CHAPITRE 1- SHEEP ETHNOLOGY
Sheep (*Ovis aries;* 2n = 54 chromosomes*)*

1. ORIGIN, DOMESTICATION & EVOLUTION

The term **sheep** encompasses several genera that are intermediate forms **between** sheep and goats. These genera include **Pseudois** (bharal from Tibet and Western China), **Hemitragus** (tahr, which occupies an intermediate position between the mountain goat and the American sheep), and **Ammotragus** (Barbary sheep). The latter seems to be the only true sheep, in physiological, anatomical, and behavioral terms, and some authors believe it is the ancestor of the modern sheep. The genus Ovis contains 4 to 8 species according to different authors, and all are capable of interbreeding with each other. Among these species are: Ovis aries (domestic sheep, 2n = 54 chromosomes), Ovis ammon (argali, 2n = 56 chromosomes), Ovis canadensis (North American bighorn), Ovis orientalis (Eastern urial), Ovis musimon (mouflon, 2n = 58 chromosomes), Ovis tragelaphus (North African aoudad), and Ovis vignei (Asian urial, 2n = 58 chromosomes). In addition, they mention that the genus Ovis generaly and species O*vis aries i*n particularr have 11 types :

-Ovis aries germinaca (Germanic sheep)
-Ovis aries batavica (sheep from the Netherlands)
-Ovis aries hibernica (sheep from the English dunes)
-Ovis aries arvensis (sheep from the central plateau)
-Ovis aries ingevonensis (sheep from Denmark)
-Ovis aries britanica (British sheep)
-Ovis aries ligenensis (sheep from the Loire basin)
-Ovis aries berica (sheep from the Pyrenees)
-Ovis aries africana (Merino sheep)
-Ovis aries asiatica (Sheep from Syria or broad-tailed)
-Ovis aries soudanica (sheep from Sudan).

- According to recent studies based on the DNA of animals (number of chromosomes) and the geographical distribution of wild sheep, six wild species of the genus Ovis likely to be the ancestor of Ovis aries have been identified, and they are:

• Ovis orientalis with two subspecies:
- O. orientalis musimon (European mouflon)
- O. orientalis laristanica (Asian mouflon)
• Ovis ammon, the Argali (nine subspecies)
• Ovis vignei, the Urial (three subspecies)
• Ovis canadensis (eight subspecies)
• Ovis dalli (three subspecies)
• Ovis nivicola (three subspecies). •
•Ovis canadensis, O. dalli, O. nivicola, have certainly not been subject to domestication. However, O. vignei or the Urial, the Afghan mouflon with 58 chromosomes, contributes to the constitution of the modern sheep by hybridizing with it. Now, only Ovis orientalis, the

eastern mouflon or the red mouflon or even the mouflon of Asia Minor, is unanimously considered an ancestor of the sheep. It currently lives in southern central Turkey, Armenia, Azerbaijan, and the southeast of the Zagros, a mountain range on the border between Iran and Iraq.

- **DOMESTICATION**

It was made from species from Asia (Ovis orientalis, O. vignei or urial, O. ammon or argali) and probably from the mouflon (O. aries musimon). The argali and the urial, which do not have the same number of chromosomes as the domestic sheep, can crossbreed with it and produce fertile offspring. 2.5 million years ago, wild sheep and goats were already found in western Asia and southeastern Europe.

Like that of the goat, the domestication of the sheep is very ancient. It took place in the "Fertile Crescent" region (present-day Turkey, Syria, Iraq, Iran). Sheep and goats are thus the first animals to have been domesticated after the dog.

Domestication was gradual, and the centers of domestication were probably multiple. An initial suspicion of sheep domestication in northern Iraq, dated to 8900 BC, is based on a high proportion of young animals according to the bones, but on a small population. Another possible site is dated to 7500-6500 BC for the so-called "Bush Mordeh" phase. Fragments of hornless skulls were found there. But this fact alone can be contested as evidence of domestication. The first domestic-type horn cores (bony bases of the horns) appear in the "Mohamed Jaffar" phase around 6000-5000 BC (Meyer et al., 2003).

The region and the period of sheep domestication were largely determined by the development of different preconditions (climate, food, and the cultivation of these plants; the increase in village size) making hunting too unpredictable to feed all these populations. Finally, the ability of ruminants to consume, digest, and transform grasses rich in cellulose and straw into products useful to humans. Like all ruminants, sheep can recycle their urea in case of a diet low in protein. All these preconditions were present in Southwest Asia, which explains why this region became the center of domestication for many ruminant species. (Lariah and Djellil, 2017).

2. CLASSIFICATION

The sheep, Ovis aries, is a domestic animal, mammal, herbivorous ruminant belonging to the genus Ovis (sheep) of the subfamily Caprinae, within the large family of Bovidae. Like all ruminants, sheep are ungulates walking on two toes (Cetartiodactyl). (Meyer et al., 2003). Table

1 shows the classification of sheep within the animal kingdom.

Table 1: Classification of sheep in the animal world (Lannies, 1785; Marmet, 1971; Mayozer, 2002 cited by Khediri and Bendir, 2022).

Kingdom	Animalia
Phylum	Chordata
SubPhylum	Vertebra
Class	Mammalia
Order	Artiodactila
Family	Bovidae
Subs famly	Caprinae
Genus	*Ovis*
Species	*aries*
Biological parameters Rectal Temperature (RT) = 39-40°C Heart Rate (HR) = 70-80 Beats/Minute Respiratory Rate (RR) = 12-15 Movements/Minute Spontaneous ovulation, discontinuous estrous cycle, cycle duration: 17 days, estrus duration: 2 days. Gestation: 5 months (Villemin, 1984)	

- **TERMINOLOGY**

Lamb: male or female sheep under twelve (12)months old

Milk lamb or lambkin: Unweaned sheep, that has never known grass, only its mother's milk

Ewe lamb: female under twelve(12) months

Ewe: female that has given birth to lambs

Ram: male sheep over 12 months old, not castrated

Sheep: male sheep over 12 months old, castrated.

DIFFERENTES REGIONS DU CORPS DU MOUTON

In the followin figure the differents regions of the sheep’s boddy

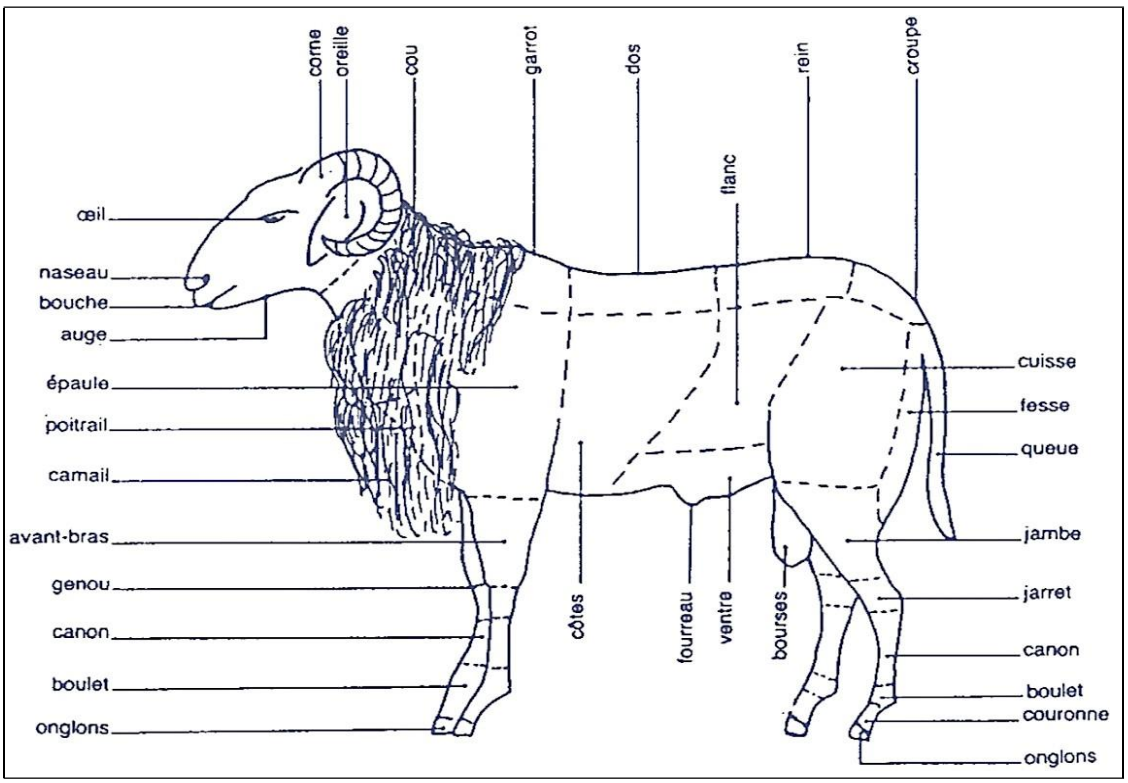

Figure 1 : Differents regions of the sheep's boddy (Charray et al., 1989 cited by Boukhechem 2023).

3. GENERAL ETHNOLOGY

Sheep are relatively **small ruminants**, which most often have horns located on the side of the head (on each side above the skull) and a **curly coat** called "**Wool**." Domestic sheep are distinguished from their wild cousins and ancestors in several ways. Some ancestral-type breeds retain certain characteristics of their wild cousins, such as a **short tail** or **short-haired** fur instead of a fleece. Depending on the breed, domestic sheep may have no horns at all (such as the Roussin), horns in both sexes (as in wild sheep), or only in males. Most horned breeds have a single pair.

Another specific trait of sheep is the great variation in the color of their wool. Wild sheep mostly have brown shades. Domestic sheep range from white to dark chocolate and can even be spotted or piebald. Selection for white wool began very early at the start of sheep domestication, and white wool became a dominant trait that quickly spread. However, colored sheep appear again in many modern breeds and can even appear as a recessive trait in flocks of white sheep. While large commercial markets want to have white wool, there is a niche for wools of color, especially in hand spinning. Depending on the breed, sheep show a significant variation in size

and weight. Their growth rate and weight gain is a hereditary trait that is often selected for in new sheep breeds.

They measure between **1 and 1.5 m** in length, including the tail. **Ewes** generally weigh between **45 and 100 kg**, while **rams** weigh between **45 and 160 kg**.

3.1. VARIATIONS OF THE LA PLASTIC

3.1.1. Variations of the format = size (heteromer)

By size, we mean the height or weight of the animal. Three types of size are distinguished, which allow animals to be classified as Eumetric, Ellipometric, and Hypermetric. Table 1 presents the different classes according to size.

Table 1: The different heterometric classes (Cheik and Hamdani, 2007, cited by Ghani, 2016)

Femal of the species	Ellipometry (eg.**Hamra**)		Eumetry (eg.**Mérinos**)		Hypermetry(eg. **Suffolk**)	
	Height at weither (HW)	Weight	Height at weither (HW)	Weight	Height at weither (HW)	Weight
Sheep	/	40kg	/	50-70kg	/	80kg

There the differents classs in function of the size (format).

a) **Eumetric**: (50-70 kg)Animals that have an average weight and size. In sheep, the **male** weighs on average **75 kg** and the **female 50 kg** (breeds: **Merinos, Ouled Djellal, Rembi, Southdown**).

b) Hypermertic: These are breeds in which the male's weight is greater than or equal to 110 kg and the female's weight is greater than or equal to 75 kg (breeds specialized in meat production: **Boulonnaise, Berrichon**).

c) Ellipometric: Also called **hypometric**, these are small-sized breeds, in which the male weighs less than 70 kg and the female weighs less than 50 kg (Algerian breeds: **D'men** and **Hamra**). (Aissat, 2024) .

The eumetric type is the most common.

Female of the species: Ellipometry (e.g., **Hamra**) Eumetry (e.g., **Merinos**) Hypermery (e.g., **Suffolk**).

3.1.2. CONFORMATION ACCORDING TO THE PROPORTIONS

According to proportions, we distinguish: Longilinear breeds. · Brevilinear breeds. · Mediolinear breeds. (Cheik and Hamdani, 2007; Laoun, 2007, cited by Ghani, 2016)

a. Longiline breeds

These breeds have long lines, more developed in length than in width, tall and long. The head is long with a narrow forehead and a long nasal bridge, the neck is elongated, the chest is high but narrow, the ribs are flat, the pelvis is long and narrow, the limbs are long and thin. Examples: Romanov breed, Lacune breed (see photos). Sheep of this type are suitable for long distances, they can produce wool but produce little meat.

Figure2 : Romanov breed (Anonyme1)

b. Brevilineal breeds

These breeds (for example, the Charollais breed) are developed in width with a broad forehead, a short face; the head appears sunk into the chest due to the shortening of the neck, the chest is square, and the limbs are short, which leads one to say that the animal is close to the ground (or low on its legs). These sheep are not very inclined to walk; however, they have great abilities to become fat and to produce meat.

Figure 3 : Charolais breed (Anonyme1)

c. Medium-line breeds

Breeds of this type (e.g., **Red West breed**, **Rambouillet Merinos**) are intermediates between the two extreme types. Of average conformation, with a square head and a very broad

forehead, they have mixed abilities and are capable of producing meat while also yielding wool of good quality. (Cheik and Hamdani, 2007 cited by Ghani, 2016).

Figure4 : Red West Breed (Meyer, 2024 ; Cirad)

3.1.3. CONFORMATION ACCORDING TO THE PROFILE

The silhouette is the drawing that indicates the outline of the sheep with a simple line. The examination of the different silhouettes of animals shows that the lines thus formed are sometimes straight and sometimes curved, the curves being sometimes convex and sometimes concave. Three types can thus be distinguished.

a. The rectilinear type. In an animal of this type, all the lines of the silhouette have the same shape. The profile of the forehead and the nasal bridge forms a straight line, with a straight neck and a straight back, vertical legs, and a straight croup. Examples: Ile de France breed, Mérinos d'Arles (Laoun, 2007; Cheik and Hamdani, 2007 cited by Ghani, 2016).

b. The convex type. If the nasal bridge is arched, the forehead is convex, the eye sockets are less prominent, and the ears are long and pendulous, all the lines of the sheep will be convex. The neck then takes a swan shape, the back is arched or "carp-backed," and the limbs are curved with a croup that shows a protrusion of the spine and clearly slopes on each side. Examples: Limousine and Noire de Velay (Laoun, 2007; Cheik and Hamdani, 2007 cited by Ghani, 2016).

c. The concave type. Conversely, a concave profile with an upturned nasal bridge, ears tending to stand up, and prominent eye sockets will give awith a reversed neckline. The back is saddled, the croup slopes sharply backward, and the limbs have hollow knees and outward-facing feet. In general, if one considers the shape of the face, the sheep are almost all convex, but this convexity is more or less pronounced. Example: the Southdown (photo below) (Laoun, 2007; Cheik and Hamdani, 2007 cited by Ghani, 2016).

3.1.4. VARIATIONS OF THE PHANE ROPTIC

a. