

Innovative housing for dairy cows

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Topics

- Research Bedded pack barns (Freewalk)
- Ongoing research alternative floors
- Designs with stakeholders



Why Free Walk (Bedded Pack Barns)?



Labour efficiency



Animal welfare and
manure quality



Monitoring 10 commercial farms

(5 wood chips, 4 compost, 1 straw)



Aerating wood chips



Compost



Straw



Bedding material used on grassland and arable land



Roof from horticulture



Farm characteristics

	1	2	3	4	5	6	7	8	9	10
Number of cows	60	130	50	105	75	55	185	80	15	65
M2 per cow	16	15	13	14	10	22	27	9	20	11
Bedding material	W	W	W	W	W	C	C	C	C	S
Aeration	B	B	S	S	N					
Milking system			AMS	AMS		AMS	AMS	AMS	AMS	
Grazing	No	Yes	Yes	No	No	Yes	No	No	No	Yes

Bedding material

W = wood chips

C = Compost

S = Straw

Aeration system

B = blowing air

S = sucking air

N = no aeration



Overall sustainability

Sustainability aspect	Criteria	Wood chips 5 farms	Compost 4 farms	Straw 1 farm
Economics	investment			
	Yearly costs			
	longevity			
Cow	Production, health			
	Welfare			
Milk quality	XTAS		Prohibited	
Environment	N losses stable			
	N losses land			
	Ammonia emission stable	2 farms and Dairy Campus		
	Nitrous oxide emission			
Manure Quality	Soil Improver			
	N mineralisation			

