

Prospects for bedded pack barns for dairy cattle

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Dairy farm systems

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housing



LIVESTOCK RESEARCH
WAGENINGEN UR

Topics

1. Why?
2. Overview research
3. Results
 - aspects sustainability
 - ammonia emission
4. Examples farms
5. Economics



Why?



- Better animal welfare and health
- Better quality manure

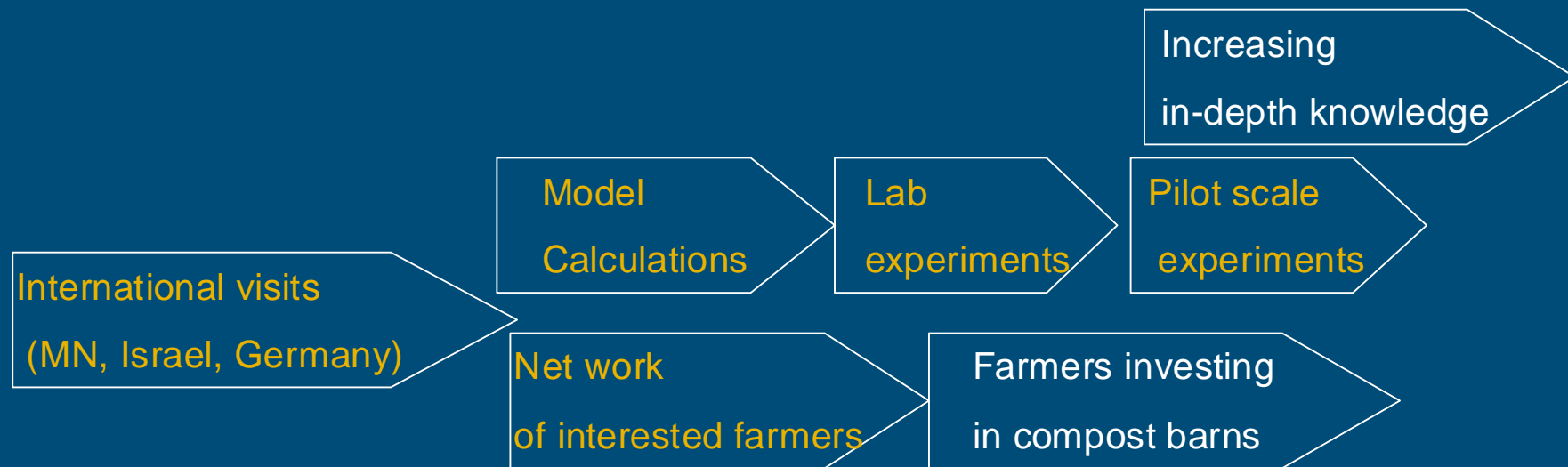
Challenge

Increase sustainability of dairy farms

- Animal welfare and health
- Environment
 - Emission of ammonia and green house gasses
 - Soil fertility
- Landscape
- Food safety
- Economics



Overview loose housing research Netherlands





bedding of dried manure Israel

20 m² per cow



60% of manure on bedding

Minnesota (USA)

