Development of Sheep systems in Finland and results from iSAGE

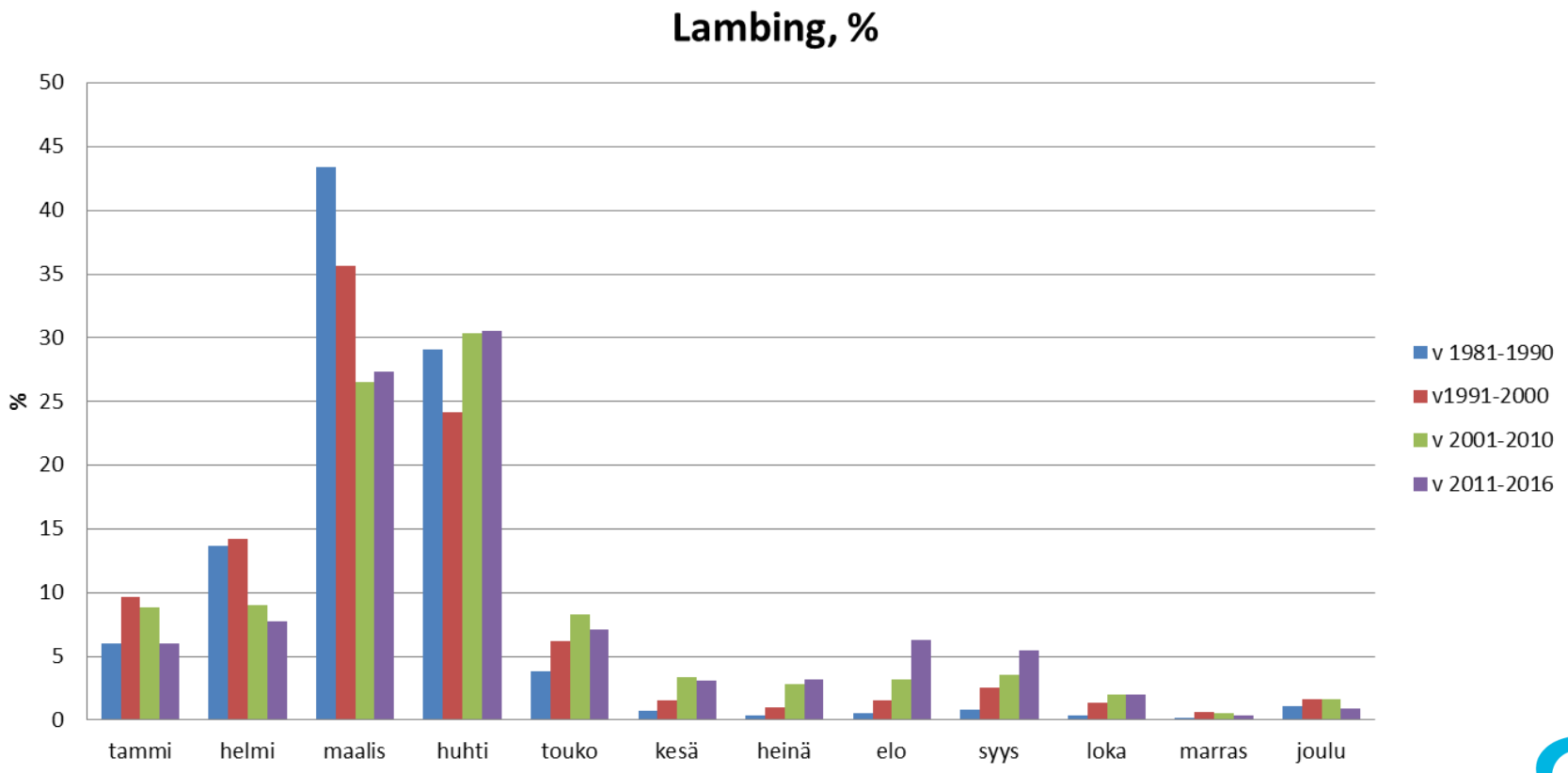
Marja-Liisa Sevón-Aimonen

iSAGE workshop and training days
UK 3-6 December

Finnish breeds in iSAGE project

- Finnsheep is original breed an mostly used breed in production
  - belongs to the group of northern short tailed sheep breeds
  - one of the most prolific sheep breeds in the world
  - It is quite normal to have 3-4 lambs at one go and it’s fertile all around a year

Change of lambing month during last 35 years



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- Texel is imported breed but it has been used in Finland already 60 years and is most common of imported meat breed
  - Moderate fertility, good muscularity
  - At the moment we have different lines of texel breeds (old danish lines, and new lines from UK and Holland)

Breeding value estimation of sheep in Finland

- The traits in breeding value estimation were
  - Weight at 120 days of age blup breeding values since 1992
  - Muscle depth, fat depth and body conformation at 120 days of age since 2002
  - Ewe productivity traits: born alive and litter weight gain from 3d to 42 days (describe unstrightly ewe milk production) from 2019
- All breeding values are calculated by MiX99

Genetic parameters for meat production traits

Finnsheep

Trait	1	2	3	4
1.Corrected weight at 120 d, kg	**0.41** (0.01)	-0.14 (0.03)	-0.15 (0.03)	-0.27 (0.03)
2.Muscle depth, mm	-0.05	**0.39** (0.00)	0.46 (0.03)	0.63 (0.02)
3.Fat depth, mm	-0.06	0.20	**0.20** (0.00)	0.48 (0.03)
4.Body conformation	-0.07	0.42	0.19	**0.26** (0.01)

Texel

Trait	1	2	3	4
1.Corrected weight at 120 d, kg	**0.32** (0.02)	-0.03 (0.06)	0.04 (0.08)	-0.11 (0.07)
2.Muscle depth, mm	0.18	**0.35** (0.02)	0.26 (0.07)	0.63 (0.04)
3.Fat depth, mm	0.06	0.17	**0.14** (0.02)	0.22 (0.08)
4.Body conformation	0.17	0.46	0.15	**0.23** (0.02)