	better
	attention needed
	worse

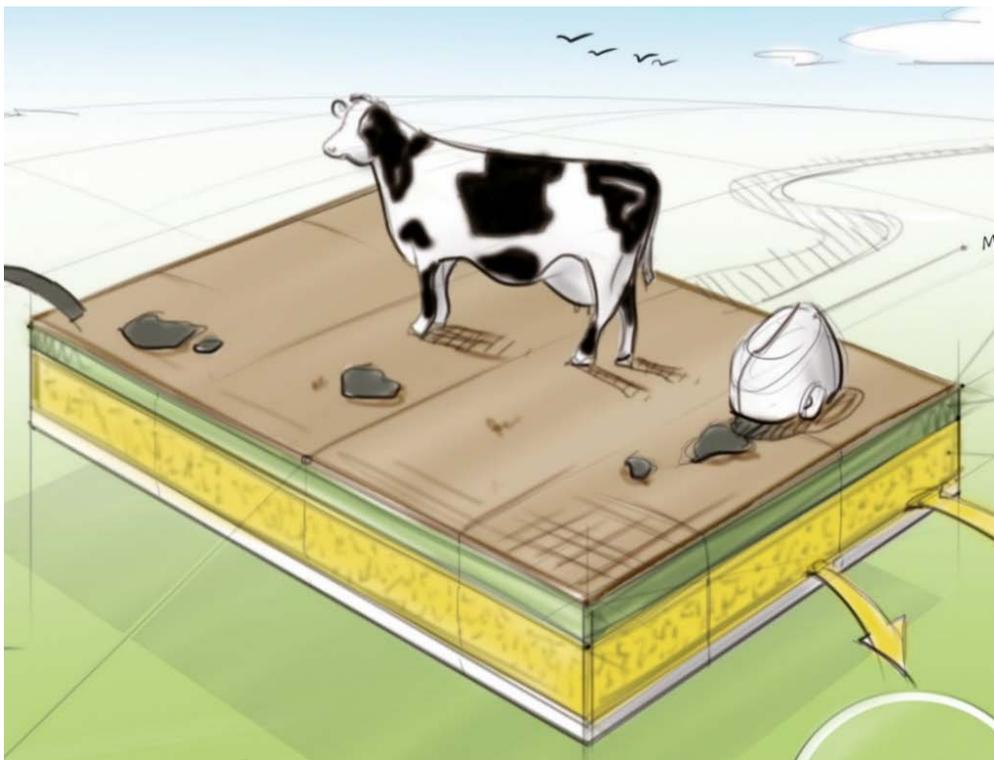




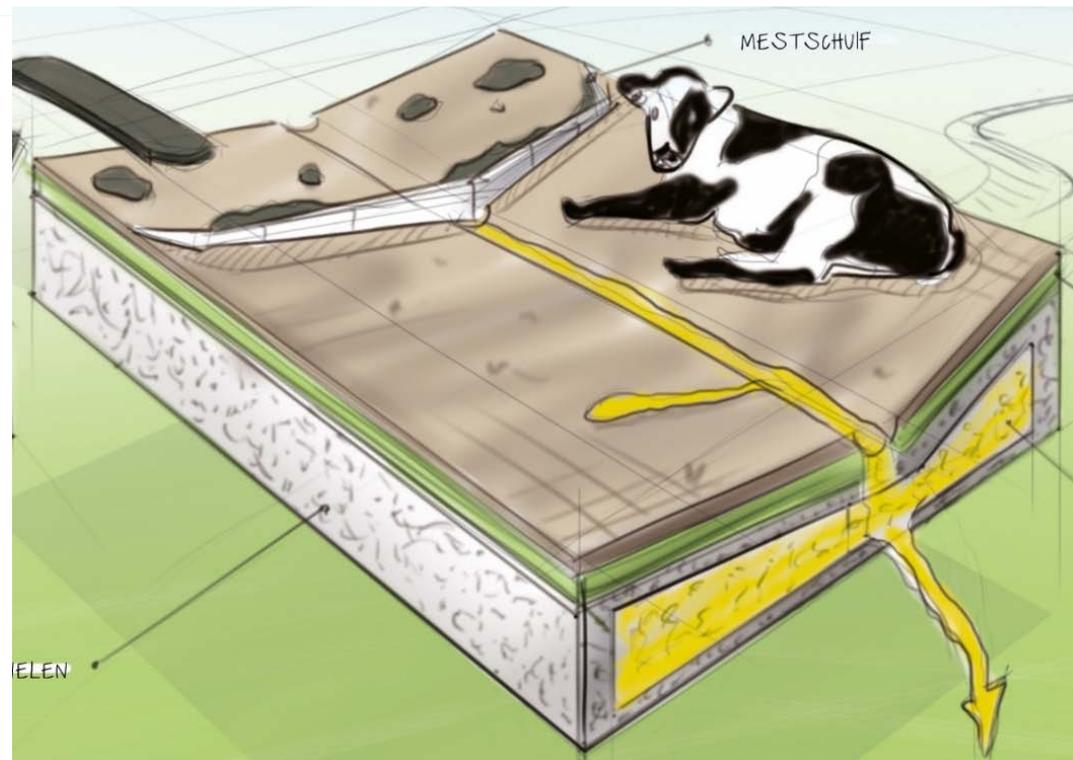
Change of bedding

Use of compost is prohibited, now straw

