

The contemporary importance of goats (individual breeds) - in the production of food extremely necessary for people with disease problems.

Modul no. 1: Precision Livestock Farming

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Content of the lecture

- Introduction – domestication, worldwide distribution
- Breeds classification
- Goat milk
- Goat meat
- Goat fat



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Goat (*Capra hircus* Linnaeus, 1758)

- Together with sheep probably the first domesticated farm animal species (Fertile Crescent, circa 11.000 years BP).
- Several different ancestors were considered at the past.
- According to recent studies Bezoar goat (*Capra aegagrus* Erxleben, 1777) is the most likely ancestor.

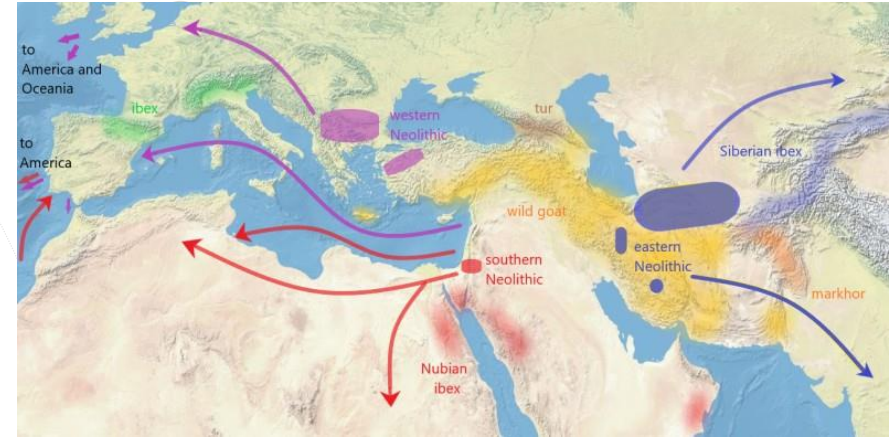
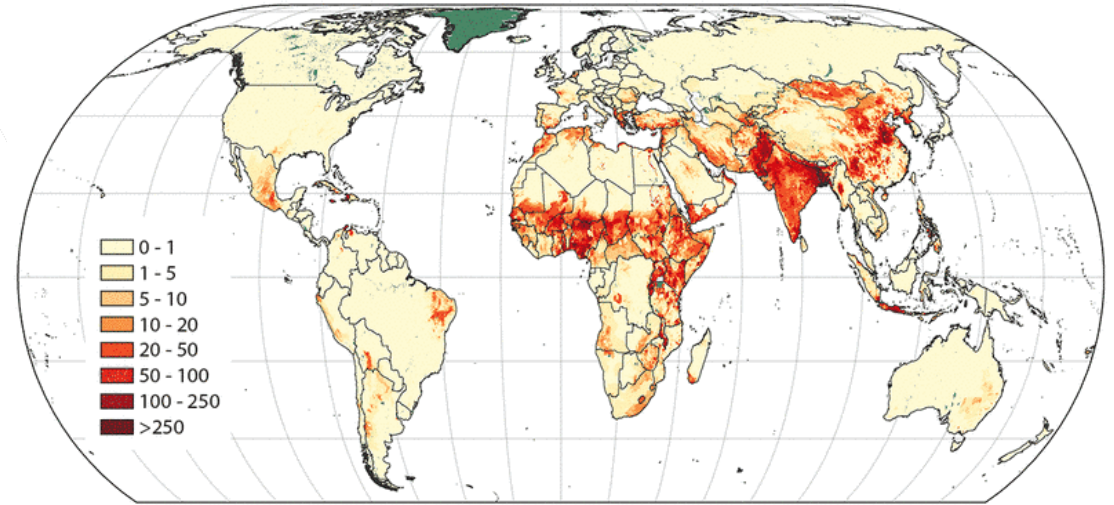


Foto: Milan Kořínek

Worldwide distribution

- Mostly distributed in developing countries of **Asia and Africa**.
- Main breeders of goats are India, China, Pakistan, Nigeria, Bangladesh, Ethiopia, Chad, Kenya, Sudan
- Among European countries Greece and Spain



Numbers of goats per square km (FAO, 2015)

Totally there are more than 850 million of goats, representing about 1.150 different breeds.

