

Innovations in Dairy



Regional Feed Centre, Bedded Pack Barns, Amazing Grazing

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Dairy farmer sells grass and maize to feed centre



...in container..



...truck picks up container...
Feed centre stores roughage...

First feed centre in Netherlands since 2010

2010/05/25



...and stores feed components..
and grain from arable farmers



...and makes total mixed ration (TMR)
...and delivers it to 3000 cows on 28 farms

Motivation regional feed centre

- Scaling up dairy farms reaches limits of labour and yard
- Lower costprice: 1,5 -3,5 € / 100 kg milk
- less problems with land at distance
- Opportunities for 'mixed farm' on regional level
- **Disadvantages**
 - More traffic
 - Less control of feeding

Energy use (MJ per 100 kg milk)

¹ **Direct energy**: use of fuels for transport and machinery and electricity

² **Indirect energy** : purchase of feed and fertiliser, feed storage

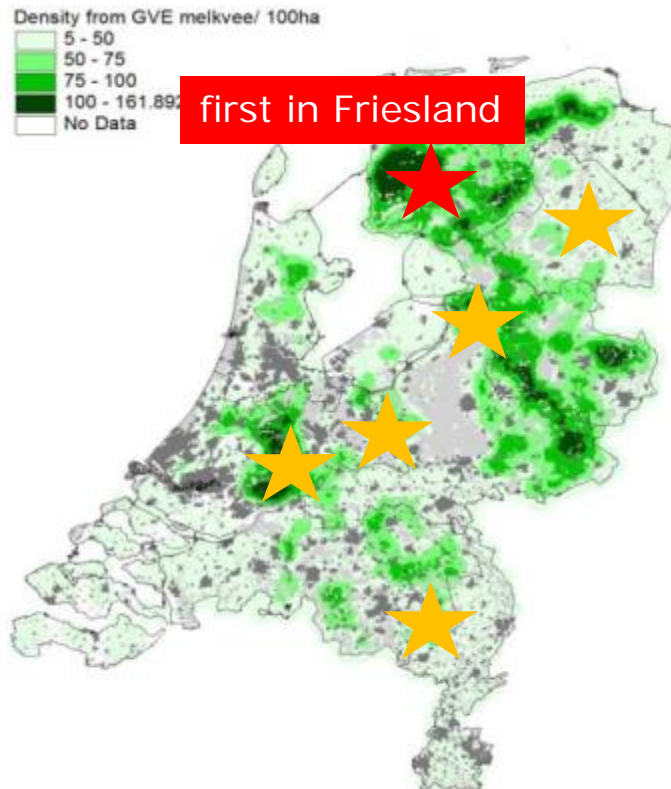
	Without feed centre	With feed centre
Dairy farms and roughage	270	226
Concentrates	183	72
Concentrate replacers	-	94
Feed centre	-	19
Total	453	410

9% lower energy use with feed centre



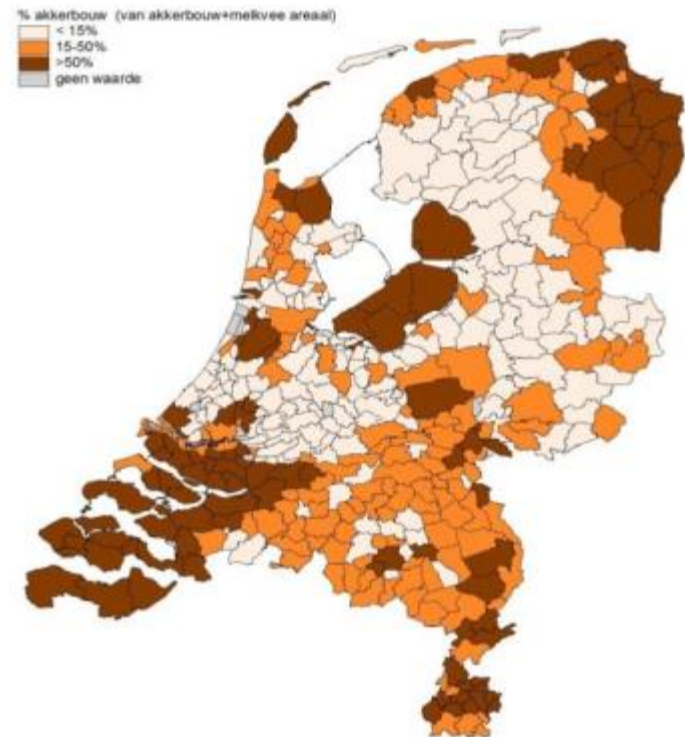
Hot spots for feed centre

Many cows per square km within 15 km



Ideas or initiatives

Many arable farmers within 80 km or ...