Genetic parameters of fertility traits

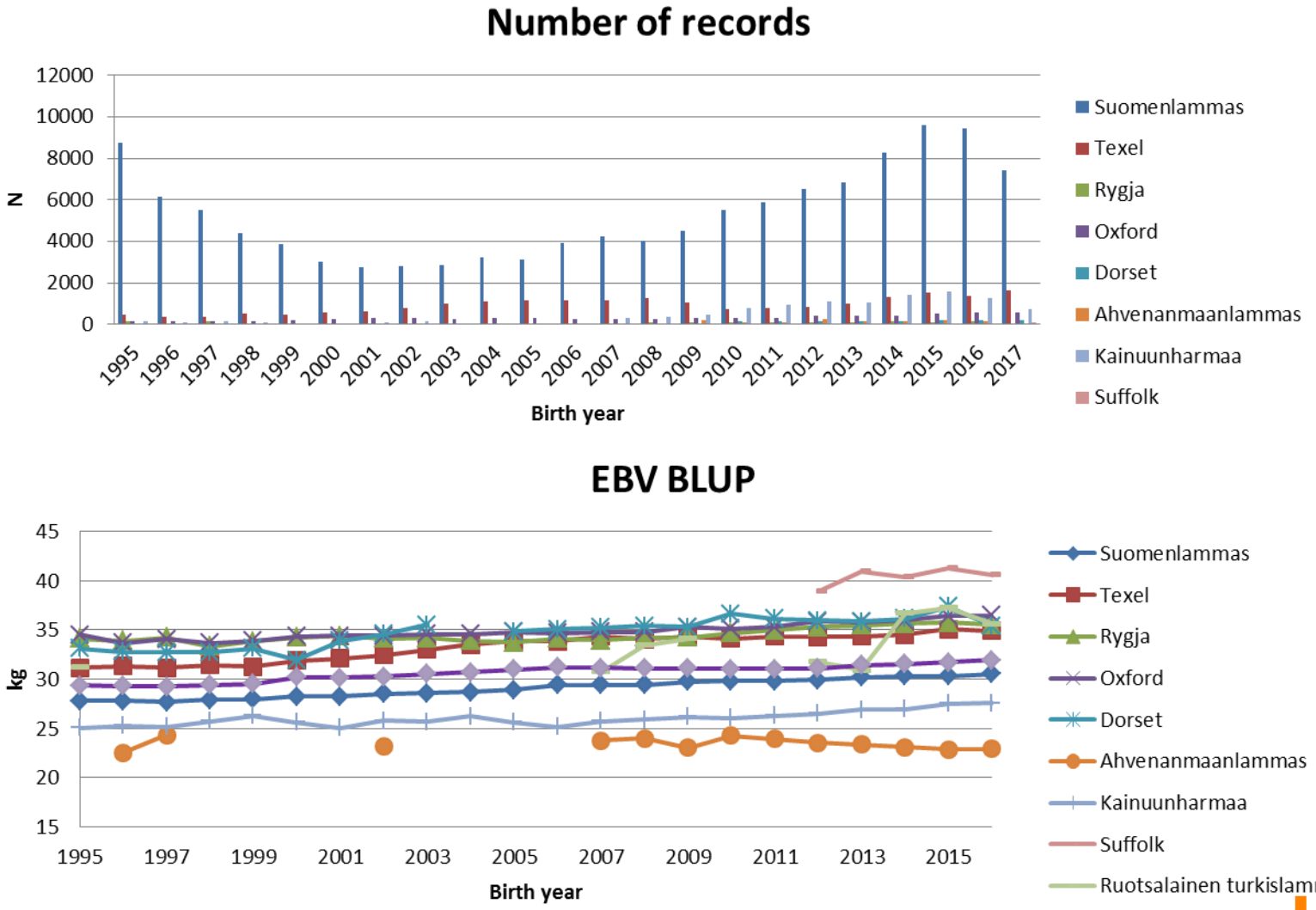
Finnsheep

Traits	1	2	3	4
1.Born alive at 1. parity	**0.06** (0.01)	0.93 (0.04)	0.61 (0.08)	0.54 (0.09)
2.Litter weight gain at 1. parity	0.83	**0.12** (0.02)	0.57 (0.08)	0.58 (0.08)
3.Born alive at later parities	-	-	**0.06** (0.00)	0.93 (0.01)
4.Litter weight gain at later parities	-	-	0.80	**0.07** (0.01)

Texel

Traits	1	2
1.Born alive all parities	**0.11** (0.01)	0.99 (0.00)
2.Litter weight gain at all parities	0.90	**0.13** (0.01)

EBV for Age at 120 d of age



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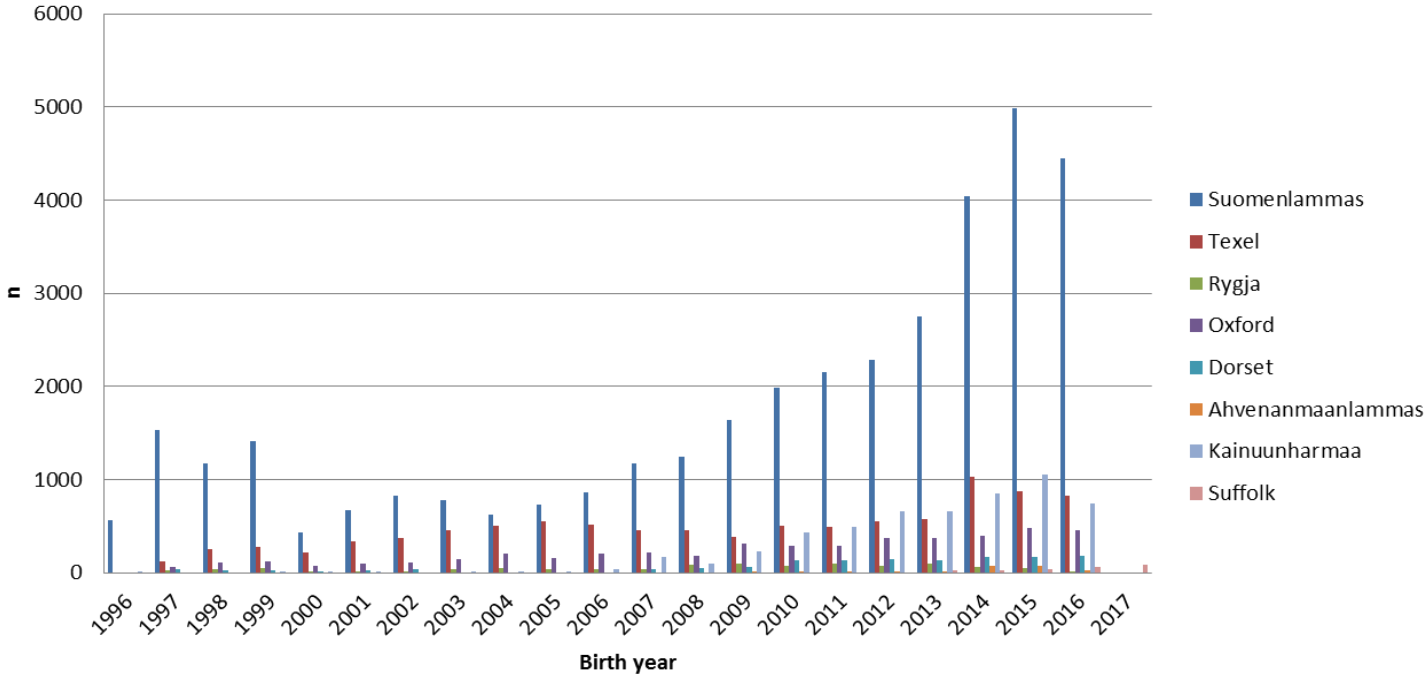
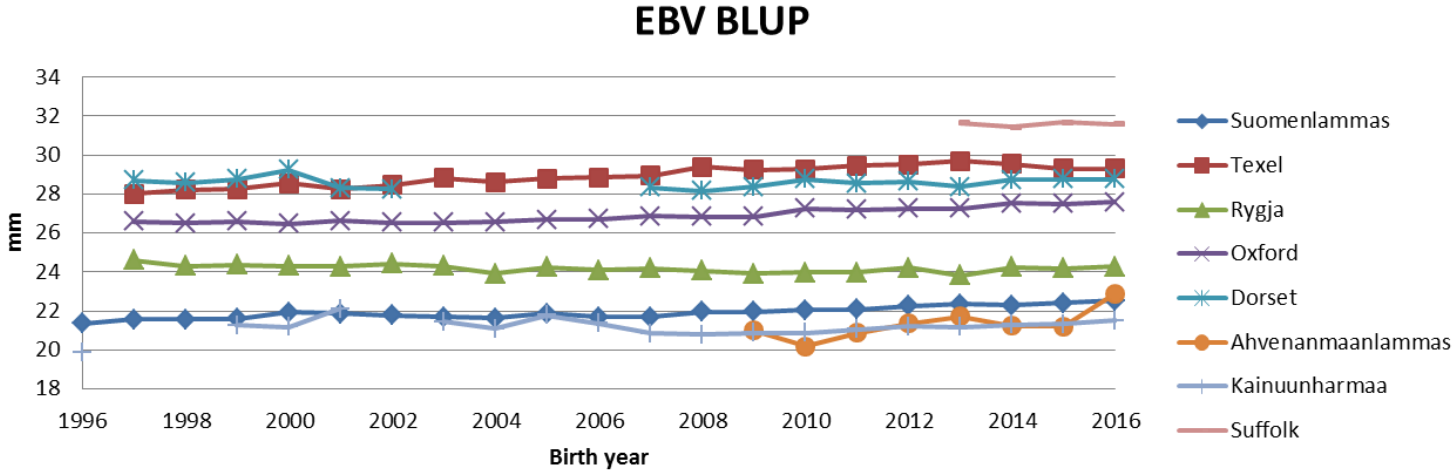
EBV for muscle depth