Breeds classification according to performance

- **Meat breeds** (e.g. Boer goat)



- **Dairy breeds** (e.g. Saanen goat)



- **Hairy breeds** (e.g. Angora and Cashmere goat)



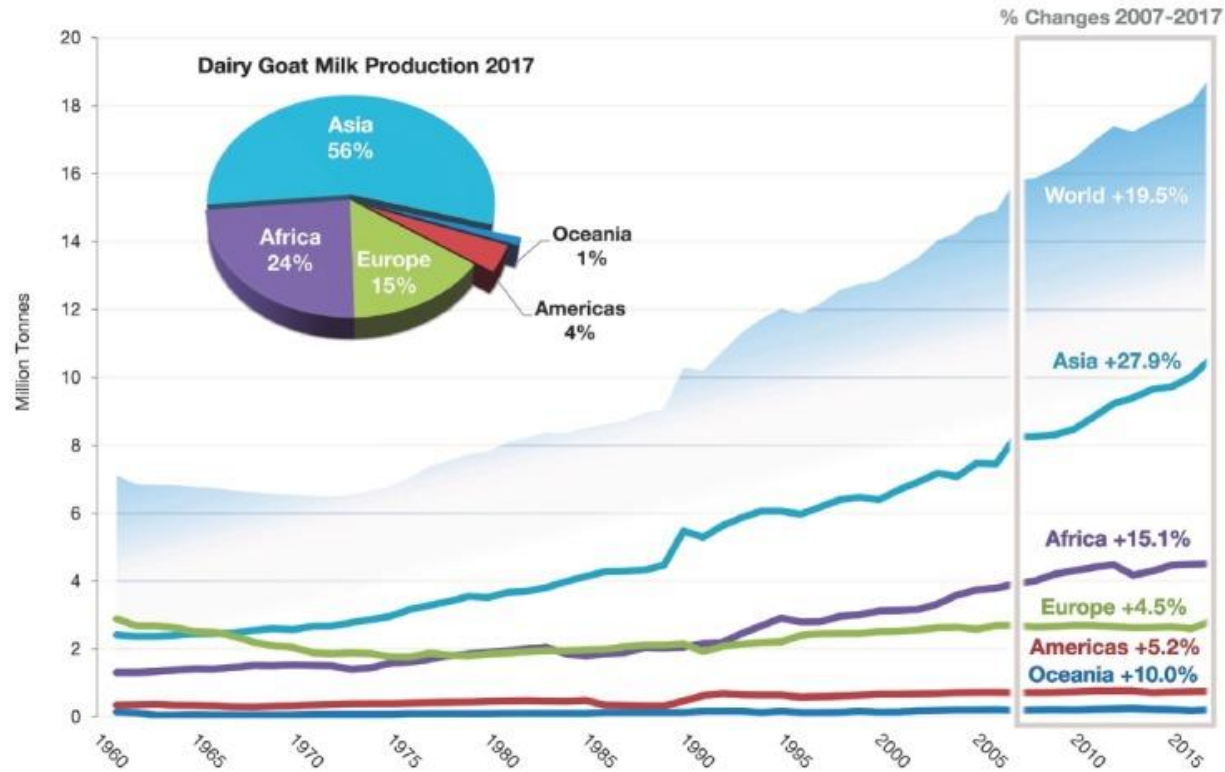
- **Dual-purpose breeds** (e.g. Anglo-Nubian goat)



Milk production

World production is about **19 mil. tons/year** (FAO, 2017)

Global Dairy Goat Milk Production by Region 1961 to 2017



(Miller and Lu, 2019)



Goat milk characteristics

Casein type of milk – similar to cow milk **BUT**

- Average size of the fat globules are much smaller in goat milk compared to that of the cow milk (Park et al., 2007).
- Higher level of essential fatty acids.
- Higher level of caprylic and caprin acids.
- Lactose is the major carbohydrate in goat milk and the content is slightly lower than in cow milk.
- Goat milk is significantly rich in lactose-derived oligosaccharides compared to cow milk.
- Goat milk has a higher vitamin A content than cow milk, it is also a good source of vitamins such as D, E, thiamine, riboflavin and niacin.
- Goat milk is reported to have a higher content of Potassium, Calcium., Phosphorus, Selenium, Zinc and Copper than cow milk.