First impressions

- 5 of 28 farmers stopped
- Interesting for farms:
 - Small and large
 - 'low' feed efficiency
 - New
 - Willing to outsource feeding
- Make good contracts; arrange what can go wrong



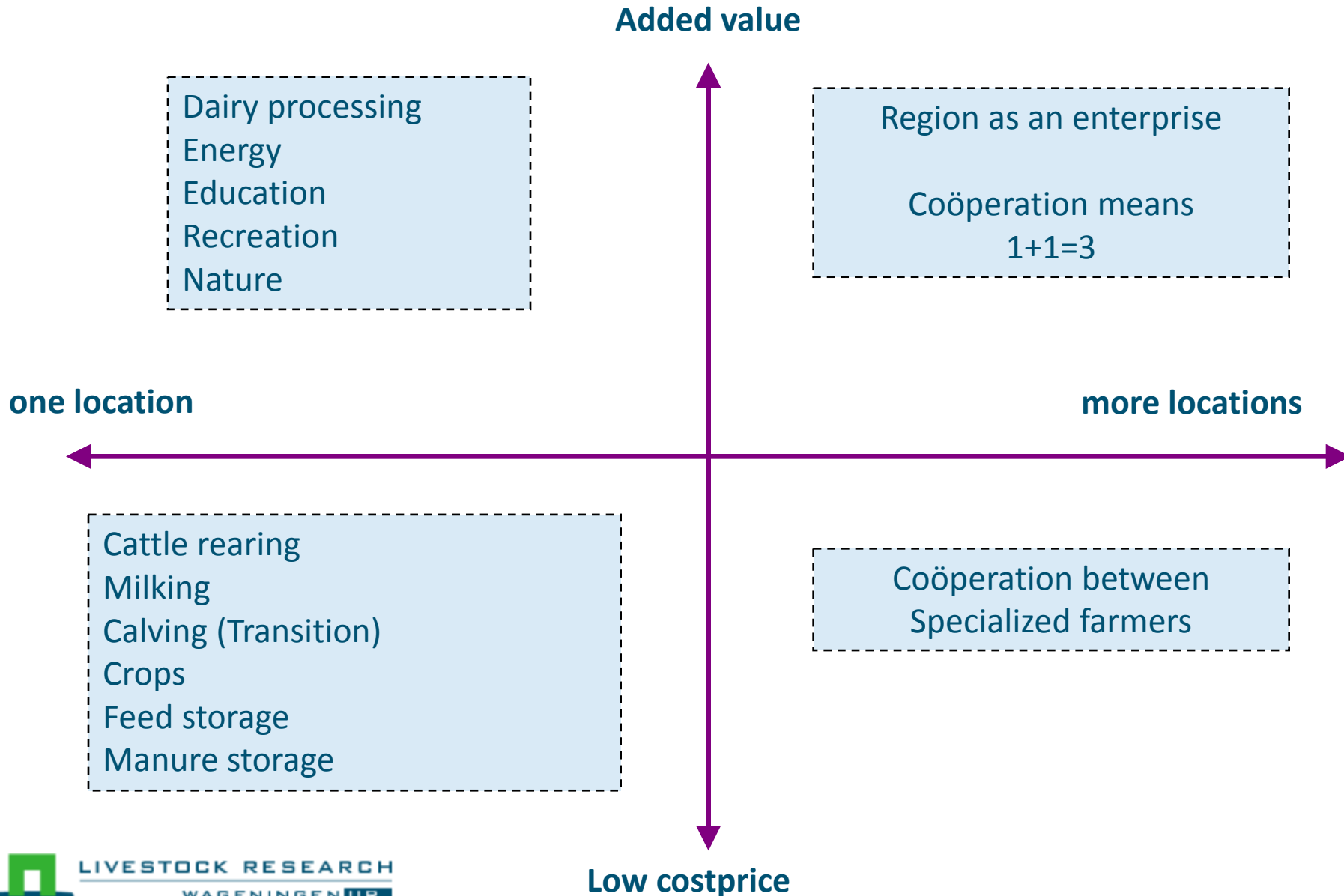
Mixed farm on regional level



- Closing mineral loops
- Using wastes or by-products of industry
- Reduce protein import
- Better use of manure



Directions for developments



Added value



One location



Regional cooperation
(mixed farm, agropark, food cluster)

More locations



All on one farm yard

Low costprice



Regional feed centre



Why bedded pack barns?



Freestall (with cubicles)



Bedded pack barn

Lie down



Lie down



Lie down



Lie down



Lie down



Lie down



Sustainability aspects

Drive of farmers

- Animal welfare, health and longevity
- Manure quality

Possible conflicts

- Emission (NH₃, N₂O, CH₄)
 - Milk quality
 - Landscape
- Government
Dairy Industry
Local government

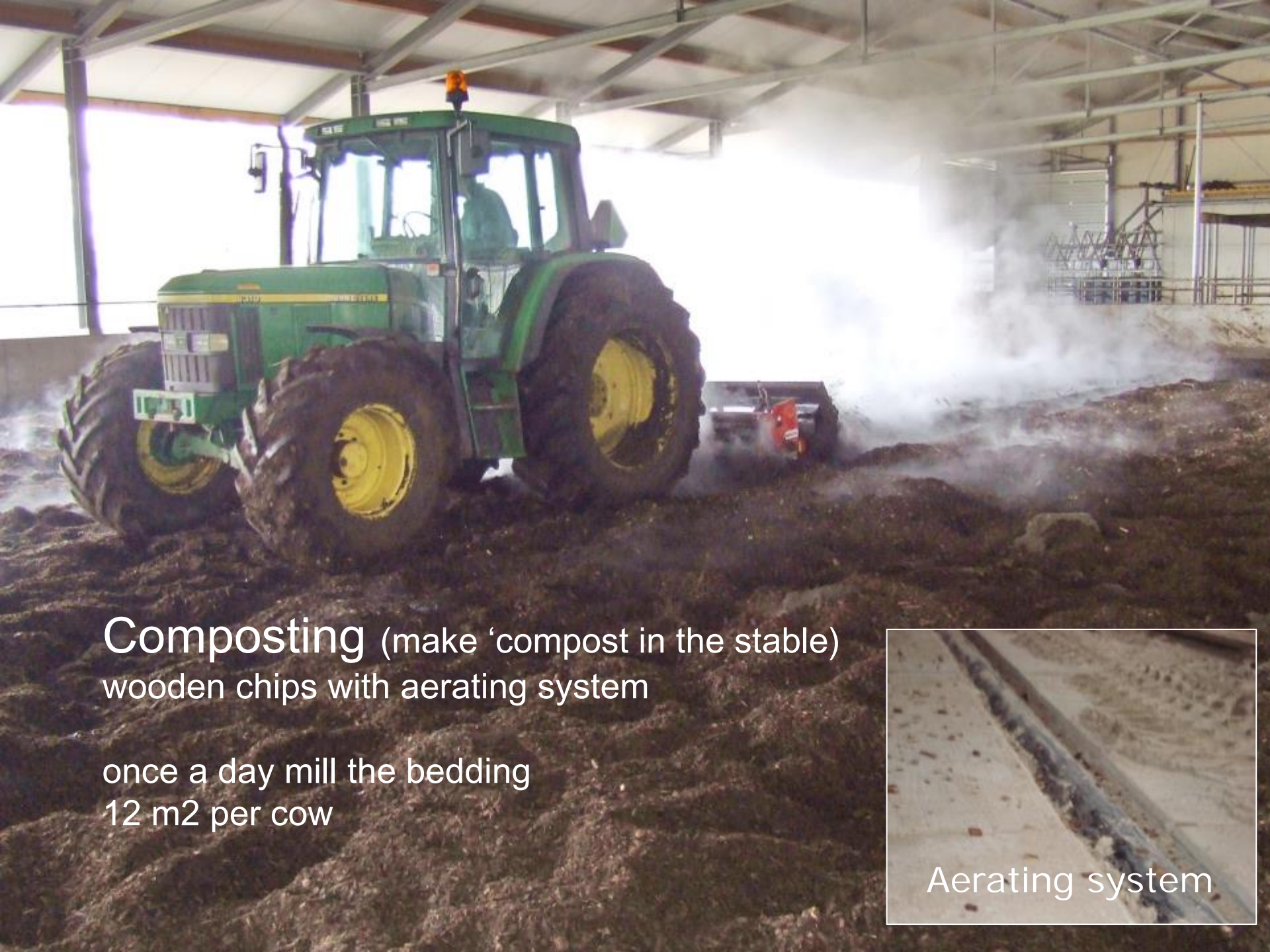


USA: Composting wooden chips and sawdust

Twice a day cultivate the bedding
7 m² per cow bedding

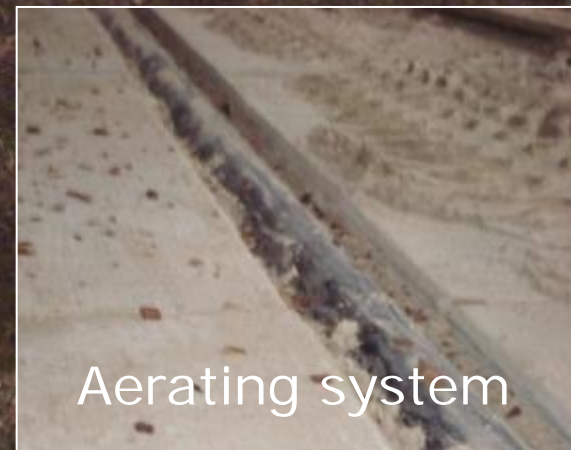


Israël:
bedding of dried manure
20 m² per cow



Composting (make 'compost in the stable')
wooden chips with aerating system

once a day mill the bedding
12 m² per cow



Aerating system



After 10 to 12 months
wooden chips
is like 'compost'