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The index for ewe productivity for Finnsheep

- Only those born alive and the weight gain
- Of those fed by the mother herself are considered
- No extra benefit in productive index of litters over three lamb

Breeding index for ewe productivity

- Altought Finnsheep good fertility is one special feature of the breed, the extra large litters are not desirable
- Too big litters decrease birth weight, increase mortality during birth, if no superviced, the proportion of still birth or of those who died shortly after birth might increase up to 25 %.
- Extra work (helping in lambing, securing colostrum and milk supply, supplementary feeding if needed)

- The index for ewe productivity for Finnsheep
- only those born alive and the weight gain
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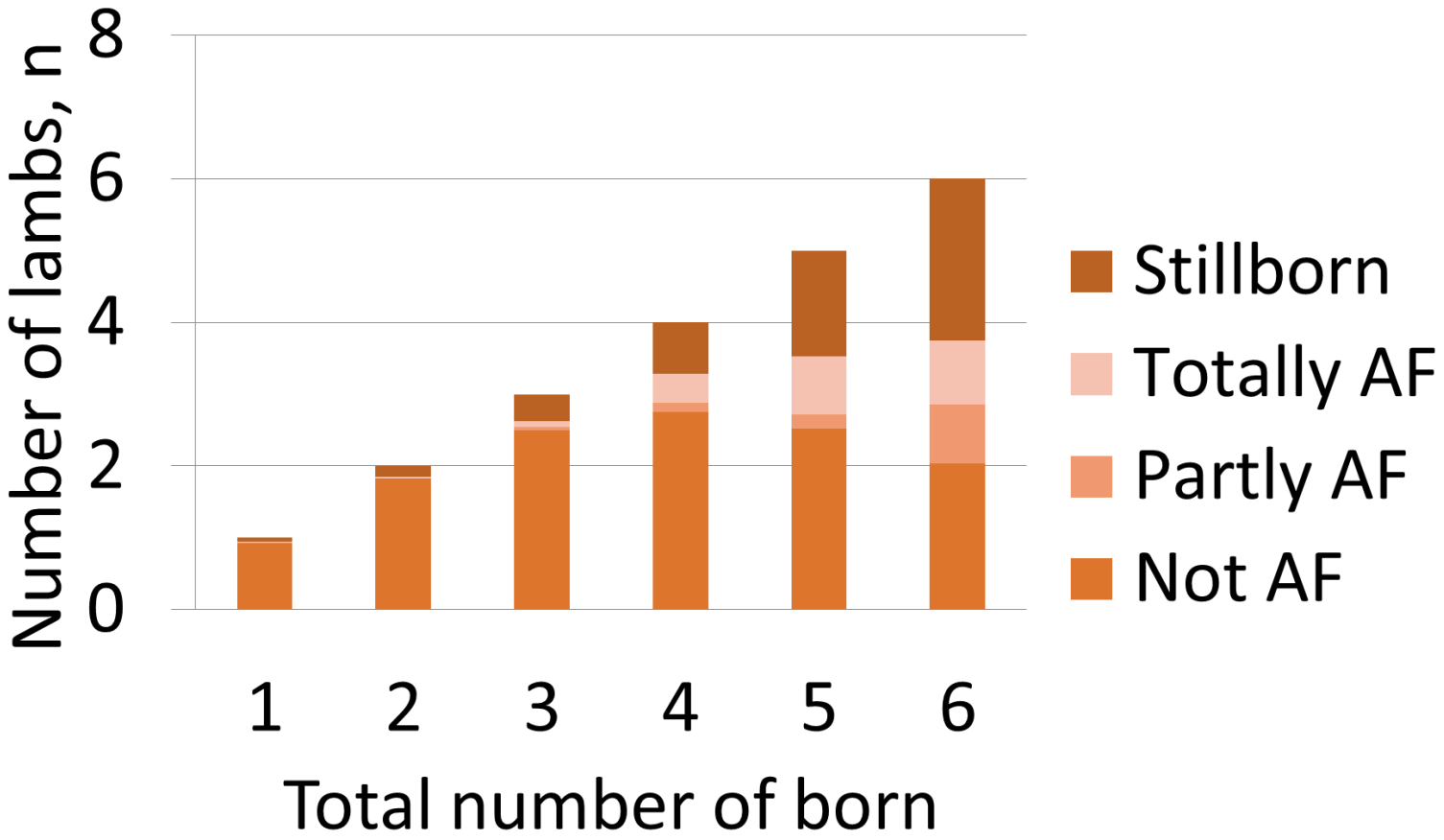
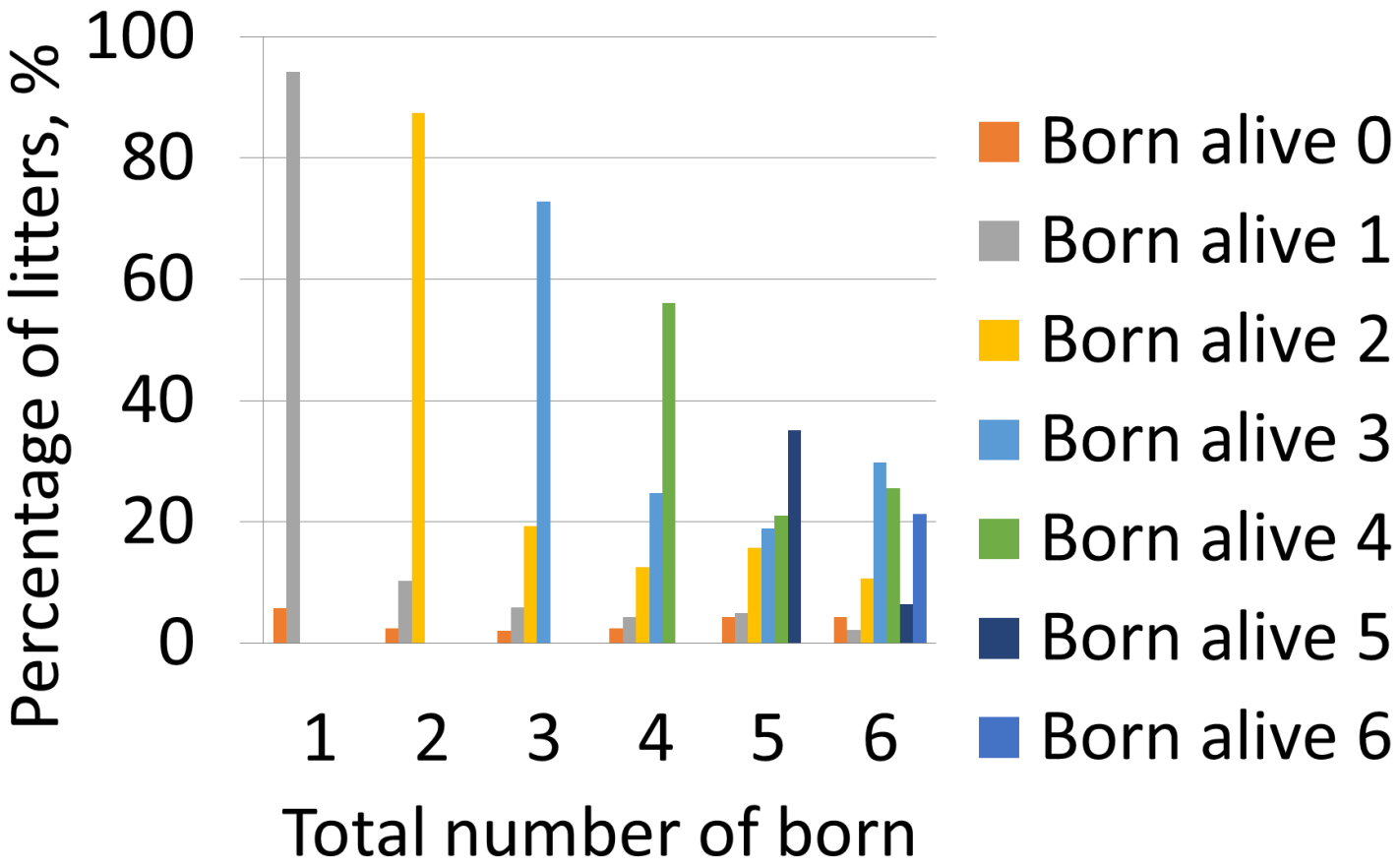
The effect on total number of born to still born and need of artificial feeding



