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Overview of the present Finnsheep population in Finland and recent studies

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Content

1. Finnish sheep breeds and number of animals
2. Characterizing Finnsheep: fertility, wool, growth and carcass quality
3. Studies in MTT concerning
   - sheep breeding
   - diversity and concervation
4. Future of Finnsheep

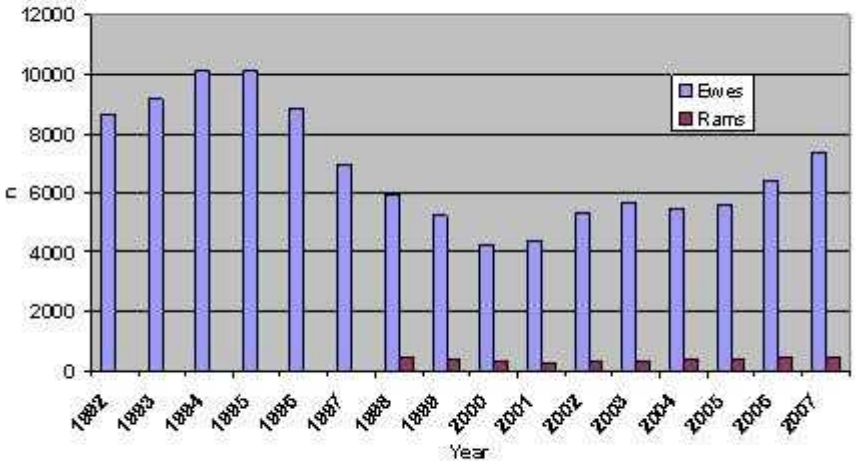
Sheep population

- Total number of sheep in Finland is 55000
- Number of purebred Finnsheep in Finland is 15000
- In the recording scheme there are 11500 ewes of which 7360 are Finnsheep (2007)
  - other breeds are Texel 970, Oxford Down 230 (Rygja, Dorset Horn, crossbreds)

- The main native sheep breed in Finland is Finnsheep

- To the Finnish recording scheme belong 7360 Finnsheep ewes and 480 rams
- About 5000 of them are white
- The rest are composed of black, brown and grey types

Number of Finnsheep ewes and rams in recording scheme



- Grey Finnish Landrace (Grey of Kainuu) and Åland Sheep are kept as separate lines
- The number of Grey Finnish Landrace ewes is under 700 and the number of Åland Sheep ewes is 100