- Goat milk contains a significantly lower level of α -1 casein, a major allergen in bovine milk (Lara-Villoslada et al., 2004)

Goat and cow milk composition

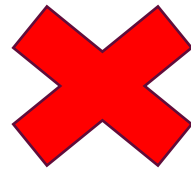
	Goat milk	Cow milk
Water content	84.8 – 88.8 %	87.3 %
Total solids	11.0 – 15.0 %	12.5 %
Lactose	4.2 - 4.6 %	4.7 – 5 %
Fat	3.2 - 4.2 %	3.5 – 4 %
Total protein	3.3 - 3.8 %	3.2 – 3.5 %
Ash	0.75 - 0.95 %	0.7 %



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Goat milk as a functional food

- Easily digestible fats and proteins
- Better nutrient uptake efficiency
- Ultra-nourishing
- Lower in lactose
- Less allergenic proteins
- Anti-inflammatory and anti-mucousal properties
- Heart health
- Immunity booster
- Prebiotic supplement
- Anti-carcinogenic



Some people can be sensitive to the specific smell and taste of goat milk.



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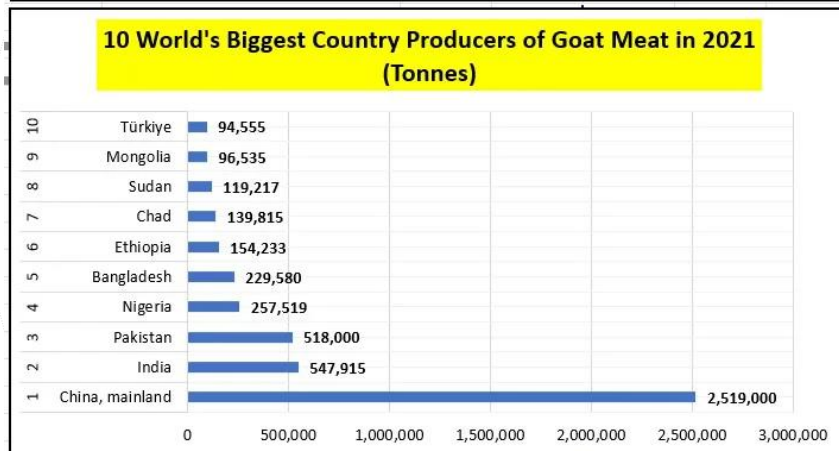
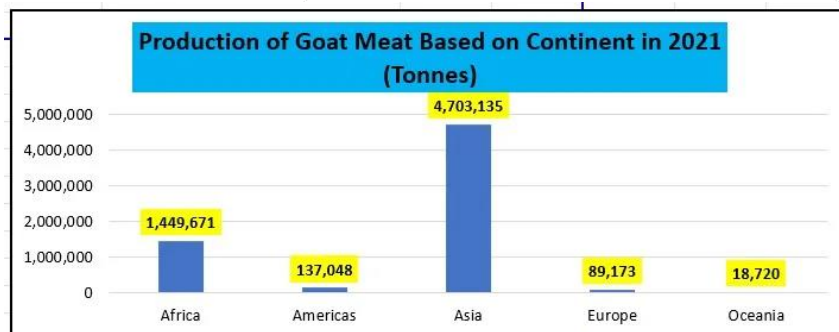
Goat milk products

- Goat cheese
- Goat butter
- Goat yoghurt
- Cosmetics products
- etc.