The effect of number of total born on number of alive lambs



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Future plans

- Better relationship management´
- now sire lines, avoiding inbreeding in breeding group planning
- In future EVA?
- New traits to breeding value estimation (wool, easy care, carcass weight and quality)

Importance of EBVs

- Heritability for weight and muscle depth at 120 d age are high (or moderate)
- It's possible to get some genetic gain using phenotypic results, but using EBV are better prediction
- values corrected by animal age, mother age, litter size, farm-year effect – effects are included in statistical model
- Heritability for ewe productivity traits were low
- Trait is measurable only for female
- Genetic gain without EBVs is slow or impossible
- According to our case study often selection has made according to fenotypic results

Task 4.2 Innovation case study report

Analysis of farmers perception of the drivers and constrains for the uptake of a new selection index for ewe productivity

Luke and ProAgria

Finland

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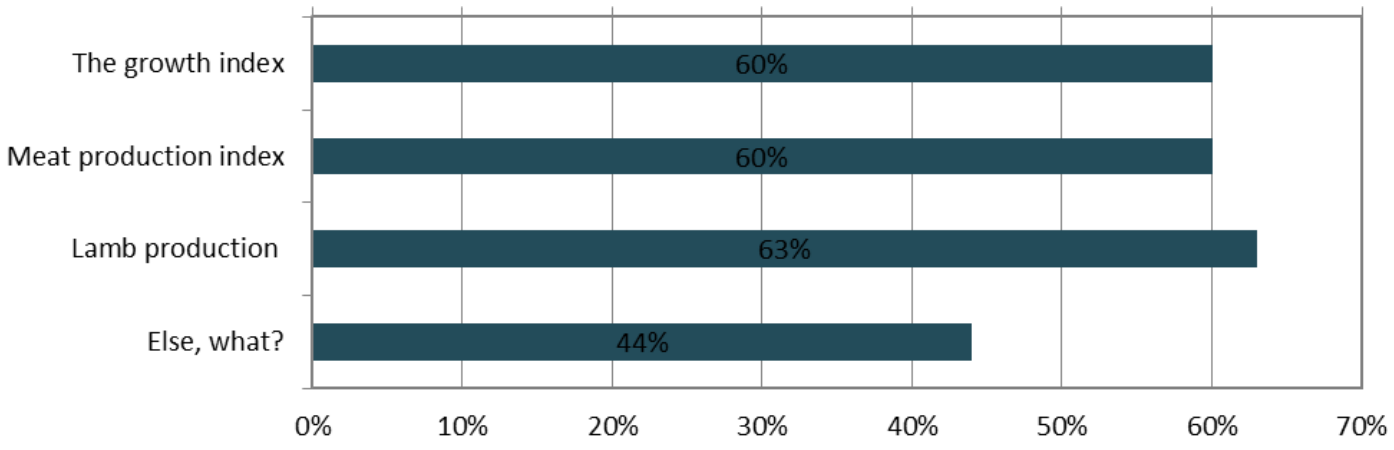
Summary of case study

