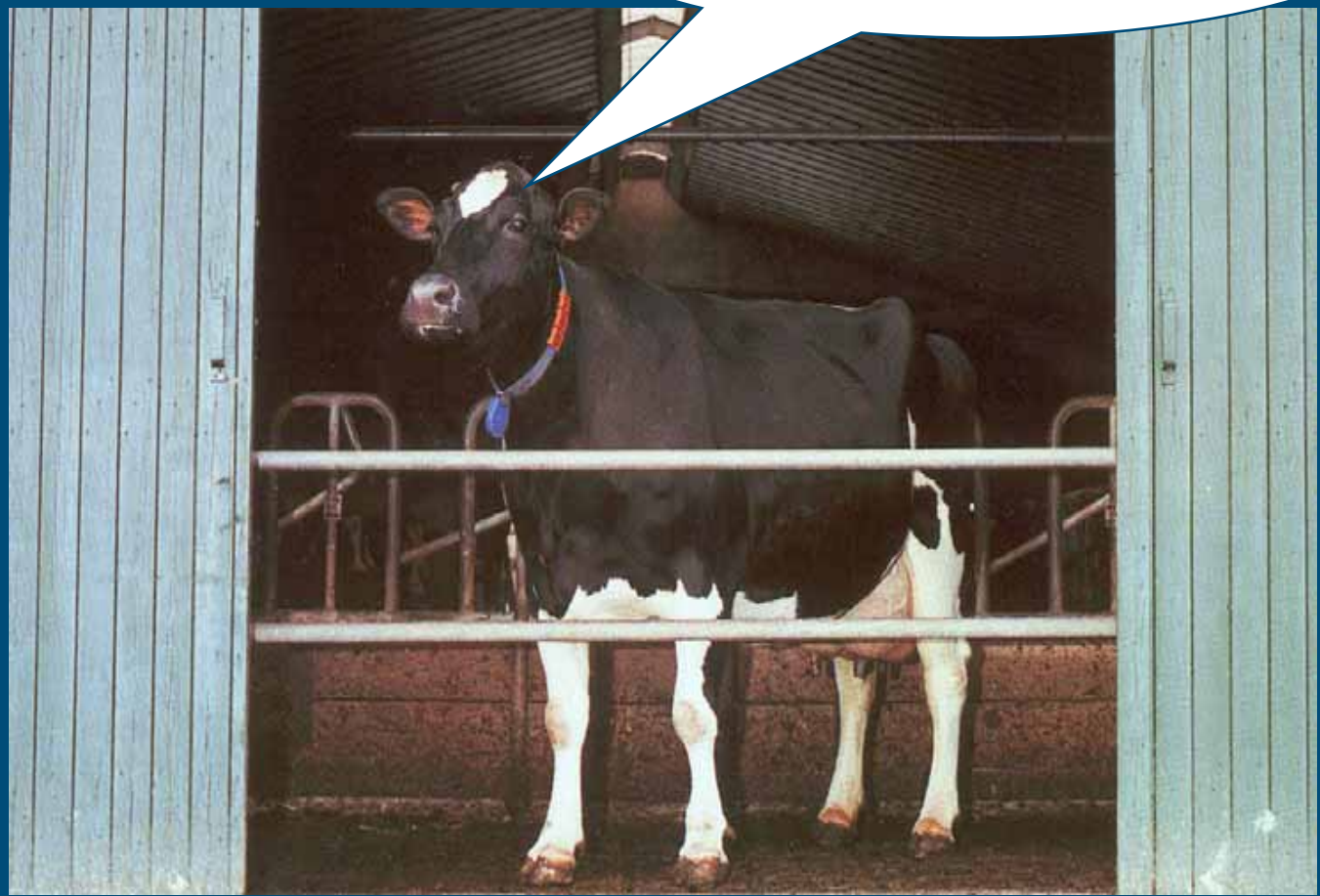
Flooring systems versus hoof trimming

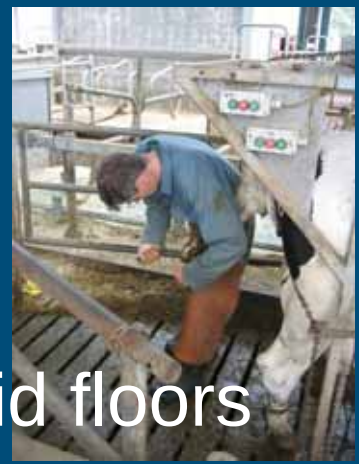
Wijbrand Ouweltjes, ASG Veehouderij

ANIMAL SCIENCES GROUP
WAGENINGEN UR

Can I go Outside please?

