Developments in the Netherlands

Paul Galama

Research Dairy farm systems

Trends in housing systems
New housing system (bedded pack barns), regional feed centre

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Trends in housing systems

- Organization Wageningen UR Livestock Research
- Developments freestal
  - History
  - Better welfare
  - Lower ammonia emission
- Developments roofs
- Milking systems
- Comparison high tech and low cost system

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Our office in Lelystad, the Netherlands

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In a landscape with windmills and tulips

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Dairy research station, Waiboerhoeve

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Experimental farms of Animal Sciences Group

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Dairy Campus

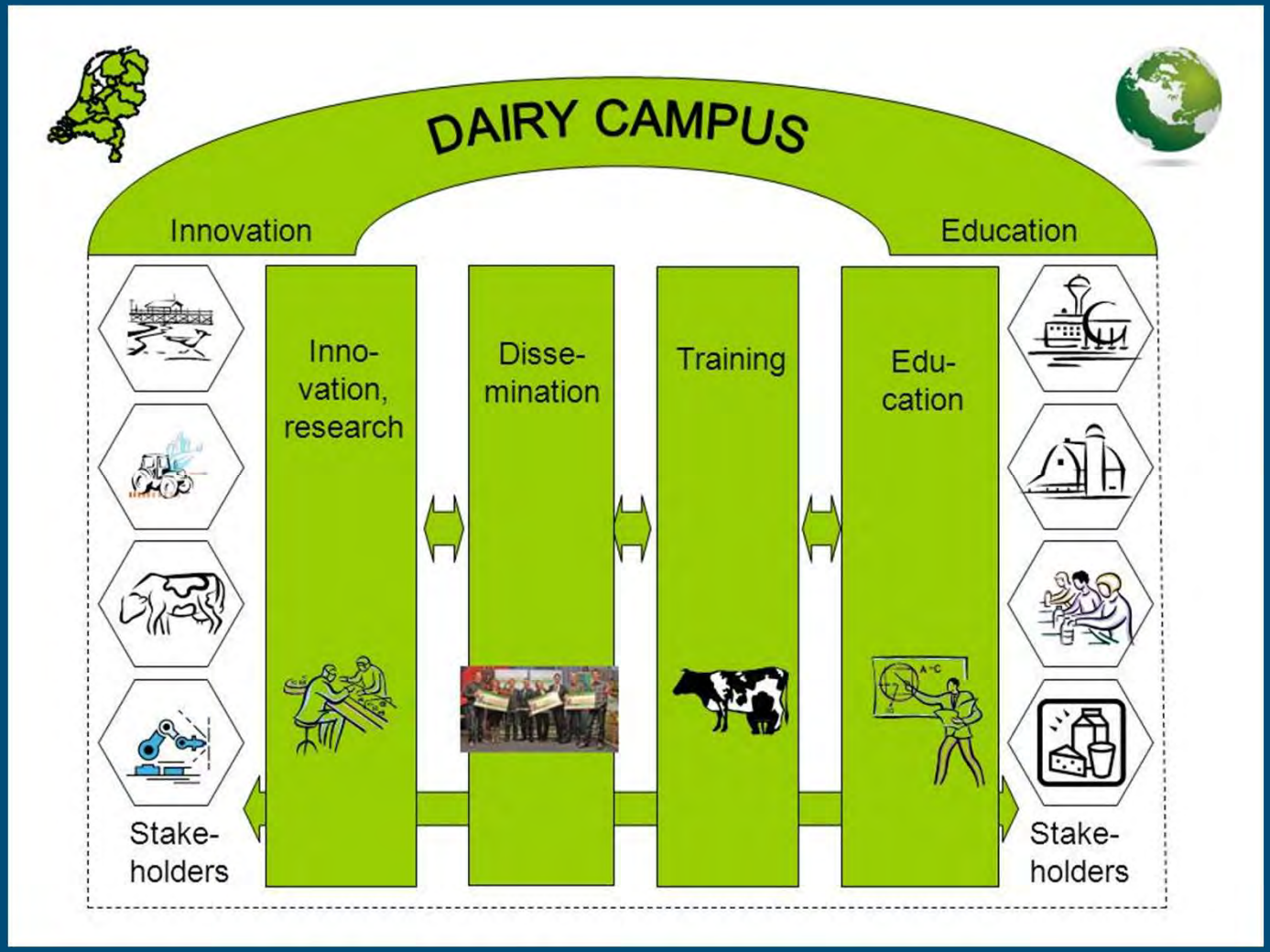
Centre for Innovation, Education and Research

www.dairycampus.com

DAIRY CAMPUS

Dairy Campus is financially supported by Province Fryslàn and City of Leeuwarden

Dairy Campus as a network organisation



Partners / stakeholders

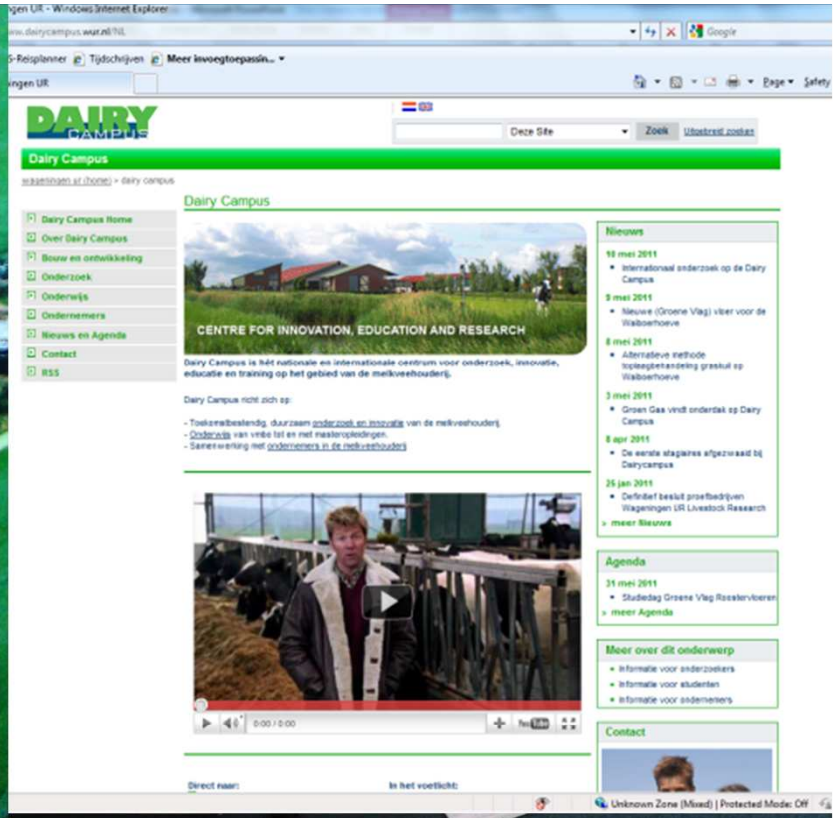
Main Innovation themes Dairy Campus

- Sustainable development of the dairy chain
- Dairy housing systems
- Improving dairy chain
- Smart farming technologies

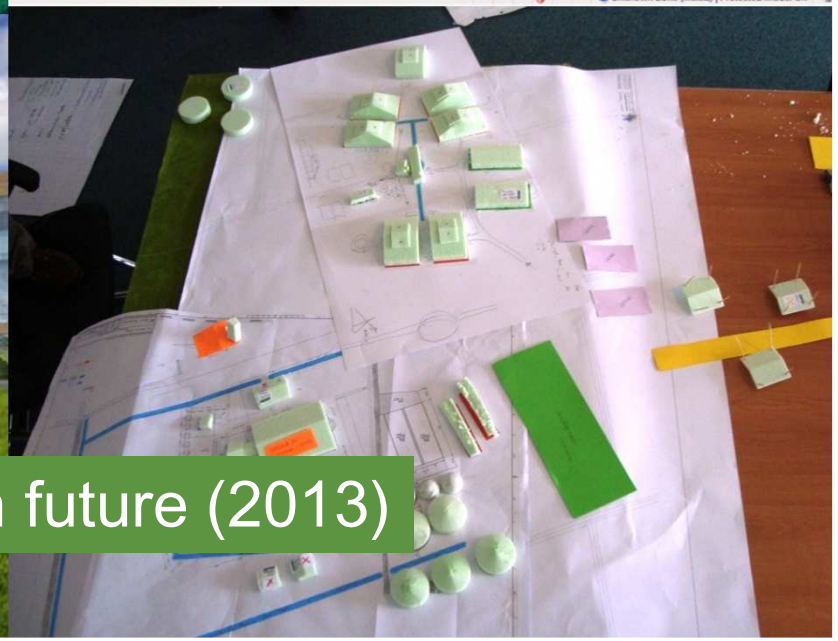
Connection with national programs

- Government, industry and farmer organizations
- Research accommodation for Wageningen UR

Nij Bosma Zathe 2011



Dairy campus in future (2013)



Dairy in Fryslân

History of housing systems

Farm Michiel and Peter Galama

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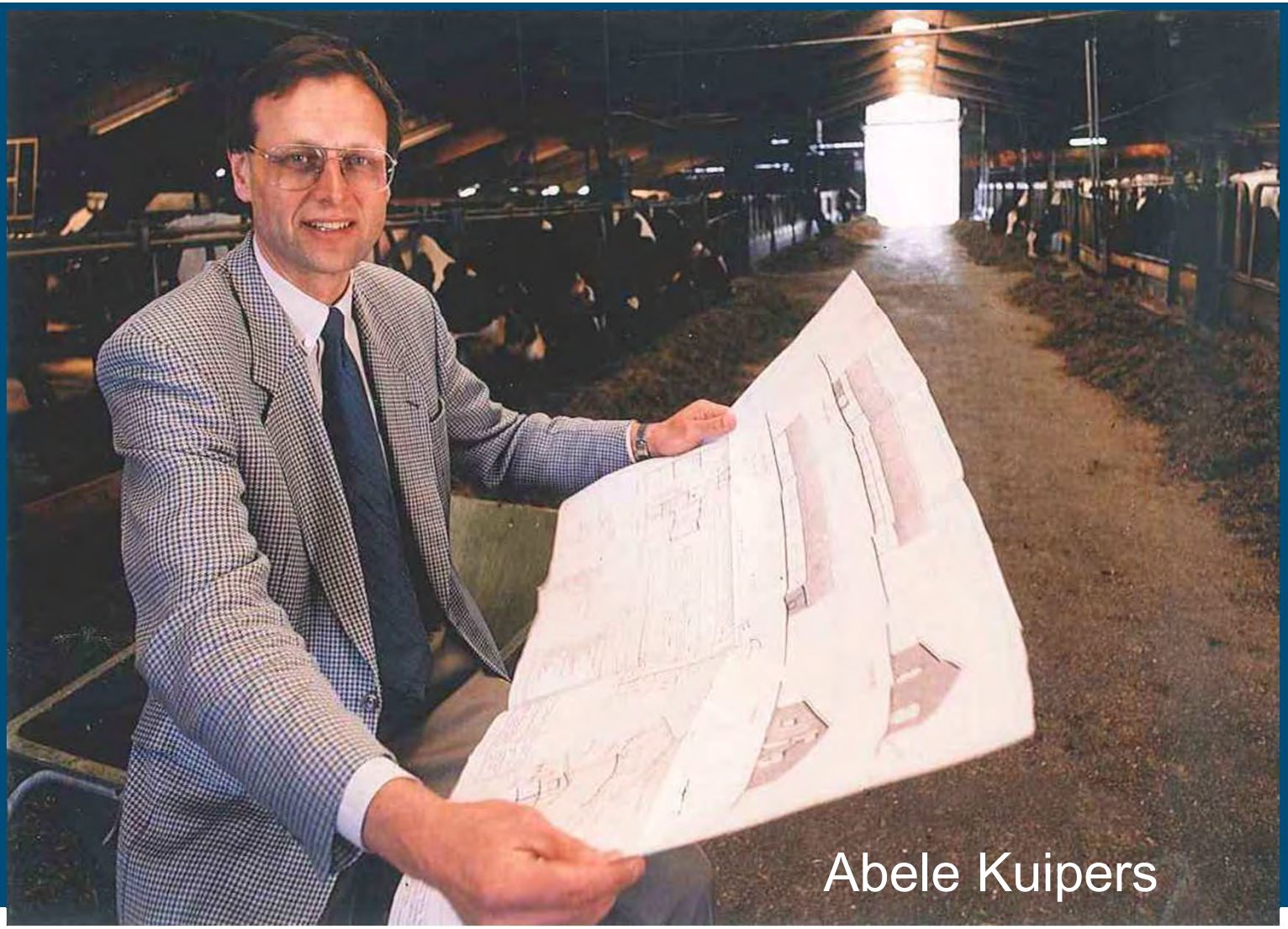
Practical research on freestall



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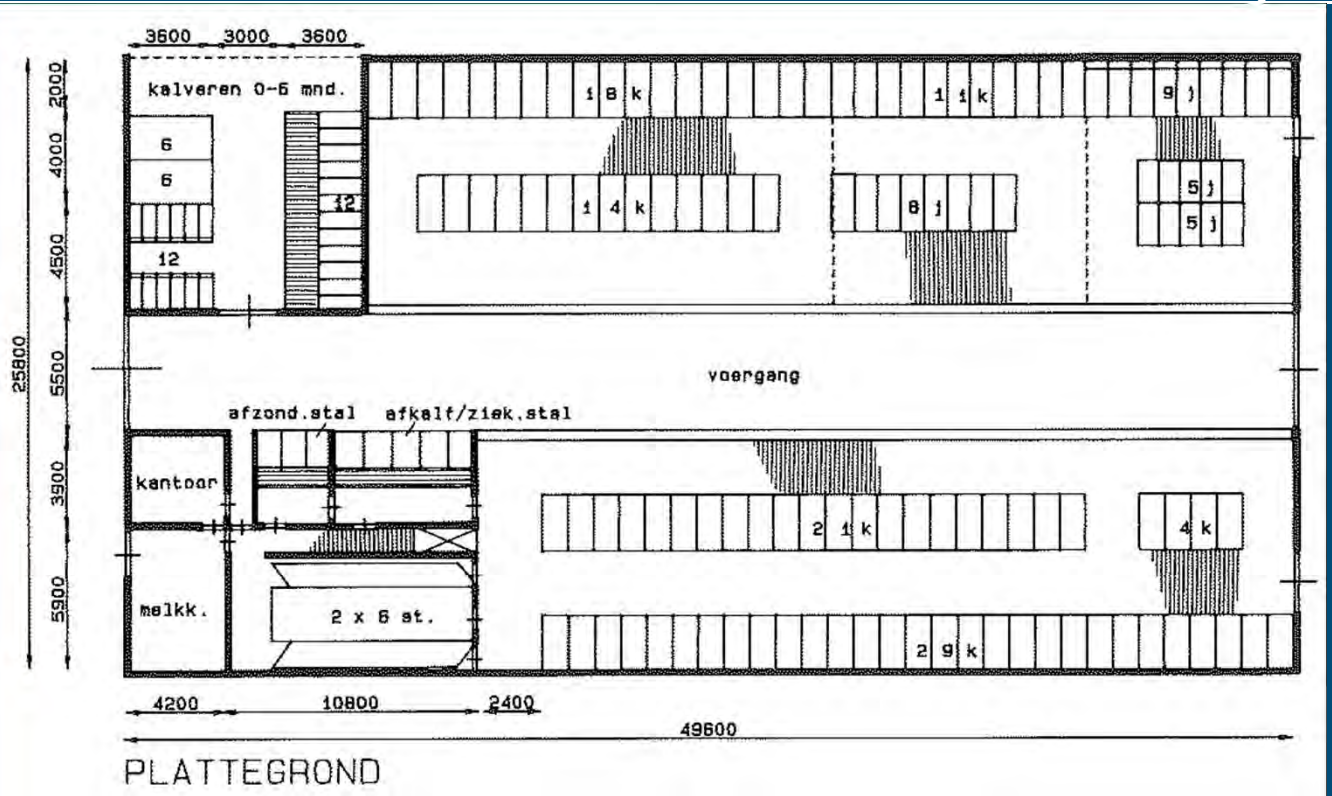
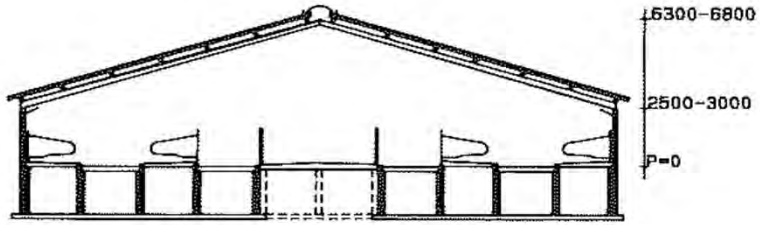
2+2-rows freestall with central feed alley



PLATTEGROND



DOORSNEDE

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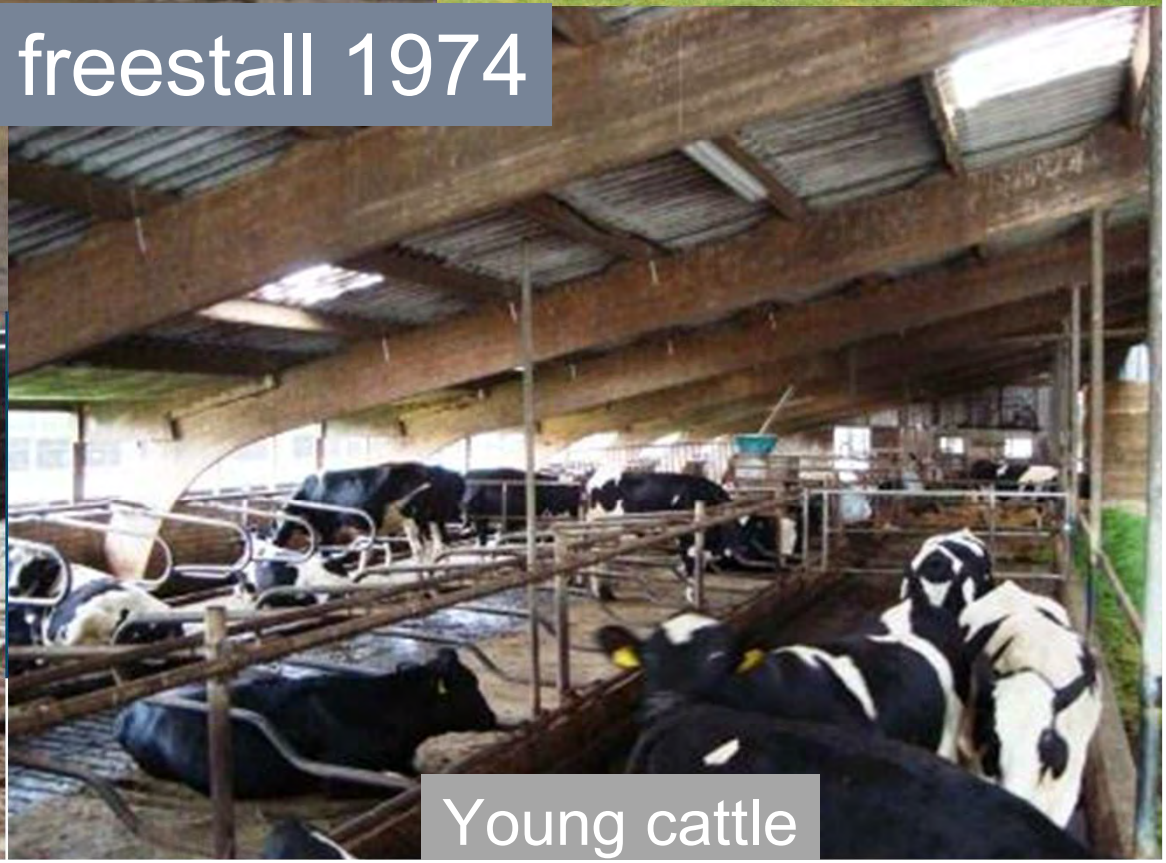
Old freestall 1974