40% manure



Twice a day cultivate the bedding
7 m² per cow bedding

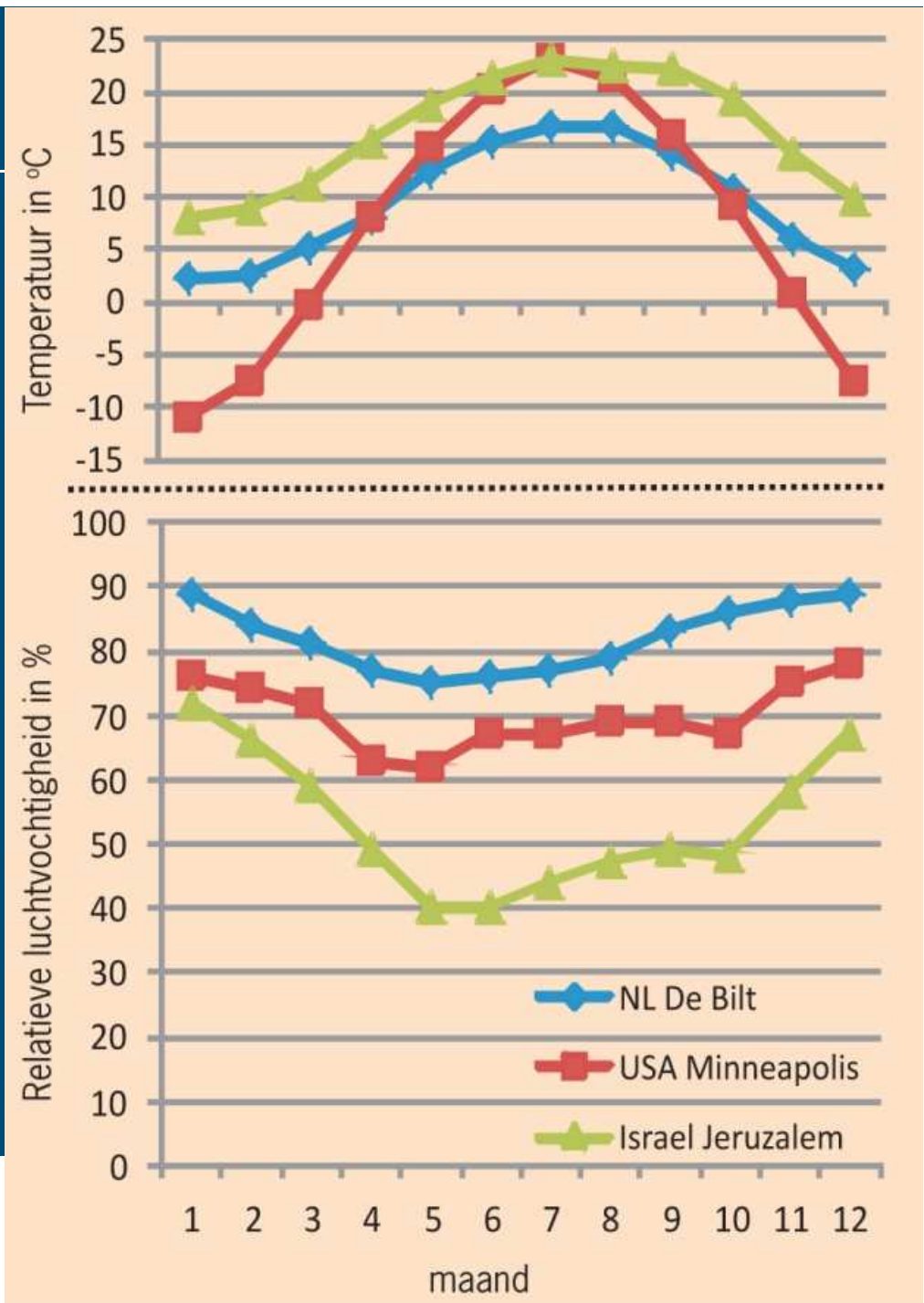
Evaporation moisture

Temperature and humidity

- Netherlands
- USA
- Israel

A cow produces

65 liter urine and
moisture of faeces