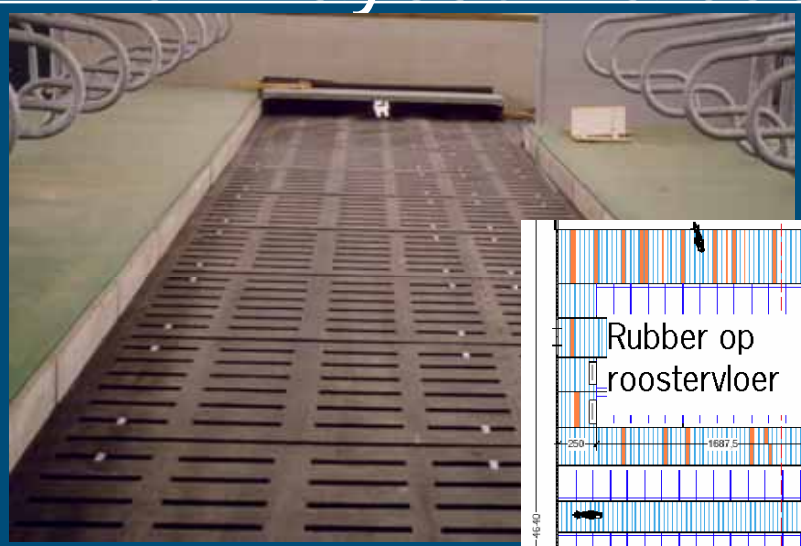


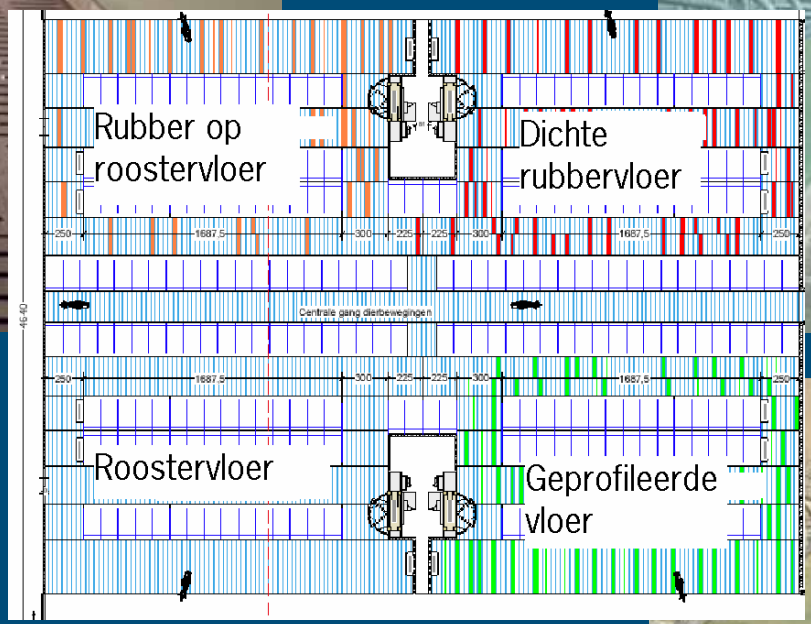
Background

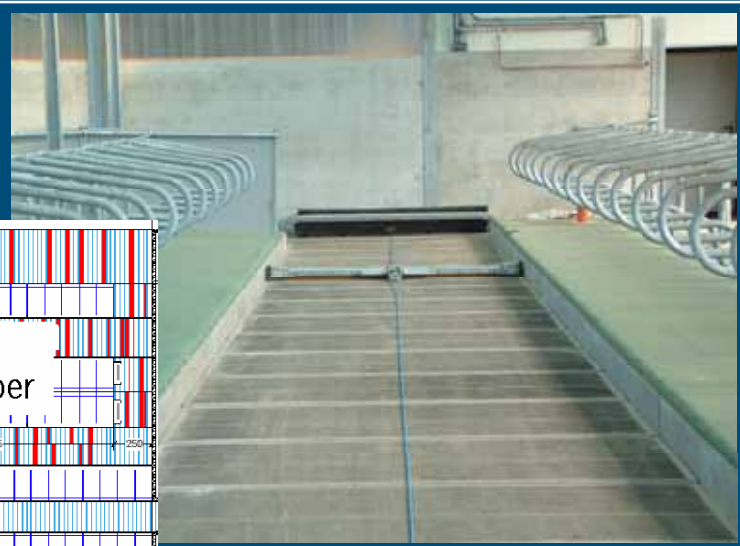


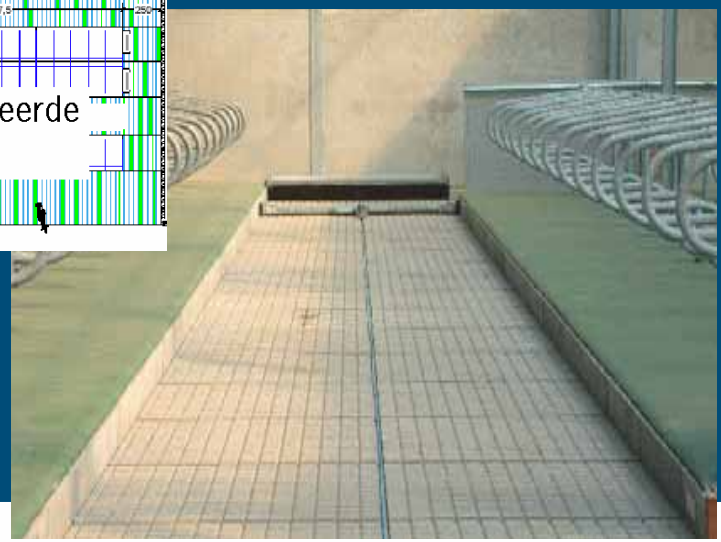
- Claw health and locomotion
- Concrete floors: hard, slippery, wet
- Reduction of ammonia emission: solid floors
- Alternative: rubber?
  - More expensive
  - Benefits?
- New research facility Waiboerhoeve (2004)

Barn layout Waiboerhoeve









Floor comparison

- Claw shape and hardness, claw disorders
- Step length, slips,
- Hygiene
- Locomotion score
- Behaviour
- Pressure distribution