Sand in boxes


Use very fine sand


big holes
make big holes in manure silo
and mix before spreading manure


Sand in boxes
and rubber on floor is a good combination

Farm in Polen

Seperating sand from manure

Developments bedding in freestall

- Sand
- Straw
- Dried (digested) manure
- Paper
- mattress

Other developments freestall

- Box
- Emission floor
- Roof


Fiber glass

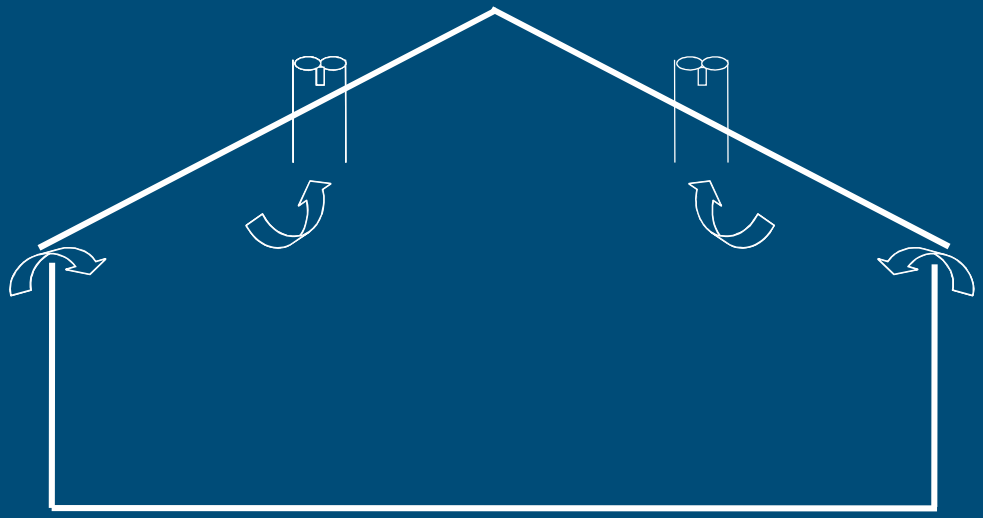

Boxes in circle

Reduction ammonia emission

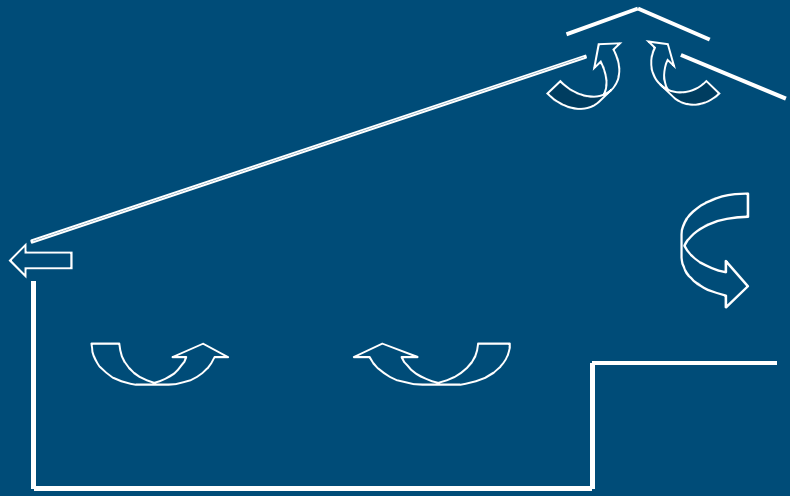
- Seperate urine and manure
- Cleaning air

Animal houses

Mechanical ventilation



Natural ventilation



Emission = Ventilation * Concentration in exhaust

Measuring with box

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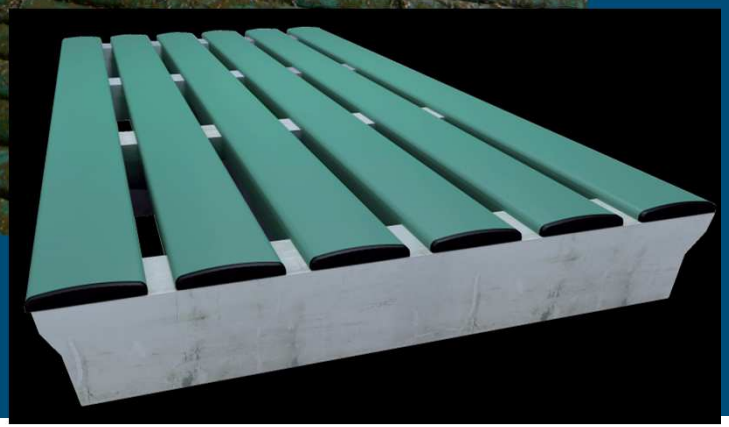
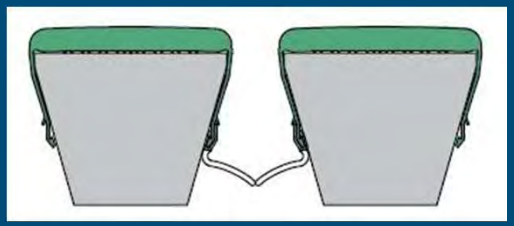
Mat and valve floor for slatted floor (green flag plus)



- **Higher cow comfort & mobility**
- **Improved hygiene**
- **Reduced ammonia emissions**
- **Cleaner air in shed**
- **Improved claw health**
- **Simple installation**



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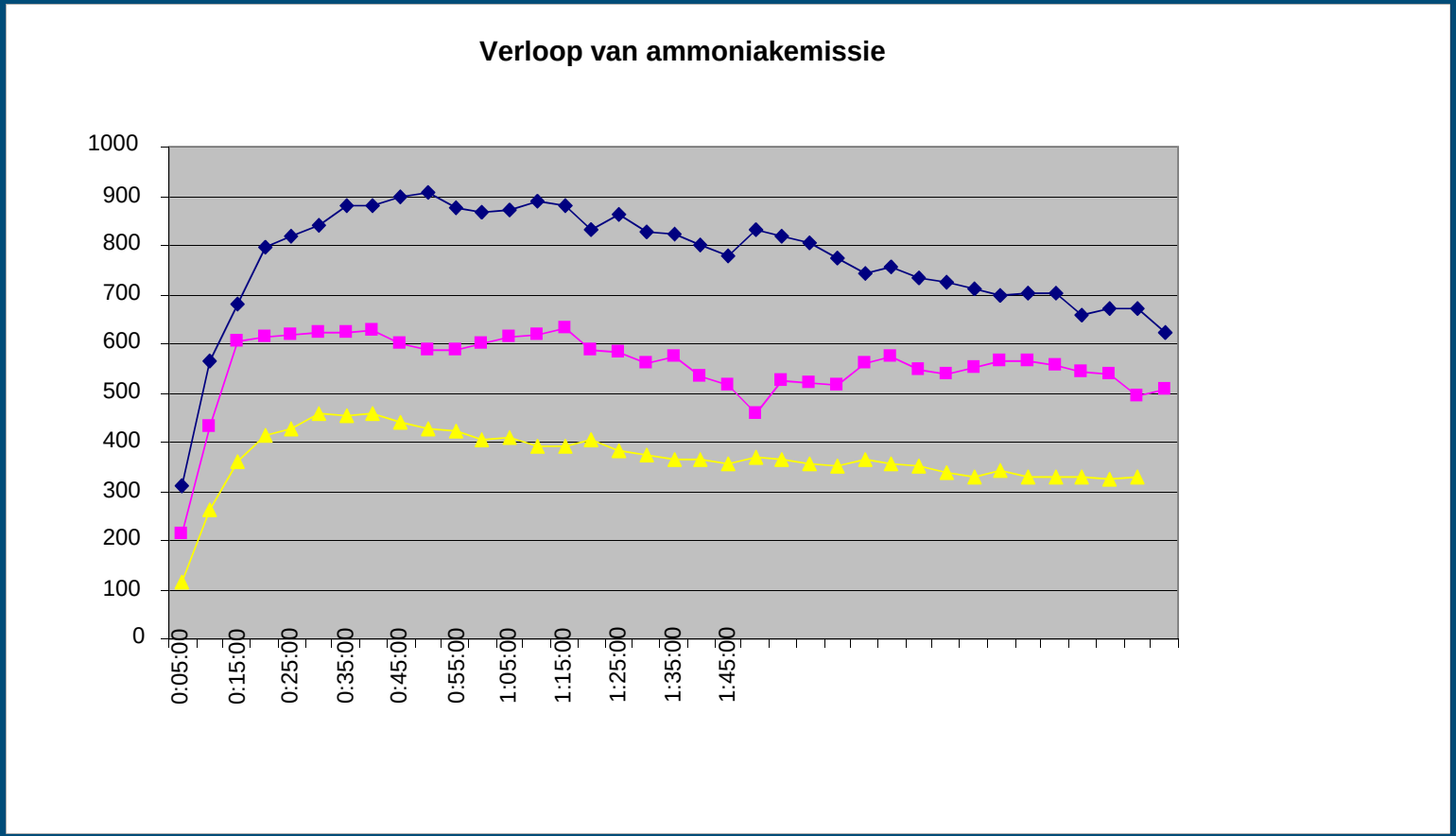
Result emission of ammonia