New floor types (Artificial floor); ongoing research



Permeable floor



Rubber floor



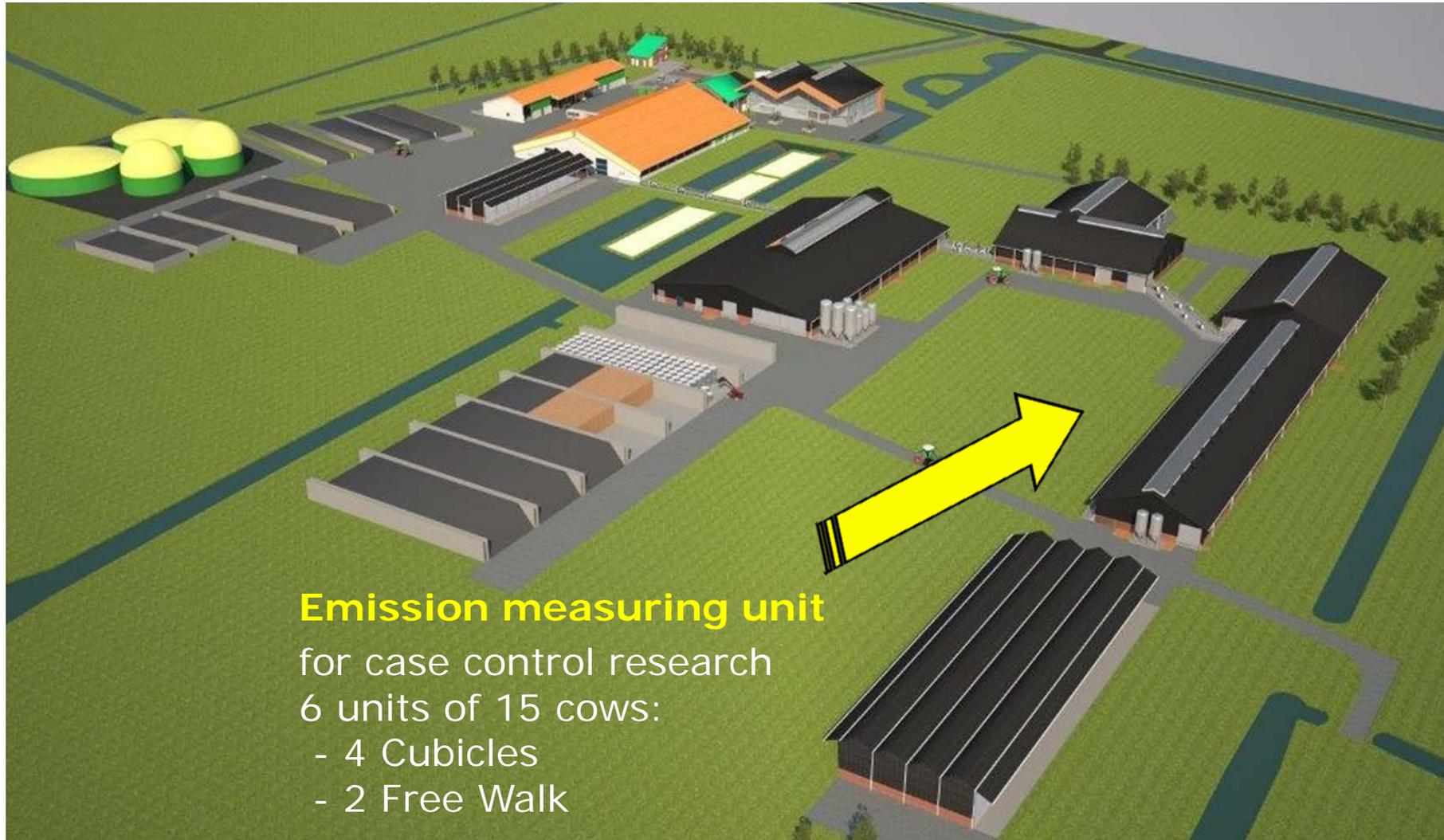
High welfare floor (permeable floor)