Wooden chips



‘Compost bedding’
(buy compost)
10 m² per koe



50% ‘compost’
50% slurry

Bedding material used on grassland and arable land





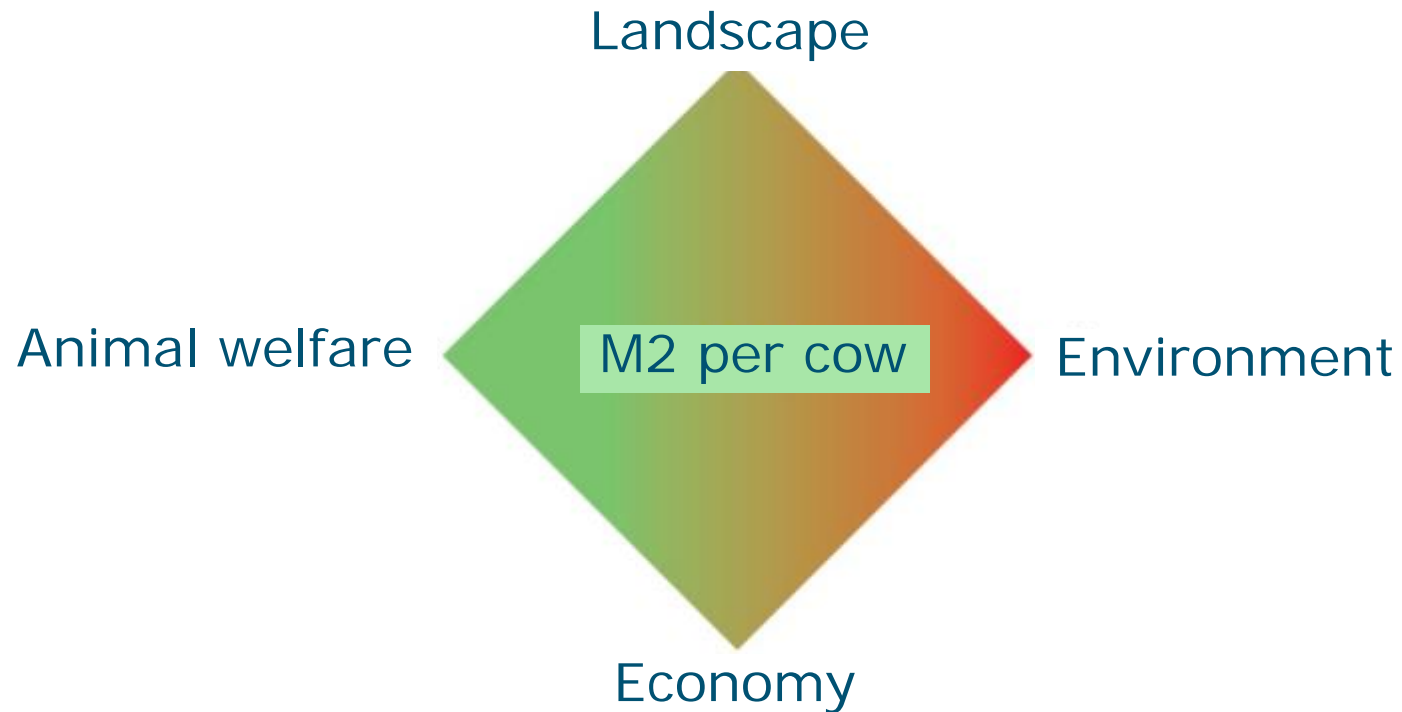
'Compost bedding'
(100% 'compost')

Green house, mobile feed mangels
25 m² per cow
no feed alley



Fertilizer pellets

Drivers and conflicts



Economics bedded pack barns

	Bedded pack barn vs freestall
Investment manure storage	-
Investment roof	++
Total investment	+
Yearly costs stable and bedding	+
higher production per cow	+
lower replacement	--
Total yearly cost	-