Blue: slatted floor Purple: mat Yellow: mat & valve

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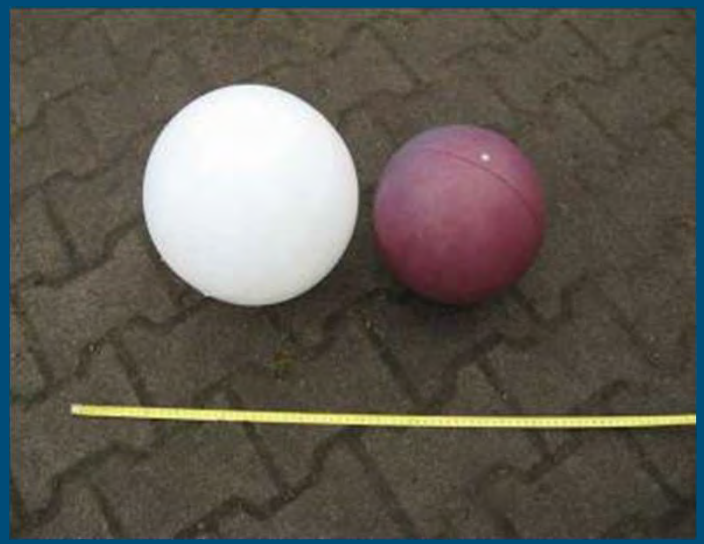
Alternative slatted floor “Sleufvloer” (Holcim)