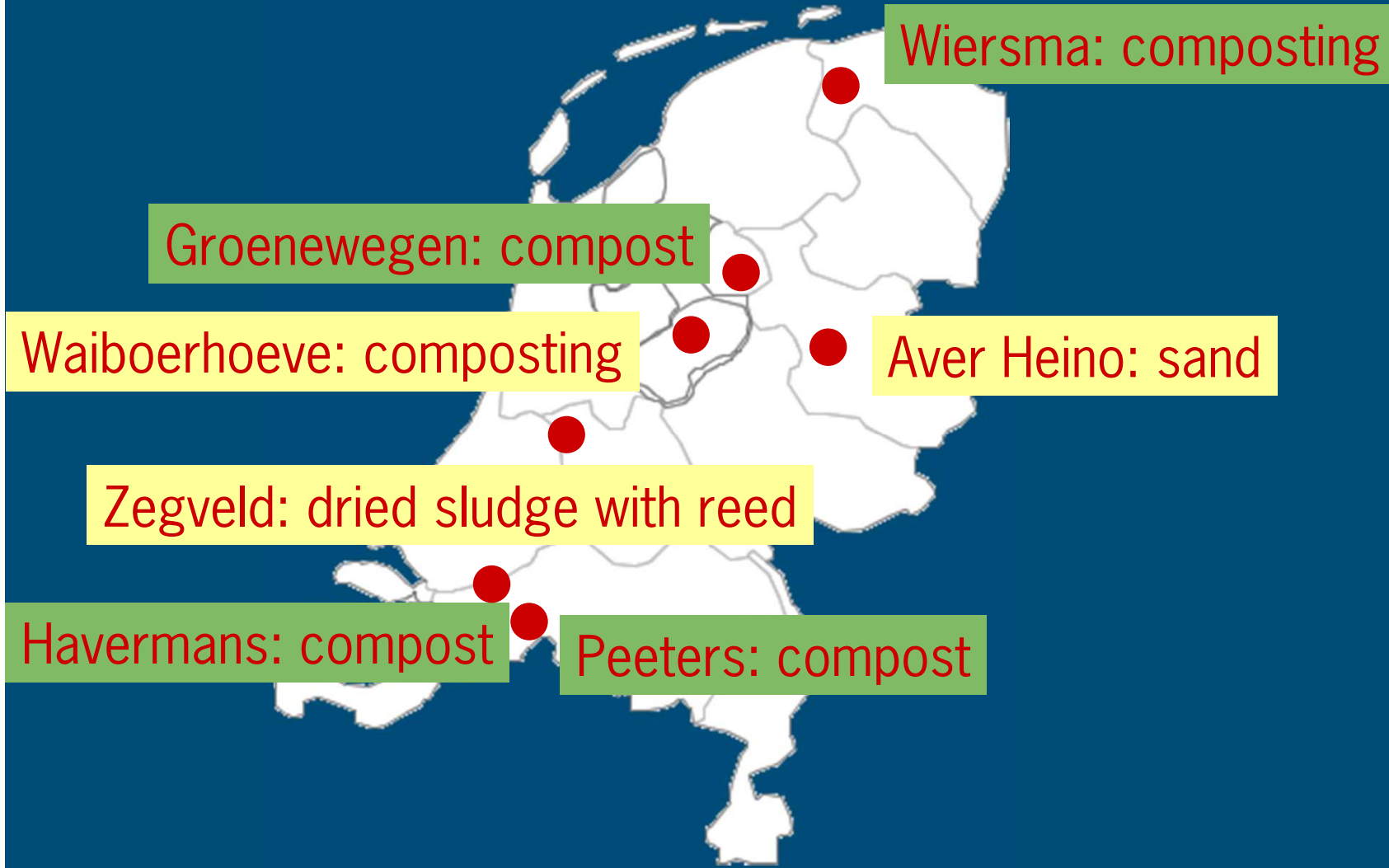


Background choices of bedding on research farms

	Material	Moisture	Nitrogen
Sand	Lavalith and sand	Draining	Seperate
Composting	Wooden chips and sawdust	Evaporation	Fixing on Carbon
Clay	Clay and reed	Absorb	Fixing on Carbon



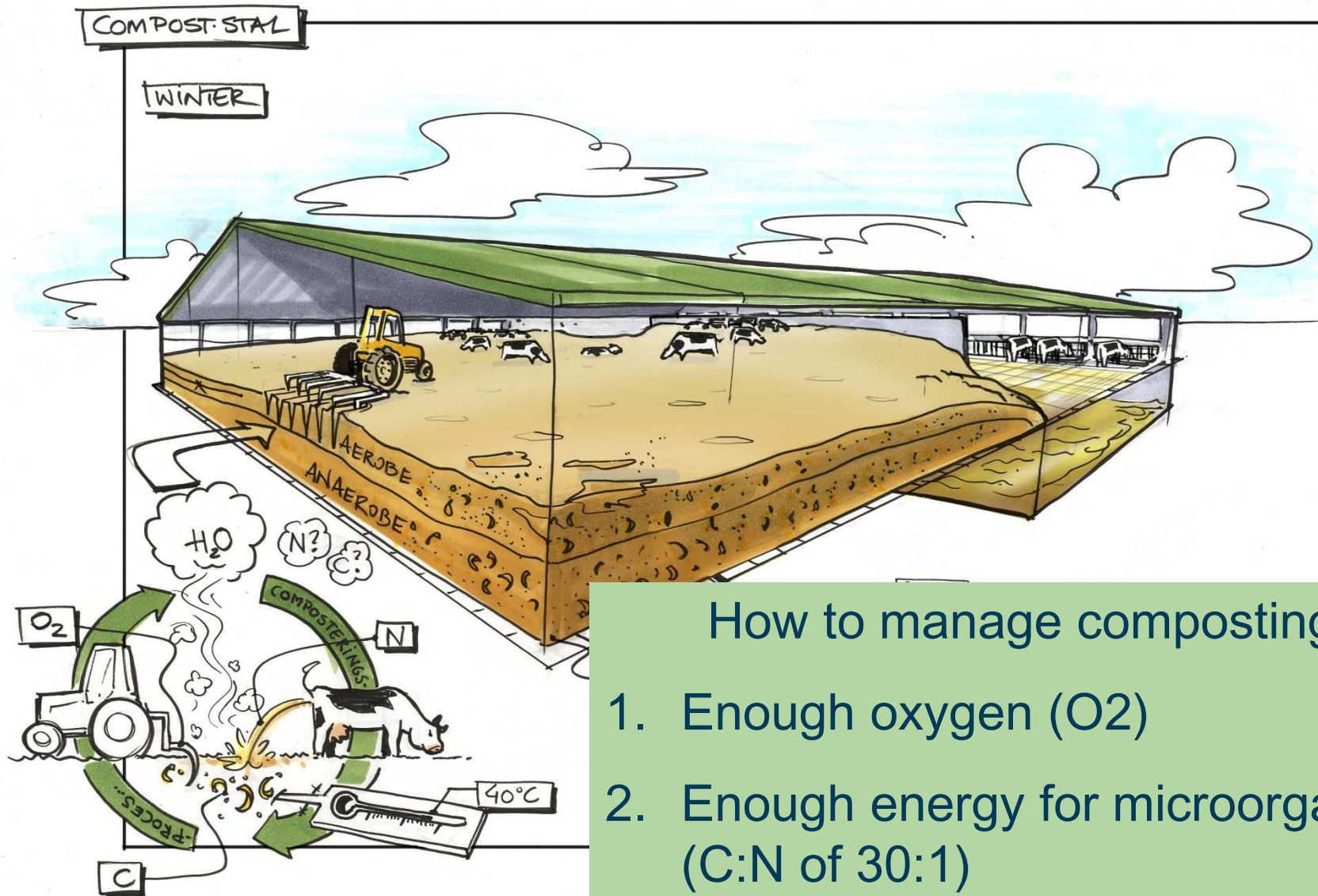
Experiences with loose housing



Sand Aver Heino



Sand does not drain urine enough



How to manage composting?

1. Enough oxygen (O₂)
2. Enough energy for microorganism (C:N of 30:1)
3. Not too dry, not too wet



Sludge (dried soil from ditches) and reed

Zegveld





Greenhouse



Zegveld

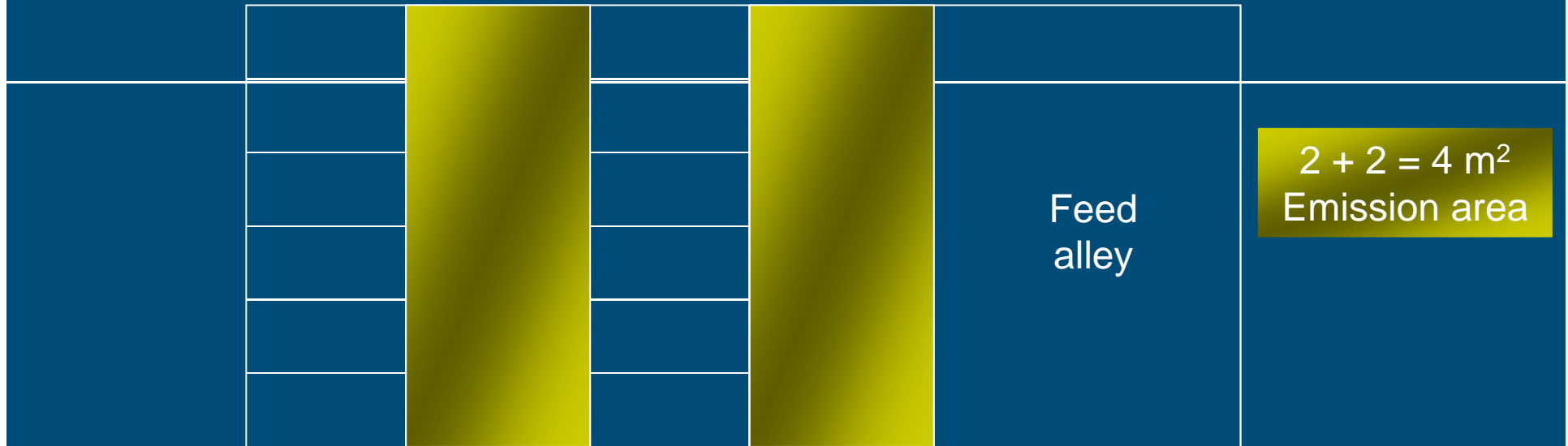
Bedding of clay ground and reed

Cows are too dirty

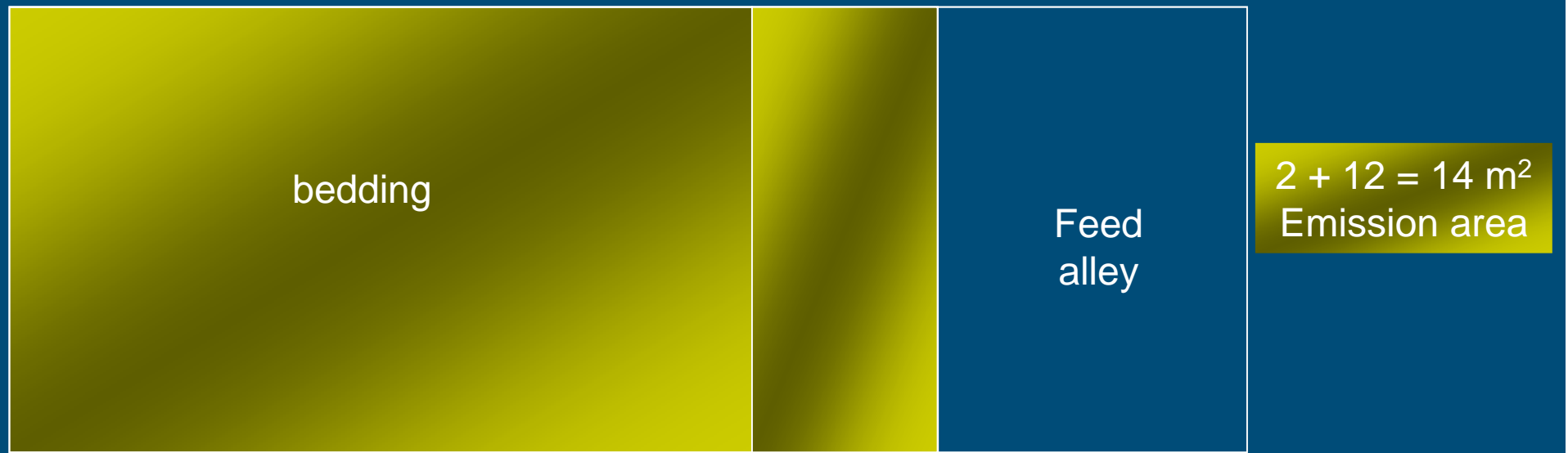
Measuring ammonia and green house gasses