Nitrogen losses

Bedded pack barn vs freestall	
stable	++
land	-
total	+



Disc injection reduces 70% ammonia



Spreading 'compost' no emission

Measuring emission of ammonia and green houses gasses



NH₃

N₂

N₂O

CH₄

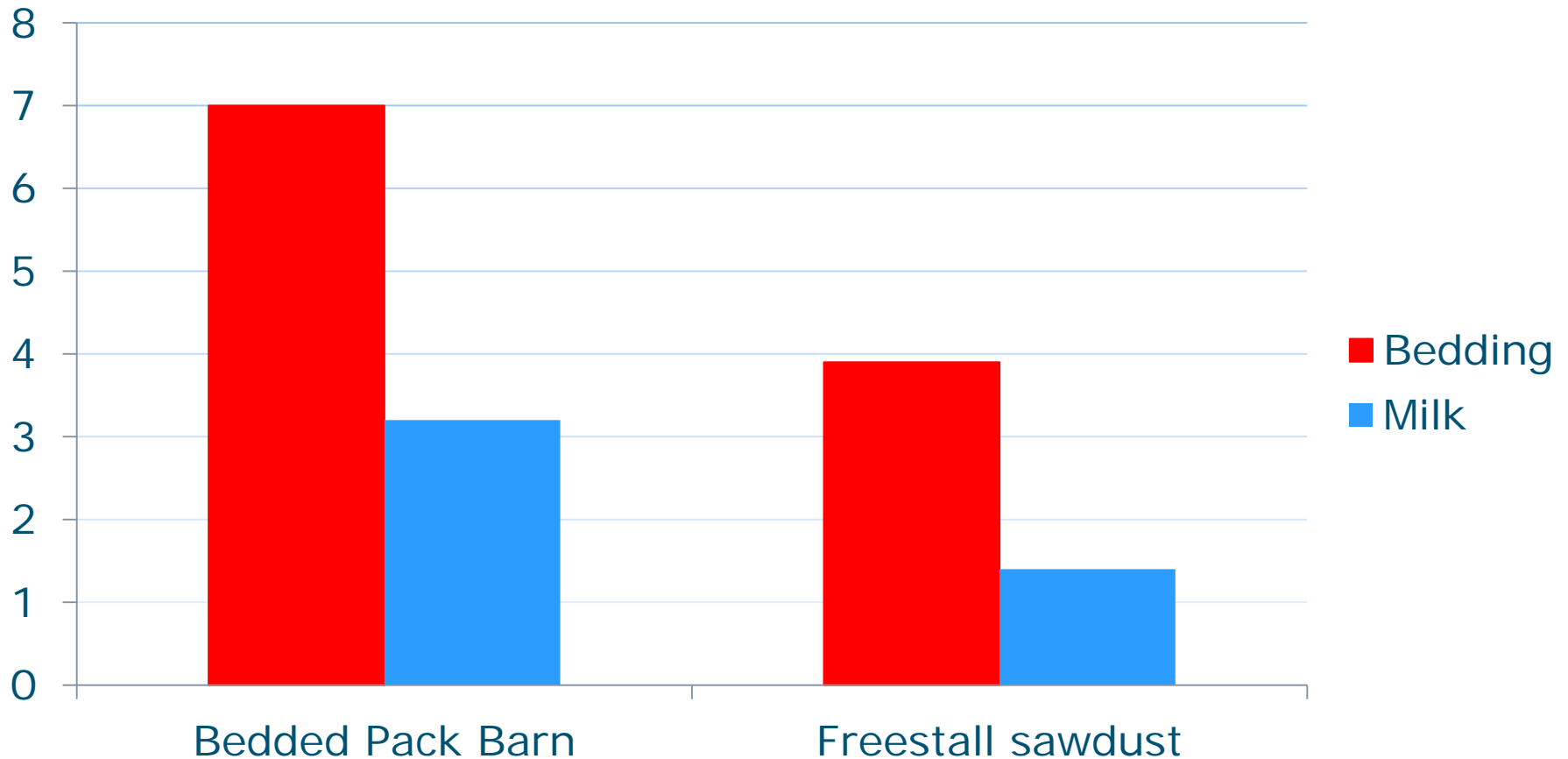
Animal welfare

	Bedded pack vs freestall
Time required to lie	+
Hygiene	0/+
Condition score	0
Skin injuries	++
Legs and claws	+
Natural behaviour	+



Thermofiele bacteria

log cfu / gram bedding and log cfu / liter milk



Example of landscape



Overall sustainability

Bedded pack vs freestall	
DRIVERS	
Animal welfare and health	+
Manure quality: organic matter	+
Manure quality: availability nitrogen	-
Economics: stable and bedding	-
Economics: longer life	+
CONFLICTS	
Ammonia emission: stable	-
Ammonia emission: land	+
Milk quality	-
landscape	+ / -



Why Amazing Grazing?

- Decline of grazing cows
 - Large herds
 - Milking robots
 - Control high production
- Need for innovations
 - Tools to support management
 - Farming systems (low cost and high tech)
 - Techniques