Floating balls

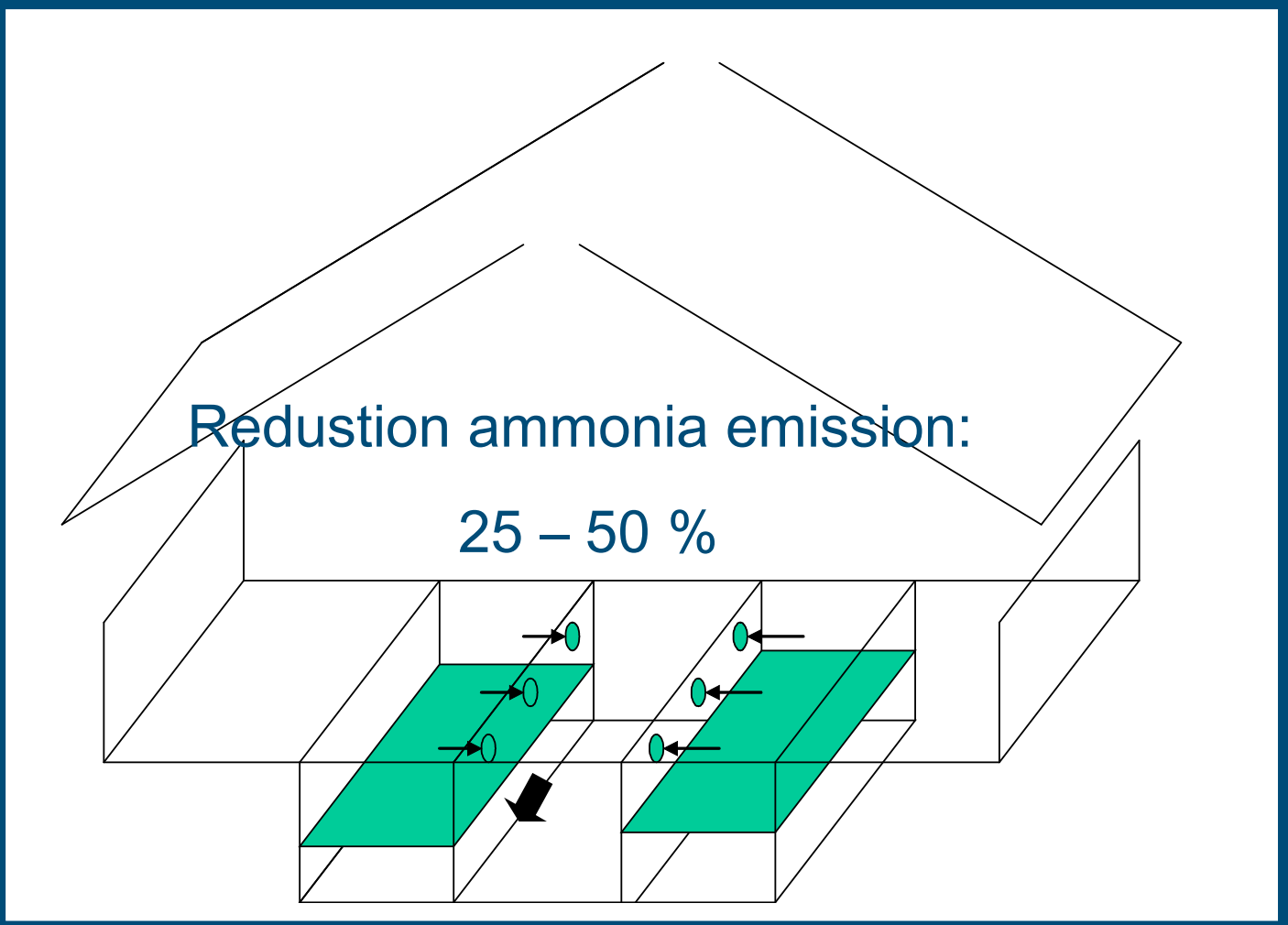
-Balls floating on slurry in pits

-Idea from pig farming

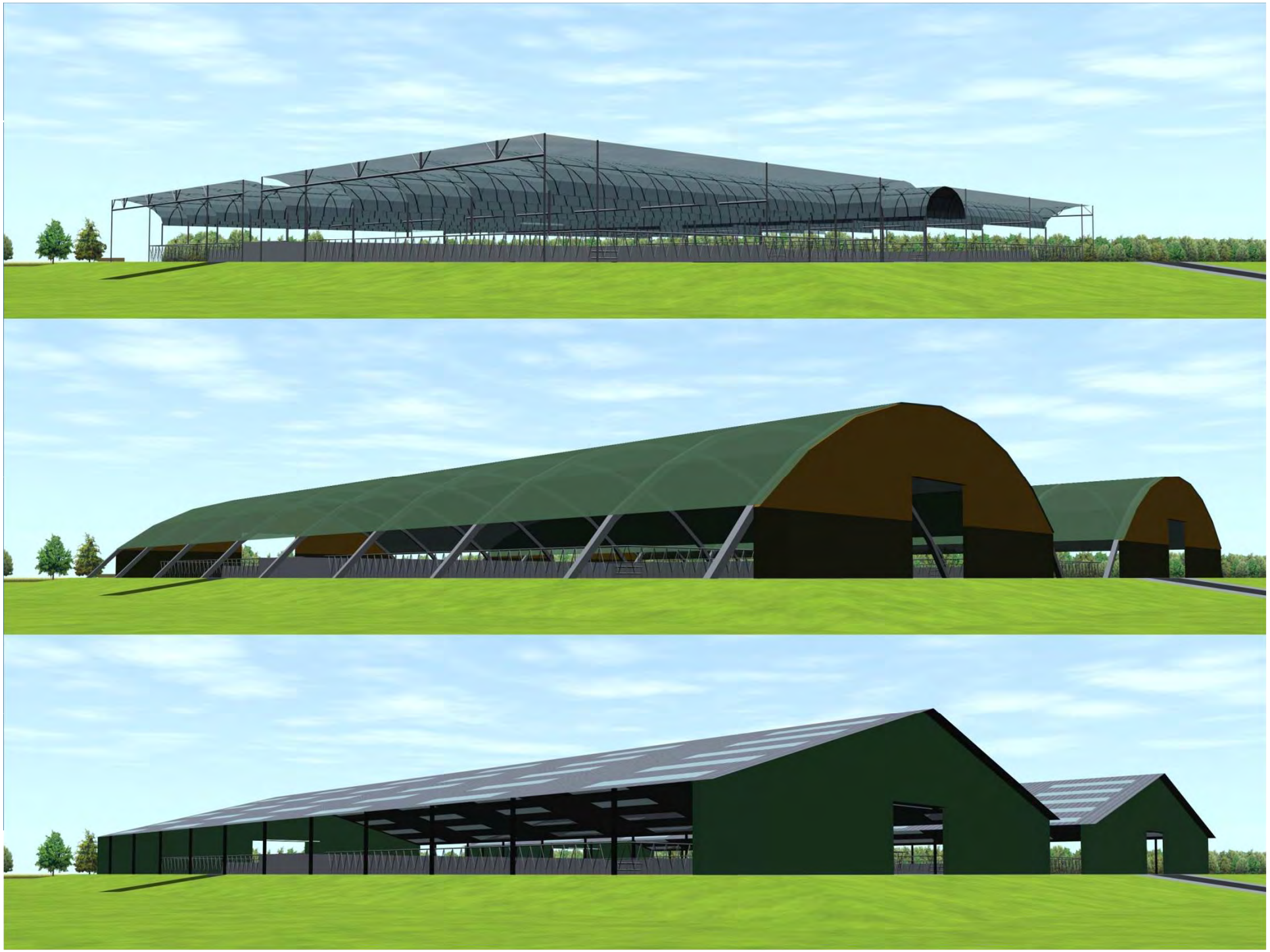
-Reducing of emitting surface



Cleaning the air



Developments roofs




Boogstal

Boogstal

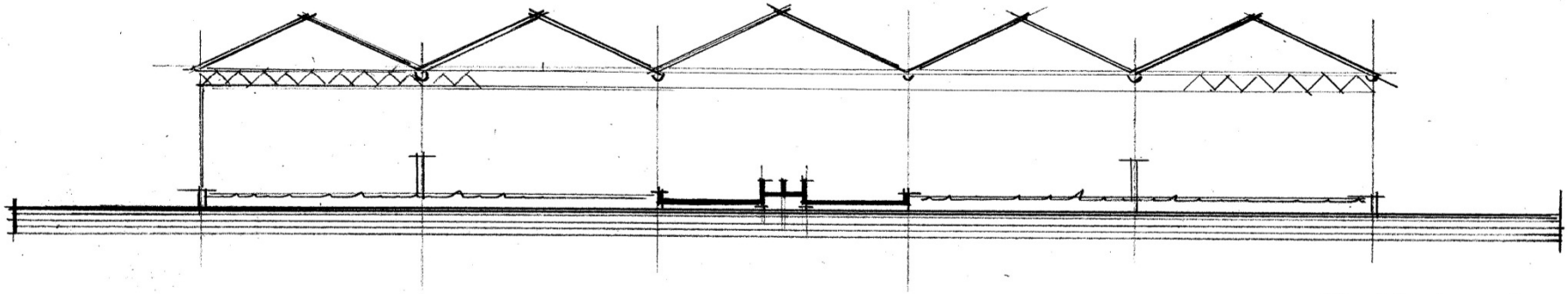

Boogstal


Serre

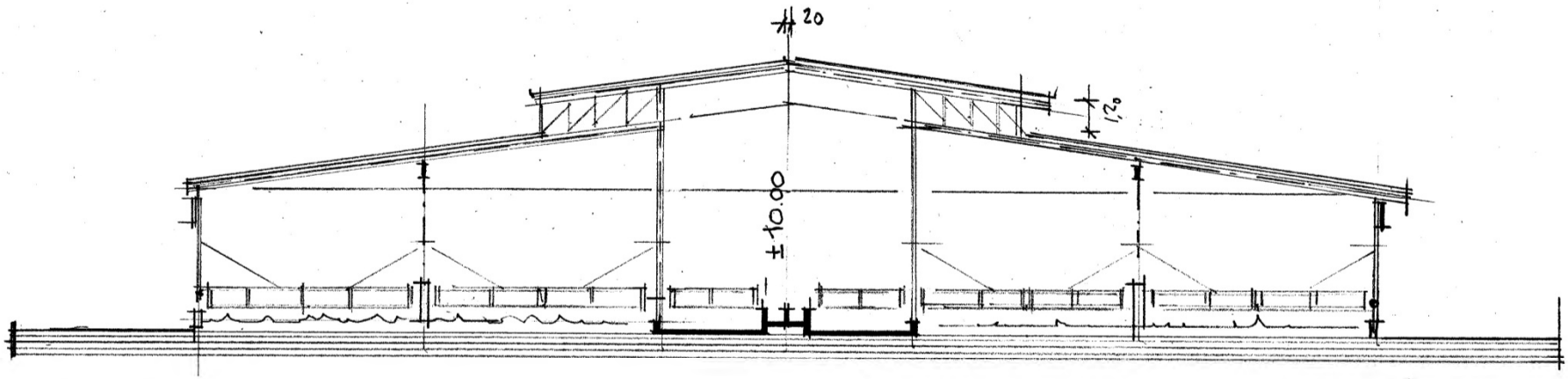

Serre


Serre

Low ridge height



Kasdak - doorsnede



Pagoda dak - doorsnede

Sprecher Architects
10 Halamed Hey str.
Tel Aviv 69277 Israel
sprecher@zahav.net.il

Green house for dairy cattle

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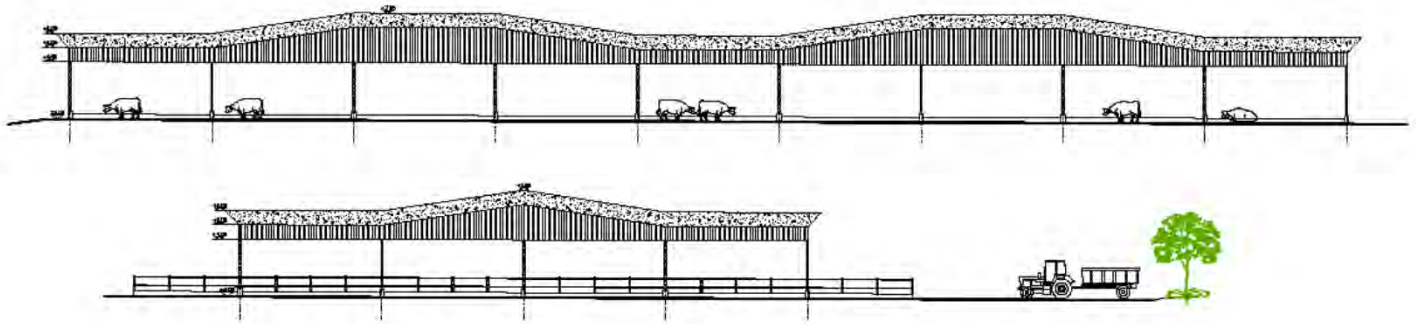
Source: DLV, Libau

Other example of decorative wall

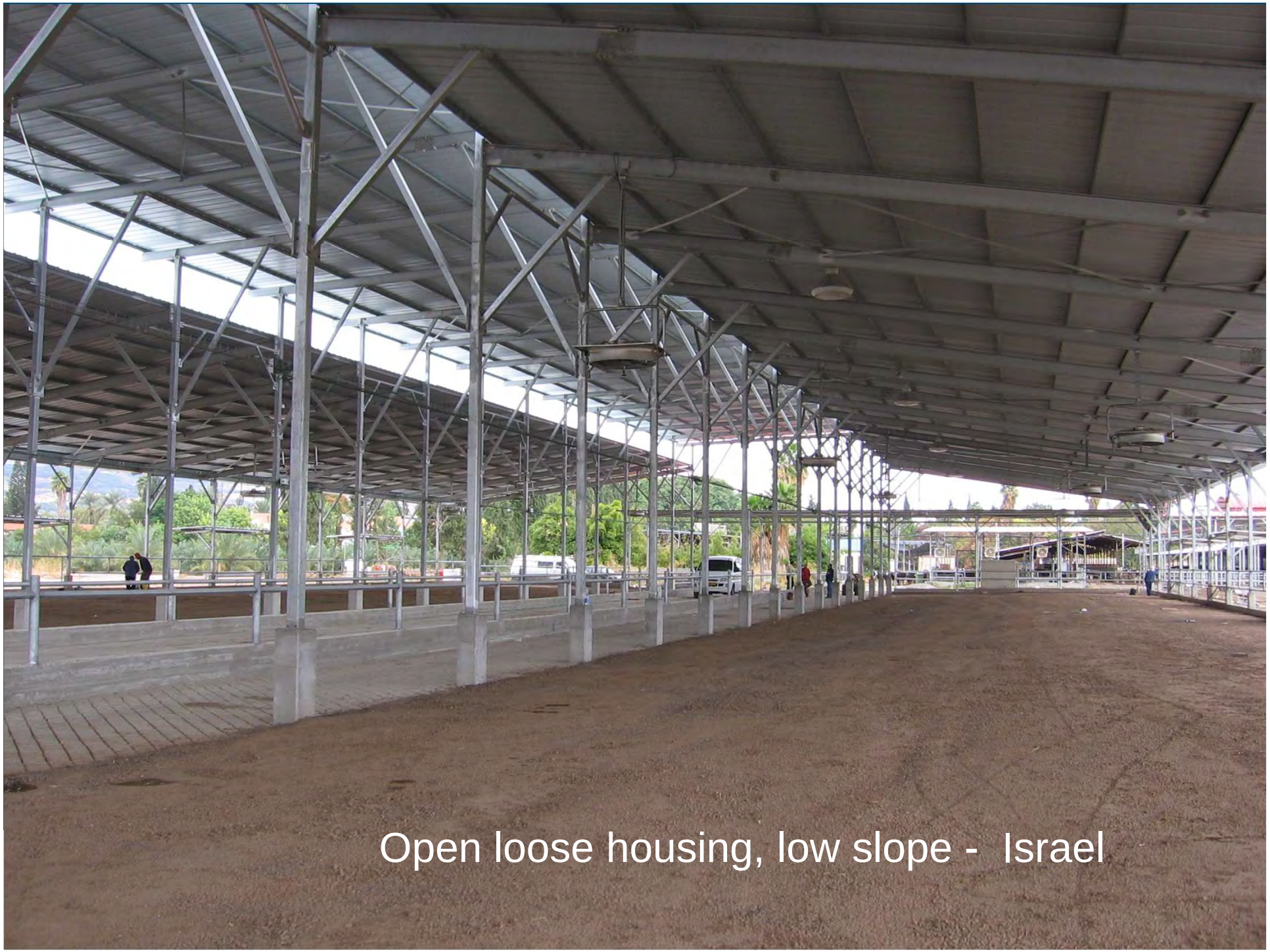


Bron: Sprecher

Inspiration from - Israel

All in shed - with sliding roof. Israel.

