

The Role of Cooperation in the Sheep and Goat Sector on the example of Norway

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Euroopa Maaelu Arengu
Põllumajandusfond:
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maapiirkondadesse

The Norwegian Association of Sheep and Goat Farmers - NSG

- National Organization
- Sheep, goat and sheepdog
- 10 000 members – 75 % of the sheep/goat farmers
- National breeding programmes
- Political work
- General services for our members
- www.nsg.no

The Norwegian Association of Sheep and Goat Farmers- NSG



The Norwegian Association of Sheep and Goat Farmers - NSG

- 10 000 members – 75 % of the sheep/goat farmers
- Personal membership
- But - lokal organized
 - 18 county teams
 - 335 lokal teams

The Norwegian Association of Sheep and Goat Farmers - NSG

- Political work
 - Norwegian farmers unions
 - Norwegian Government
 - Norwegian Parliament
 - The Norwegian Food Safety Authority
 - Others
- General services for our members

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- General services for our members
 - Member services
 - Members magazine
 - Organizing sheepdog training and competitions
 - Organizing shearing education and competitions
 - Scientific work
 - Others

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What make us strong together:

- ❑ One national organization - NSG
- ❑ National breeds (in general) (best under norwegian conditions)
 - Norwegian White Sheep
 - Norwegian Short Tail Sheep
 - Norwegian Milk Goat
- ❑ National breeding programmes (best in the world?)
 - NSG in charge
 - Farmers very loyal to the common work
 - Includes AI
- ❑ Close cooperation with other national organizations and authorities
 - Recording programmes
 - Animal health (unique animal health)
 - Animal welfare (making national welfare programmes)
 - Free range grazing

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Challenges:

- ❑ Economy
- ❑ Balancing production
- ❑ Climate changes
- ❑ Animals lost during grazing
 - Predators
 - Dogs
 - Accidents
 - Diseases
 - Others
- ❑ Green house gases (world wide focus)

Norway in general

- Total land area: 320 000 km²
- Arable land area: 3 per cent
- Population: 5.4 million
- Unemployment: 4.5 per cent
- GDP per capita: 610 000 NOK
- High-cost country (oilproduction)

AGRICULTURE IN NORWAY

- 3 % «fully farmed» area
- Small farms
- Family farms
- More productions on each farm
- Production according to climate
- Very good animal health

Norwegian agriculture (1)

- 39 000 farms in Norway (2019)
- 45 000 annual «mans-work»
- 1,7 % of the employment
- Agricultural land area: 1 million hectares
- 65 per cent grassland
- 30 per cent cereals or oil seed crops
- 90 per cent used for feed production
- $\frac{3}{4}$ of the agricultural income from livestock farming

Norwegian agriculture (2)

Livestock farming (in 2011):

- ❑ Meat: 323 000 tons
- ❑ Milk: 1 500 million litres
 - Cow's milk: 1 300 million litres
 - Goat's milk: 20 million litres
- ❑ Eggs: 60 000 tons

MEAT CONSUMPTION

- 69 kg per head in Norway
- Only 4-6 kg mutton/lamb – no change for the last 25 years
- Total production mutton/lamb 23 – 25 000 000 kgs per year

