

Sheep - farm animals with a very diverse use - their importance both in the natural environment and in the food economy of the society.

Modul no. 4: Precision Livestock Farming

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Lecture content

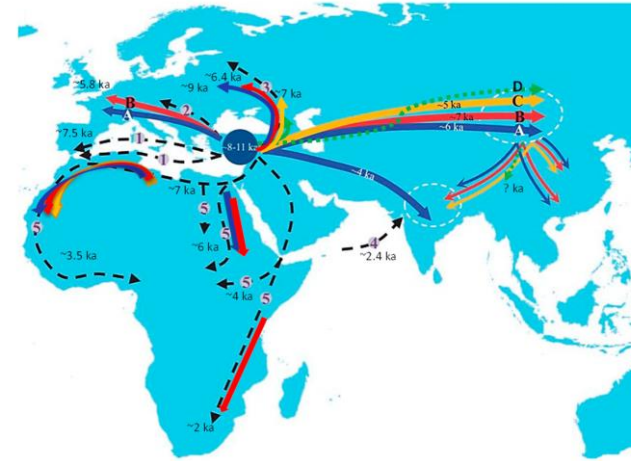
- Introduction – domestication, worldwide distribution
- Sheep breeds
- Production traits
- Environmental importance



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Sheep (*Ovis aries* Linnaeus, 1758)

- Together with goat probably the first domesticated farm animal species (Fertile Crescent, circa 10 - 11.000 years BP).
- The origin is not completely clear.
- According to recent studies *Ovis orientalis* (Gmelin, 1774)/ *Ovis gmelini* is the most likely ancestor.



(Lv et al., 2015)



Worldwide distribution

Total number 1.2 bil. pcs

Mostly in Asia (446 mil. pcs)
and Africa (305 mil. pcs)

Europe – 127 mil. pcs

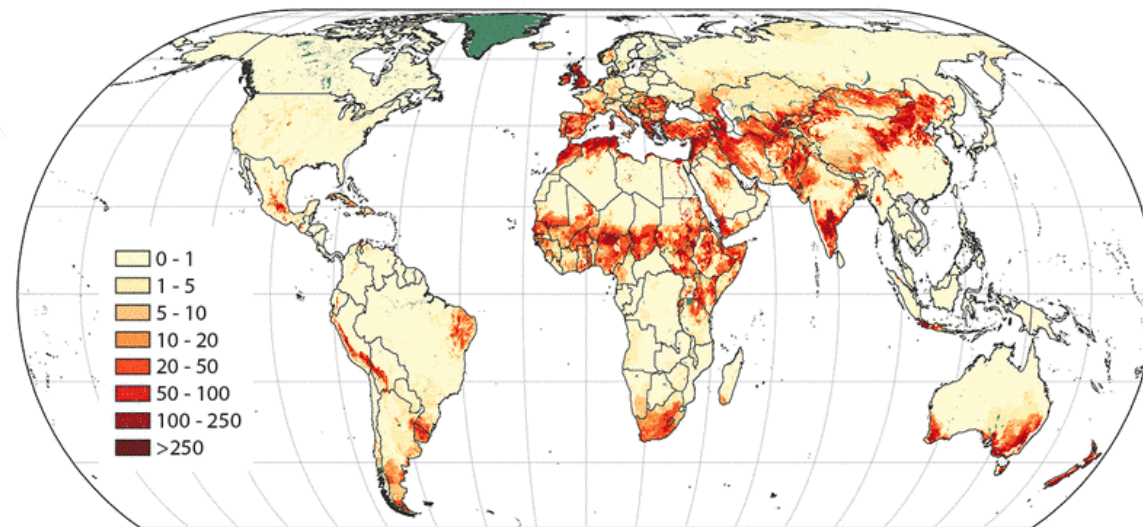
EU – 97 mil. pcs

States

China - 139 mil. pcs

India - 75 mil. pcs

Australia - 73 mil. pcs



Numbers of sheep per square km (FAO, 2015)

What are sheep used for?