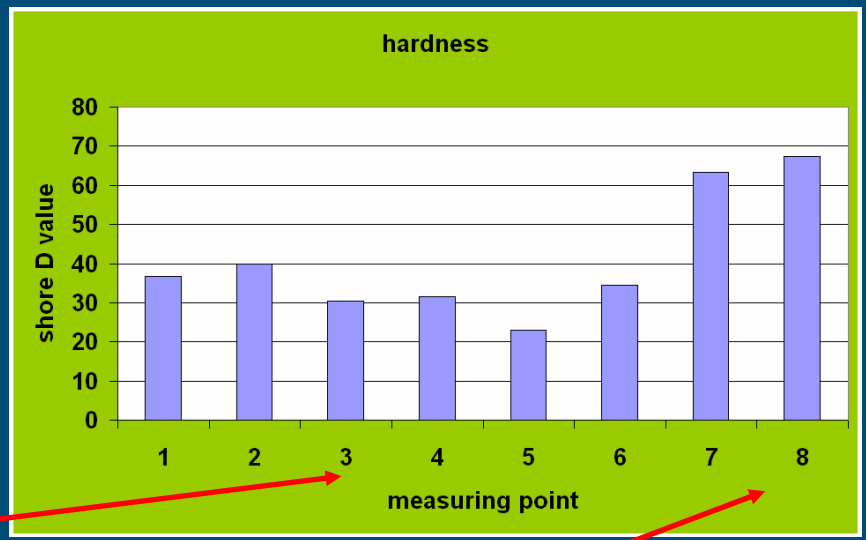
Summarised results (1)

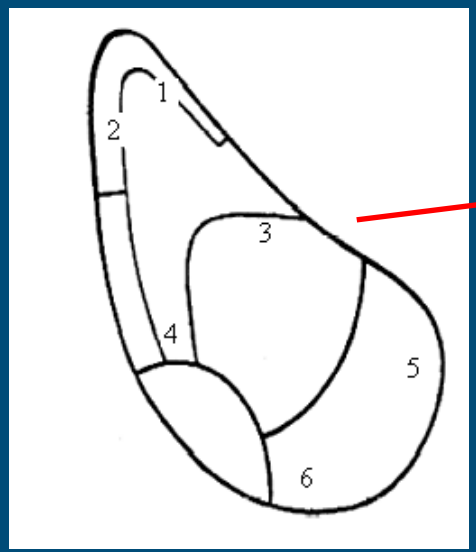
- Growth and wear:

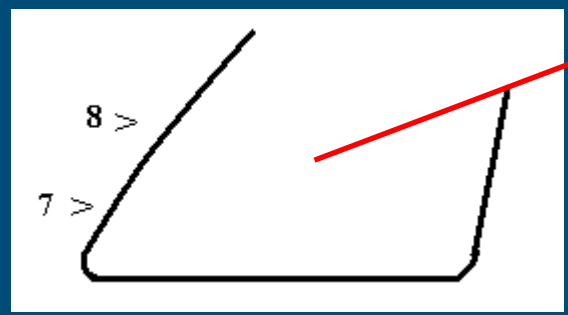
floor	growth/6 weeks (cm)	wear/6 weeks (cm)
profiled concrete	0.62	0.46
slatted concrete	0.63	0.65
slatted rubber	0.44	0.09
solid rubber	0.48	0.30

Summarised results (2)

- Claw hardness





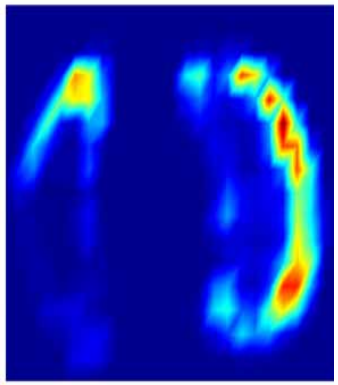
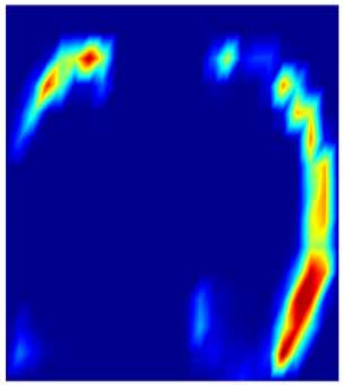
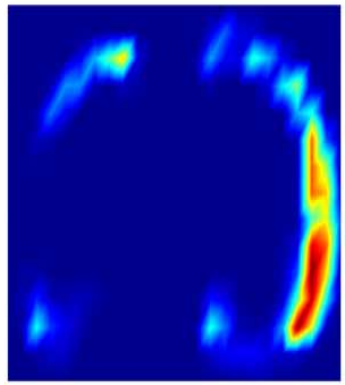
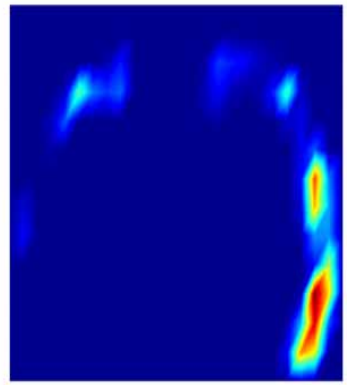


Summarised results (3)

- Behaviour (visual observations)
  - Rubber slats: longer step than solid floors
  - Rubber (both): less standing in cubicles
  - Rubber solid: more slips