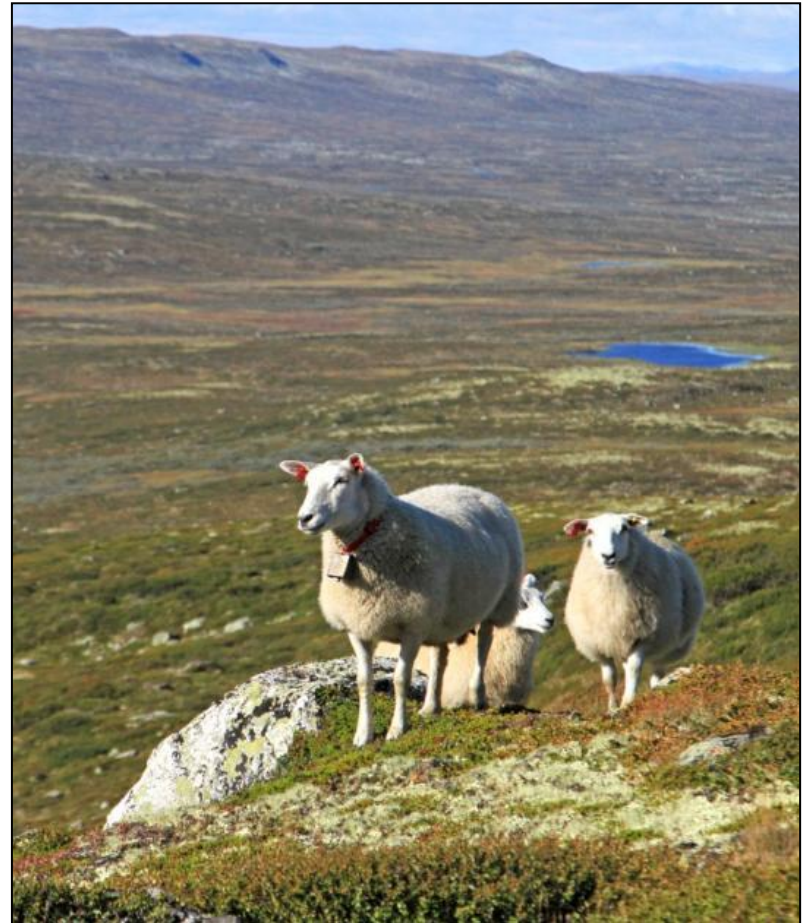
Free range grazing

- ❑ Is the most important production factor for sheep farmers in Norway
 - 2,2 mill ewes & lambs
 - 1,9 mill ewes & lambs grazing in outlying fields
 - 1,6 mill ewes & lamb in national organized registration systems



Free range grazing

- ❑ Grazing animals are demand due to overgrowth
 - ❑ Rural culture landscape
 - ❑ Outlying fields
- ❑ Feed are harvested in the outlying fields – approximately 1 billion NOK
 - The sheep alone eat two-thirds of the grass that are harvested in outlying fields
- ❑ A third of the usable outlying fields are used fore grazing today
- ❑ Potential to double the number of sheep in Norway, based on usable grazing areas



Goat produktion in Norway

- ❑ 39 000 farms in Norway (2019)
- ❑ 1 400 have goats
- ❑ 45.000 goats in all
- ❑ 35.000 milk goats
- ❑ 275 have goat milk production
- ❑ 20 million litres per year
- ❑ Number of goat-milk farms reduced to less than 70 % last 30 years

- ❑ The other farms have goats for meat, landscaping, wool and **hobby**

Organized breeding

1. Defining the breeding goal / breeding goals (traits to be improved)
 - Emphasis between individual goals - collective index
2. Find effective breeding measures
 1. Current registrations related to the traits
 2. Animal control
 3. Breeding herds
 4. Breeding value calculation (index calculation)
 5. Other breeding measures — **Genetic testing / genomic selection**
 6. Selection → The best ones become parents of the next generation
3. Implement the measures according to plan
4. Document the results
 1. Genetic progress
 2. Phenotypic Progress (Better Production Results)

Goat breeding: - why and for whom?

- The breeding work is a tool for creating economic values

- Continuous improvement and lasting value
 - Wholesalers and consumers
 - Quality
 - Reputation
 - The goatfarmers
 - Better price per kg milk
 - Reduced costs per kg milk
 - Lower feed consumption
 - Lower fixed costs
 - Reduced time consumption
 - The goats ??..

