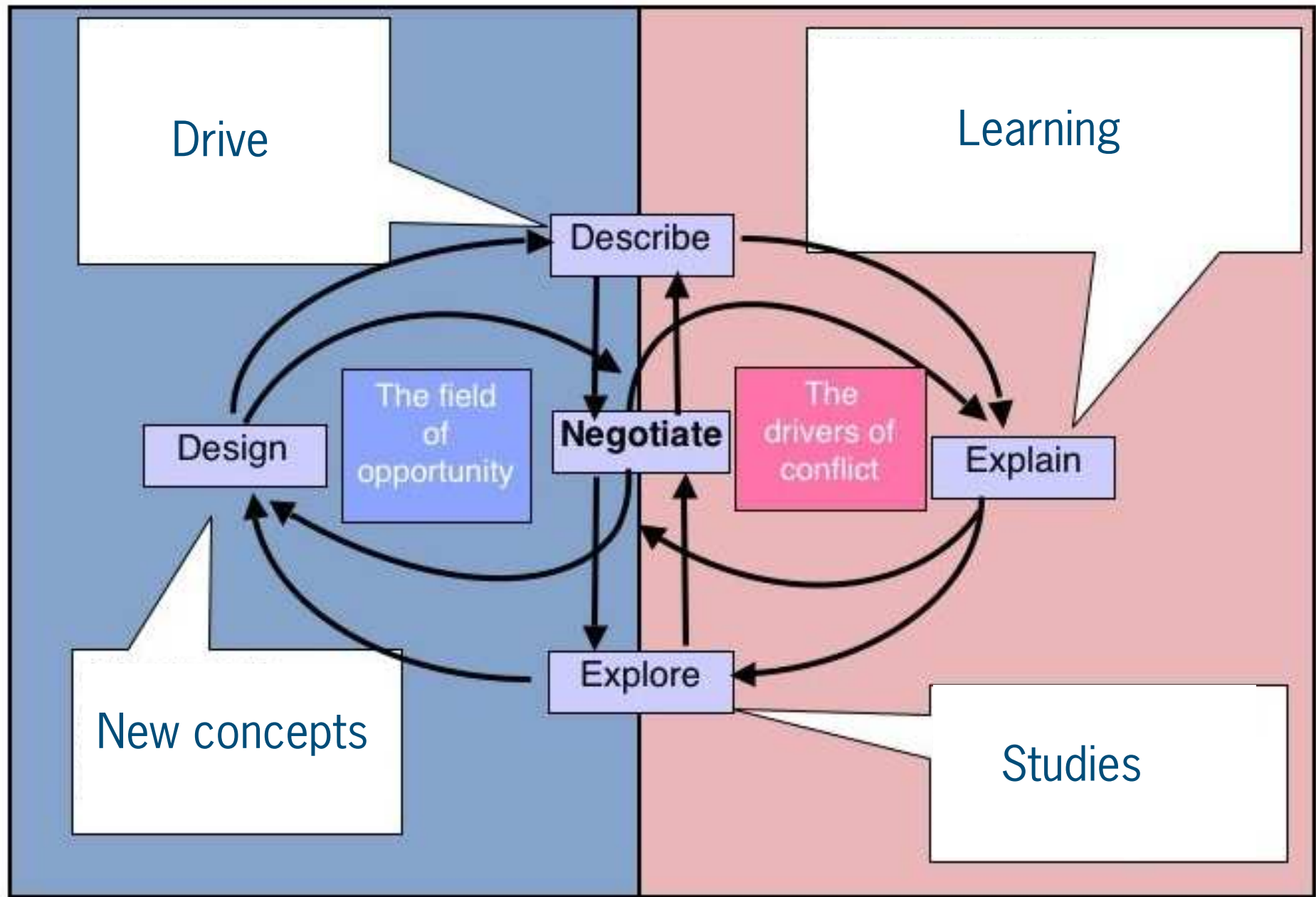
New housing systems, inspired by:

- Farmers Netherlands
- Farmers Minnesota
- University of Minneapolis
- Farmers Israel
- Vulcani Institute Israel
- Yehuda Sprecher (architect)
- Animal welfare experts
- researchers



Concepts of large scale dairy farming





Topics

- Why from cubicle stables towards free walk stables
- Experiences with free walk
 - compost barns in Minnesota (USA)
 - dried manure barns in Israel
- Large scale farm systems
- Research plans in the Netherlands



Why cubicle stables?