Van architect Yehuda Sprecher



Open loose housing, low slope - Israel

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Source: Sprecher

Other material - Foil

Greenhouse cow shed. Canada.

Other foil

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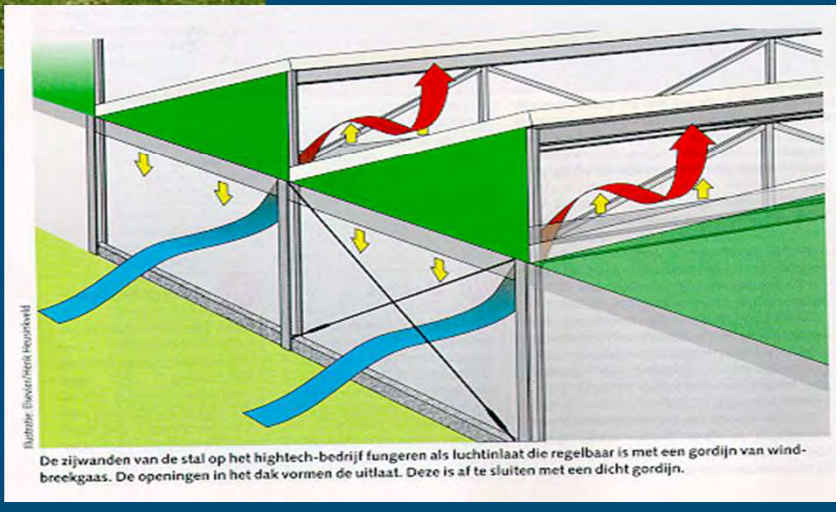
Cheap housing – from bicycle

Cheap – feed alley outside


“Saw roof”

Best ventilation



De zijwanden van de stal op het hightech-bedrijf fungeren als luchtinlaat die regelbaar is met een gordijn van windbreekgaas. De openingen in het dak vormen de uitlaat. Deze is af te sluiten met een dicht gordijn.

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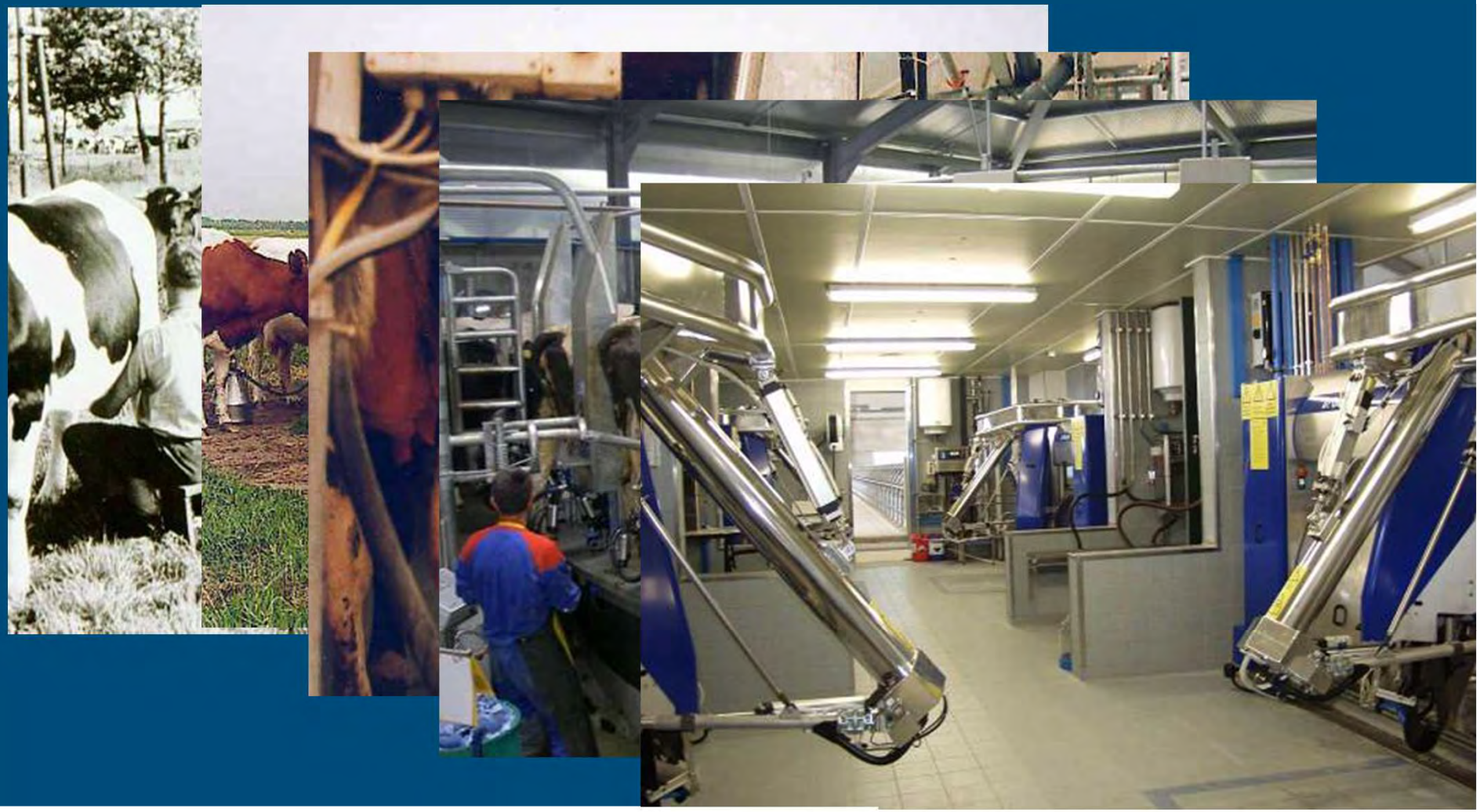
Milking systems

Development milking systems (1950-2010)



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Waiting area seperate from stable

24 rotary milking parlour

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Waiting area

between boxes

28 rotary in stable

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Costs investment milking systems

Parlour	Investment
2x5 side by side	€ 22.000,-
2x12 side by side	€ 38.000,-
2 x12 rapid acid	€ 55.200,-
20 rotary	€ 96.700,-
28 rotary	€ 122.700,-
Milking robot (1 box)	€ 118.500,-
Milking robot (2 box)	€ 162.000,-

	Labour costs	
	10 € per hour	40 € per hour
60 cows	2x5 side by side	2x16 swingover
		or milking robot
120 cows	2x5 side by side	2x16 swingover
240 cows	2x16 swing over	48 rotary
	or 2x10 side by side	

Comparison high tech and low cost

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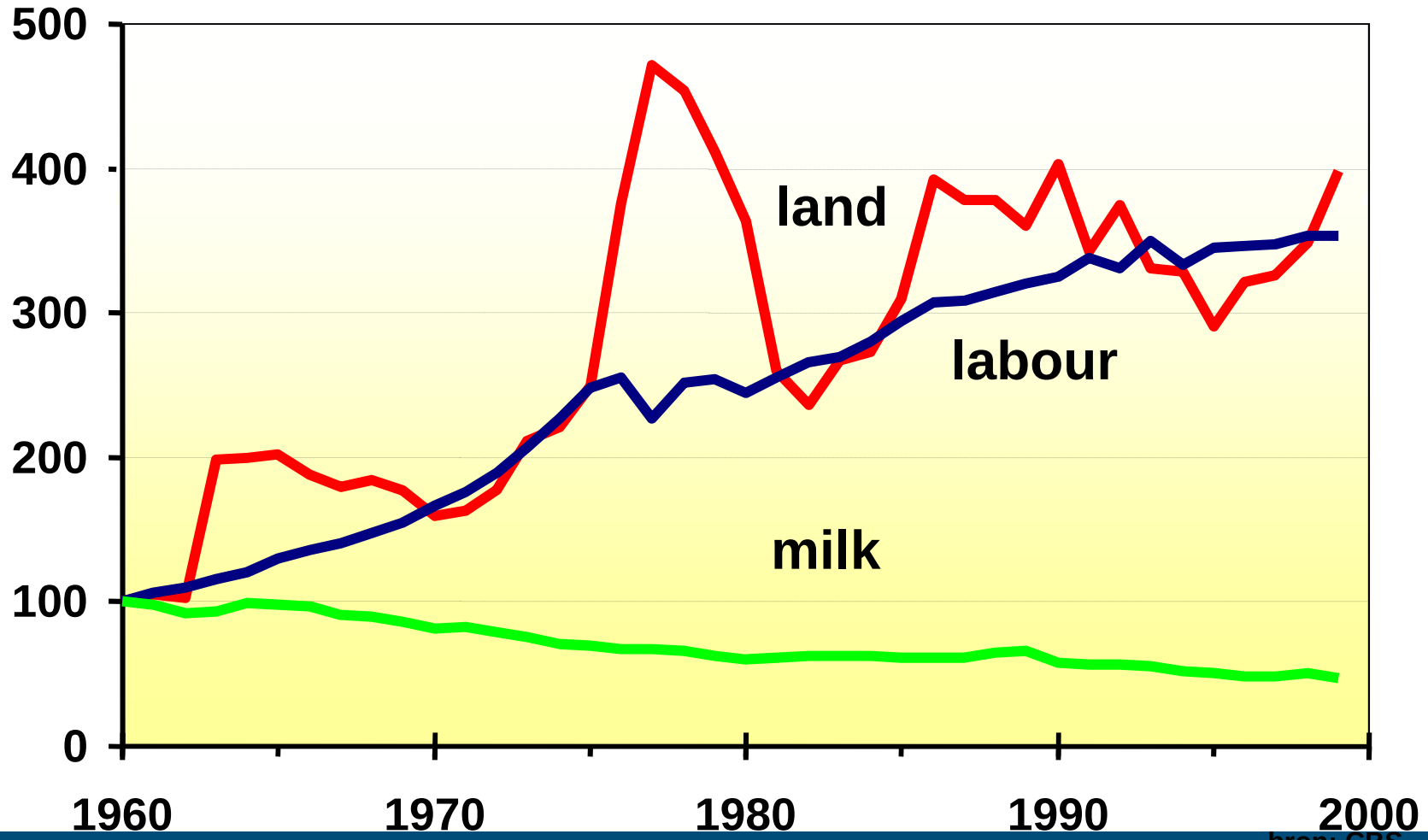
Price development: Price index milk (fat 3,7%)



