



MTT
Agrifood Research
Finland

Silage in Finland

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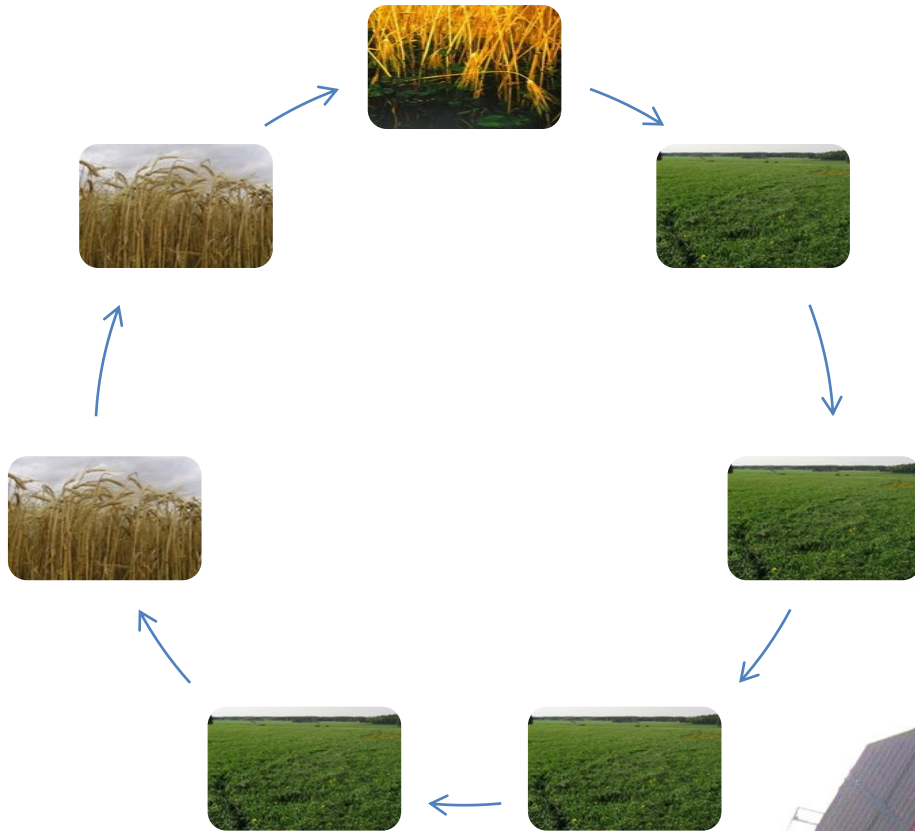


Photos: Facebook, Jokioisten Maa-ja kotitalousnaiset

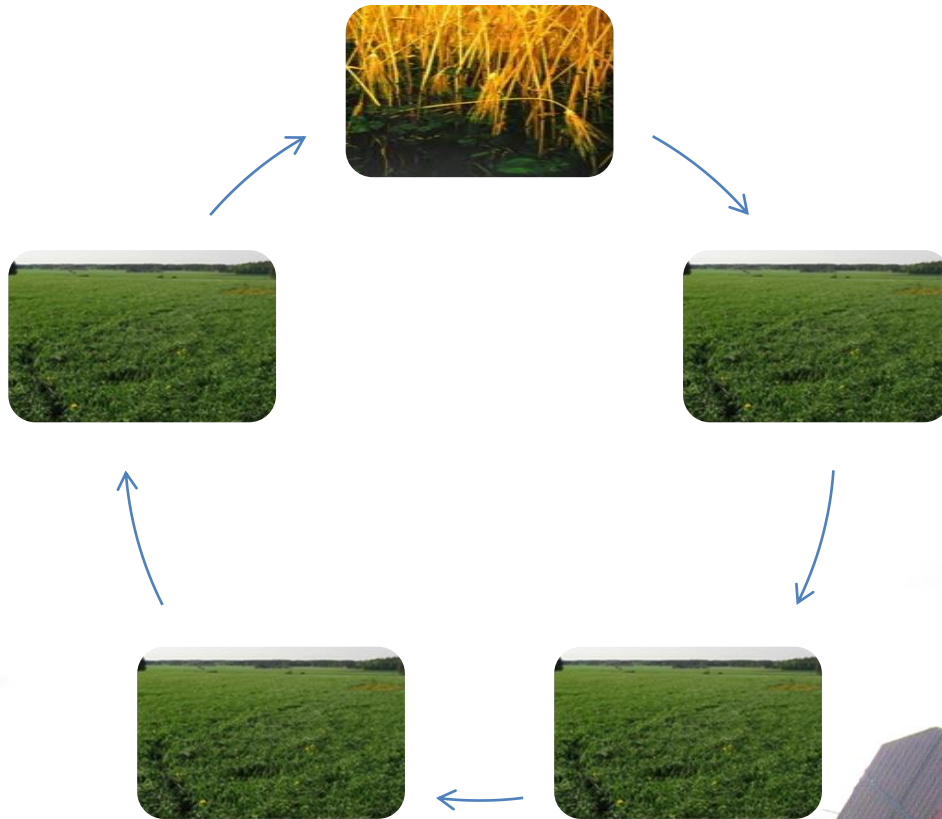


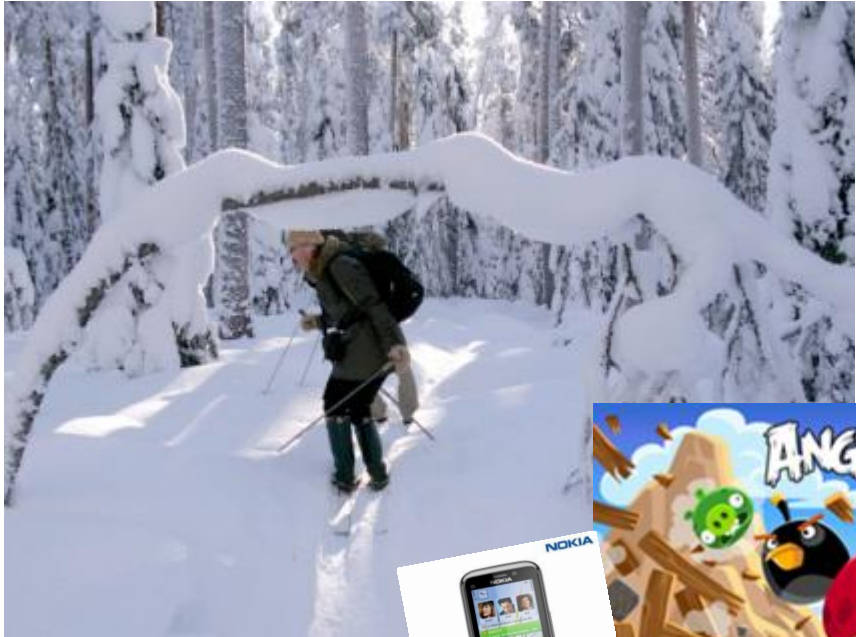
	Ireland	Finland
people	4,5 miljoonaa	5,3 miljoonaa
Area, km ²	70 000	338 000
Total land area, km ²	68394	304086
Utilised agricultural area , km ²	41394	22923 = 2,3 milj. hectars
Arable land, km ²	10053	22502
Permanent grassland and meadow, km ²	31324	304
grass area less than 5 years, km ²		6600- (9000)