90% grazed in 2010

75% grazed in 2011 and 2012



1. Pasture based farming systems

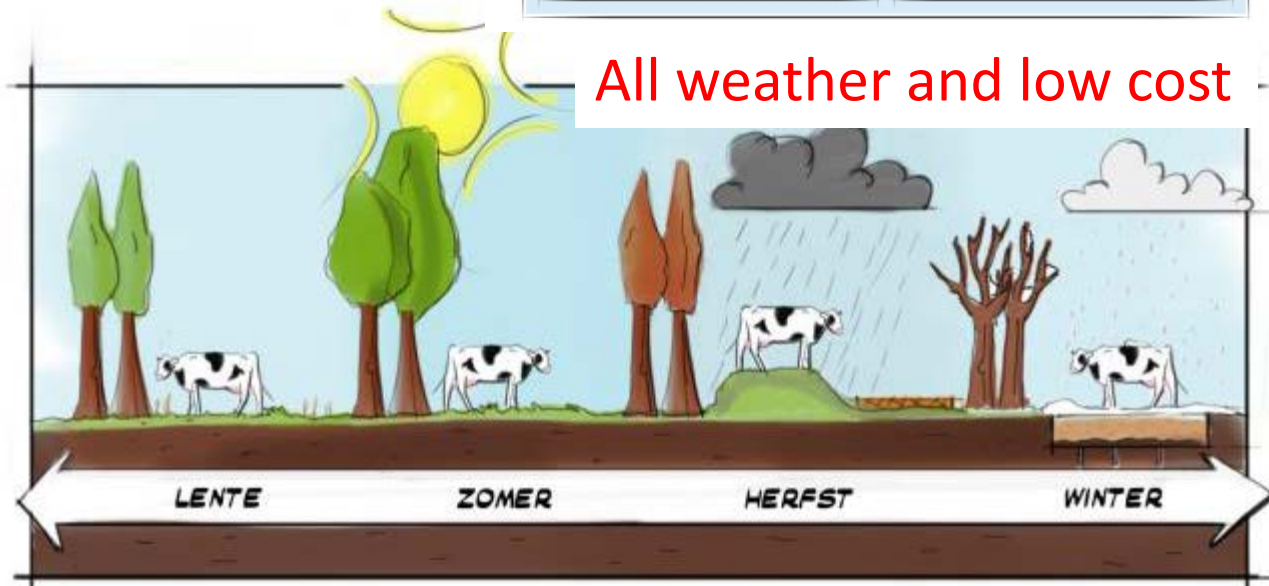


Calving season

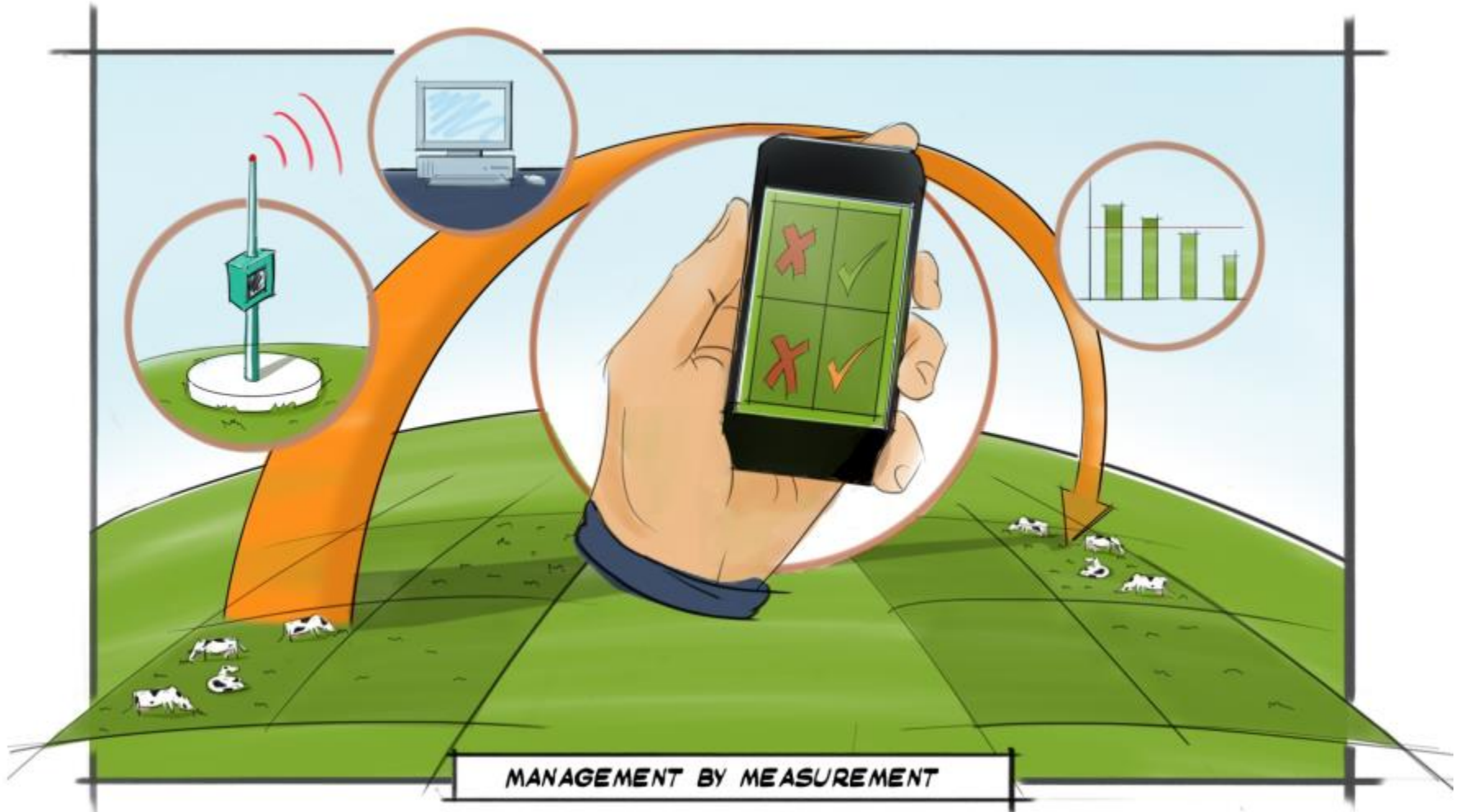
Milking robots and large scale