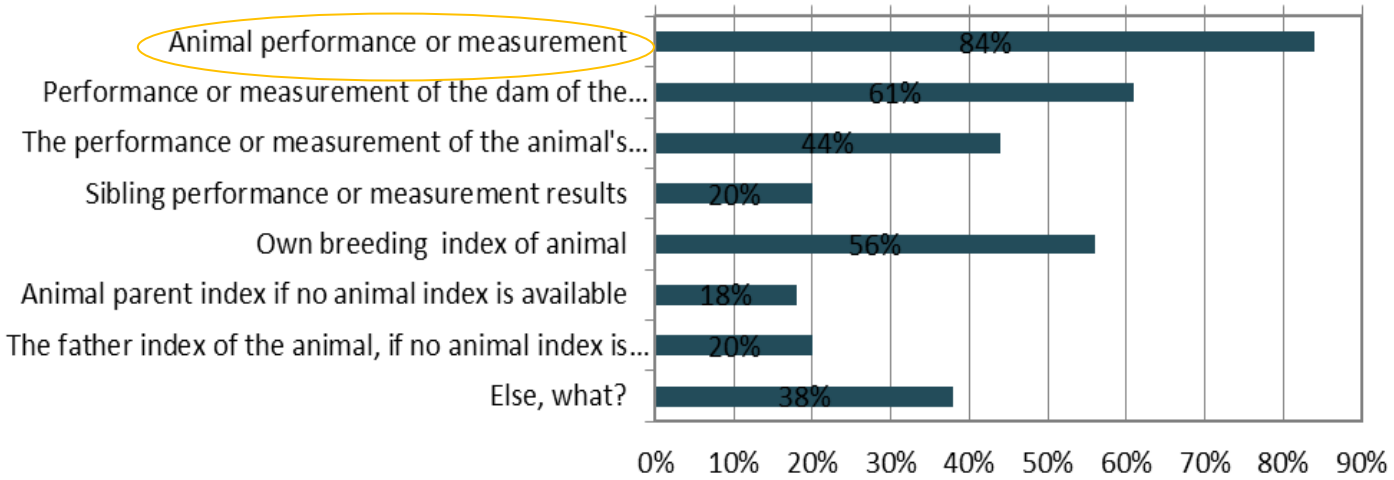
- Selection is not always based on breeding values.
- In the case study we wanted to find reasons, which cause the differences in farmer's willingness to use indices.
- We surveyed the importance of different factors to find possible bottlenecks in using the breeding indices.
- The preassumption was that difficulties in data transfer or use of information technology were the main reasons for avoiding the use of indices.

https://www.isage.eu/wp-content/uploads/BREEDING-GENETICS_No-3_Analysis-of-farmers-perception-of-the-drivers-and-constrains-for-the-uptake-of-a-new-selection-index-for-ewe-productivity_FINLAND.pdf

Important traits in selecting breeding ewes



Selecting breeding animal from own flock



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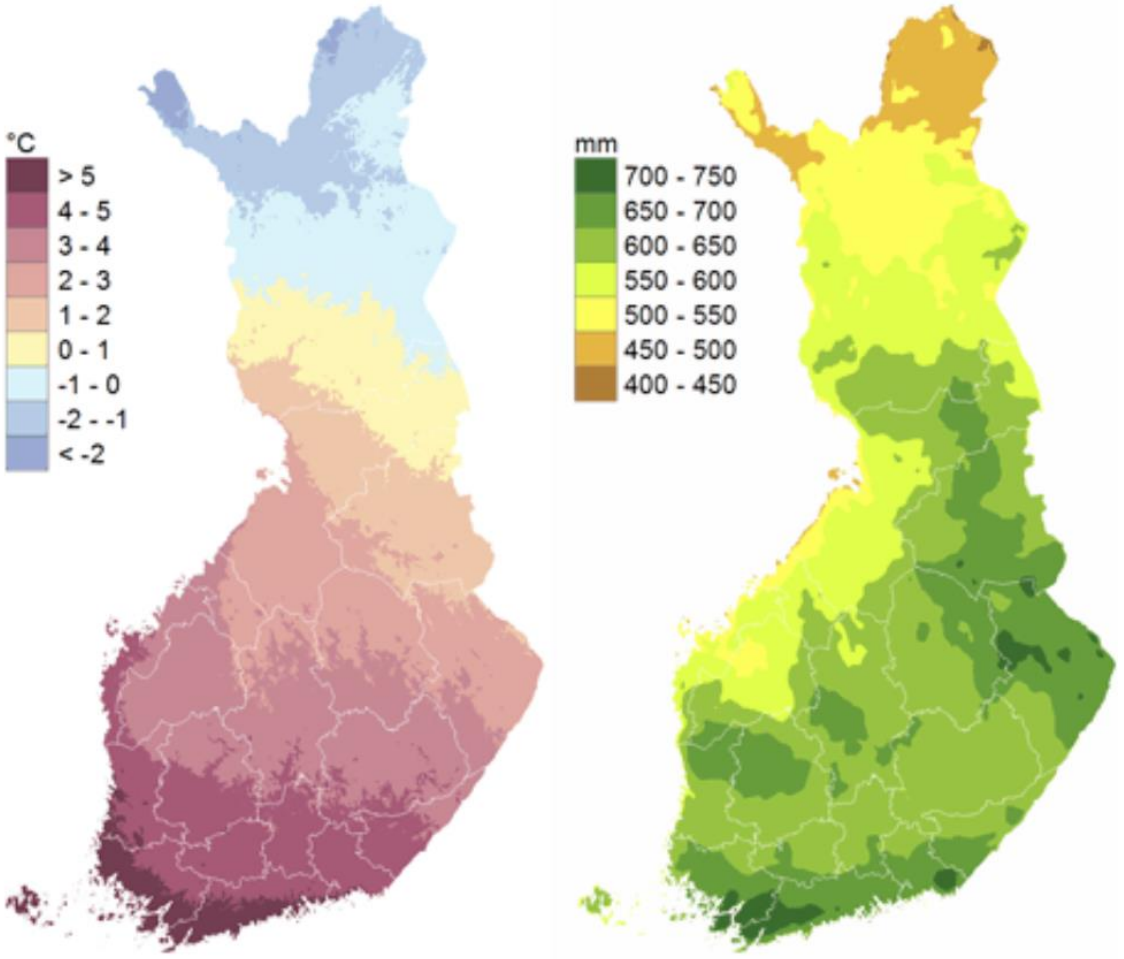
Statements	Agree	Quite agree	Neither	Quite disagree	Disagree
I know that environmental factors taken into account	**10%**	23%	36%	13%	18%
I know the results of relatives affect the individual's index (s)	38%	38%	18%	3%	3%
I know what a good index value is	43%	36%	13%	2%	6%
I know how to use indexes in selection	36%	36%	18%	5%	5%
I know why indexes changes over the time	33%	33%	16%	11%	7%
Enough information about indices can be found on the web	**2%**	16%	38%	20%	24%
Enough information about indices can be found on sheep guides	**0 %**	15%	38%	21%	26%
Sheep advisors provide information about indices	31%	36%	16%	10%	7%
Enough information about indices can be found on the magazines	**2%**	16%	39%	25%	18%

Economic profitability	N	Number	Knowledge	Information	Confidence	Use
Good	5	3.6	11.8	13.0	24.0	18.6
Satisfactory	33	2.2	11.0	12.4	24.9	19.0
Weak	23	2.1	11.6	13.2	25.8	18.6

It turned out that the lack of knowledge about the indices themselves and their benefits were the main factors.