The main tasks:

1. **Create the greatest possible breeding progress!**

2. **Spread the progress to "the many"**

Often obtained through increased production per animal

Norwegian milk goat

- breeding goals (what we wish to improve)

Overall breeding target

- ❑ Develop a goat that produces milk with good and distinctive goat flavor, well suited for the production of various types of goat cheese (white cheese / brown cheese)
- ❑ Goat must have good health and fertility and good usability
- ❑ It should be able to utilize the natural resources as best as possible (roughage / outfield)

Breeding target – focus on milk quality

❑ Raw material

- ❑ Increased solids content
 - ❑ Increased milk quantity
 - ❑ Increased solids content
 - ❑ % Fat
 - ❑ % Protein
 - ❑ % Lactose
- ❑ Better taste
 - ❑ Reduced FFA
 - ❑ Casein gene variations
- ❑ Better cheese quality
 - ❑ Casein gene variations

❑ Useabilities

- ❑ Udder and milking
 - ❑ Conformation udder and tits
 - ❑ Milkingspeed
 - ❑ (Leak)
- ❑ Health
 - ❑ Cell counts
- ❑ Exterior (body shape)
- ❑ Useabilities

Breeding tools

- AI: the farmers do the job themselves



- ❑ More than 400 farmer have learnt this
- ❑ The metod is «Shot in the Blind»
- ❑ More herds can get the best bucks
 - Important to create genetic gain
- ❑ Breeding herds and buck circles have to use AI
- ❑ At insemination we have 60 % non return
- ❑ 50 % ends in offspring

Sheep produktion in Norway (1)

- ❑ 39 000 farms in Norway (2019)
- ❑ 13 800 have sheep
- ❑ Number of farms reduced to less than 50 % last 30 years
- ❑ Heavily subsidized – up to 2/3 of income

Prices to the farmer:

- ❑ Meat(lamb): 5-6 € per kg carcass weight
- ❑ Wool: 3-4 € per kg

Development last 35 years

Year	Sheep farms	Total number of ewes	Flock size(ewes)	Family income NOK
1985	33 815	1 077 469	32	39 500
1990	26 394	1 009 793	38	42 500
1995	24 355	1 041 680	43	36 588
2000	21 644	1 081 633	50	69 507
2005	16 717	1 083 685	65	66 661
2008	14 748	1 027 098	70	97 800
2010	14 238	1 053 546	74	151 600
2015	14 041	1 057 146	75	148 200
2016	14 285	1 063 852	75	
2020	13 800	902 725	65	

Development in production of sheep meat and wool

Year	Production/ sale 1000 kgs	Live weight Kgs/lamb	Lambs per ewe	Kgs per ewe Live weight	Slaughter weight lambs	Wool production 100 kgs
1960	14 870					
1970	16 648				15,8	
1980	18 459	42,1	1,4	58,9	17,3	
1990	23 377	43,7	1,55	67,7	16,7	4 964
1995	25 211	42,9	1,54	65,0	17,9	5 428
2000	23 499	44,0	1,87	67,4	18,1	4 957
2005	25 413	44,6	1,95	70,5	18,4	5 072
2010	23 383	43,4	2,09	73,5	18,7	4 372
2016	25 500	44,9	2,10	70,5	18,5	4 000
2020	24 483	45,2	2,08	70,2	18,7	3 800

Sheep production in Norway (2)

- Production very seasonal
 - Housed during winter
 - Before mating until 1-2 weeks after lambing
 - Indoor lambing April-May
 - Slaughter in August-November
 - Age 160 days
 - Carcass weight 19 kg
- Intensive care during lambing time
 - Assist the ewe
 - Assist the lamb
 - Colostrum
 - One lost lamb is one too many

Sheep production in Norway (3)

- Feeding

- Grass silage in the winter
- Spring pasture on farm
 - 2 - 6 weeks
 Aprile – May – June
- Summer pasture in the woods or the mountains (mid June - mid Sept.)

- Autumn pasture on farm
 - First group of lambs:
 Directly to the abattoir –
 September
 - Second group: October
 - Third group: November
 - The rest: Jan. - Feb.