Advantages cubicle stables:

- labour efficiency
- less m² per cow (economics)
- lying area is clean

Disadvantages:

- not much space to lie and to stand up
- not much space to move around; forced routing
- less locomotion on a slatted floor
- concrete is bad for claws

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Example cubicle stable with mattress as bedding



Bedding with straw



Bedding with sand

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Fiber glass to seperate cows



Why towards free walk stable?

- Better animal welfare and health
- Better quality manure
- Less volume manure

Emmision of ammonia must be low



Improvement aspects animal welfare (according to experts)

- More space
- Better movement
- More space bij lying and stand up
- More social contact
- Better climate in stable
- No horns ?
- Keep calf with cow (mother)? (Family herd)



Example free walk with straw as bedding



Different types of bedding in free walk stables

- Anorganic material
 - sand
 - artificial
- Organic
 - compost
 - dried manure



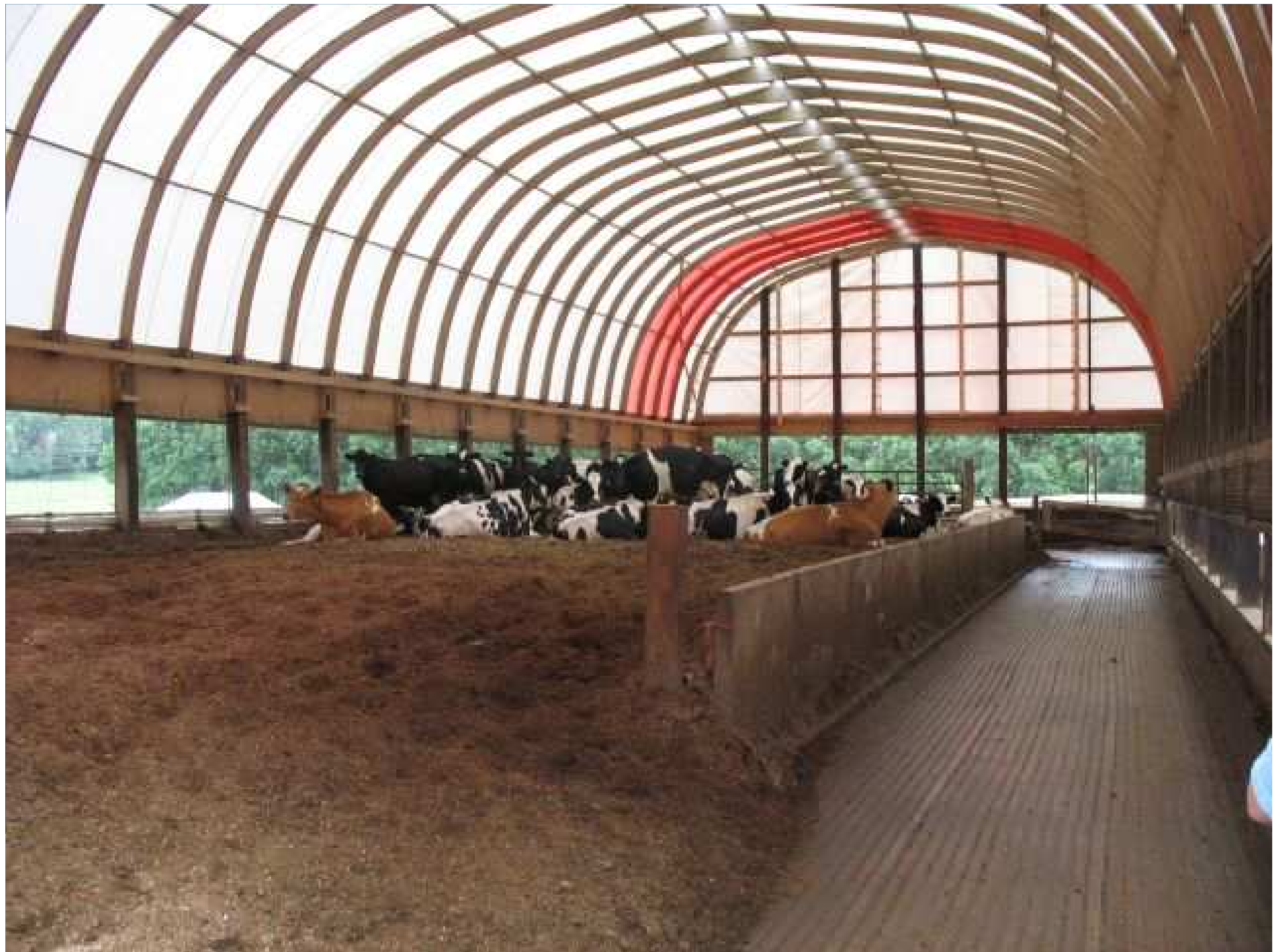


Compost barn in Minnesota



Bedding with sawdust

7 m² per cow



Good ventilation is important



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Cultivating twice a day
for good composting
and keep it clean

Results 12 compost barns Minnesota