bron: CBS

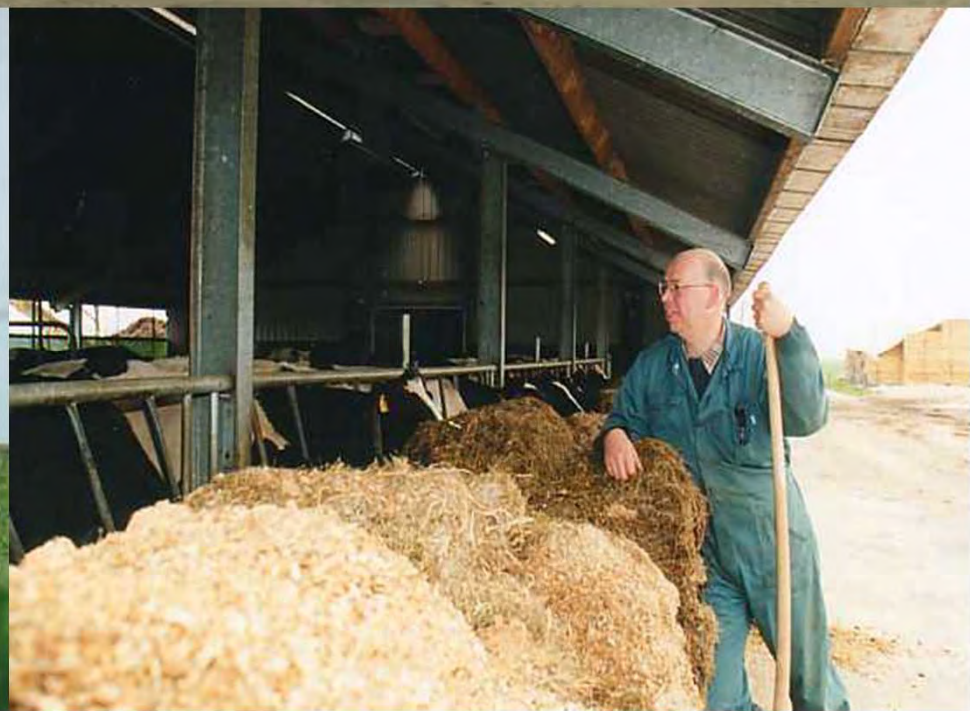
Structure Low Cost Farm

- 400.000 kg milk
- ca. 50 cows; 8000 kg milk per cow
- 32 ha: 25,5 ha grass and 6,5 ha maïze
- “green” farm

Strategy Low Cost Farm

- Few young stock (5 per 10 cows)
- Maximum grazing
- Few concentrate per cow
- white clover
- Few machinery - a lot of contract work
- Cheap Buildings

Low cost farm



Rule of thumb 1: m^2

Rule of thumb 1: m^2

Rule 1: m^2

Few young stock

Rule 2: Materials

High-Tech farm

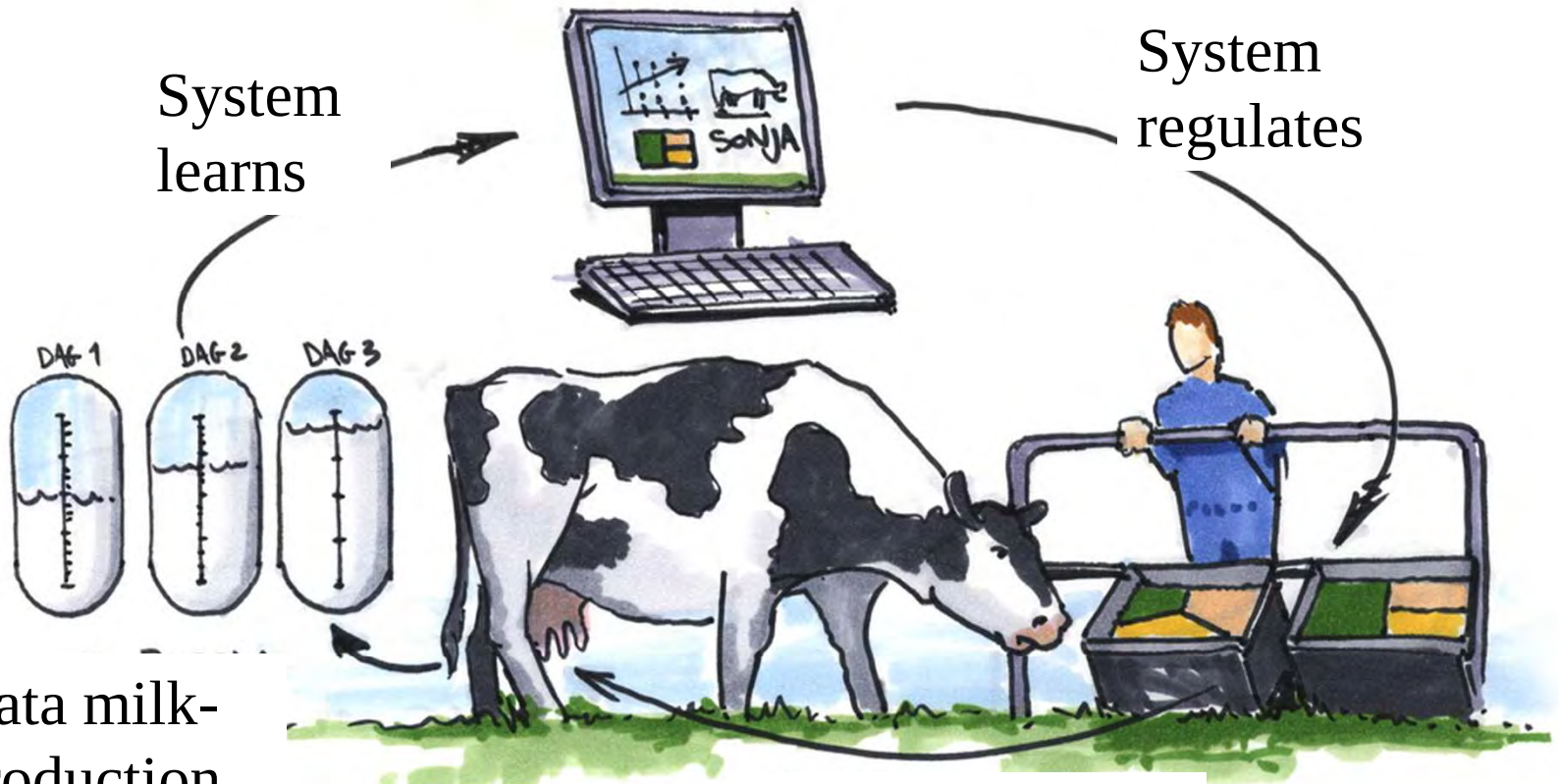
Structure High Tech Farm

- 800.000 kg milk
- ca. 75 cows; 10500 kg milk per cow
- 35 ha: 22 ha grass en 13 ha maïze