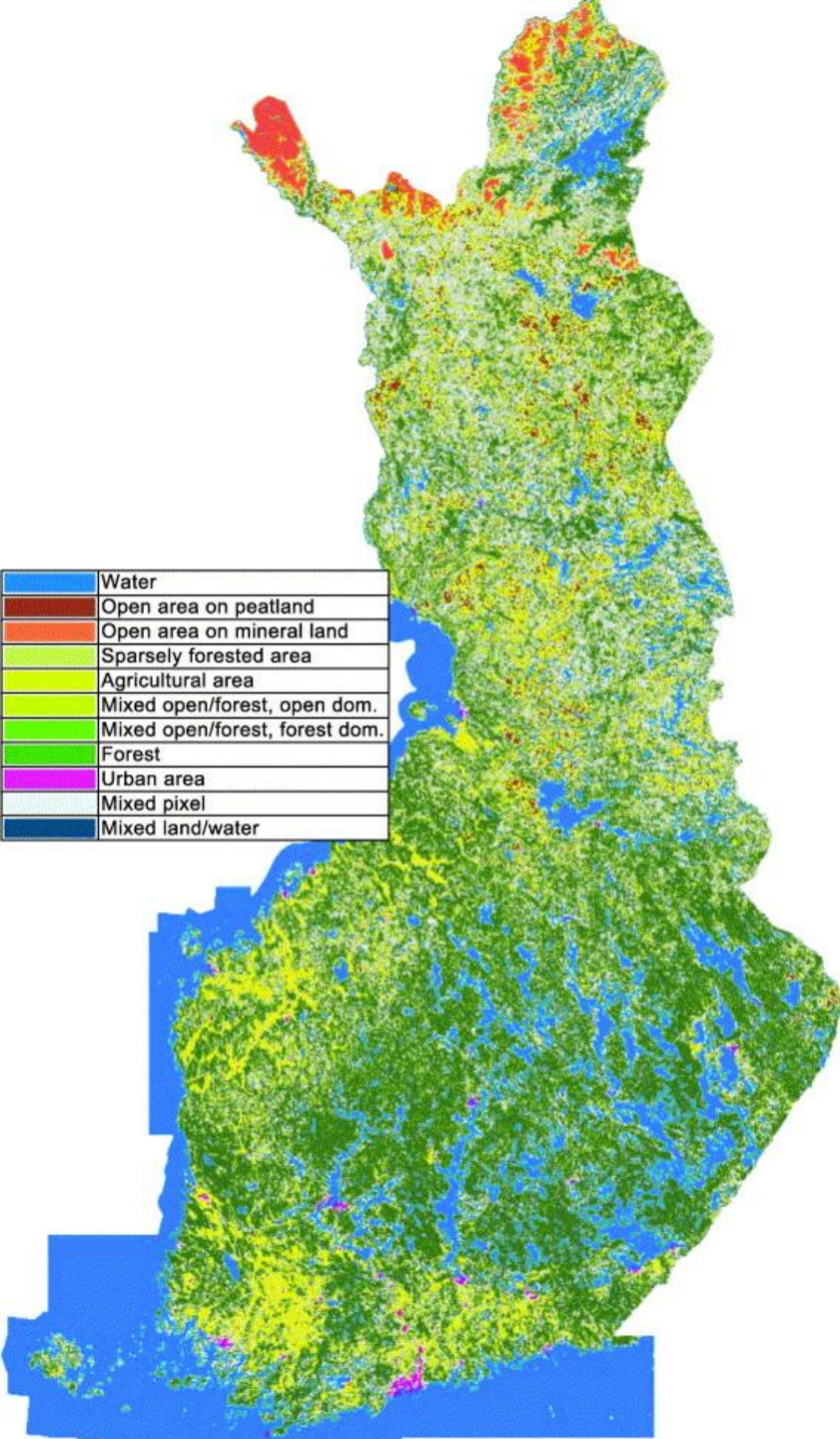
Grass cultivation in Finland



Grass cultivation in Finland





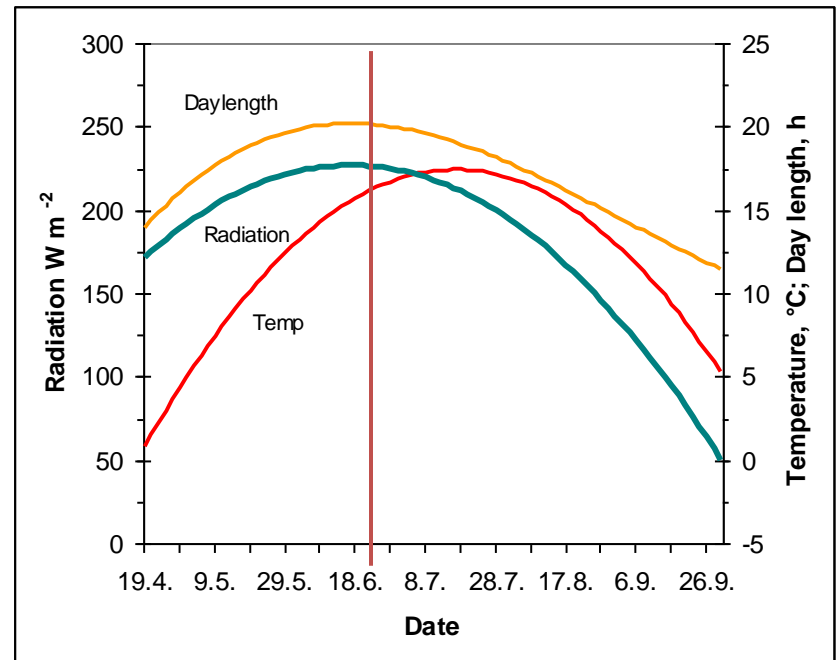






Climate in Finland

- Mixed climate (marine/continental)
- Half of the annual precipitation (580 mm) comes as snow (Central Finland)
- Growing season 130-180 d
- Grazing season 100-130 d
- Snow cover 5 months
- Soil frost 10 – 30 cm
- Day length up to 21 hours per day



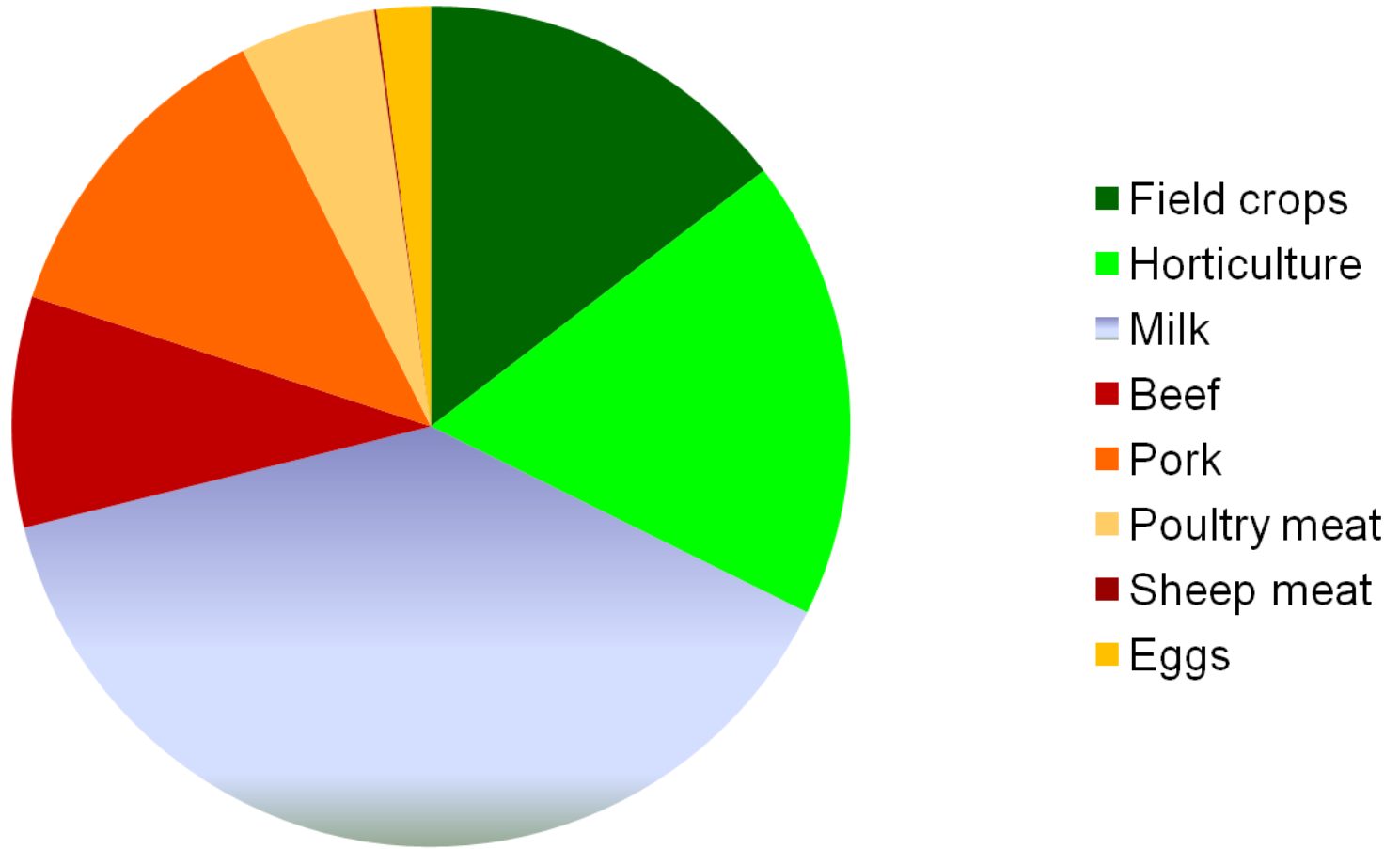
Finnish farms

- 60 000 farms totally,
- 39 hectares/farm
- 27 % of the farmers have incomes outside agriculture
- Nearly 1/3 have some animal production
- Average farmer is 51 years old
- Number of farms in main production sectors:
 - 26700 cereal production
 - 9800 dairy farms
 - 3500 other cattle (beef)
 - 1700 pig husbandry
 - 1800 horse husbandry