(congres june 2007; University Minneapolis)

- Reducing lameness from 30% to 15%
- Turnover rate reduced from 35% to 27%
- Somatic Cell Count compost barns 325000
average in Minnesota 357000



Economics compost barns

(congres june 2007; University Minneapolis)

- 160 cows farm (compared with cubicle stable with sand as bedding)
 - construction costs the same
 - more costs for bedding 15000 dollar
 - improved turnover 12000 dollar
 - reducing lameness 6500 dollar
 - **total advantage 3500 dollar**



Dried manure stables in Israel

Experiences based on study trip in 2008 with:

- 5 dutch farmers
- 1 Journalist
- 2 Researchers

Organised by architect Israel (Sprecher)



New stable in Israel

Soil of fine stones

Picture: Sprecher





20 m² per cow



Cultivating twice a day



Open roof

Manure along feed alley goes back on lying area



On farm Hardoef



Results Israel

- Ammonia emission great variation between farms
- M2 per cow not many variation;
much variation in dirty cows
- Farmers are satisfied



Is compost barn or dried manure stable possible in the Netherlands?

	USA	Israel	NL
Temperature	7,2	19,1	9,4
Sun (hours)	2607	3310	1477
Rain (mm per yaer)	719	605	802
Humidity (%)	70	71	82
Windspeed (m/s)	5,4	4,5	3,5



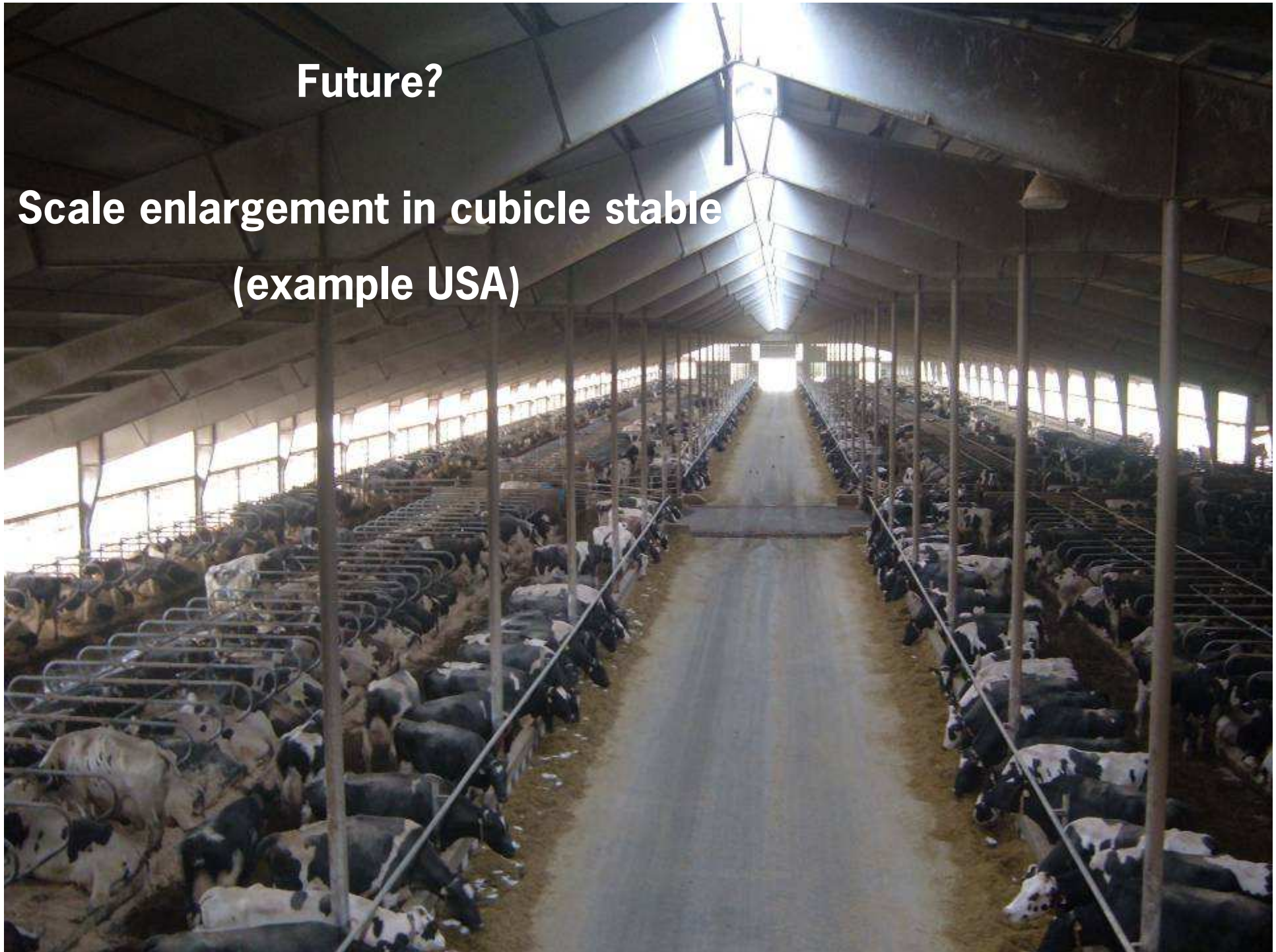
Animal welfare on large scale dairy farms