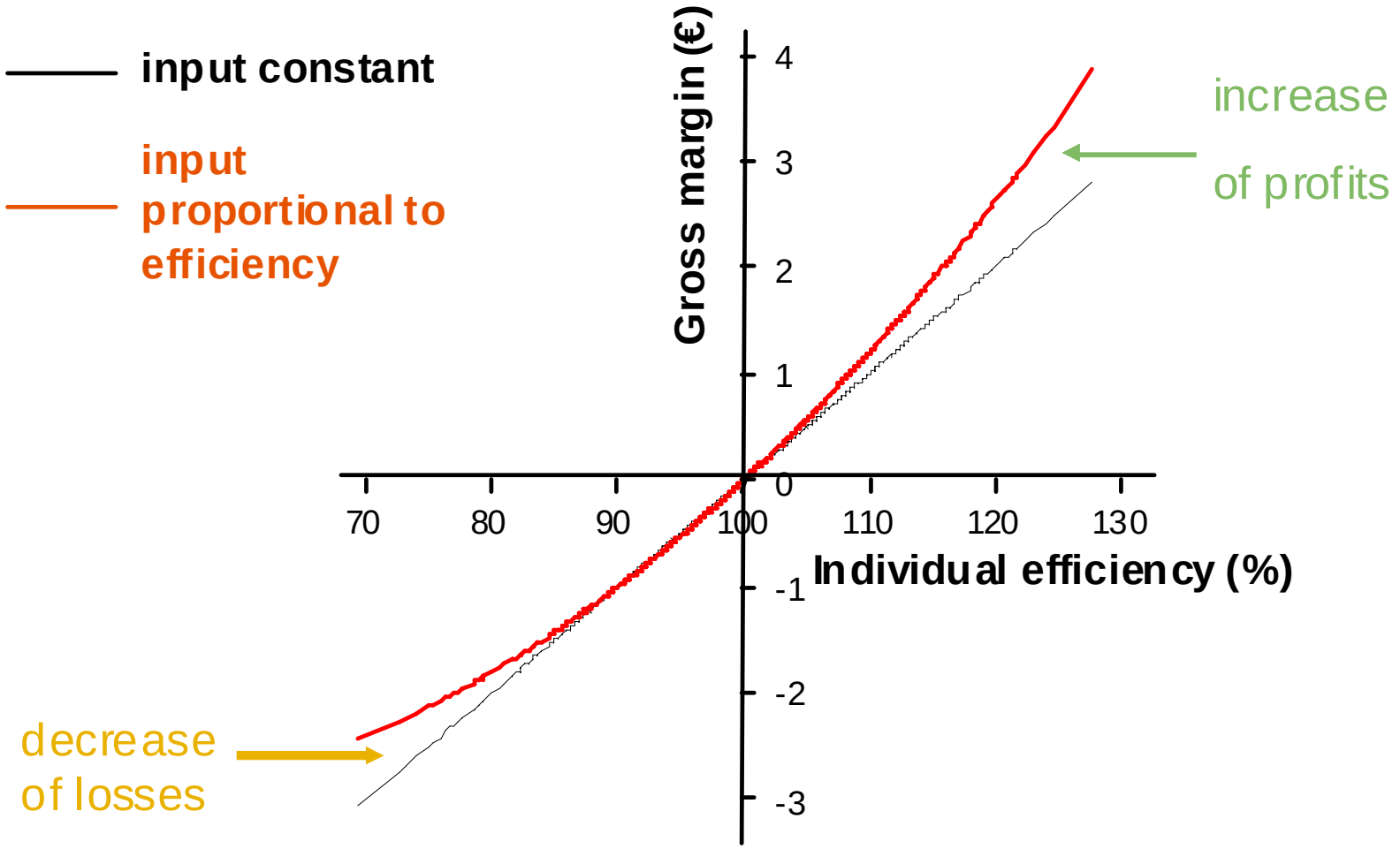
Strategy HTF

- 1 milking robot
- Much milk per cow
- Summerfeeding; zero grazing
- Much milk per ha: few costs for ground
- Feeding robot
- Few machinery - a lot of contract work
- Emphasis on animal health: no cows bought
- Emphasis on cowmanagement

Dynamic feeding system

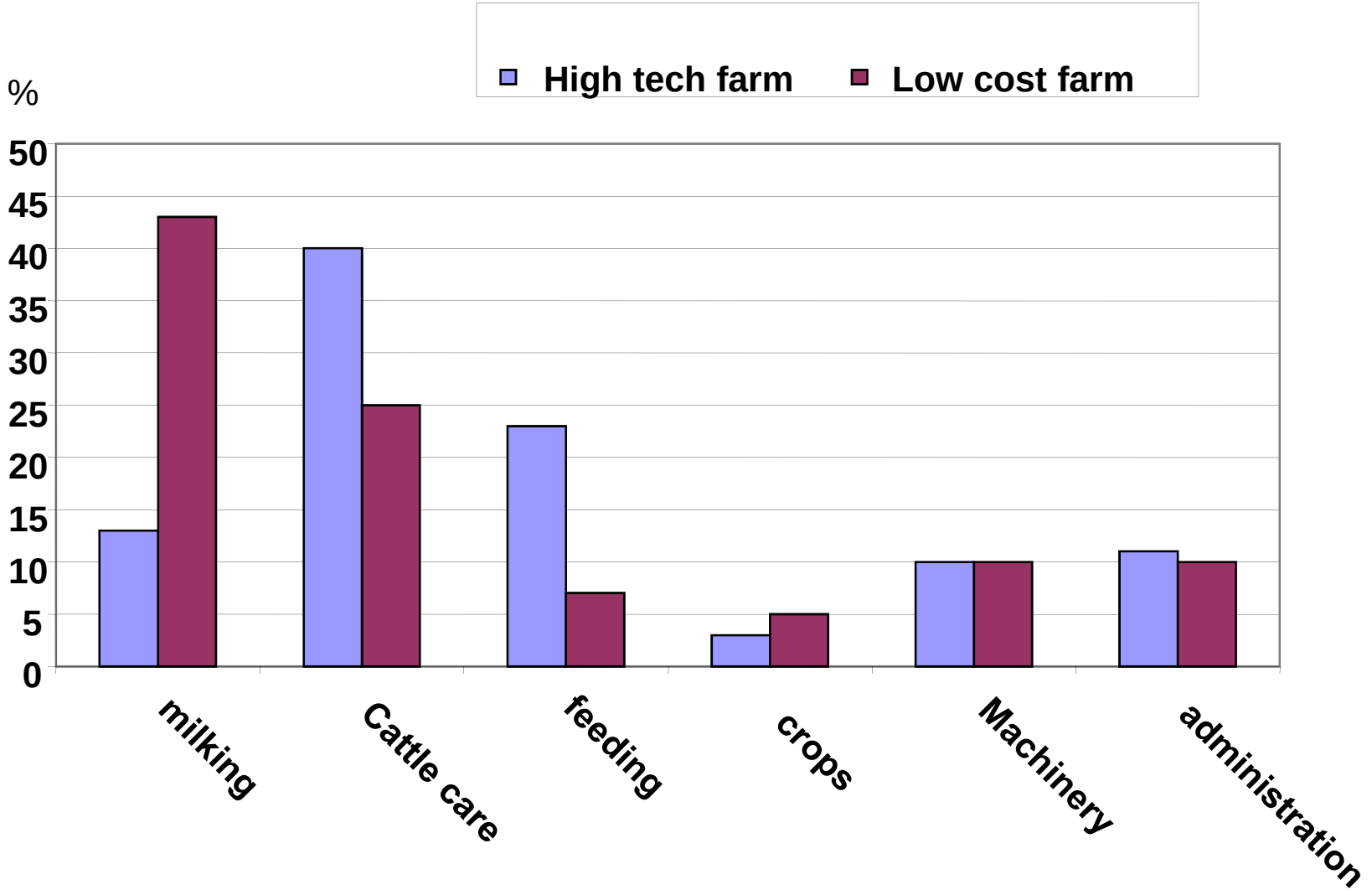


Variation in efficiency: using it works both ways



PRAKTIJKONDERZOEK VEEHOUDERIJ

Labour: 50 hours per Week!

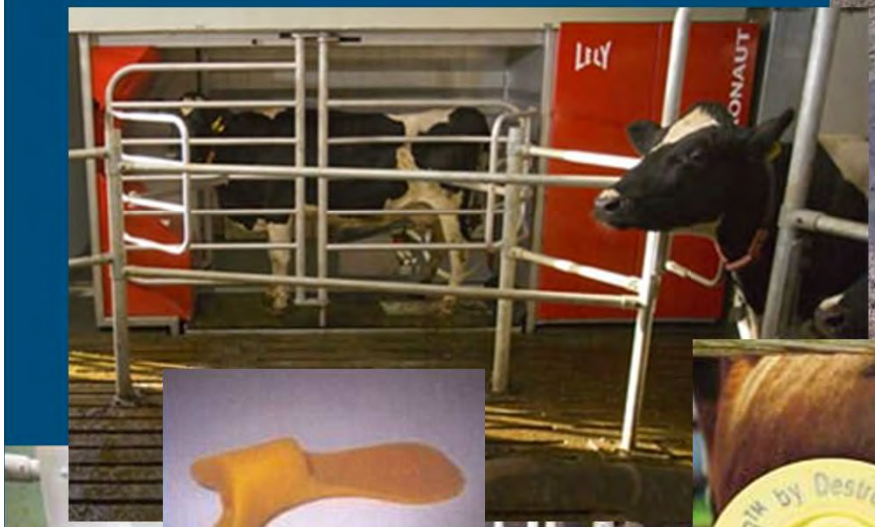


PRAKTIJKONDERZOEK VEEHOUDERIJ

Cost price 2002

	Practical	LCF	HTF
Costprice milk	**41.4**	**36.5**	**40.9**
Feeding	5.3	3.0	7.2
Cattle and crops	4.1	4.9	5.3
Labour	15.3	**11.7**	6.9
Contract work	2.1	5.6	5.8
Machinery & installations	5.4	5.7	8.0
Ground and buildings	9.6	7.4	8.2
General costs	2.5	2.2	2.4
Total	44.3	40.5	43.9
Earnings other than milk	2.9	4.0	3.0

Sensor technology will go on



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“We are drowning in data but starving for information” John Naisbett

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Thanks, Paul Galama

happy environment