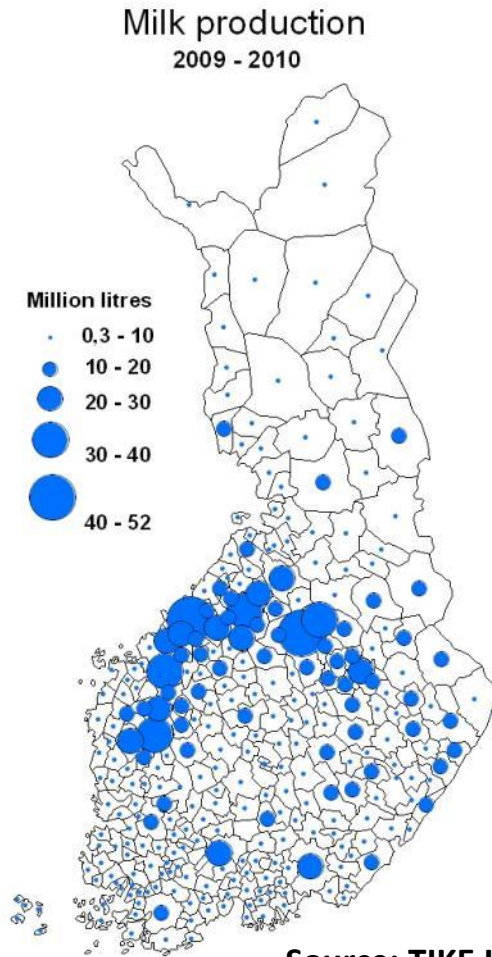
Agricultural income in Finland from different sectors – totally 2310 M€

Source:

www.ruokatieto.fi



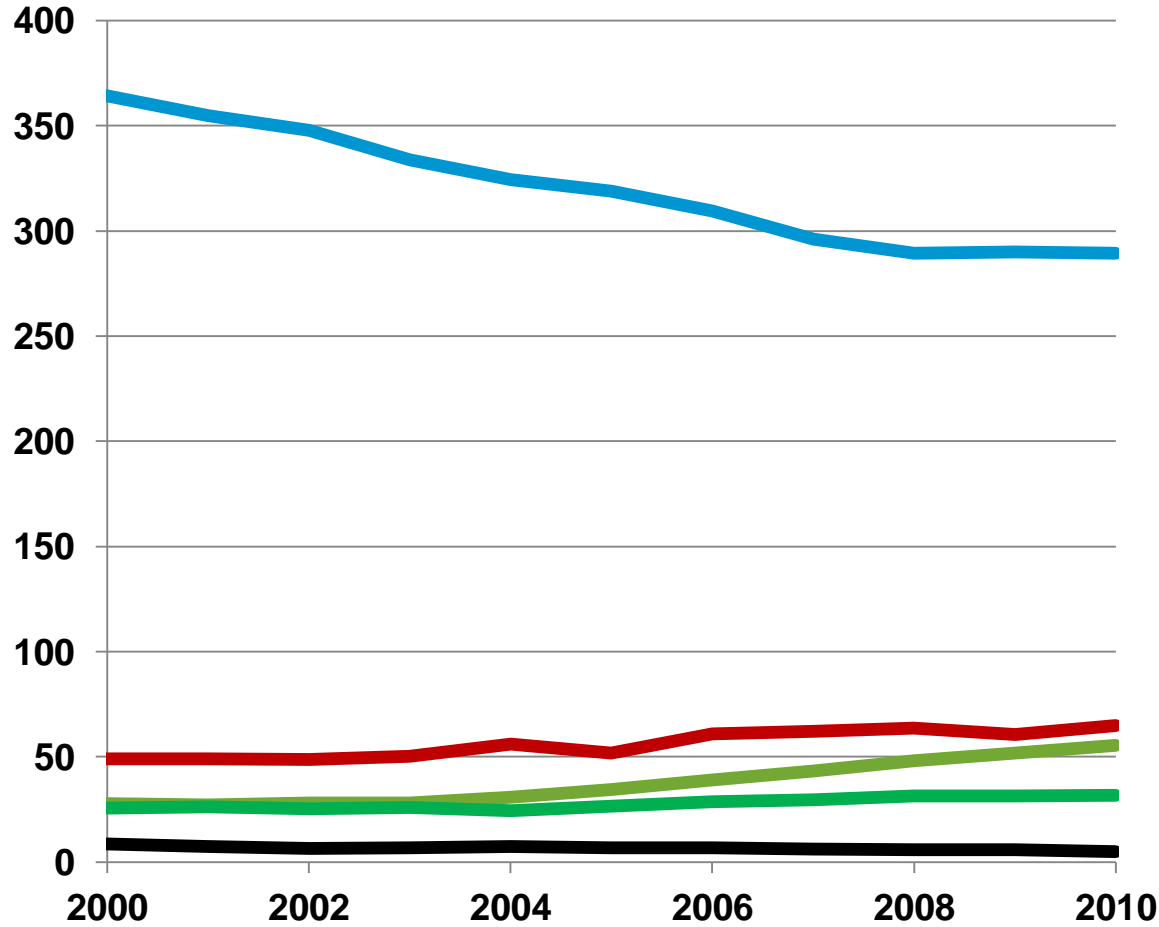
Geographical distribution of milk production



In addition to national importance, grass, milk and beef production has a strong regional impact

Source: TIKE Information Centre of the Ministry of Agriculture and Forestry, 2010