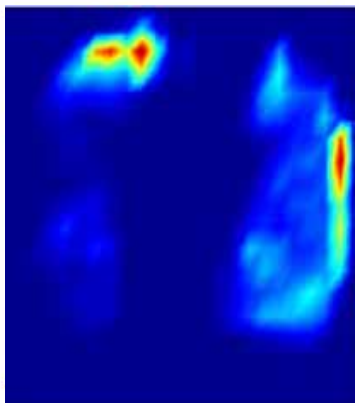
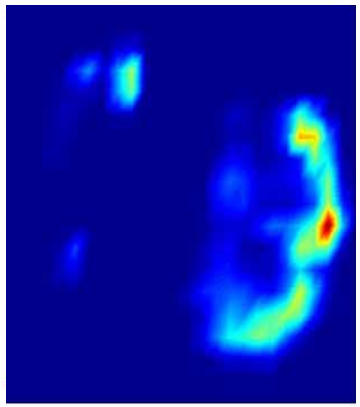
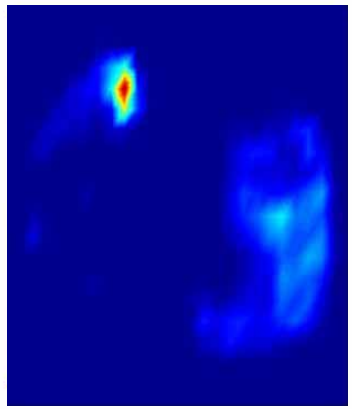
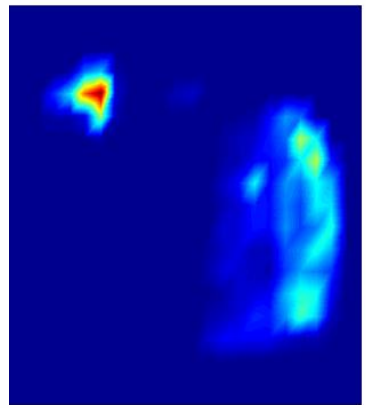
Summarised results (4: pressure distribution)

rubber

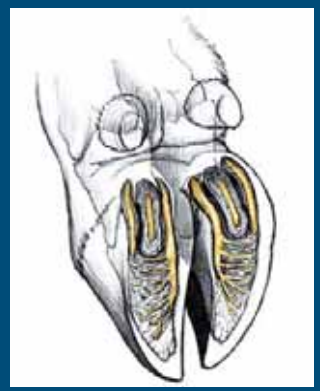





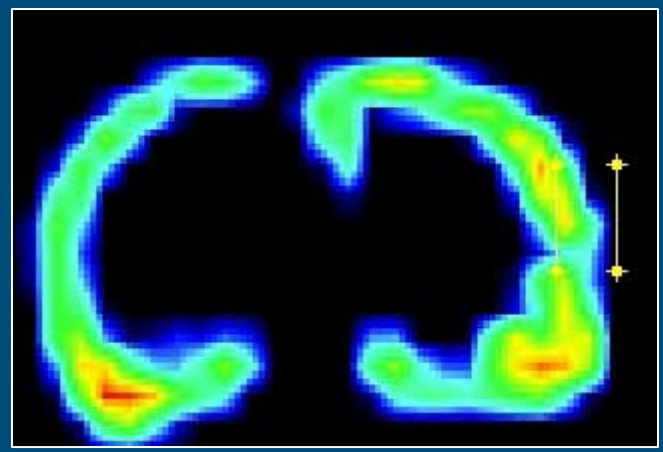
0 wk | 6 wk | 12 wk | 18 wk

concrete

Biomechanical insights



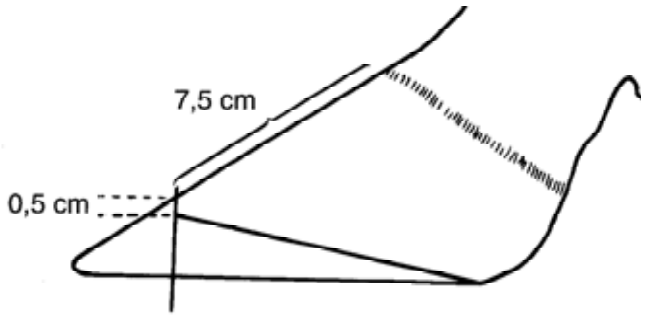


- Adapt trimming method?
  - Large force on bulb area
  - Natural claw shape: bearing wall, heigth difference
- Different strategies for different floors?

Claw trimming

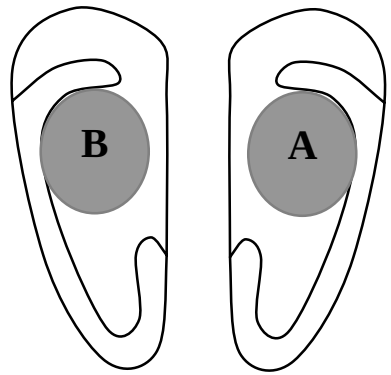
Maintenance claw trimming (standard method)

1. Make inner claw 7.5 cm long, make tip of the claw 0.5 cm thick Spare height in bulb area
2. Make outer claw as long and high as inner claw (if possible)
3. Make models



Maintenance claw trimming (alternative method)

1. Make inner claw 7.5 cm long, make tip of the claw 0.5 cm thick Spare height in bulb area
2. Make outer claw as long as inner claw, but height difference may remain up to 5 mm
3. Make model: continue line of wall from outer claw to inner claw. Dig out gray area A of outer claw 3 – 5 mm and do the same (if possible) for gray area B (inner claw)