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Future?

**Scale enlargement in cubicle stable
(example USA)**





Very crowded



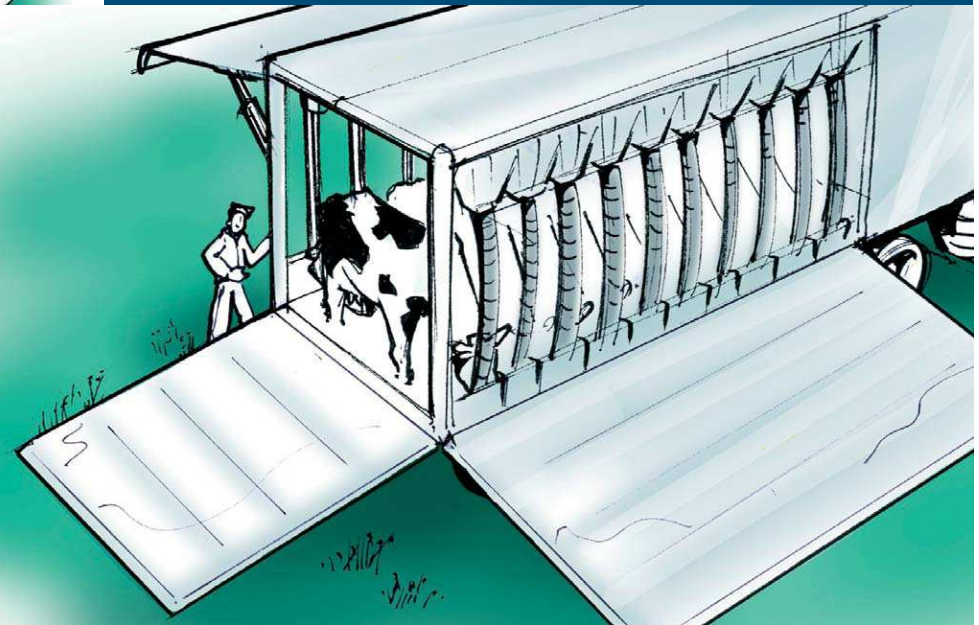
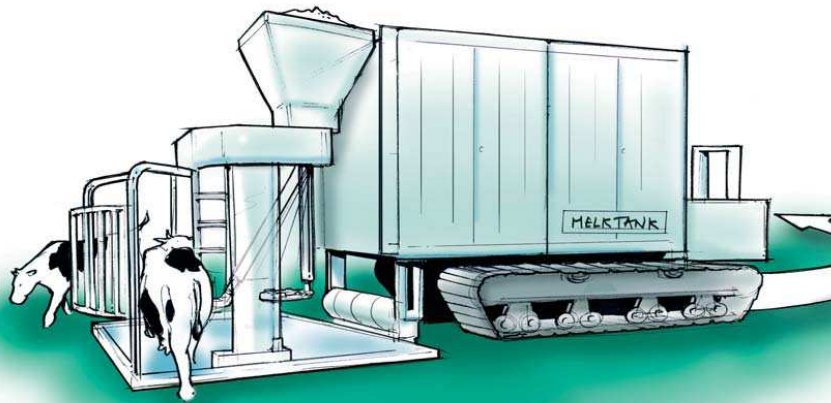
More space, ...sustainable...?