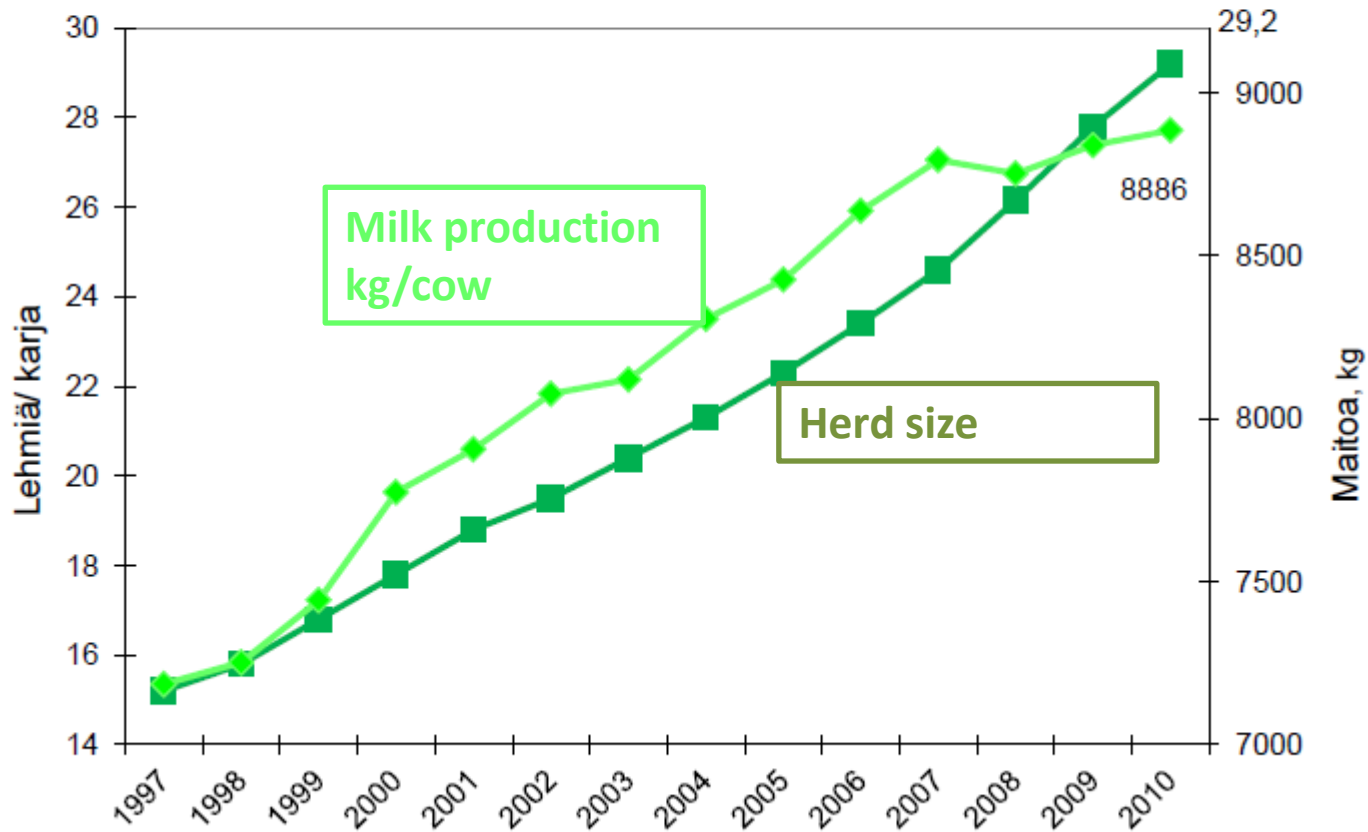
thousands



- Dairy cows
- Ewes
- Sucler cows
- Horses on farms
- Goats

Dairy farms:
-Average herd size 27
cows

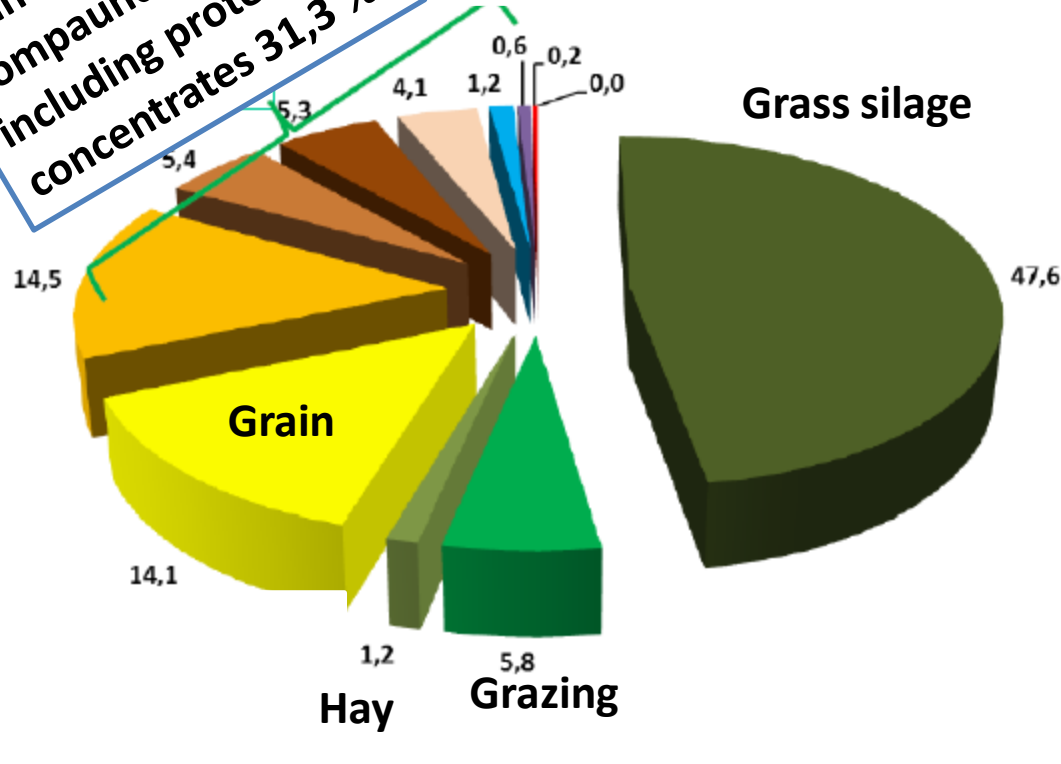
Development of herd size and average milk production/cow, kg





Feed consumed by finnish dairy cows, % of fed dry matter

Manufactured compaund feeds including protein concentrates 31,3 %



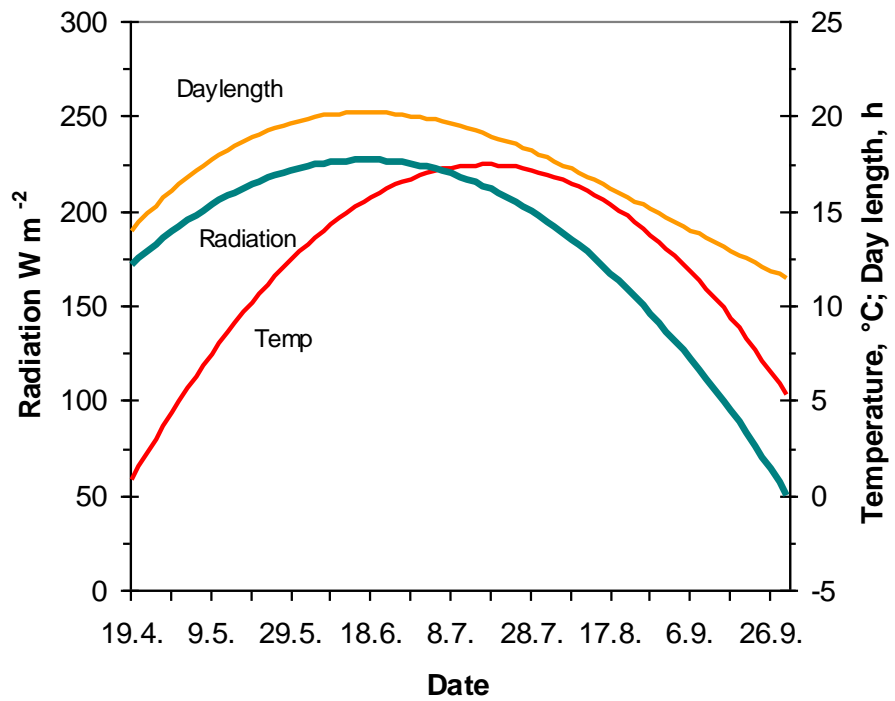
Forage production and conservation are key components in milk / beef production under Finnish conditions

Grass silage is typically harvested 2 or 3 times per summer

Silage yield is 3000 - 9000 kg

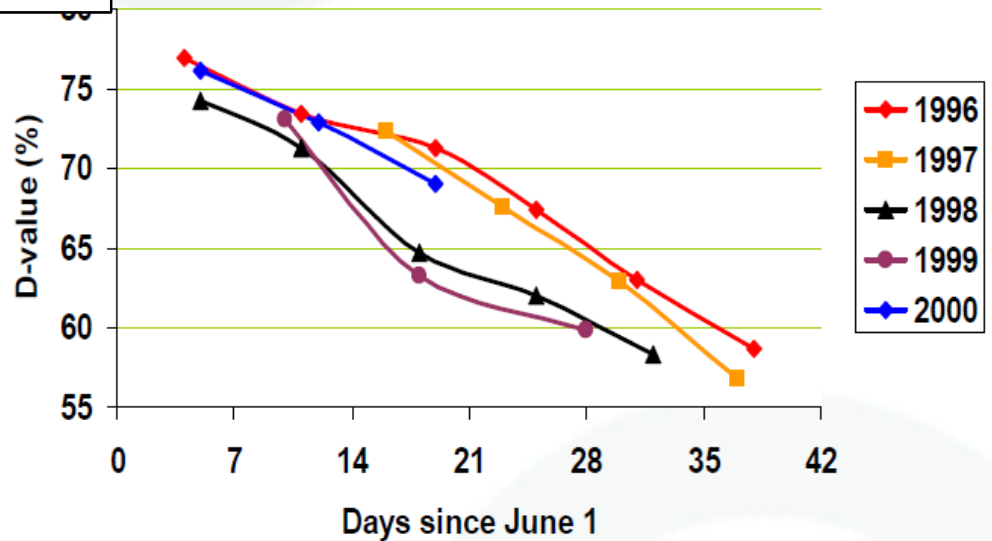
DM/hectar





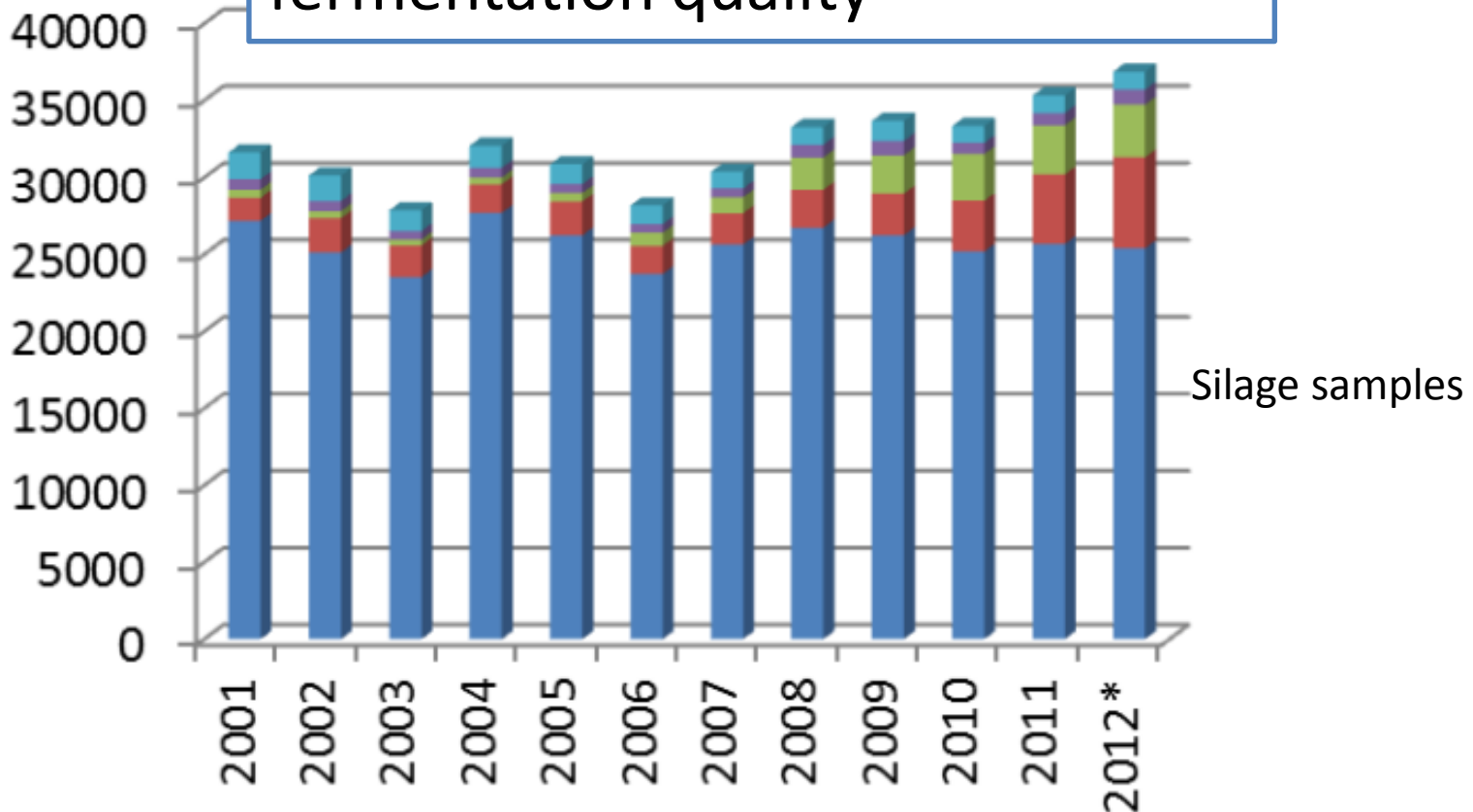
Grass D-value declines on average by 0.5 %-units per day

D-value = digestible organic matter % dry matter



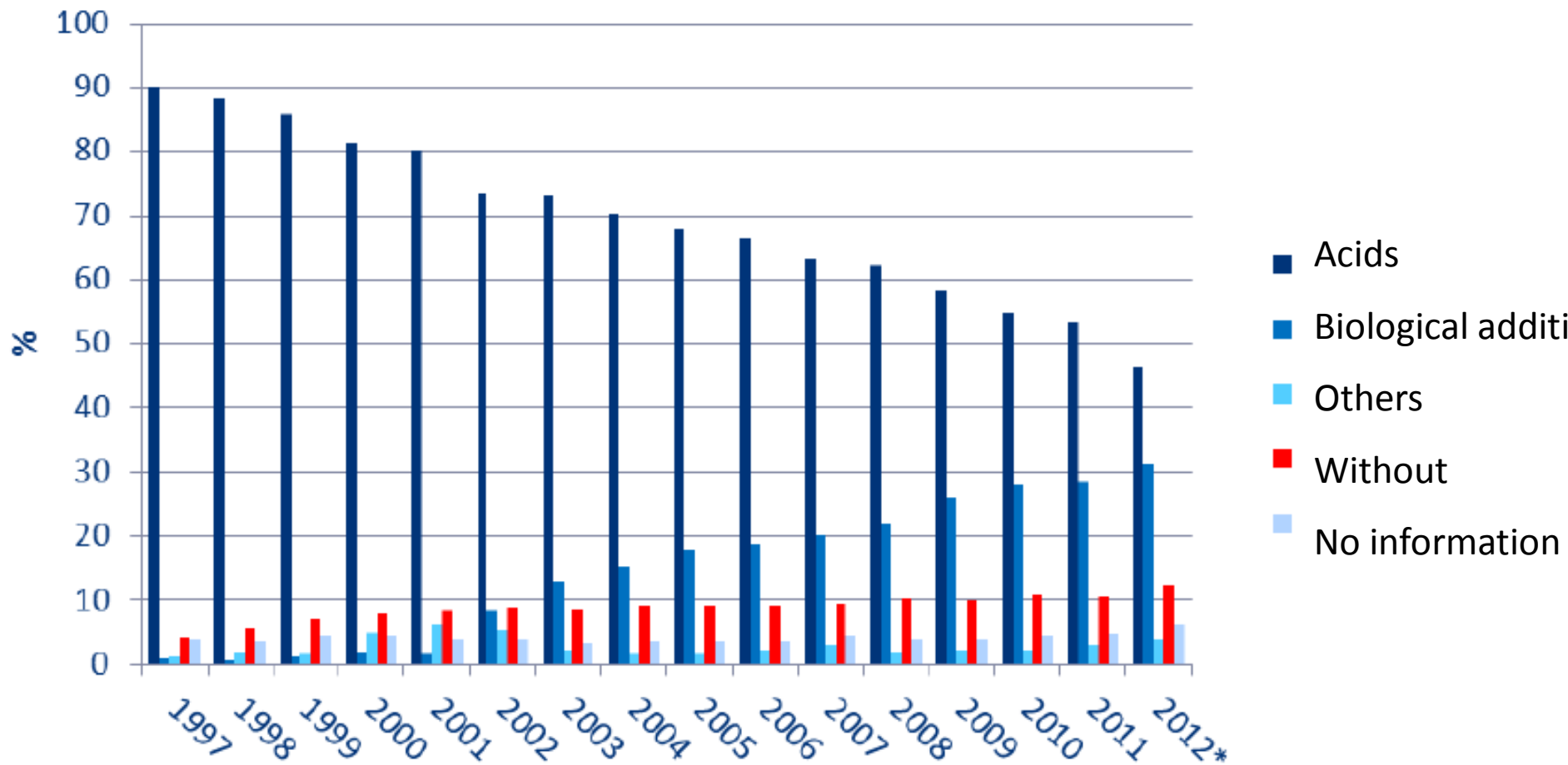


Number of feed analysis in Valio laboratory, NIRS method used for analysing silage digestibility and fermentation quality