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Meat production

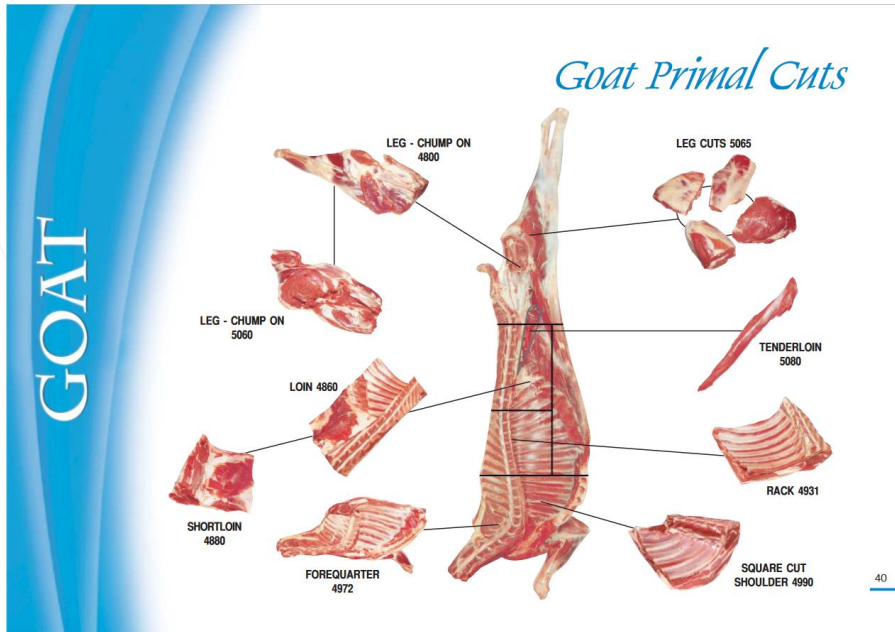


<https://scienceagri.com/10-worlds-biggest-goat-meat-producing-countries/>

Goat meat has no cultural or religious taboos.

Meat production

- The main production is covered by slaughtering kid goats – the highest quality meat and good carcass performance (between 60 and 65 %)
- Dressing percentage of adult animals is lower (up to 50 %)



Goat meat characteristics



- Red meat with favorable nutritional characteristics - low fat content, high protein level, source of vitamin B and iron).



- Coarser texture, less juicy.
- Specific flavor and aroma - the odor has been associated with 4-ethyl octanoic acid in goat meat.

The nutrient composition of goat and other types of meat (per 100 g of cooked meat)

	Goat	Chicken	Beef	Pork	Lamb
Calories (kcal)	144	190	210	212	206
Fat (g)	3.1	7.4	9.3	9.6	9.5
Protein (g)	27.0	29.4	29.4	29.4	28.2
Cholesterol (mg)	75.0	89.0	86.0	86.0	92.0

USDA Nutrient Database for Standard Reference (2001)



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Benefits of goat meat



- **Low in fat and saturated fat** - benefit for people looking to lose weight, less risk of LDL cholesterol storage
- **High in iron** which is necessary for making hemoglobin
- **Source of vitamin B12** which plays important role in production of energy in cells, DNA synthesis, nerve cell function, red blood cell formation
- **Source of potassium** which helps to regulate blood pressure and maintain cell functions

Downsides of goat meat

- Eating too much red meat has been suspected to increase cancer risk (???)
- **Specific taste and smell**, which some people didn't like
- If it's not cooked well it can be quite tough and undesirable to eat



Some examples of using goat meat for specific problems

- Suitable for weight reduction diet
- Metabolism stabilization
- Prevention of cardiovascular diseases – e.g. atherosclerosis
- Prevention of Alzheimer's disease
- Improvement of joint function
– support of chondroblasts development



Some examples of using goat fat for specific problems

- Used in the traditional Chinese medicine – especially in ointment formula
- Treatment of upper respiratory tract diseases
- Treatment of purulent wounds
- Prevention of kidney disease and stroke
- Treatment of gastritis
- Cosmetic products – regeneration of skin cells (anti-aging and antioxidant effect), preserving moisture balance



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Other possible use of goats

- Animal Assisted Activities and Therapies
- In the case of goats called also as „farming therapy“



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Thank you for your attention!

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Picture sources

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