Challenge: can we graze 1000 cows sustainable...?



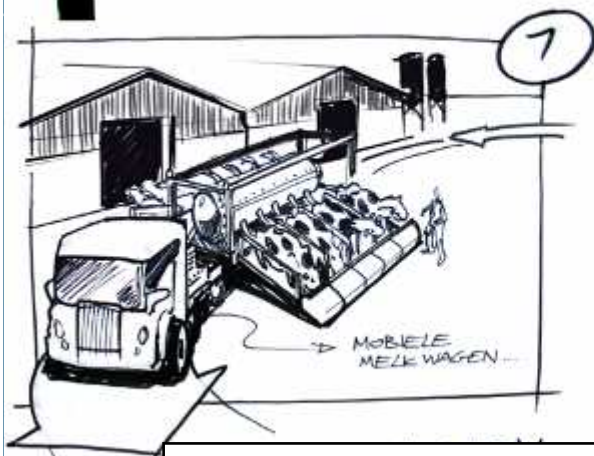
Grazing with mobile milking systems

VERPLAATSBARE MELKROBOT



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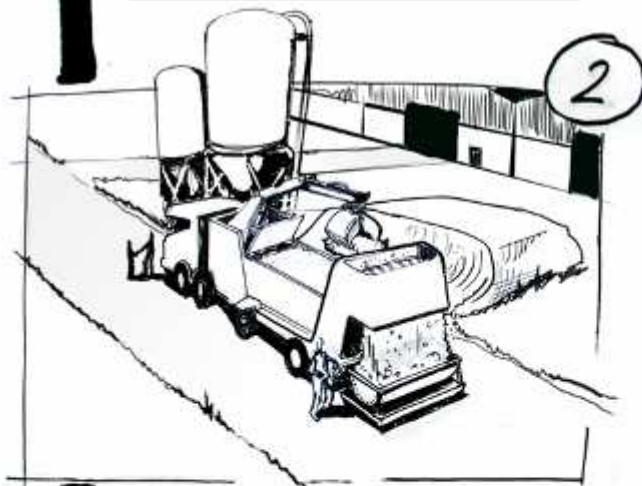
Dairy village



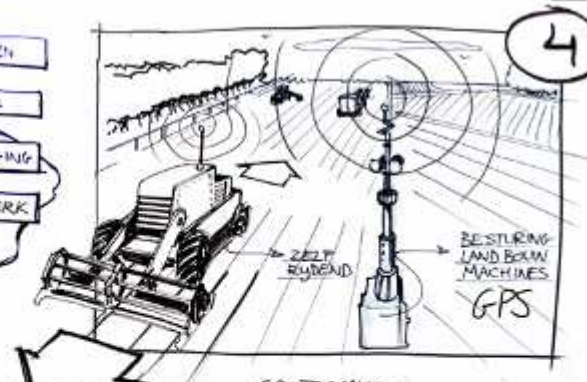
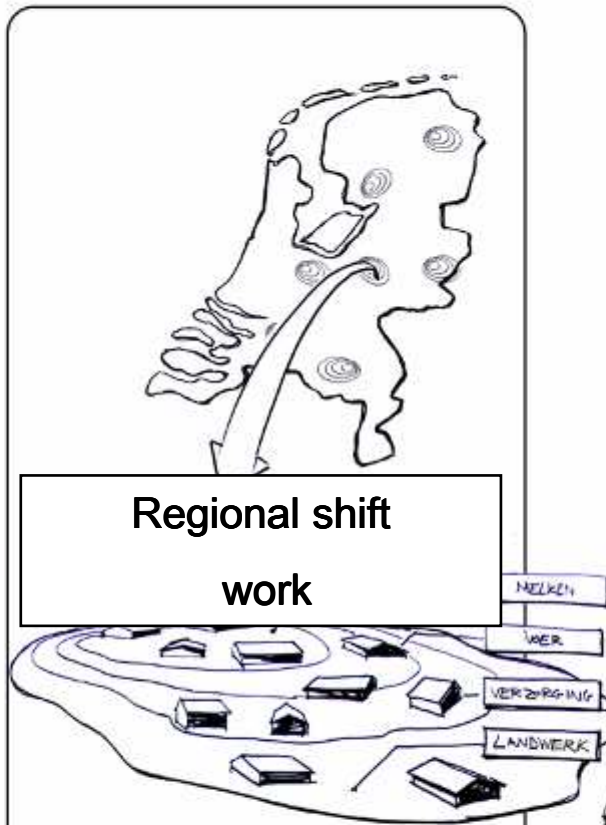
Mobile milking