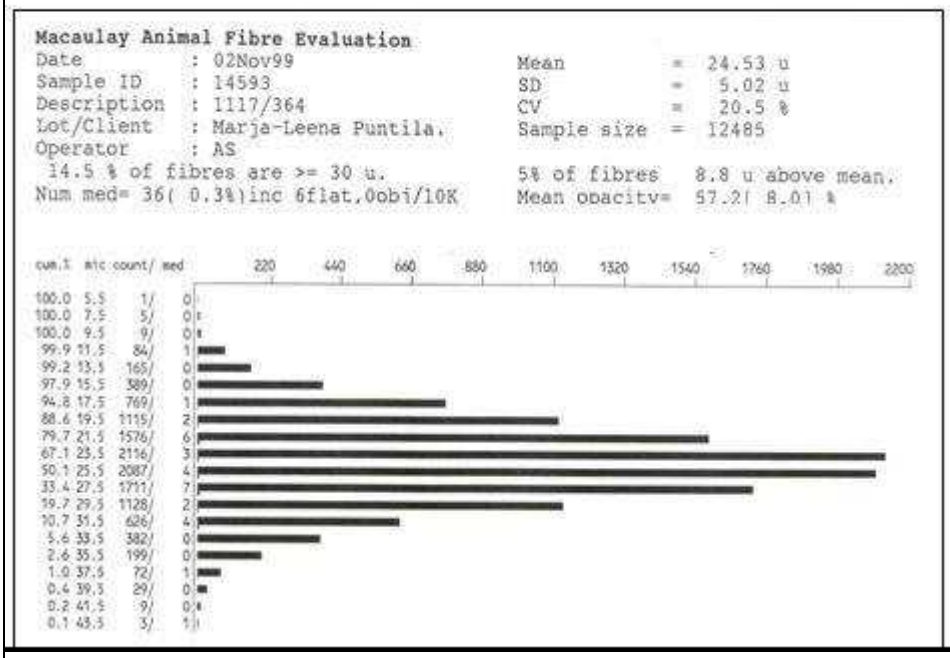
Fertility traits

- Finnsheep ewes are sexually mature already at their first autumn
- Rams reach maturity as early as at 3 - 4 months age
- The litter size at first lambing is 1.8 on average
- Older ewes get 2.5 lambs on average
- Finnsheep has been exported to 40 countries mainly due to it's good fertility

Wool traits

- Wool production per lamb is about 1.2 kg
- Wool is fine and it has beautiful lustre
- At the moment, the price of wool is low and so it's impact on the farmers income is only minor

Fig.1. Example of the OFDA histogram showing the fibre diameter distribution in a typical white Finnsheep lamb for explanation of the parameters (M.-L. Puntila et al. 2007)

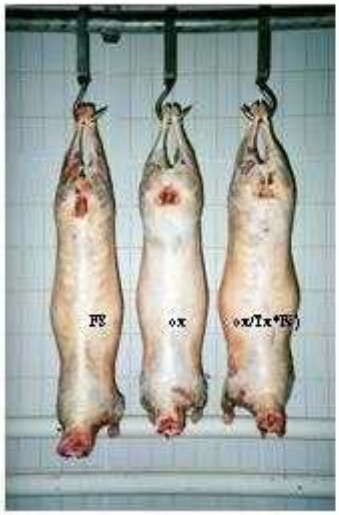


- Wool is used for handicrafts in minor scale
- Also pelts are used

Meat production

- The main product is meat
- The live weight at 120 days age is 34 kg (in Texel it is 38 kg)
- The Finnsheep is not as muscular as the specialised meat breeds (legs are long)
- Back fat is usually very thin (good)

Use Finnsheep for crossbreeding



- In meat production, Finnsheep is often used as a crossbred with some meat breed, especially with Texel
- Crossbreds are used to improve carcass traits and to utilize the good fertility of Finnsheep

Breeding studies: meat traits

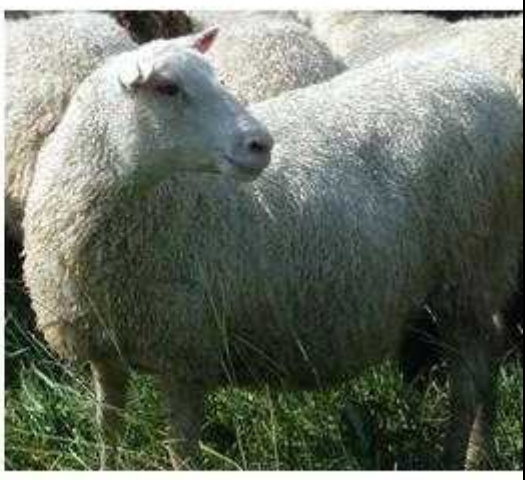
- Most important project has been the developing work of selection programme for meat production traits
- Work started in 1998 (M.-L. Puntila et. al)
  - measuring technology for carcass traits: ultrasound muscle and fat depht, EUROP for living lamb
  - heritabilities and correlations
- New genetic parameters for live weight at 120 days age and for muscle and fat depht from larger data containing 11000 records from 1998 to 2003 (M.-L. Sevón-Aimonen and M.-L. Puntila)