Cowgarden

Dairy Campus facilities; different floor types



Emission measuring unit

for case control research

6 units of 15 cows:

- 4 Cubicles
- 2 Free Walk





Measuring ammonia emission wood chips Freewalk



...in consultation with companies
for better floor and manure robot...

Meadow floor



...to reduce ammonia emission while improving cowmobility..



aerating



...to mix slurry and reduce ammonia emission...



Other designs

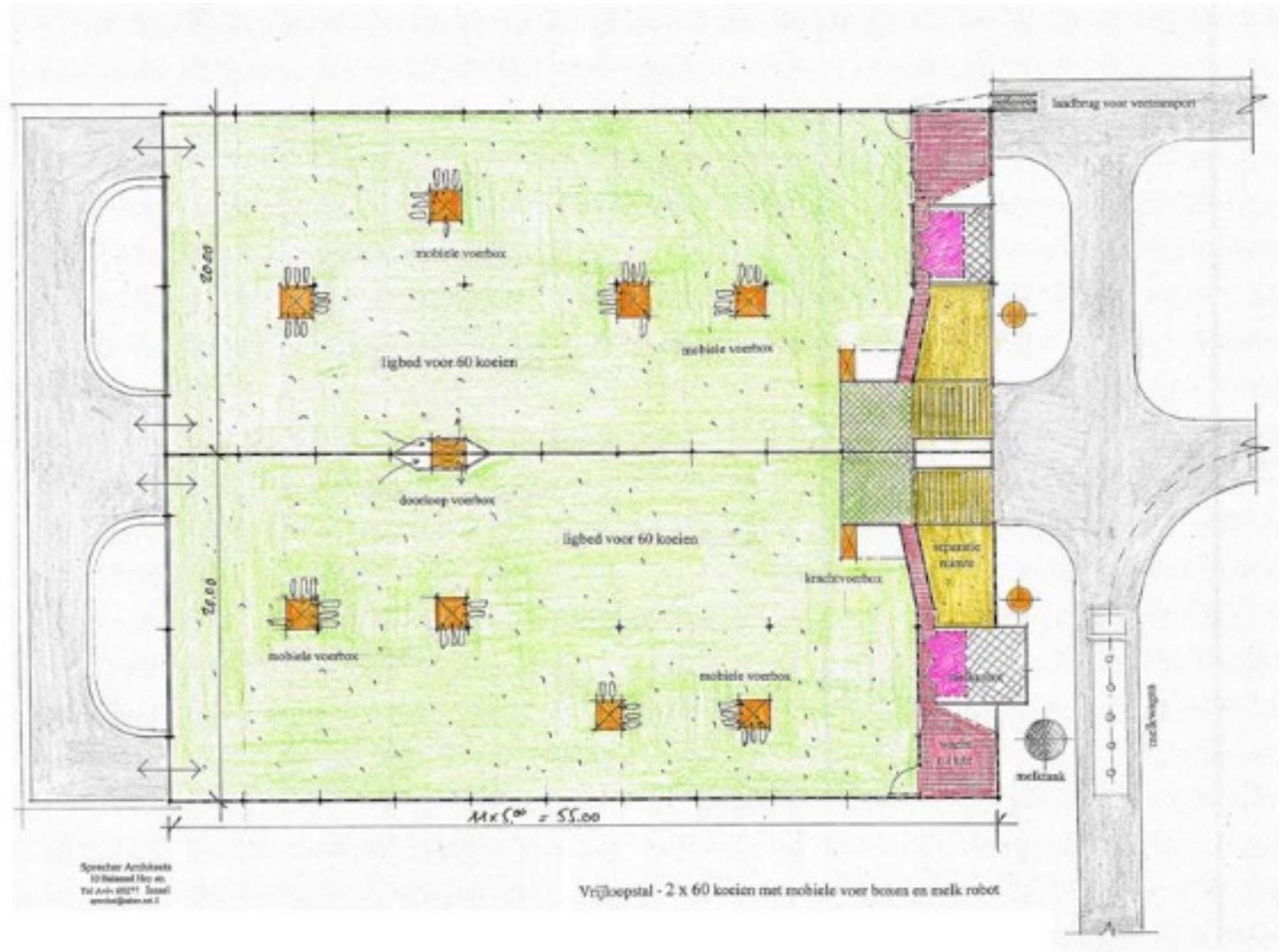
➤ Freewalk

➤ Family herd

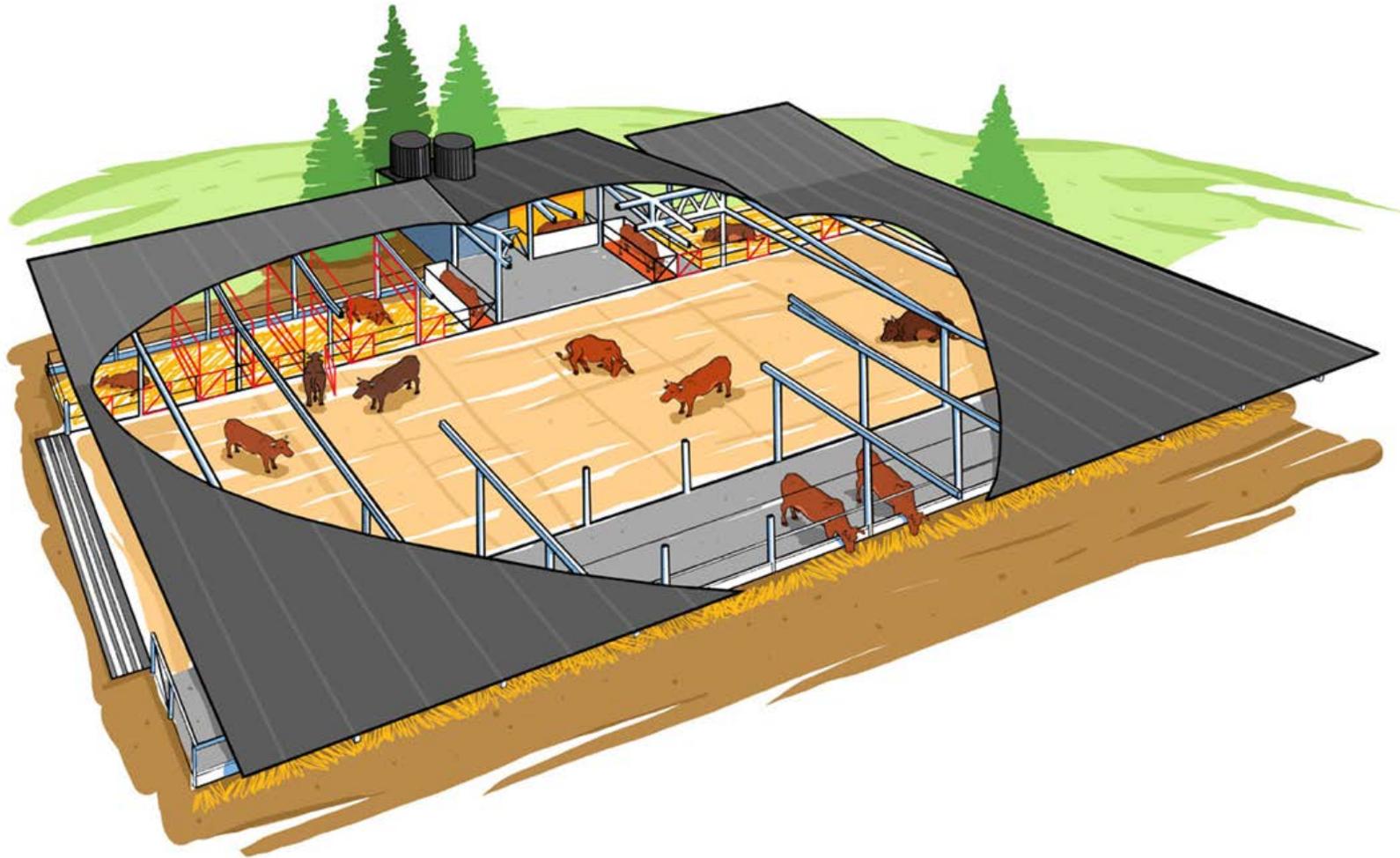