Mobile care

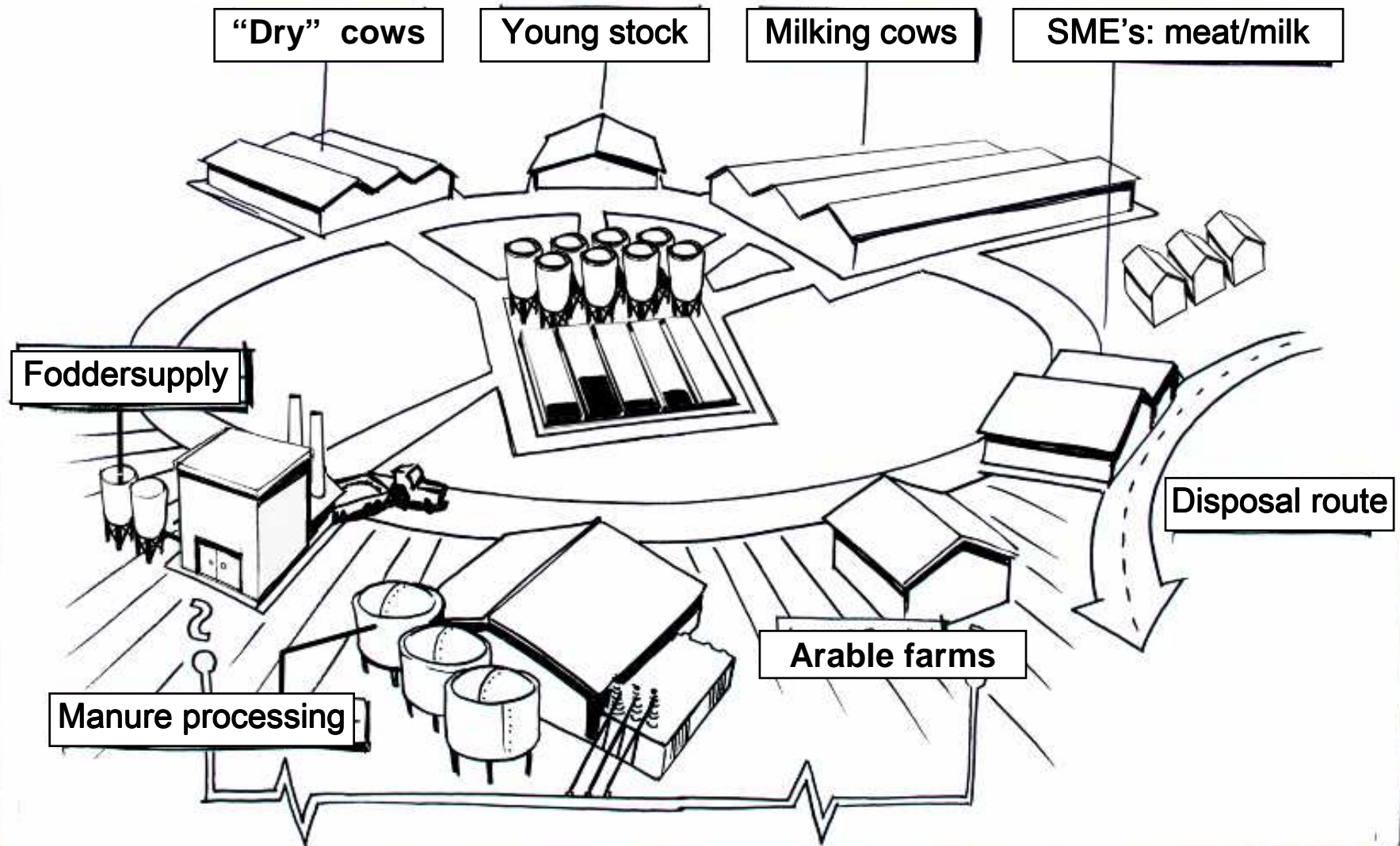


Mobile feeding station



High specialized crop production

Specialized cooperation



Research topics

- Housing
- Large scale dairy farming



Research topics for sustainable housing

- Does free walk system works in Netherlands?
- Animal welfare and health
- Quality manure
 - soil fertility
 - transport costs
- Environment
 - ammonia emission
 - emission of green house gasses
 - odeur
- Landscape (day and night)