All weather and low cost

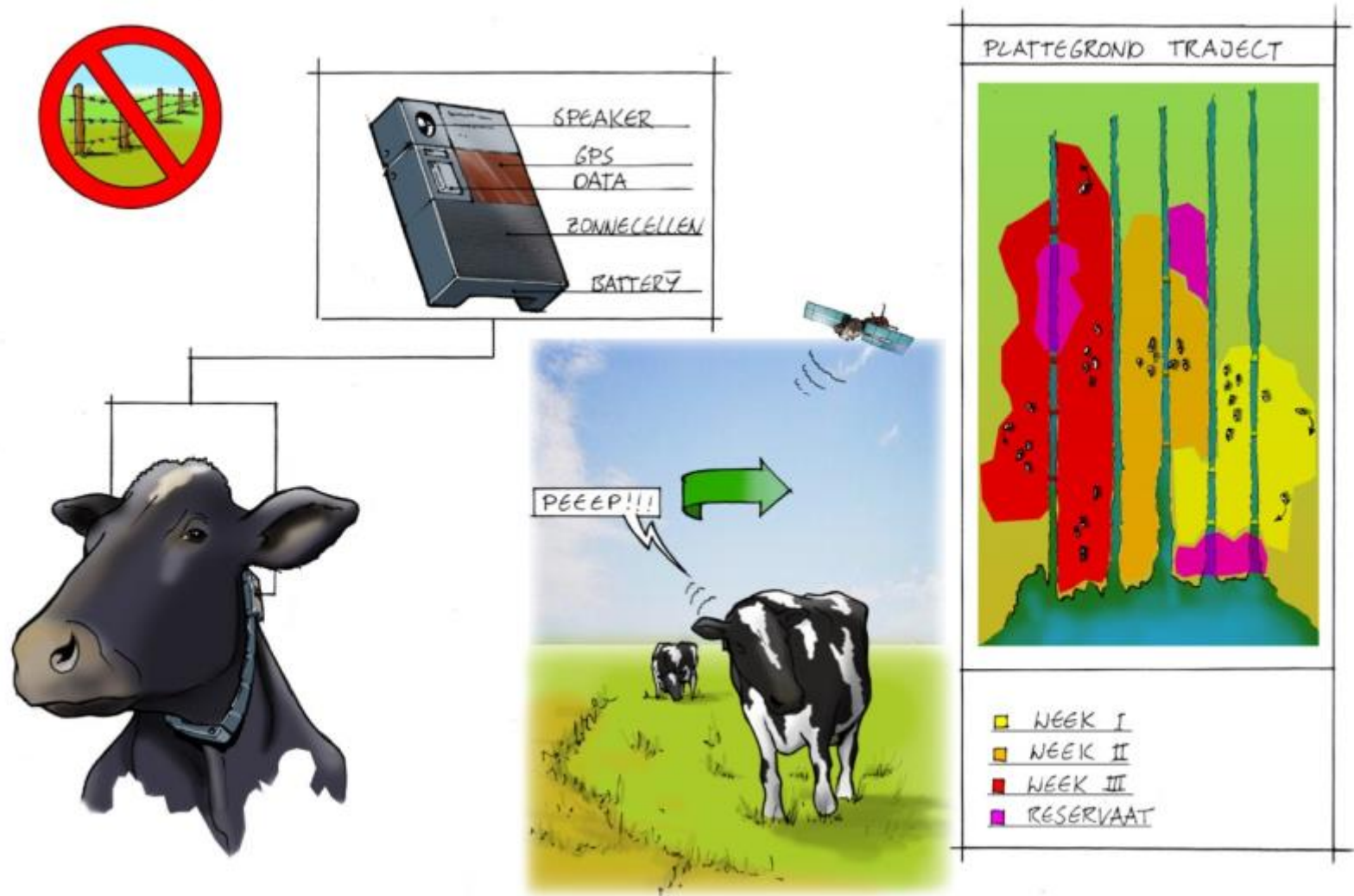


2. Management by measurement



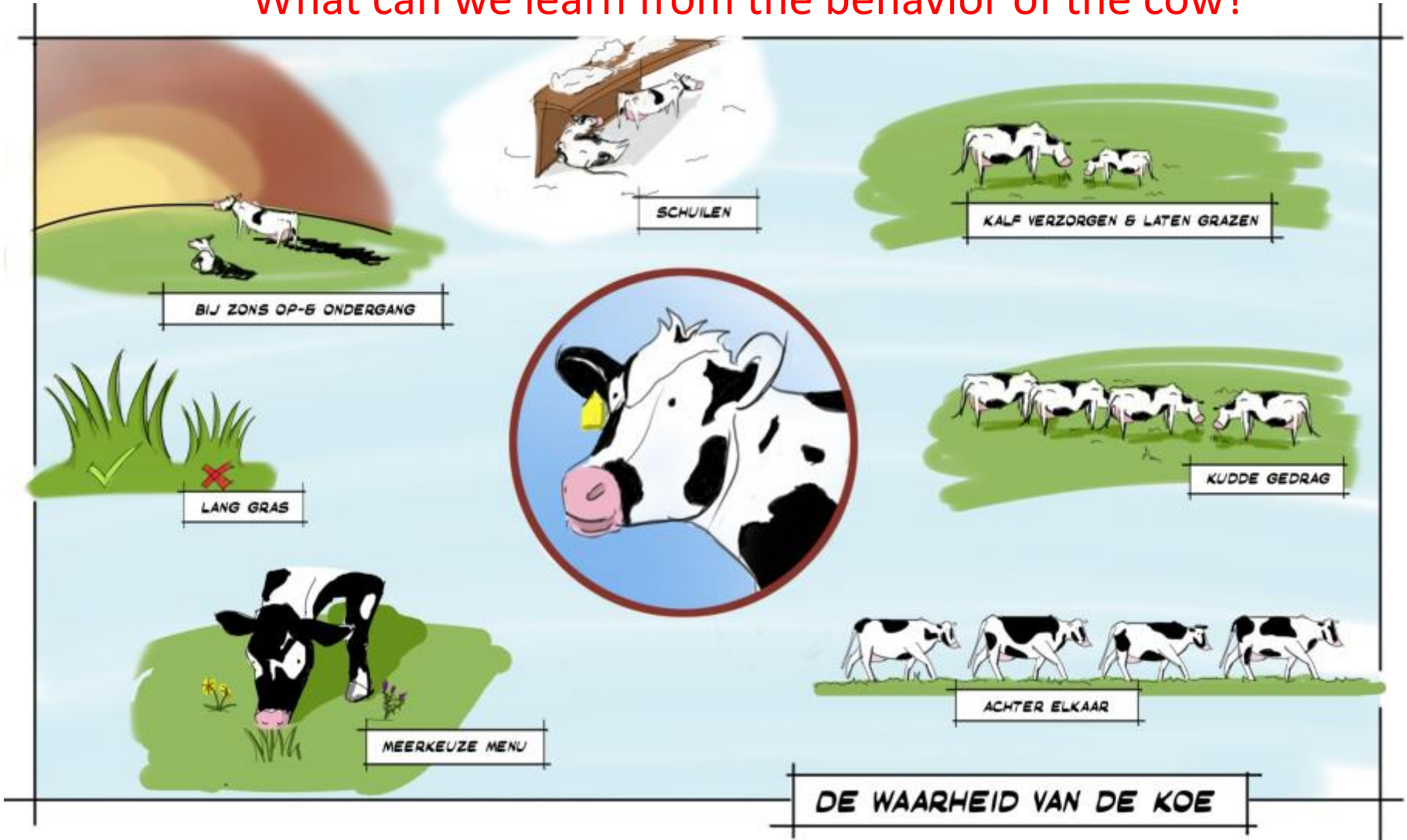
3. Auto Border Collie

(Virtual Electric Fence)