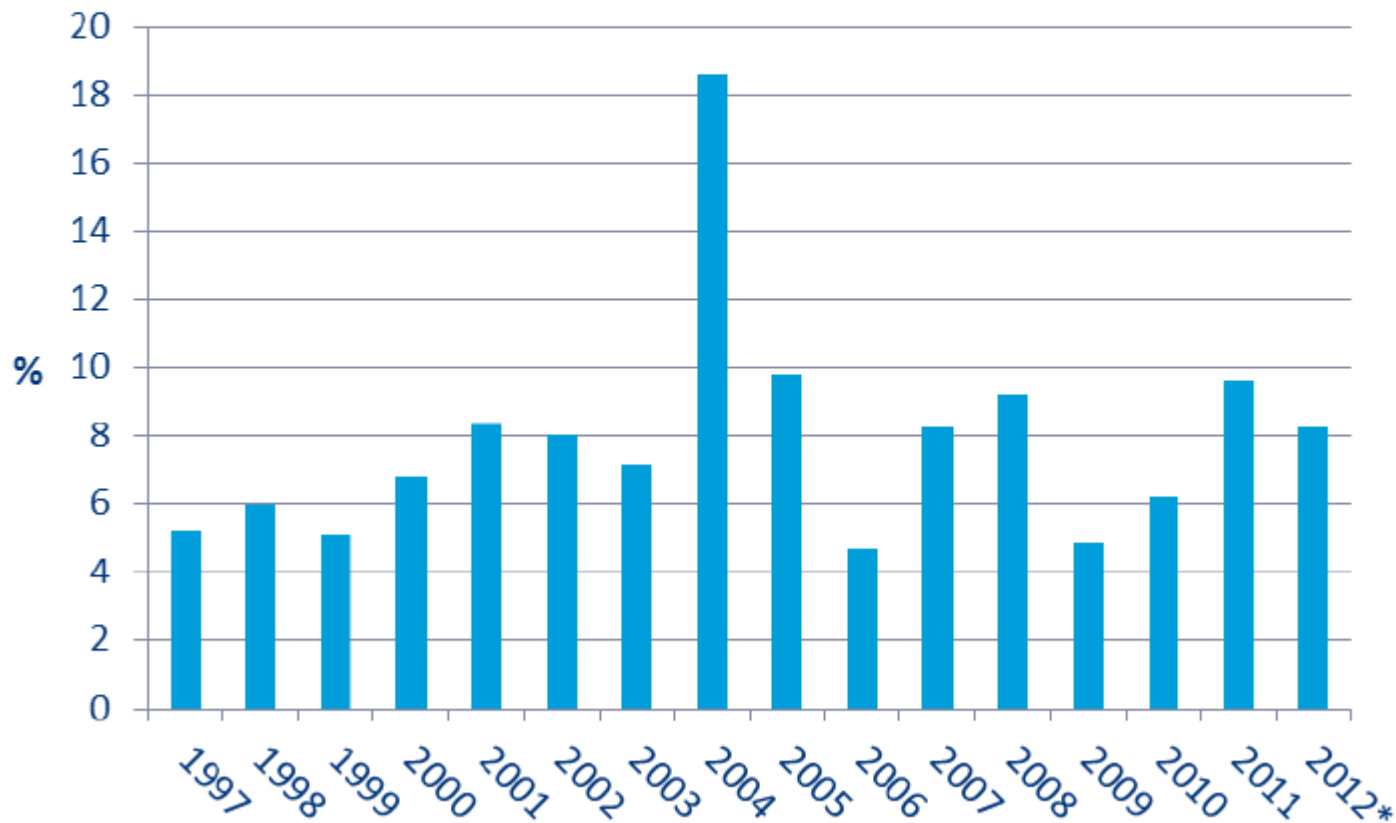
Säilöntäaineen käyttö





Proportion of poor quality silages, %

$\text{NH}_3\text{-N} > 80 \text{ g/kg N}$ ($\text{ka} < 450 \text{ g/kg}$)



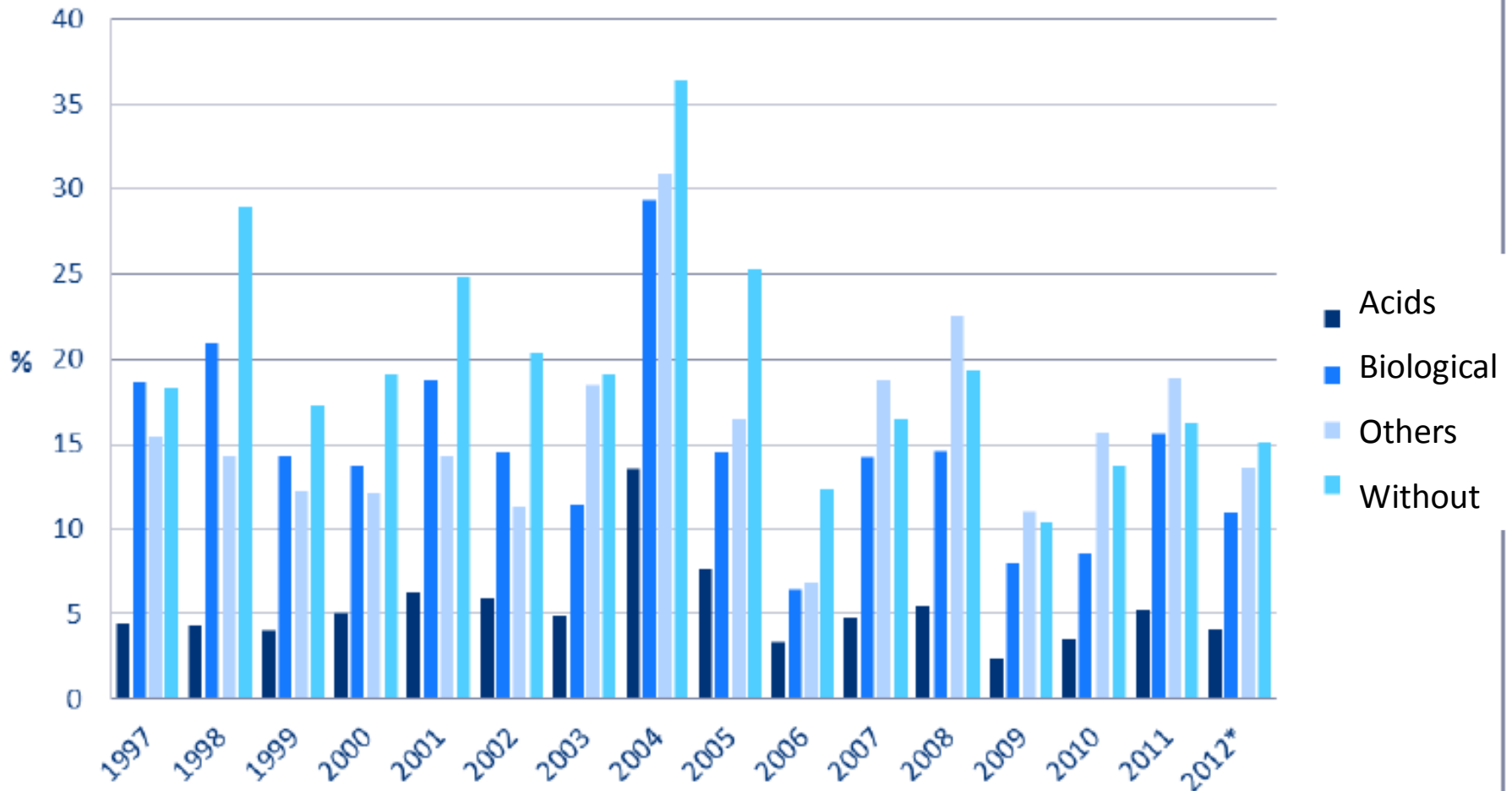
*Elo-joulukuu 17.12.2012)



Proportion of poor quality silages
Among different additives



NH₃-N > 80 g/kg N (rehut, joiden ka < 450 g/kg)