Meat production index

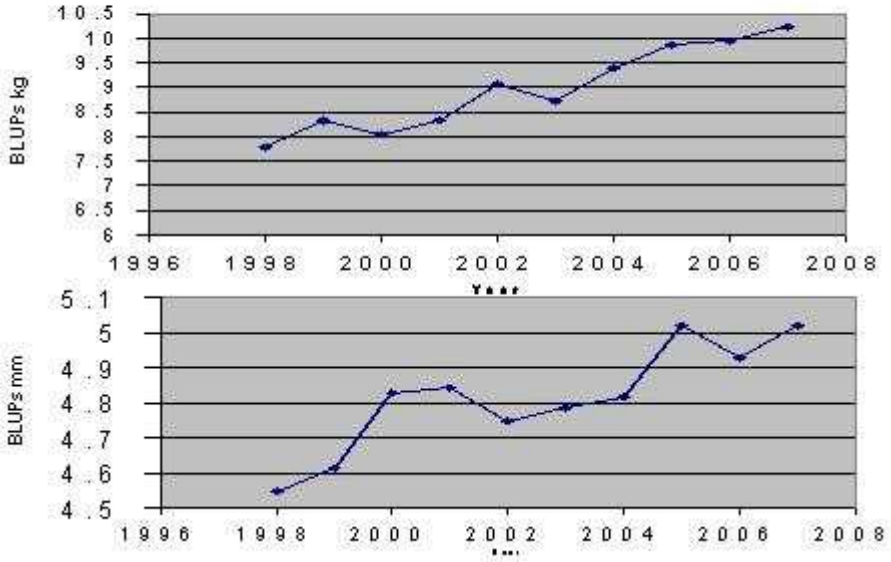
•Total merit index for meat production traits was taken in use 2003

•It consist of weight at 120 days, ultrasonic muscle and back fat depth

•Yearly 1000 Finnsheep lambs are measured in breeding stocks



Genetic gain (yearly BLUPs) in 120 days weight and muscle depth mm



Breeding studies: Wool traits

(M.-L. Puntila et al. 2007)

- 5300 lambs
- Wool traits
  - fleece uniformity,density, stable formation, lustre, crimp frequency, fines grade, fibre diameter(OFDA)
- Heritabilities for visually assessed traits varied from 0.23 to 0.43 and for measured traits from 0.45 to 0.62.
- Stable lenght was negatively correlated with crimp frequency and fibre diameter

Diversity studies (mainly M.Tapio, J. Kantanen)

- Many diversity studies have been made in MTT (M. Tapio, J.Kantanen & al.)
- Dissertation about 'Origin and maintenance of genetic diversity in northern European sheep' (M.Tapio)
- In his work, several molecular genetic markers were used (e.g. mitochondrial and autosomal markers)
- Finnsheep display high level of genetic diversity

Pedigree analysis

(M.-H. Li, J.Kantanen and I. Stranden)

- The aim was to analyze genetic diversity
- Data were 148,833 animals between 1989 and 2006
- Inbreeding coefficient was 1.5 in 2005 (small)
- Effective population size was 119 (large)

- Results were consistent with diversity studies. Also in breeding studies, lot of genetic and phenotypic variation has been found (high heritabilities)

Genome mapping (J.Kantanen)

- With SNP micro array is possible to detect 60 000 SNP
- The aim is to study overall genetic diversity, linkage disequilibrium and effects of selection on genome

- Finnsheep is among the breeds that will be studied
- 100 DNA samples of Finnsheep were sent to Australia CSIRO Livestock industries (project coordinater).

The future of Finnsheep

Using in production

- The use of Finnsheep in production helps to guarantee enough large population
  - developing production traits is important!
- Selection conserning only meat traits might decrease the diversity in the long run
  - Fertility and wool should be included in the breeding scheme
- Finnsheep is not fully competitive with the meat breeds in meat production
- Without substitues for endangered breeds, meat breeds might replace Finnsheep in the meat production

Preservation

- Preservation of Finnsheep include both
- Characteristics of Finnsheep
  - multi-purpose breed (good fertility, fine wool and vitality)
- Enough large population size and genetic diversity

Current situation

- At the moment the Finnsheep population is not immediately endangered contrary to Grey Finnish Landrace and Åland sheep
- Some farms (e.g. Pelso, Lihasula) are preserving different family lines
- However, all lines are not used equally
- In recent year *ex situ* programme has been started to cryopreservate sperm to a gene bank. Aim is to maintain the breed's genetic resources

Literature

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