Weather data: Average annual temperature and precipitation



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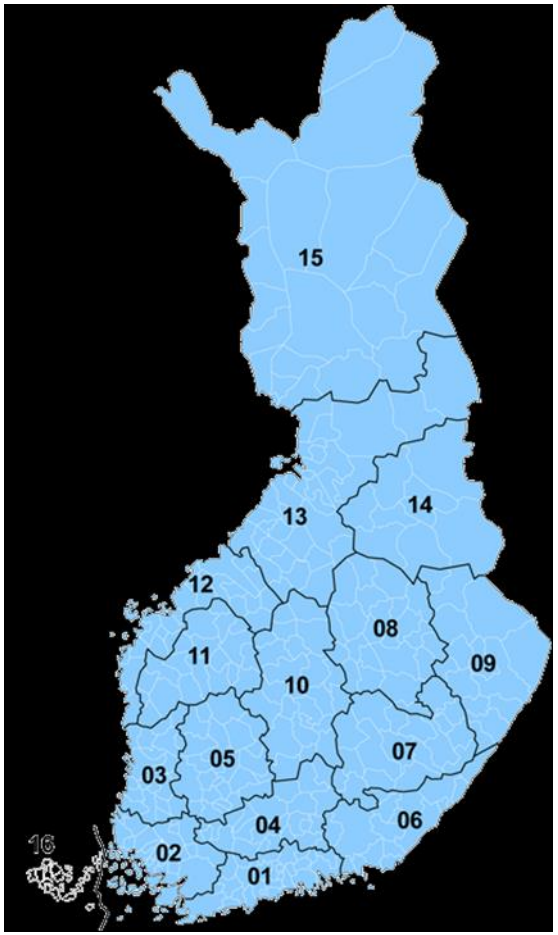
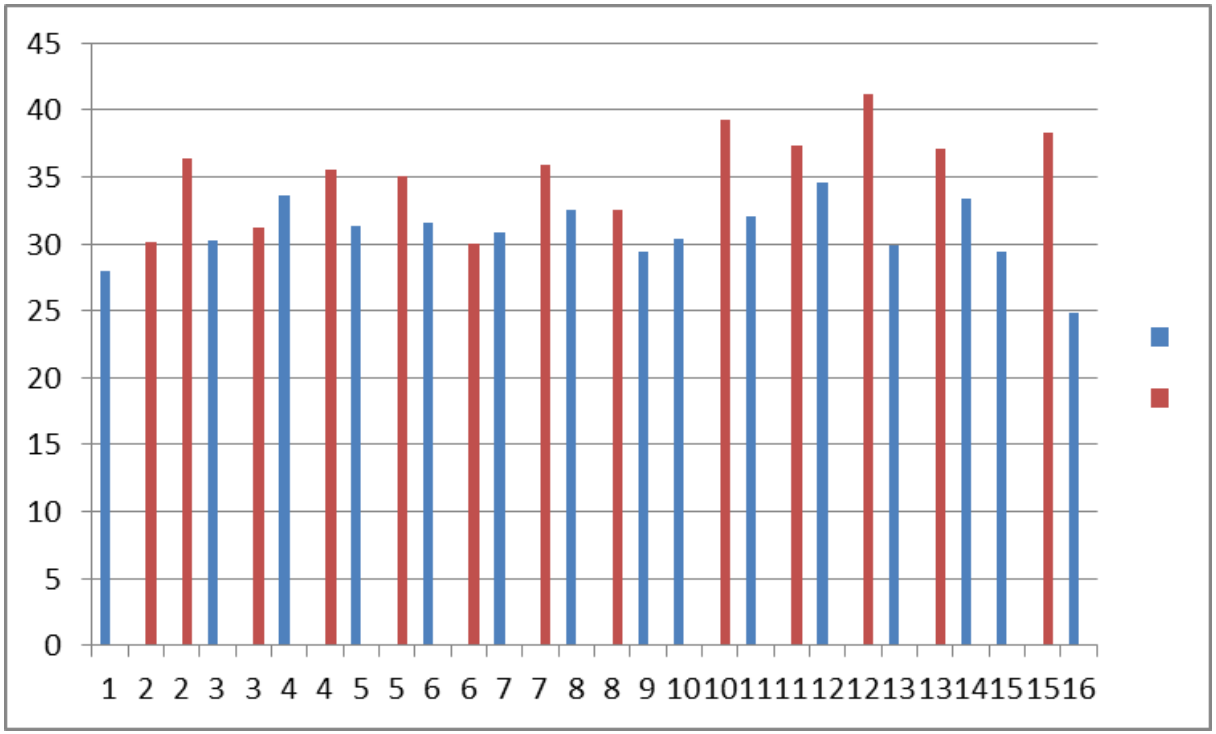
Interaction between area and breed, weight at age of 120 days