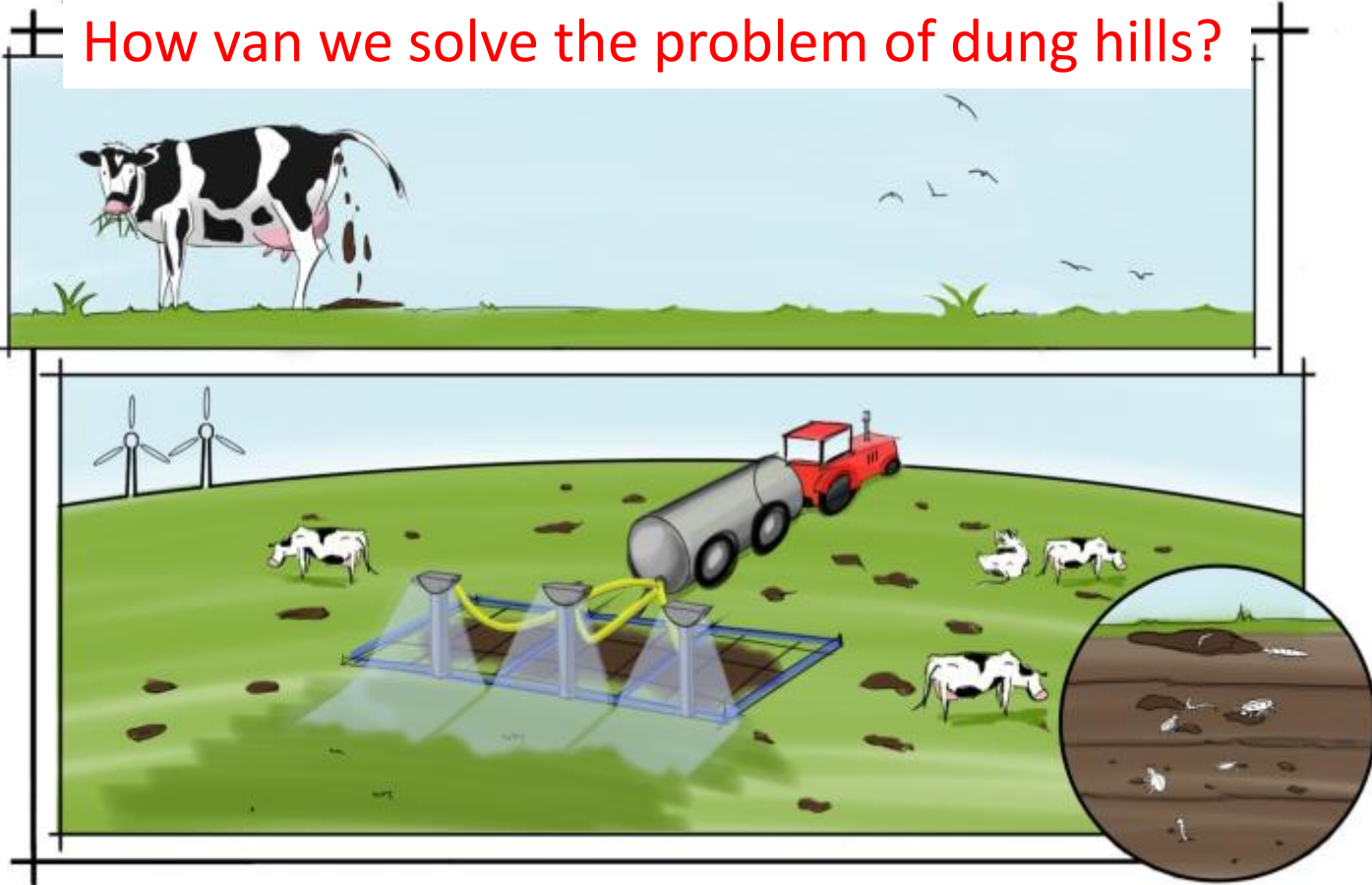
4. The truth of the cow

What can we learn from the behavior of the cow?



5. Pasture cleaner

How can we solve the problem of dung hills?



Points to continue

- Regional feed centre
 - part of 'mixed farm' or 'food cluster' in region

- Development bedded pack barns
 - bedding materials and management in different climates
 - synthetic floors
 - sustainability

- Amazing grazing
 - Decision support Tools
 - Farming systems: low cost and high tech



More information

www.voercentrum.nl

www.vrijloopstallen.nl

www.amazinggrazing.eu



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Thanks
for your attention

Innovation starts with imagination