Main products

- ☐ Meat
- ☐ Milk
- ☐ Wool
- ☐ Skin, fur

Other benefits

- ☐ Agrotechnology and ecology – manure production, pasture utilization, landscape management, preserving biodiversity
- ☐ Animal model

Secondary products

- ☐ Lanolin
- ☐ Fat
- ☐ Blood
- ☐ Hooves, horns
- ☐ Guts, stomach



Dolly the sheep

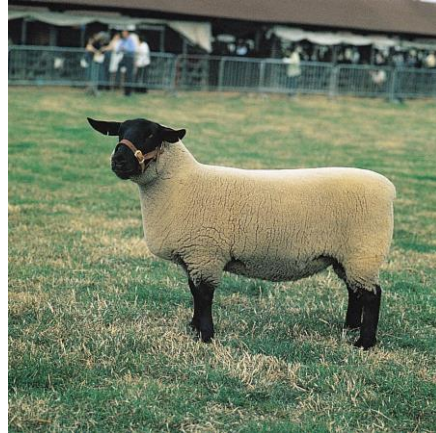


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Sheep breeds

Meat breeds

- ☐ Suffolk
- ☐ Charollais
- ☐ Texel
- ☐ Oxford down



Dairy breeds

- ☐ Awassi
- ☐ Lacaune



Breeds with excellent reproductive performance

- ☐ Romanov sheep
- ☐ East Friesian sheep
- ☐ Olkuska sheep



Multi-purpose breeds

- ☐ Merinolanschaf
- ☐ Bergschaf
- ☐ Kent – Romney
- ☐ Tsigai sheep



Totally there are about 1.200 breeds of sheep (*Scherf & Pilling 2015*).

Genetic resources

Sumavska sheep



Valachian sheep



In Poland 17 native breeds - see Kawęcka, A., Pasternak, M., Miksza-Cybulska, A., & Puchała, M. (2022). Native Sheep Breeds in Poland—Importance and Outcomes of Genetic Resources Protection Programmes. *Animals*, 12(12), 1510.

Reproduction

The main (the most important) production trait – all others are dependent to it

Ewes are

- seasonally polyestrous (average estrus cycle duration 18 days)
- multiparous (differences between breeds)

Pregnancy length is in average 150 days

Parturition is called „lambing“
– optimum is 3 times in 2 years

Mating of sheep is called „tupping“

- ☐ Free mating
- ☐ Group mating
- ☐ „Harem“ mating
- ☐ Individual mating
- ☐ Artificial insemination

Heat detection usually by teaser ram (vasectomized male)



Meat production

Worldwide sheep meat production
= approx. 8 mil. tons/year

Lamb/mutton meat consumption (per citizen/year)

World: 2 kg

Czech Republic: 0.25 kg

New Zealand: 23 kg



Lamb meat

- Slaughtering at the age of 4 – 6 month
- High quality, healthy, easily digestible meat
- Favorable fat (13 g/100 g of meat) and protein (17 g/100 g of meat) content
- Low in cholesterol
- Low in energy

Carcass value (dressing) approx. 50 %

Milk production

- Lactation 100 – 250 days
- Production up to 600 kg of milk (0.5 – 3 kg per day)
- Milking 2 times per day (manual or machine)



Worldwide sheep milk production
= approx. 8 mil. tons per year

Milk composition

	Sheep	Cow
Total solids (%)	19	12
Protein (%)	6	3,5
Fat (%)	7	4
Lactose (%)	5	5
Energy value (kJ/L)	4.200	2.800

Sheep milk is more nutritious.



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Cheese production

For 1 kg of cheese 5 L of milk is needed.

Aproxx. 800 types of sheep cheese exist in the world – e.g. feta, pecorino

For original Roquefort exclusively milk of Laucane breed is used.



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Wool and skin

Worldwide wool production
= 2 mil. tons per year

The oldest natural fiber.

Sheep body cover = **fleece**.

For wool production especially
merino breeds are used.



Worldwide sheep skin production
= 1.6 mil. tons per year

All breeds can be used.

E.g. – Karakul sheep (persian lambs)



Ecological significance

- Pastoral culture historically shaped the character of the landscape.
- The maintenance of traditional sheep farming practices can contribute to the preservation of cultural heritage and the associated biodiversity.



Nowadays well managed sheep grazing helps to ensure the maintenance and recovery of vegetation, especially in:

- protected areas,
- difficult to access areas,
- areas unsuitable for other animal species.



Social and educational significance.



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Thank you for your attention!

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