Interaction between area and breed, blue=Finnsheep, red=Texel

https://www.stat.fi/meta/luokitukset/ely/001-2010/index.html

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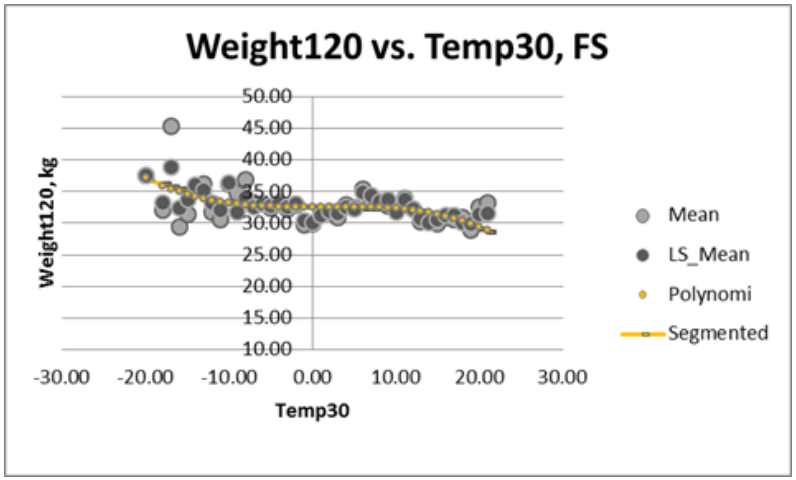
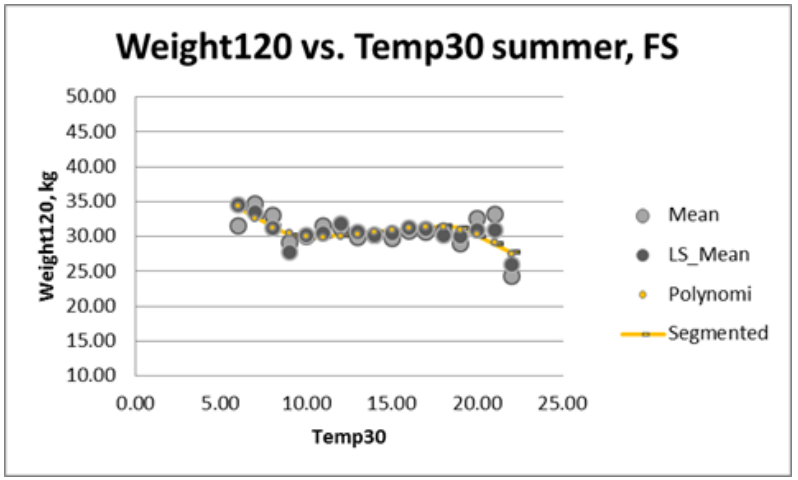
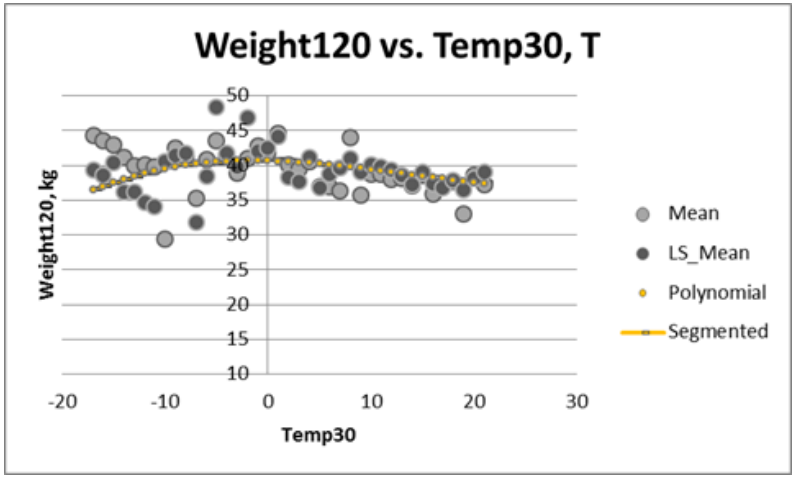
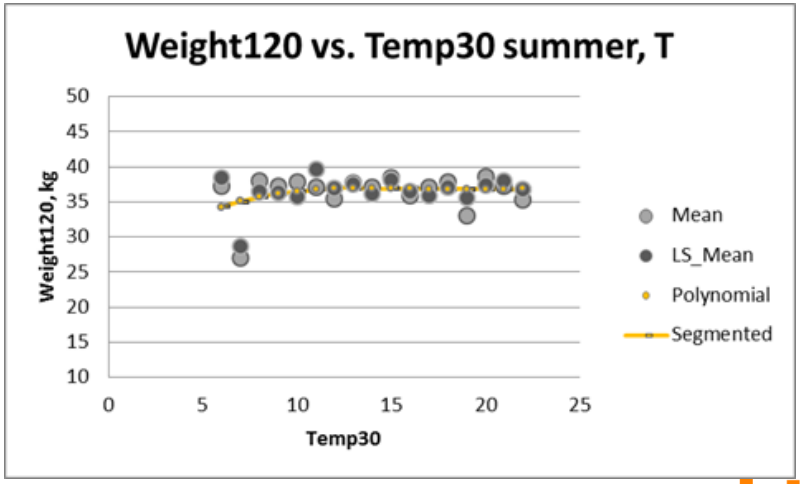
Effect of temperature to weight at age of 120 d in Finnsheep (FS) and Texel (T)









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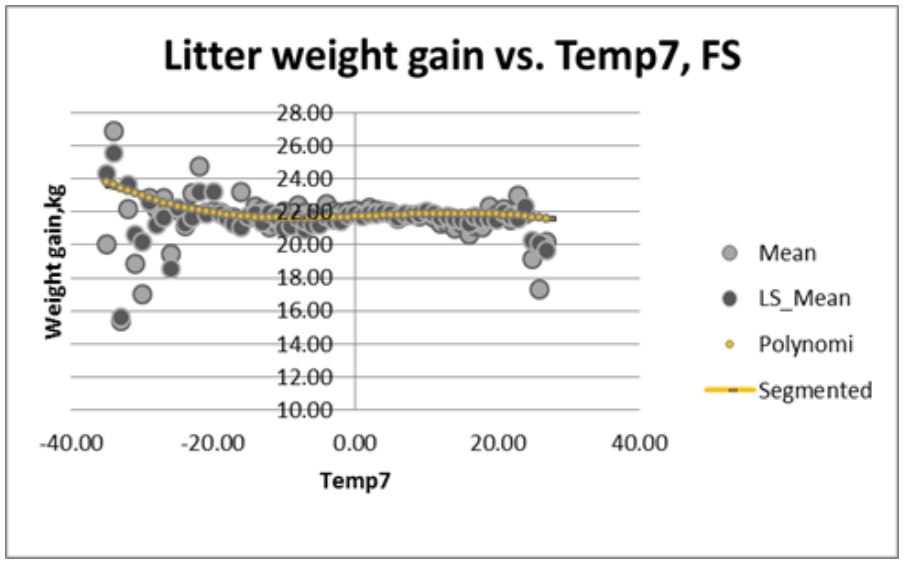
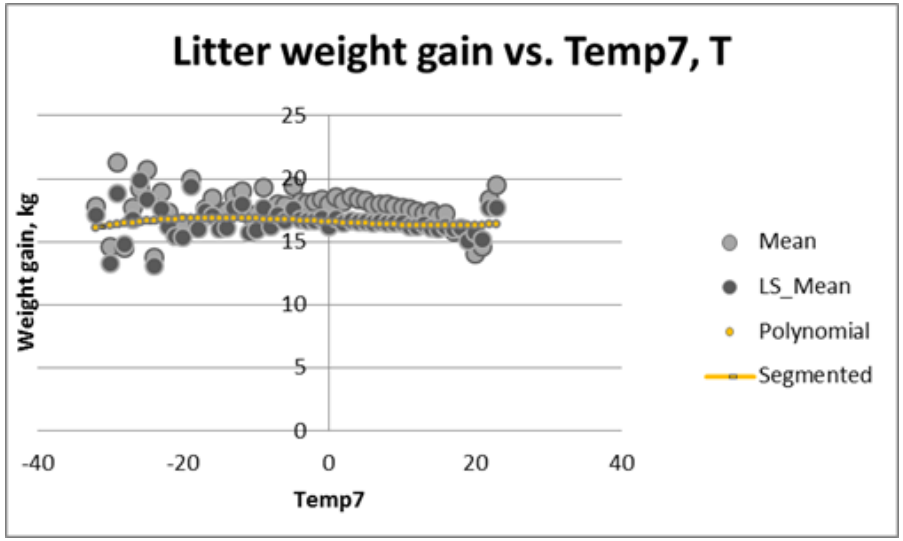
Effect of temperature on litter weight gain in Finnsheep (FS) and Texel (T)





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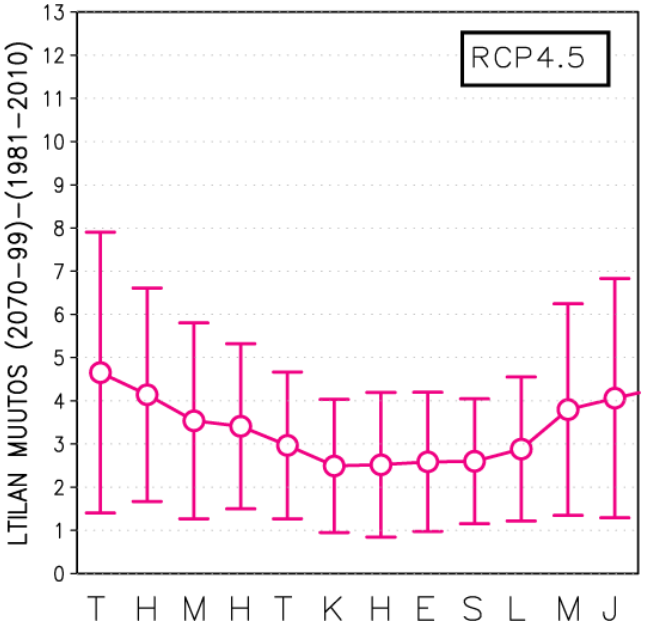
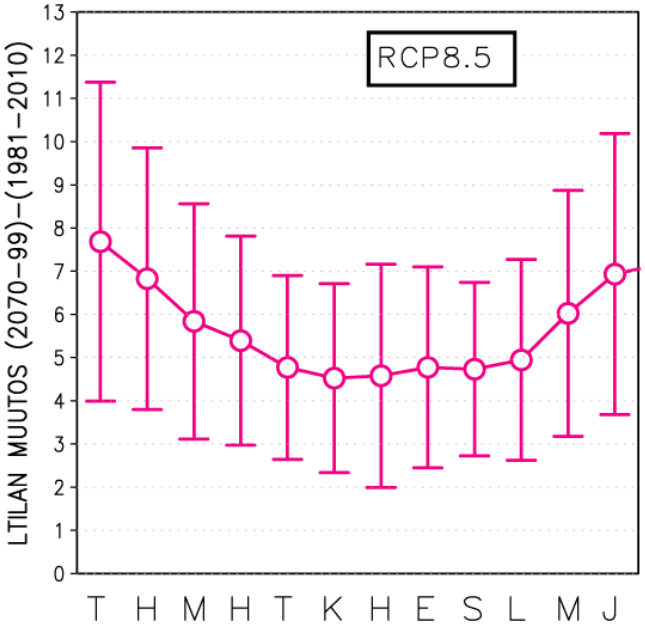
Weather changes, predictions





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Temperature is going to increase more in winter, more in north

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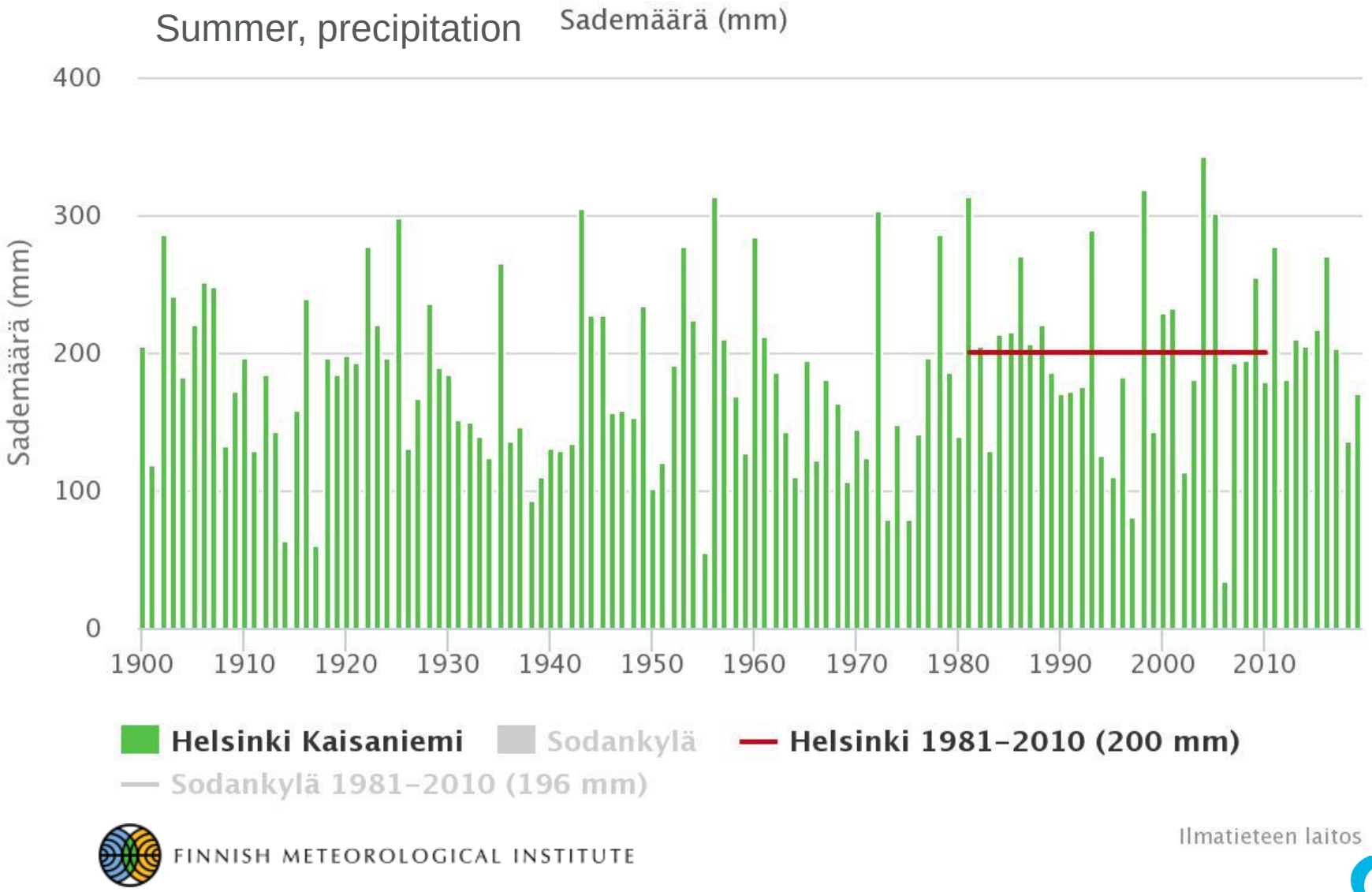
Kesä

Summer, precipitation



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Ilmatieteen laitos

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Climatic effect

- Based on the weather data, the current temperatures do not rise as high to affect the performance of the animals
- to test the heat (or cold) resistance of the breeds, it should demand experiment in which the temperature can be controlled

  - Extreme weather events can affect production.
  - Drought reduces crop yields
  - rain hampers harvesting
  - warm winters can increase parasite retention in pastures
  - warming climate can increase diseases transmitted by insect

Thank you!

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