ptc+

ANIMAL SCIENCES GROUP
WAGENINGEN UR

Examples

Experimental setup: number of animals

		trimming method	
		standard	alternative
floor	concrete	18	18
	rubber	19	17

Observations

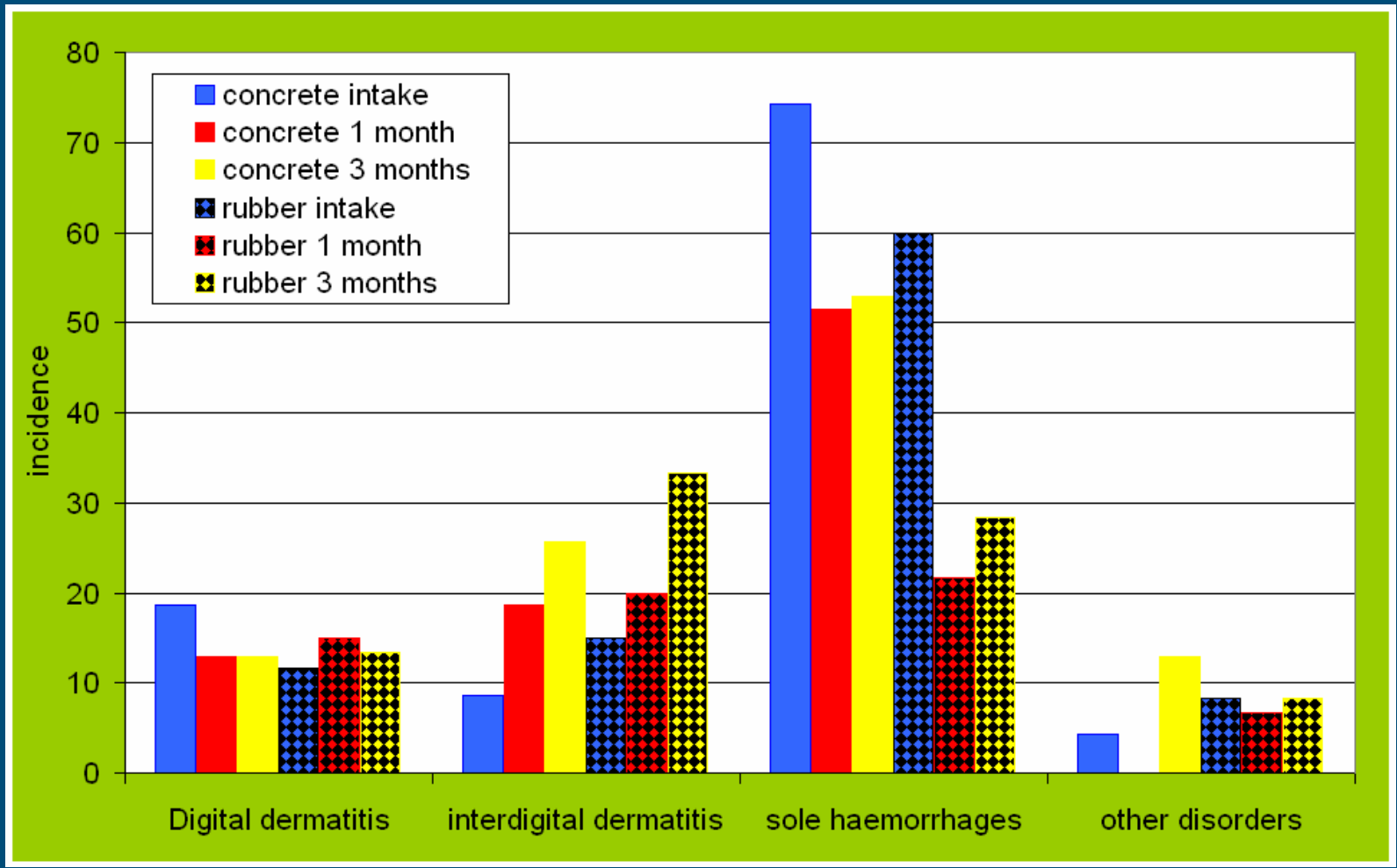
Intake, 1 month and 3 months:

- Claw shape and claw disorders
- Locomotion score
- Behaviour (IceTag)
- Pressure distribution
- Horn quality

Results claw shape

- Inner claws:
  - Smaller than outer claws
  - Slower growth
- Rubber floors:
  - Somewhat larger claws
  - Slower growth and wear
- Trimming mehod:
  - No significant effects