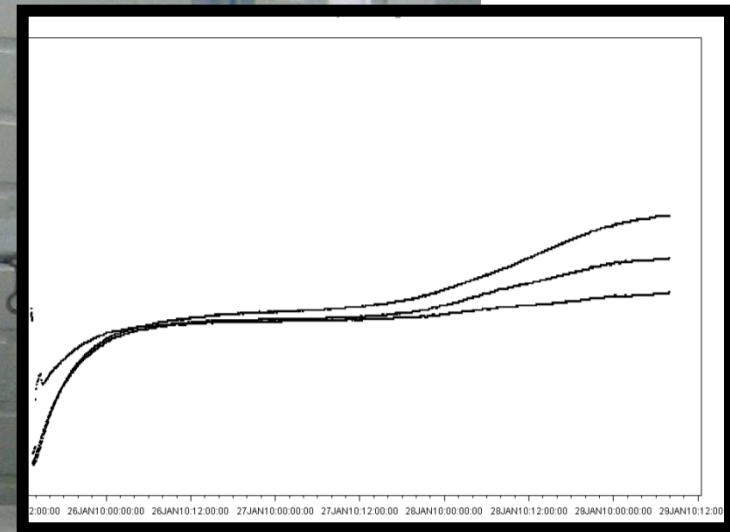


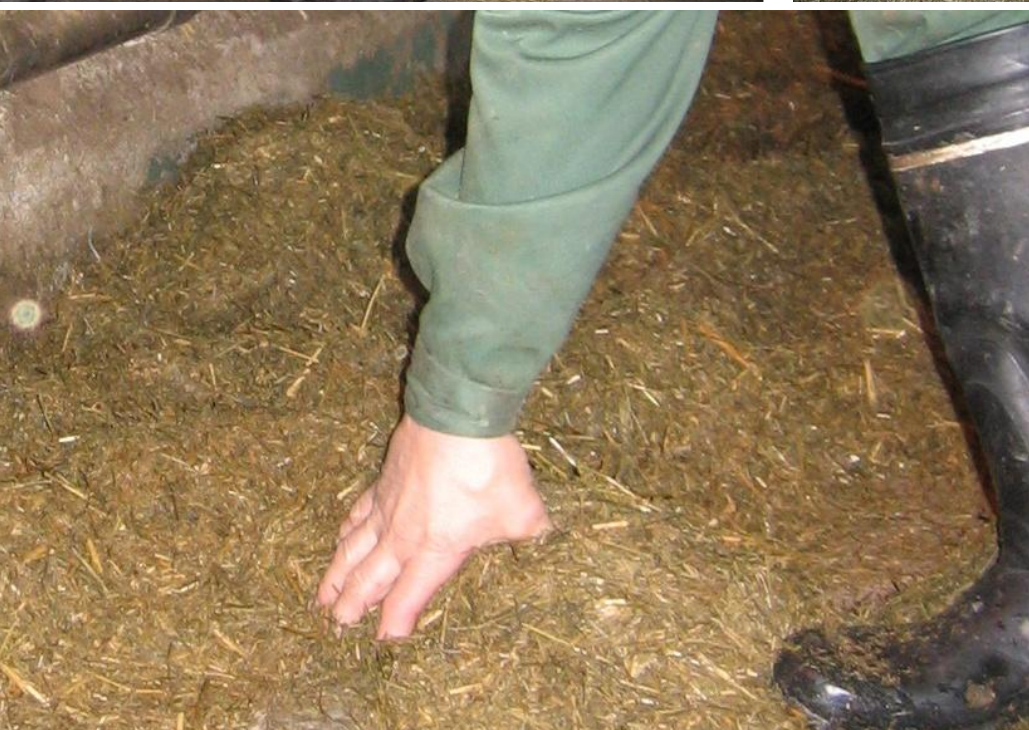




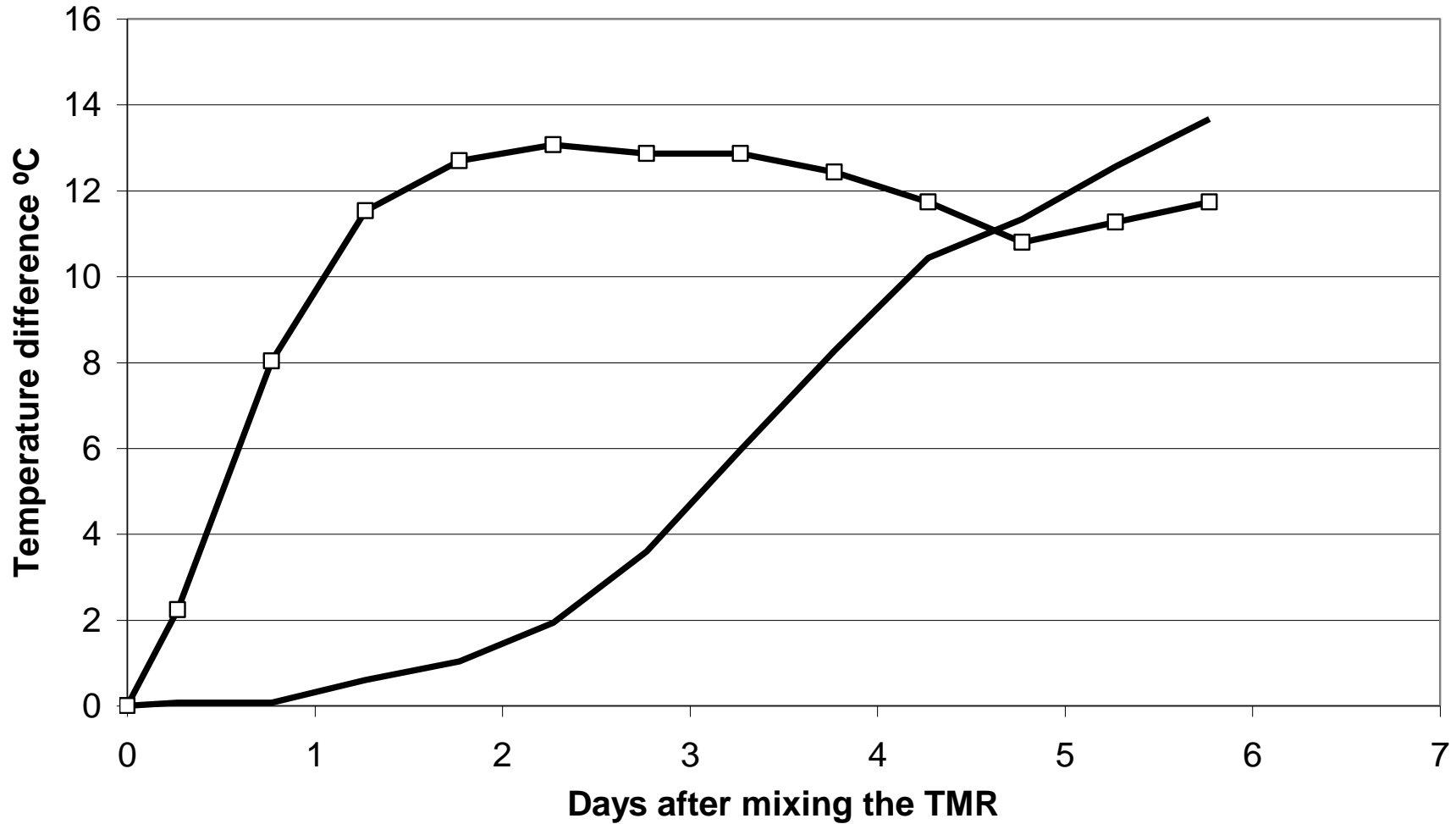






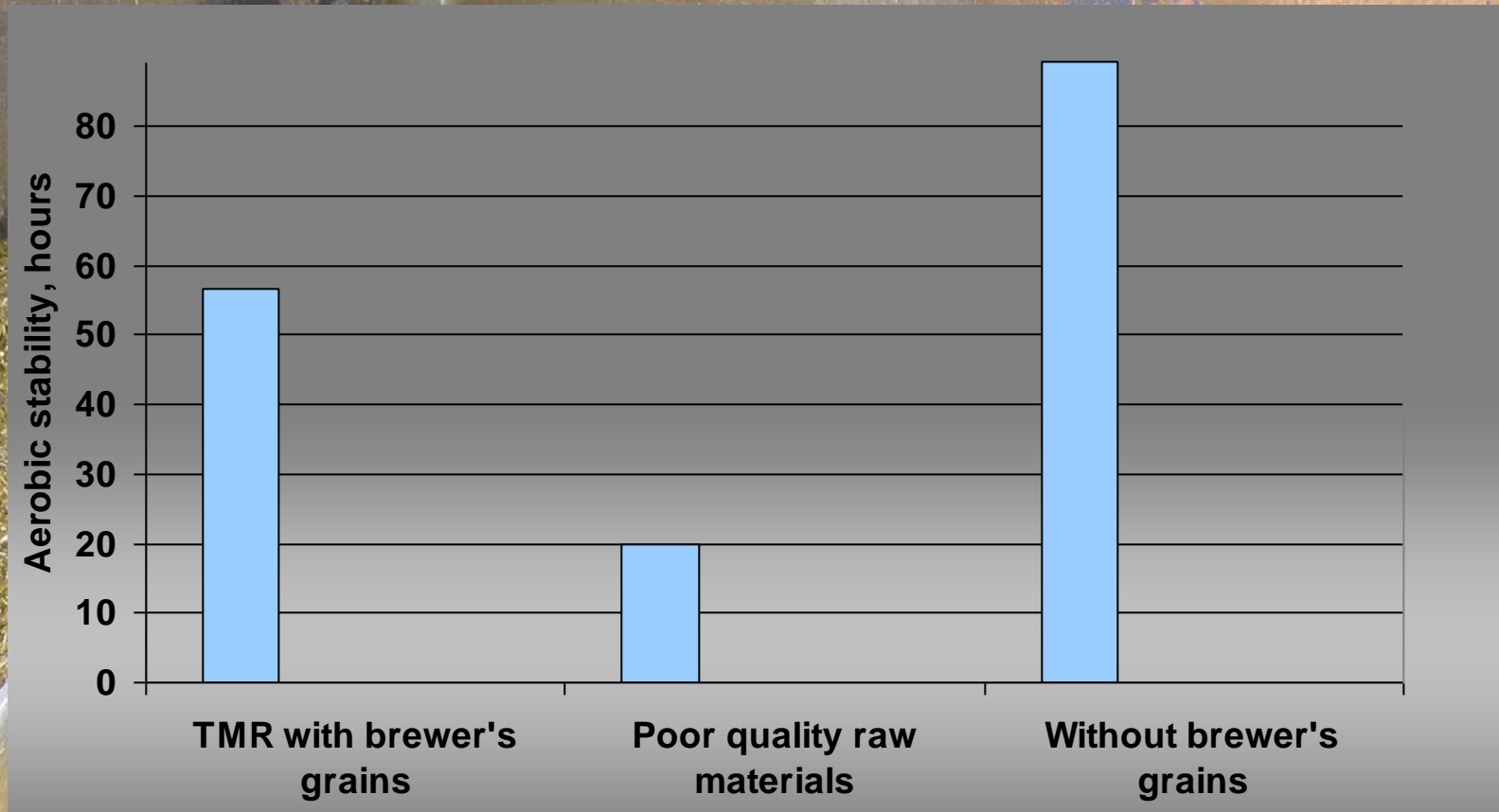


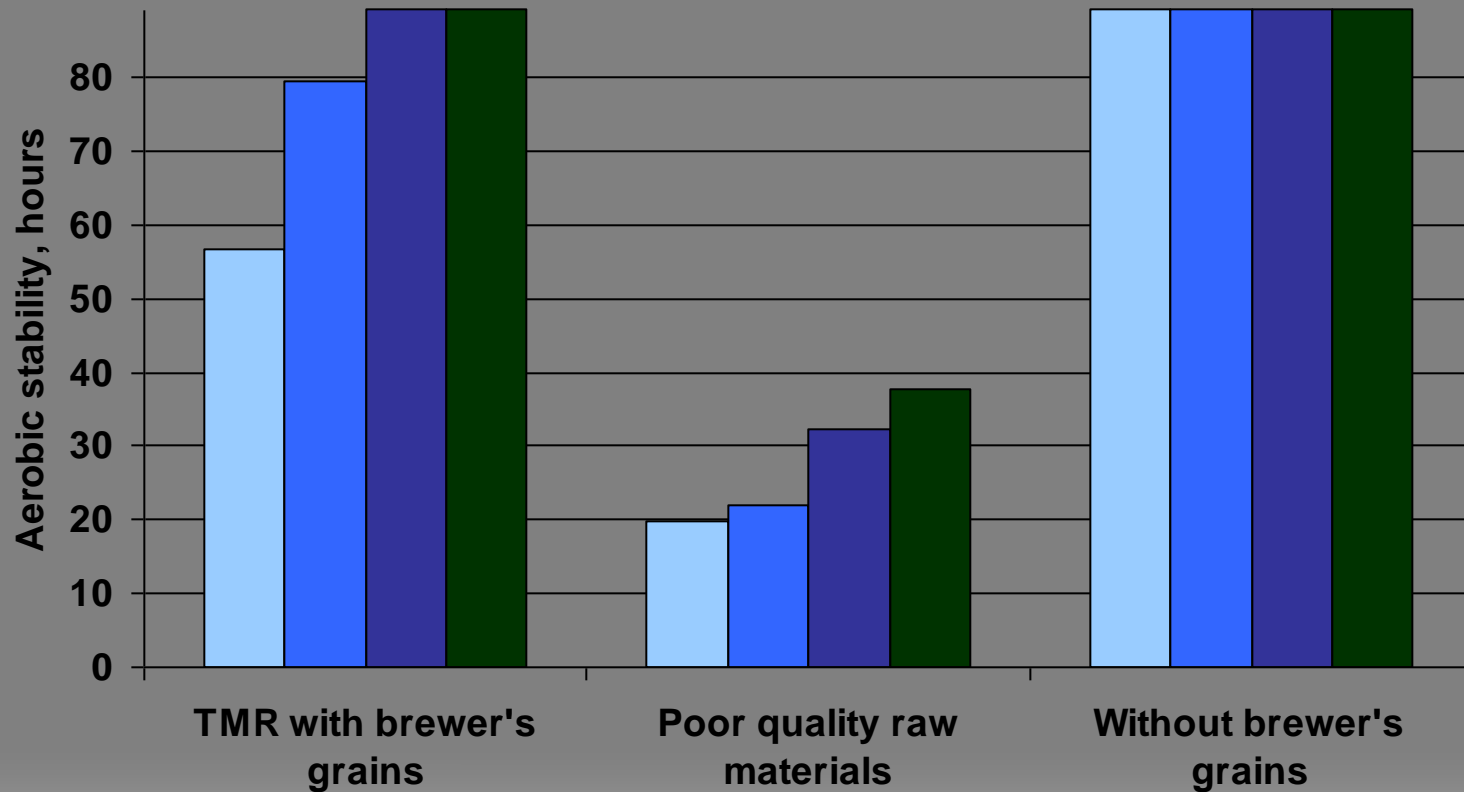
Temperature changes of the TMR feeds during aerobic exposure



The aerobic stability of TMR was reduced from 66 hours to 9 hours by contamination with a 10 % inclusion of spoiled TMR ($P < 0.001$).

Aerobic stability of total mixed ration





Stabilizer TMR L

Propionic acid (38,0 %)
 Formic acid (27,2 %)
 Ammoniumformiate (16,3 %)
 Water (18,5 %)

Kemira

- TMR without preservatives
- Stabilizer TMR L 2g/kg
- Stabilizer TMR L 4g/kg
- Stabilizer TMR L 6g/kg

MTT Maaninka research farm

- Silage harvesting is done by contractors
 - Both in bales and in bunker silos
 - Precision weighing of silage
- Possibility to conduct farm-scale experiments
 - Arable land 145 ha
 - Possibility to use contractors and other experts



Maaninka dairy barn was taken into use in 2009