➤ More space



Freewalk with mobile feeders



Barn design for family herds





Milking cow



Pregnant young animal



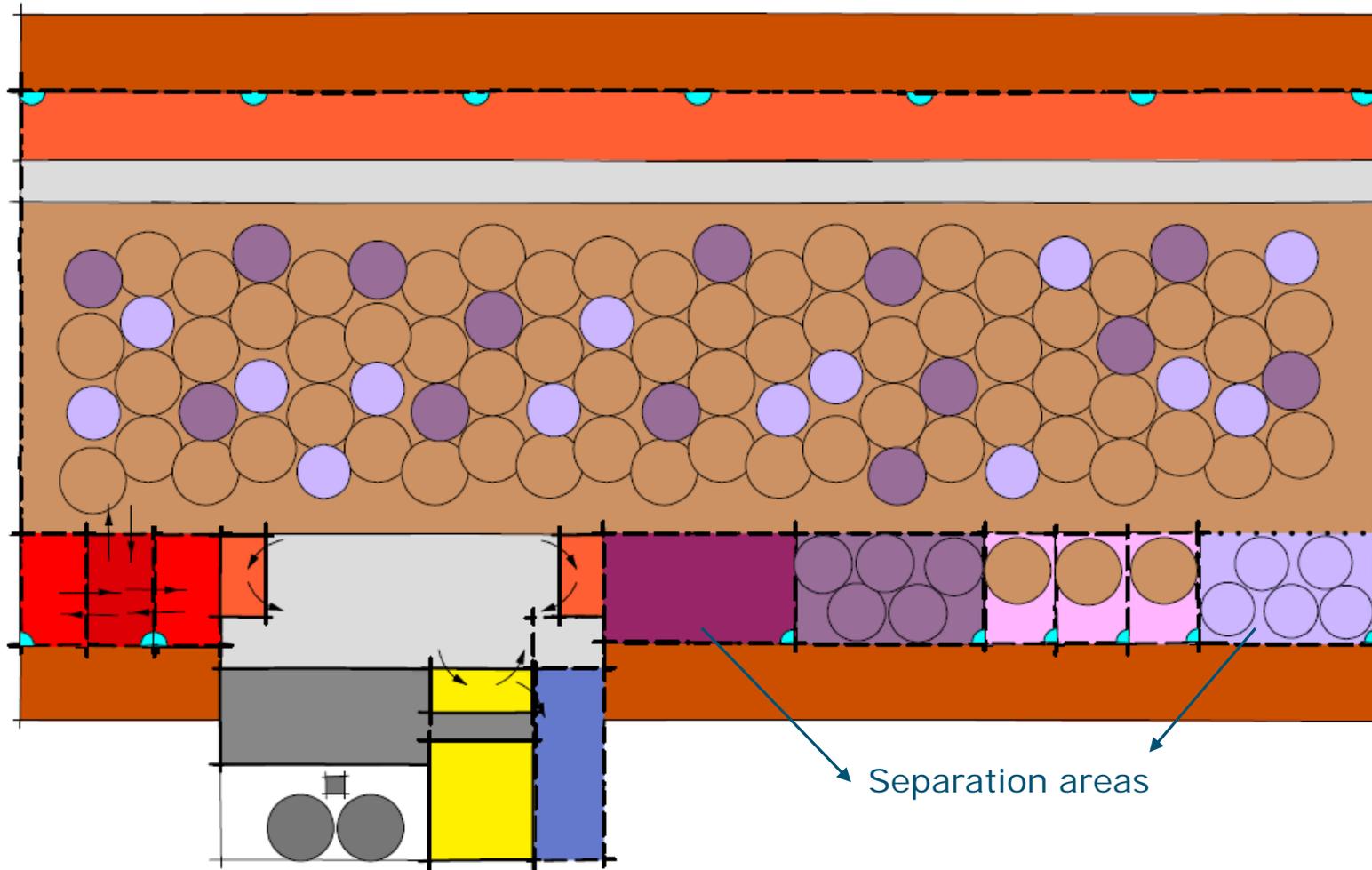
Calf



Milking robot and milk tank

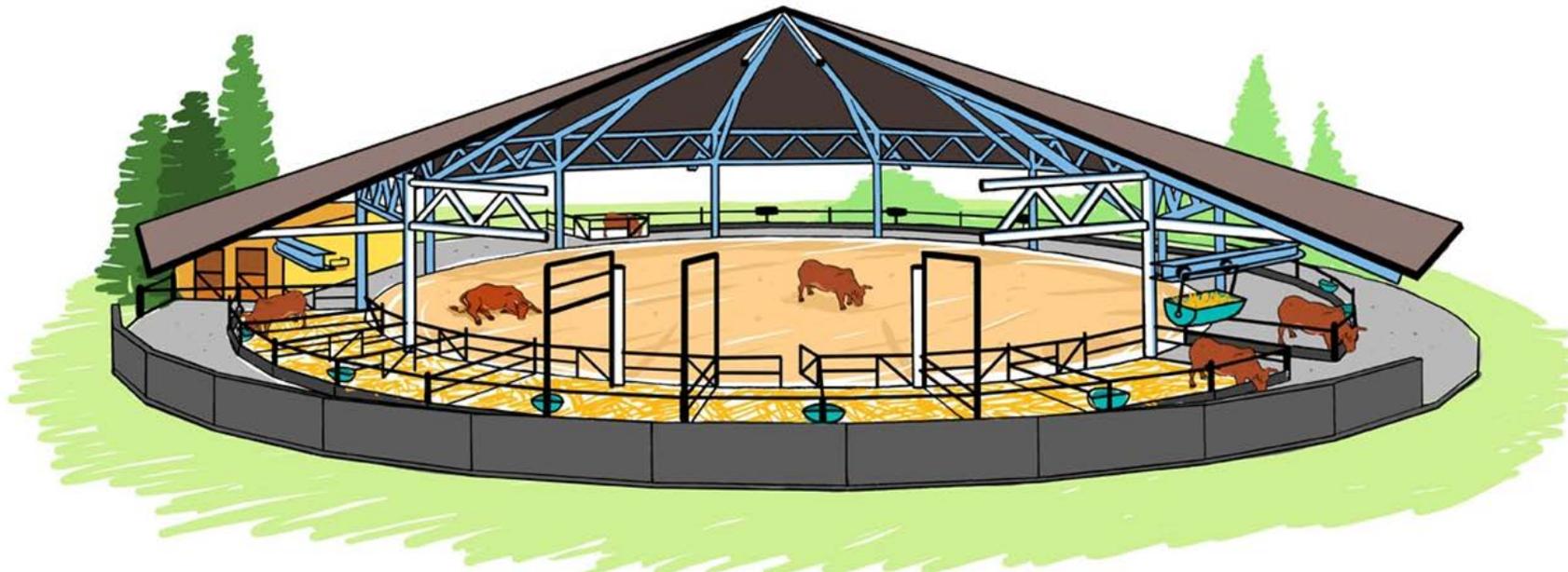


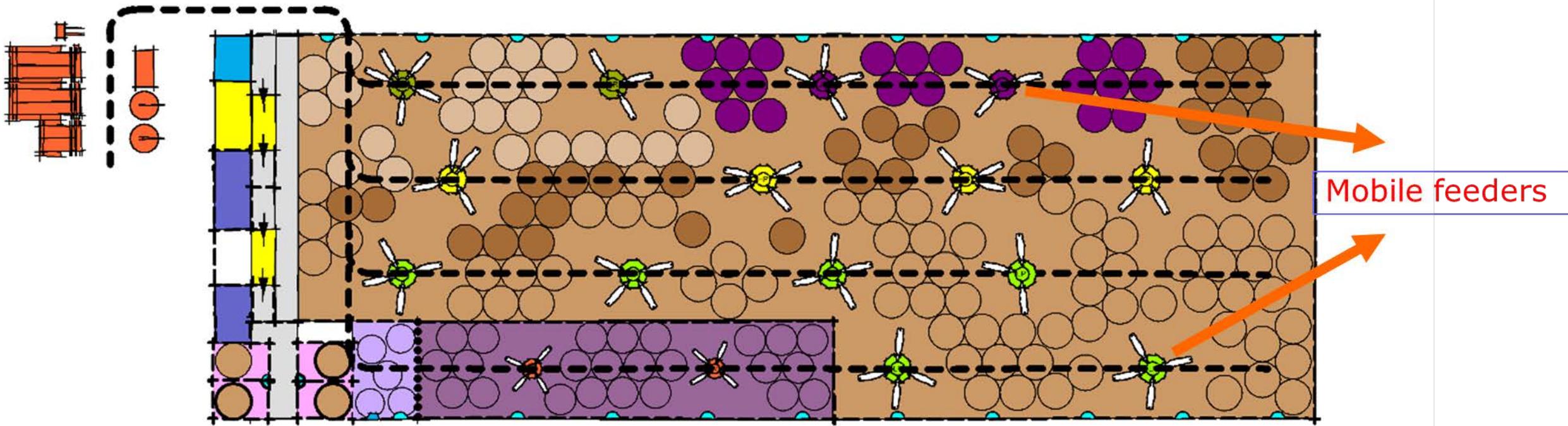