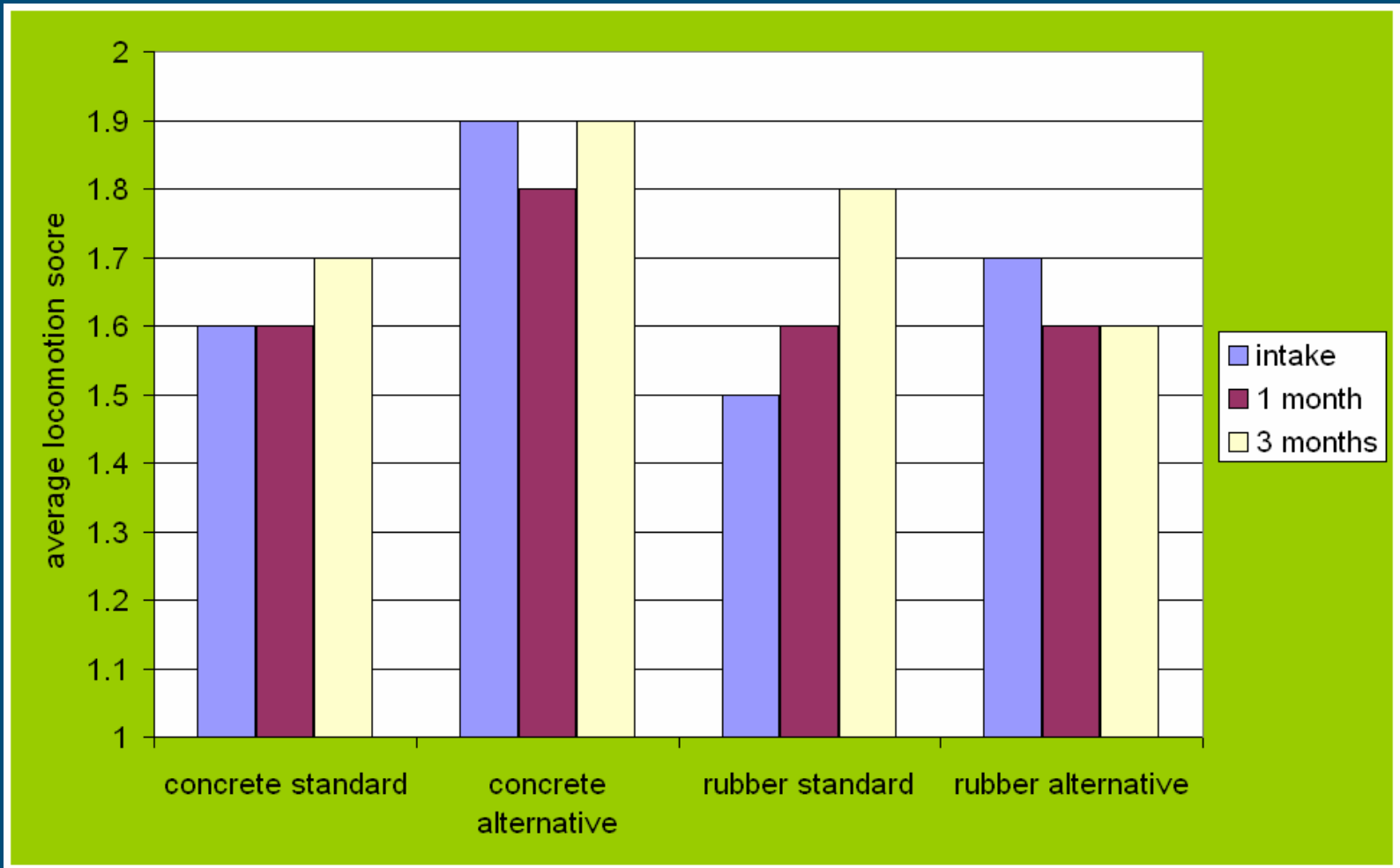
Results claw disorders



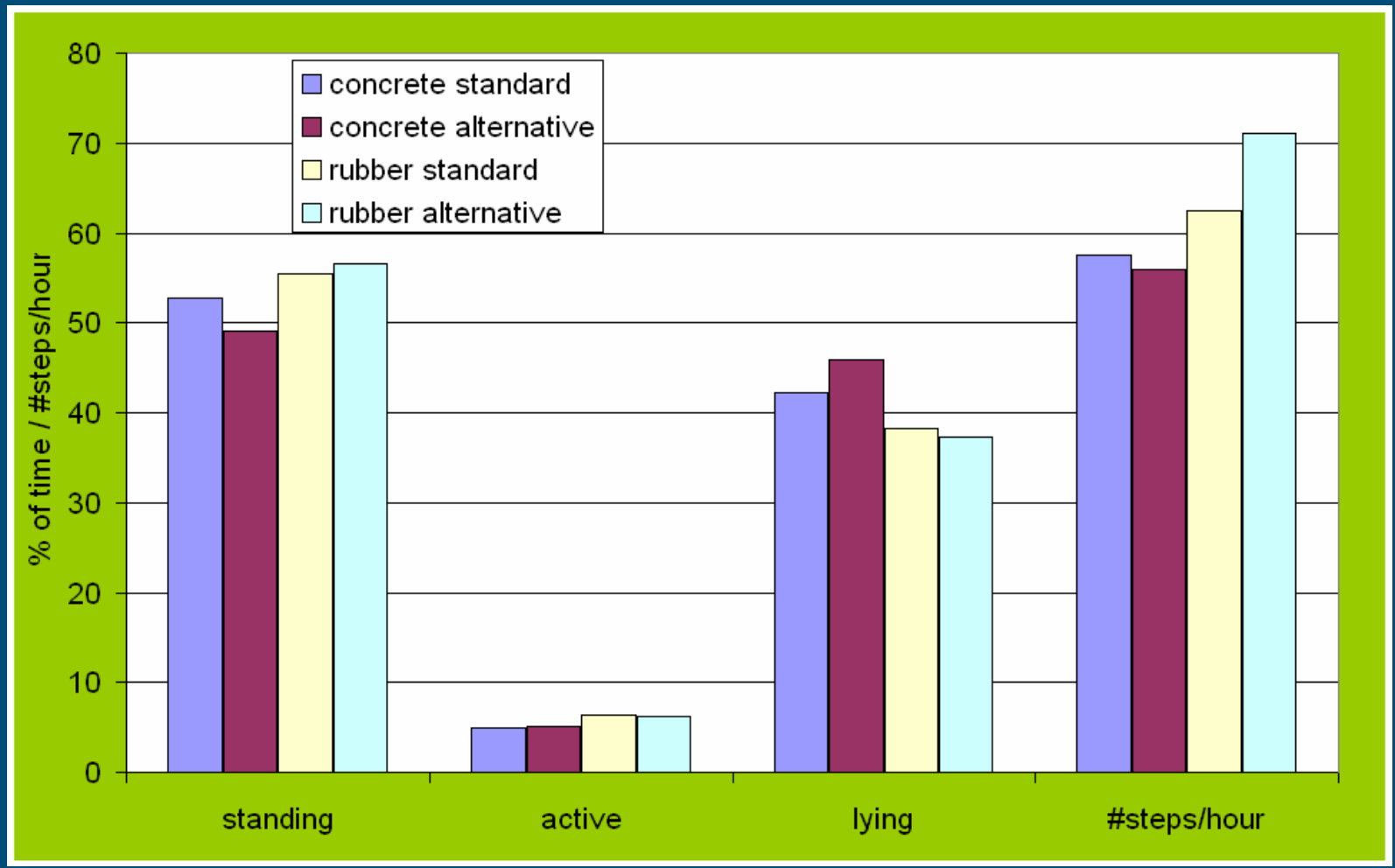
Locomotion scoring (Manson &Leaver):