- 120 dairy cows in a loose-house system
- Farm scale biogas reactor
- Situated in the middle of "dairy Finland"
- Possibilities to conduct farm scale systemic research combining feed and animal production and manure use
- Focus on "precision dairy farming"



Photo: Mikko Jauhiainen



Photo: Juho Väisänen

Holstein and Ayshire

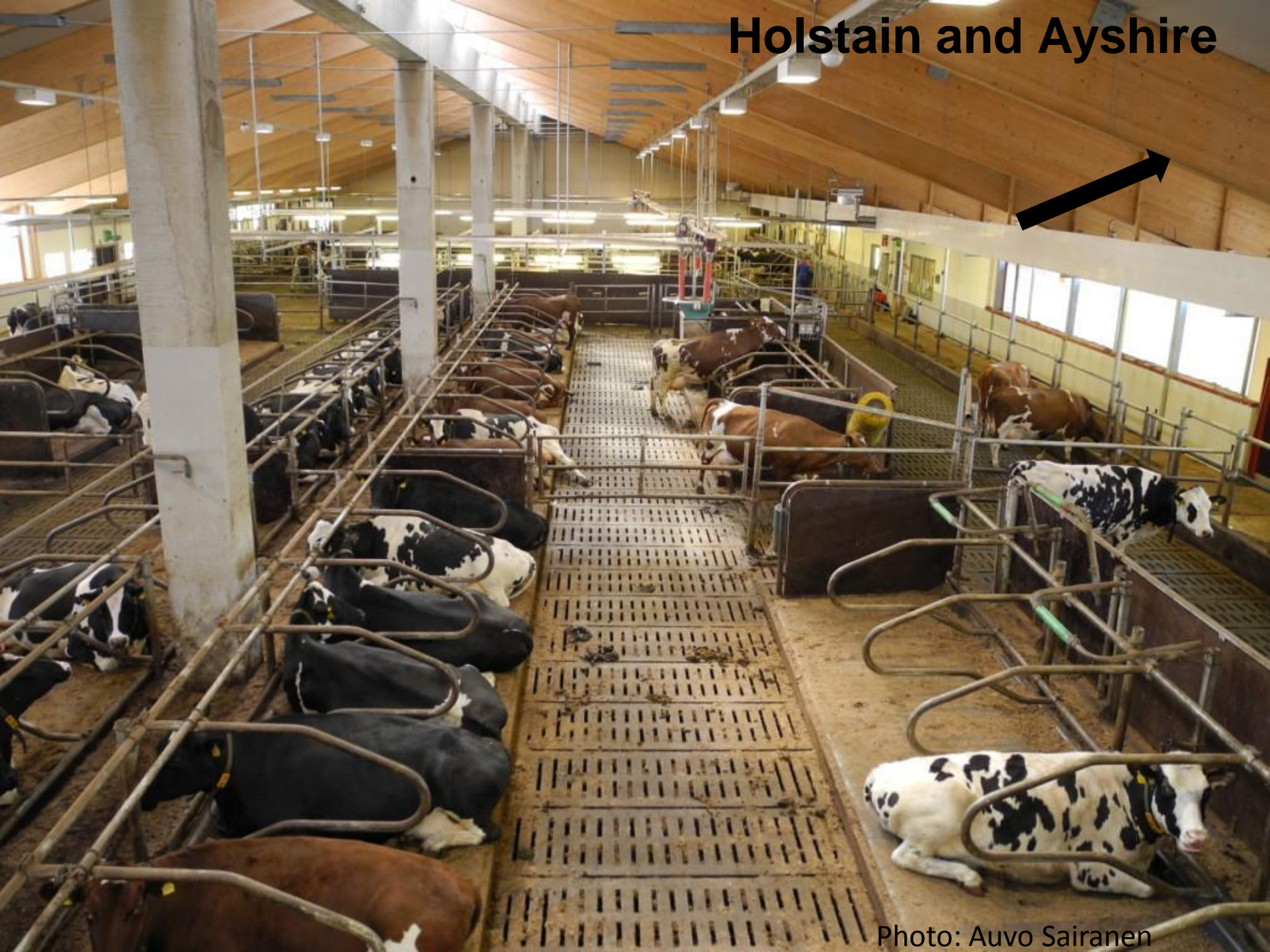


Photo: Auvo Sairanen

Beef production research

- **Five research topics**
 - **Feeding strategies for growing and finishing cattle**
 - **Welfare and behaviour of growing cattle**
 - **Meat quality of growing cattle**
 - **Grazing management of beef cattle**



Photos: MTT/Maiju Pesonen



A group of goats are resting in a hay-filled enclosure. There are five white goats and one black goat with a white face. They are all lying down, some with their heads resting on the hay. The enclosure has metal bars on the left side. The text "Thank you! Kiitos!" is overlaid on the right side of the image.

**Thank you!
Kiitos!**