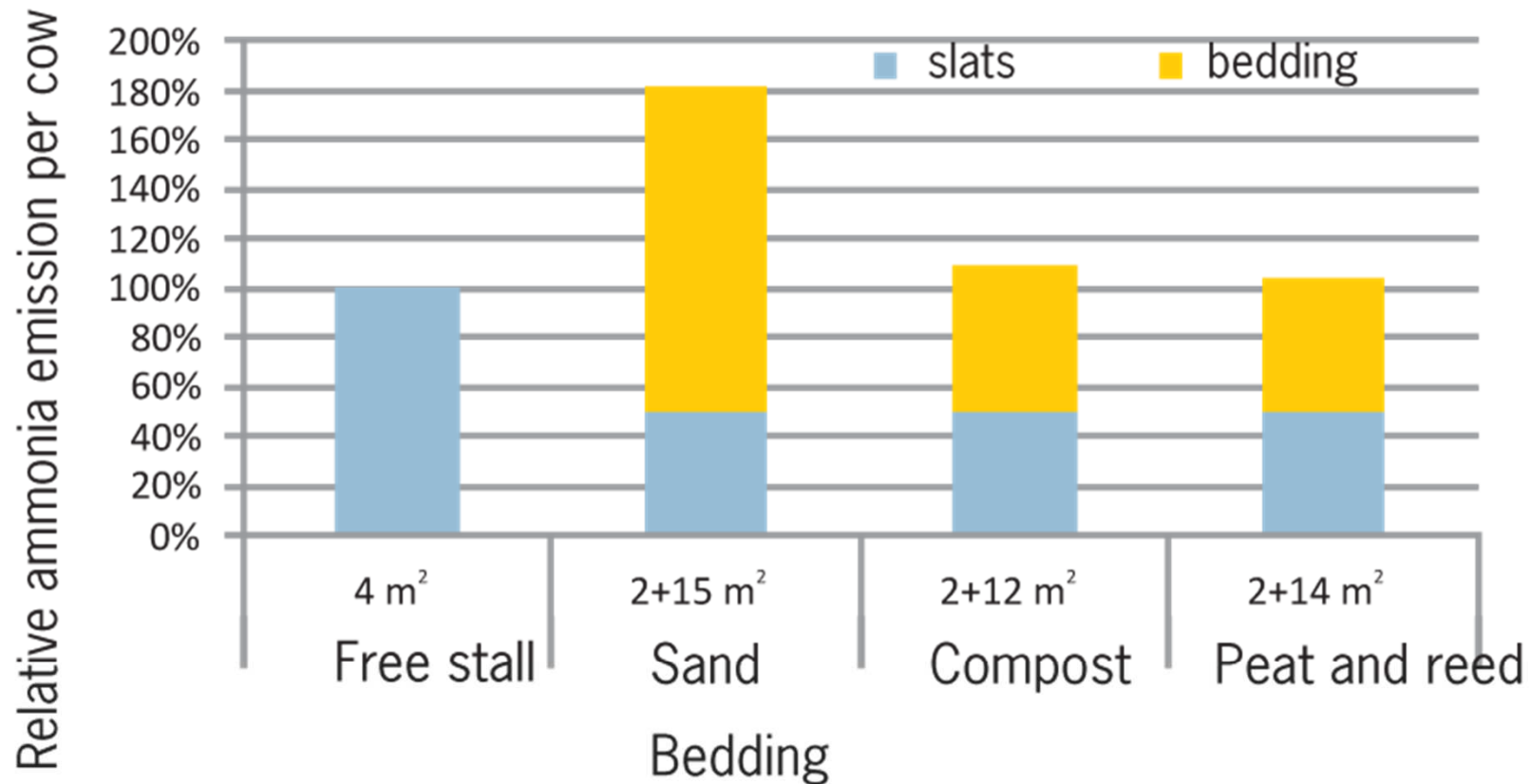
Freestall with cubicles



Loose housing



Ammonia emission per cow (compared to freestall)



Ammonia emission per cow of area in the bedded pack barn against the free stall barn.



Practical farms





1100 m² with wooden chips and aerating system

For 70 cows

15 m² per cow



Composting = making compost in the barn

50 to 55 degrees celsius inside bedding

Whole bedding is mostly aerobic

15 m² per cow, 8 m² per cow is possible



Once a day mill the bedding



Cows are clean
11000 kg milk per year
Low somatic cell count



Machine to spread compost
with manure on the field



Compost bedding =
buying compost from factory

Green house, mobile feed mangels

25 m² per cow

no feed alley



Mobile feeding



1/3 shadow is possible



... I am learning every day.....



Fertilizer pellets

Economics bedded pack barns

	Free stal	compost	composting
Bedding area per cow (m2)	3	15	8
M2 per cow stable	9.3	19.3	12.2
Investment per cow	€ 3000	€ 3100	€ 2580
Yearly cost per cow	€ 385	€ 472	€ 371
Difference		€ + 91	€ -14
Bedding material (€)	€ 20	€ 75	€ 40
Bedding material (m)		0,5	1,0
Price bedding material (€/m3)		€10	€ 5



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A scenic landscape in the Netherlands. In the foreground, a paved path leads away from the viewer, flanked by a grassy bank and a canal. To the left of the canal, several cows are grazing in a lush green field. In the distance, a city skyline is visible under a dramatic, cloudy sky. Two people are riding bicycles on the path, moving away from the viewer.

Thanks for attention....

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