- 1 = firm, regular and balanced steps
- 2 = skating steps, somewhat unequal
- 3 = irregular, little bit lame
- 4 = clearly irregular and lame, still 4 feet loaded
- 5 = severely lame, difficulty getting up, tries to avoid load on painful leg

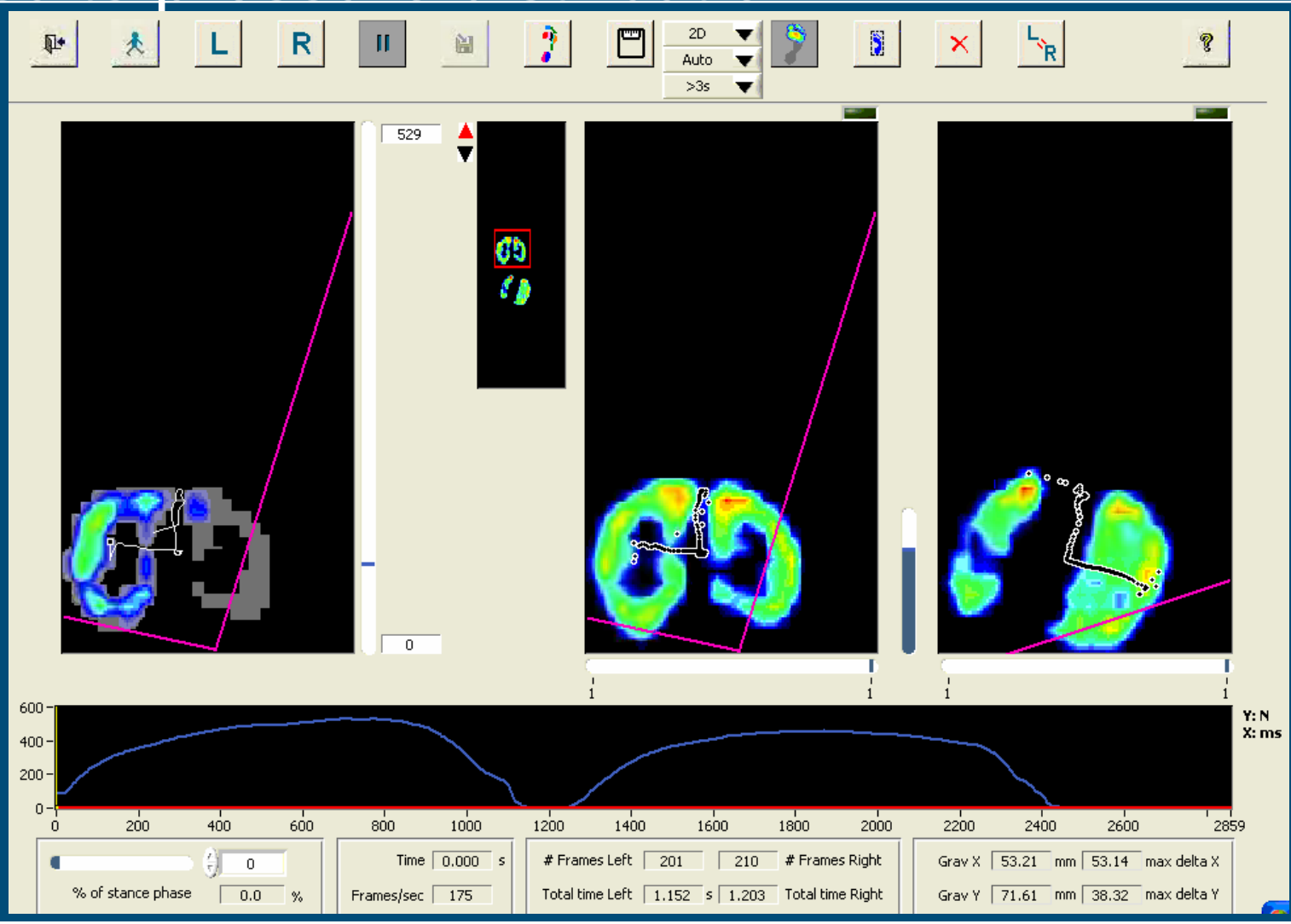
Results locomotion score



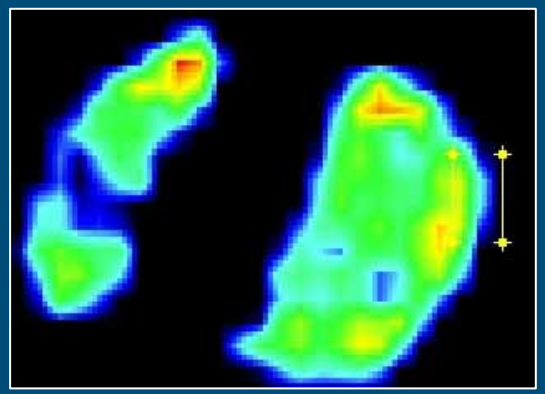
Results behaviour (Ice Tag)