- Economics and labour
- Food safety



Research plan for housing next years

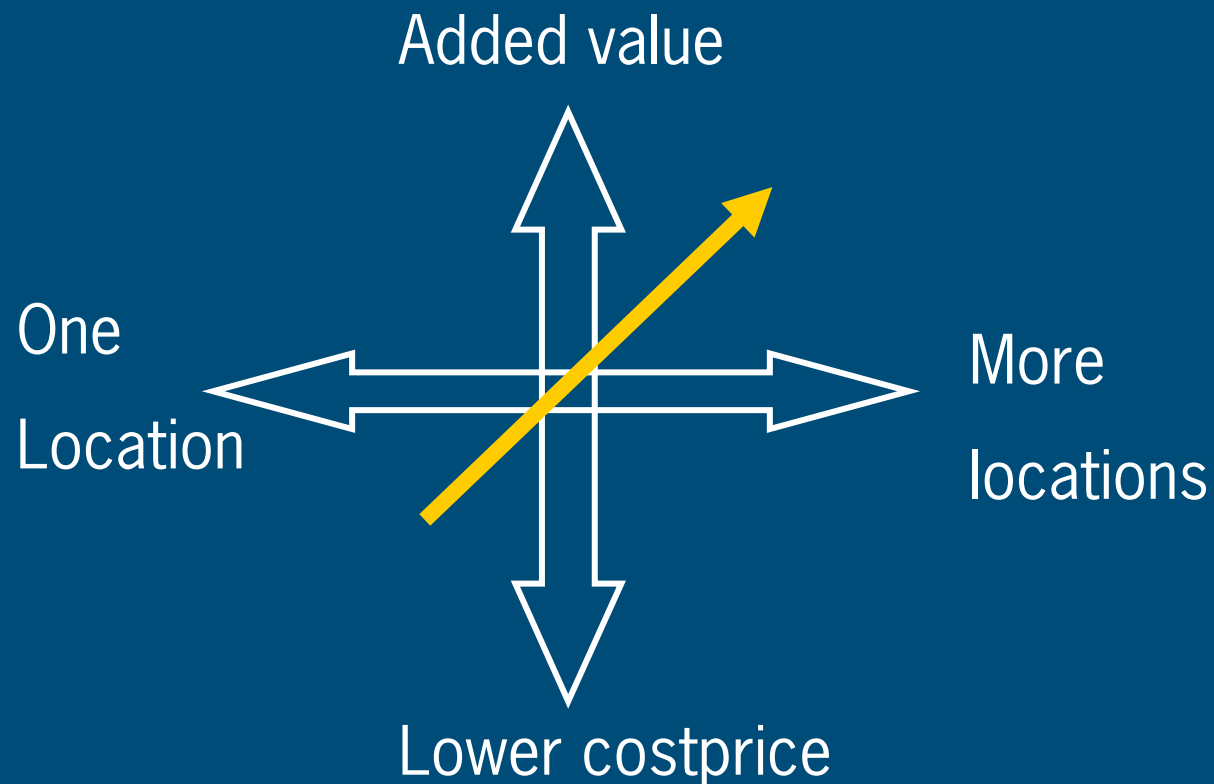
- Family herd in free walk barn on organic research farm Heino
- Comparison of different bedding packs on research farm Bosma Zathe
- Developing and demonstrate different roofs
- On farm research



Research centres



Work out (inter)national examples of Large farms
in each section



Advantage of pasture
...also in the stable...



Thank you for your attention.....