Concentrate feeder



Separation areas







Family herd with
automatic feeding
and mobile feeders
for each group



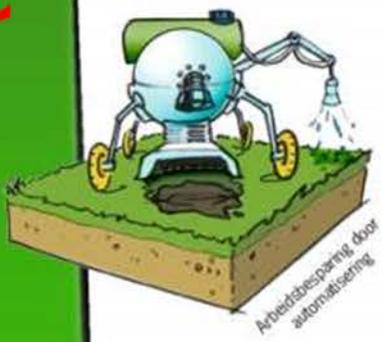
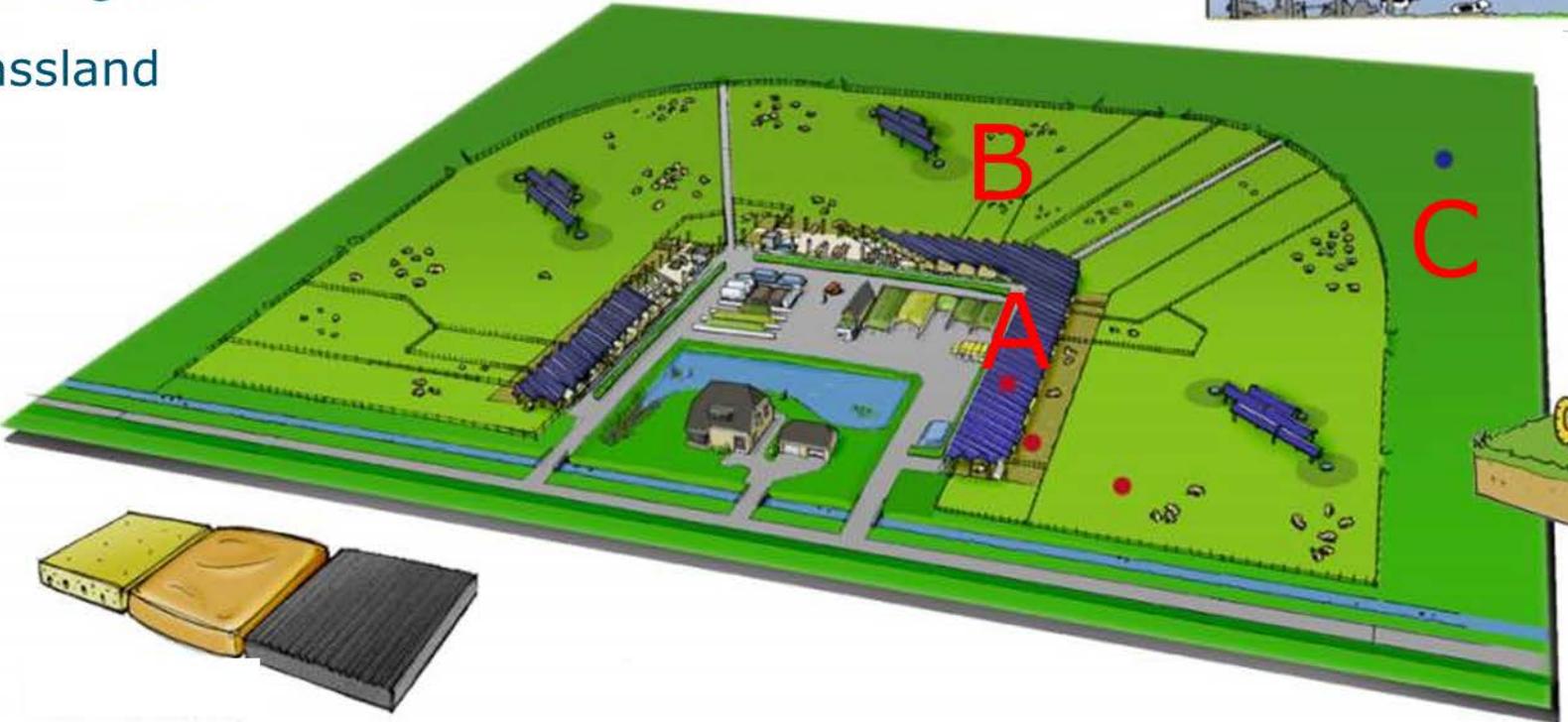
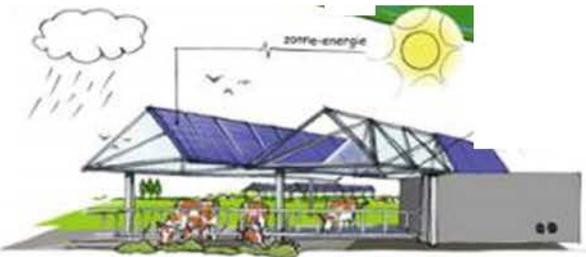
Farm design based on demands:

- cow
- farmer
- society

(many space per cow)

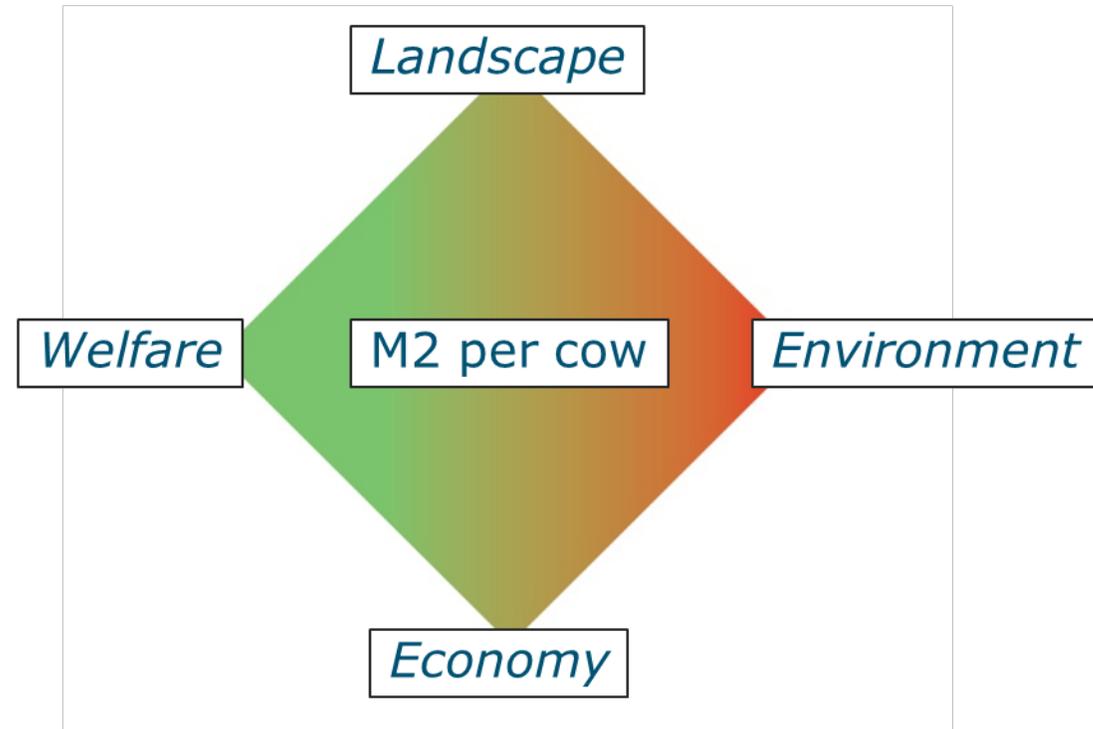
Area:

- A: Stable
- B: mobile roof cleaning soil
- C: Grassland



Take home messages

- Design new housing systems based on demands *society, industry, cows, farmers*
- Dilemma
optimal space per cow?
- Challenge
new floor type and roof



- Freewalk with bedding of organic material or artificial floor are promising concepts, but needs more research





Questions?

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