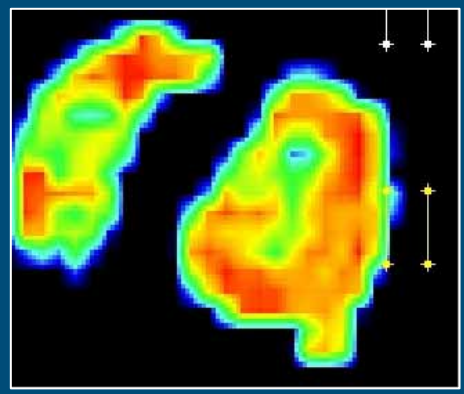
Results pressure distribution



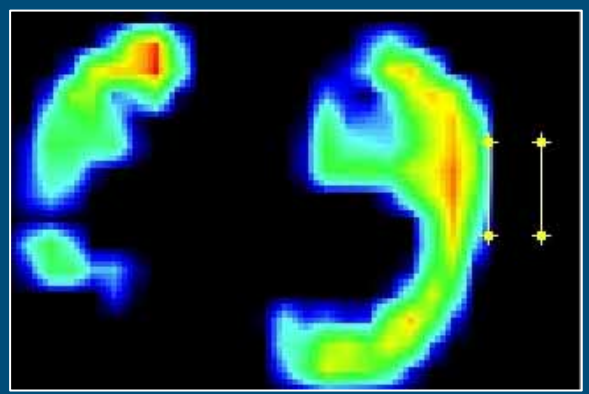
Results pressure distribution



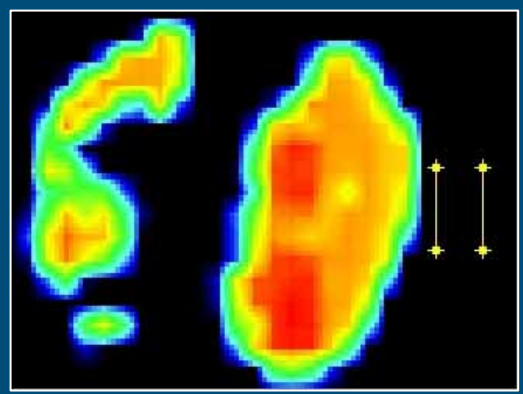
Concrete, standard, intake



Concrete, standard, month 3

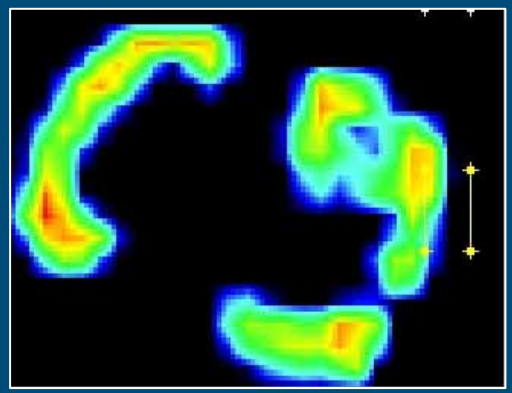


Concrete, alternative, intake

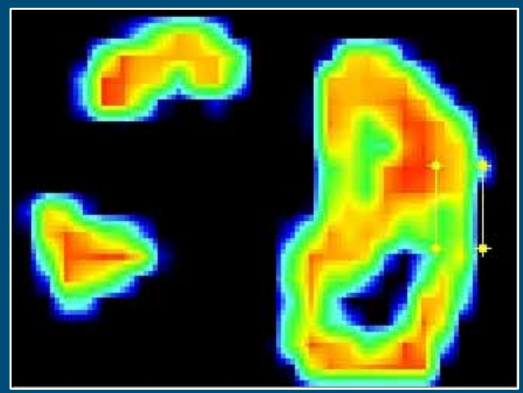


Concrete, alternative, month 3

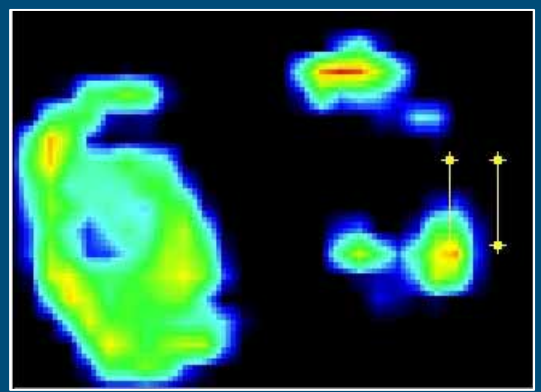
Results pressure distribution



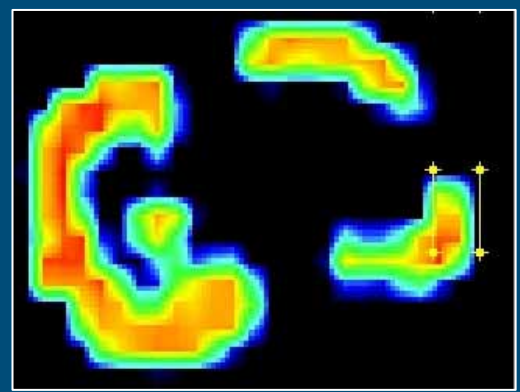
Rubber, alternative, intake



Rubber, alternative, month 3



Rubber, standard, intake



Rubber, standard, month 3

Concluding remarks

- Differences between rubber and concrete substantial
- Alternative trimming did not differ from standard trimming:
  - Interpretation
  - Outlook
- Sensitivity of parameters

acknowledgements

- Farm crew Waiboerhoeve
- All who contributed to the project
- Dutch Ministry of Agriculture, Nature and Food Quality
- Dutch Dairy Board


Thank you for your attention