- Concentrate
 - Ewes
 - Lambs

Breeds

- Norwegian Short Tail Sheep (Spælsau): 15 %
 - Most important: Flock instinct
 - Short tail ("spæl")
 - Fleece: Dual coated wool, white - coloured
 - Polled - Horned
- Norwegian White Sheep (NWS): 75 %
 - Long tail
 - Fleece: Crossbred type, white
 - Polled
- 15-20 other breeds: 10 %

Norwegian Spælsau of today



Norwegian White Sheep - definitely a composite

NWS:
A population,
not a proper breed



NWS:

- NWS is a dual purpose breed
- Used as “pure”
 - No appreciable crossbreeding in Norway
- Highly productive
(2014 results from the 90,000 ewes in 950 breeding flocks)
 - Number of lambs born: 2.29
 - Age of slaughter, days; 156
 - Carcass weight, kg; 21.1
 - Carcass conformation: R+ (9.3)

Animalia:

The Norwegian Sheep Recording System

□ Sheep Recording in Norway

- Sheep producers: 40%
- Ewes: 50%
- Slaughtered lambs: 49%

□ Central database

- On farm data
 - Web / Mobile app
- Abattoir data
 - File transfer

□ Output

- Management tool
- Benchmarking
- EBVs
- R&D

Recording (2)

- Individually recorded
 - Electronic ear tags (EID)
- Birth info
 - Dam and Sire
 - Total born
 - Live born
 - Lambing ease (code)
- Weights of lambs
 - Birth
 - 6 weeks
 - 20 weeks (weaning)
- Disease
 - Mastitis

- Abattoir info
 - Carcass weight
 - EUROP conformation and fat score
 - Fleece weight and quality
- NOT DONE IN NORWAY
 - Ultrasound scanning for meat and fat
 - CT scanning
 - Fecal egg count

Sheep breeding

Making results – together!

- what is unique for Norway?

- Centrally financed
 - 1.3 million £
 - Recording
 - One central database
 - Carcass data transfer
 - Large breeding population
 - 90,000 ewes
 - 1,800 rams
 - AI
 - The very best rams
 - Intensively used
 - Substantial genetic and phenotypic gain
- The sheep breeders
 - A strong belief in the breeding theory
 - Confidence in the central breeding management
 - The same breeding goal for all breeders within a breed
 - Collaboration, not competition
 - Within ram circle
 - Across ram circles

The breeding company:

- NSG and *the Ram Circles* (2)

The Ram circle:

- **Select rams**
- **Circulate rams**
- **Plan elite matings**

- Ram circle: A small financially independent organization that has breeders as members
 - More than 50 years of good work
- Rams are owned by the ram circle and used among member flocks
- Ewes are owned by the members themselves
- Cooperating with NSG
 - Regulations
 - **Guidelines**
 - **Financial support from NSG**
 - 150 £ per test ram that qualifies

AI: The key to success

- Selection intensity of rams
- Connectedness among flocks

NWS breeding

- The breeding population
 - 150 ram circles
 - 950 members
 - 90,000 ewes
- Progeny testing of rams
 - Selection within ram circle
 - Test rams (0.5 y.): 1,800
 - Elite rams (1.5 y.): 300
- AI
 - Selection across ram circles
 - 20 rams (2.5 years)
 - 5 rams (3.5 years)

- Elite matings
 - 15% of ewes in ram circles are AI'd
- Sired by an AI ram in ram circle flocks (2014)
 - Lambs born: 9%
 - Lambs slaughtered: 5%
 - Ewes lambing: 21%
- AI sires in ram selection
 - Test rams sired by an AI ram: 85%

AI the Norwegian way

- 35.000 semen doses per year

“A shot in the dark”

- ❑ No synchronisation, no hormone treatment
- ❑ Oestrus detection 2-3 times per day
 - Walk the ram; Leach and apron
- ❑ Inseminate once 18-24 hours after onset of oestrus
 - Frozen semen – 240 mill. sperm cells
 - Vaginal deposition
 - Done by the farmer
- ❑ Non-return: 70%
- ❑ Cost: (Rent of shipper + freight + 20 doses)
 - Per semen dose: 23 £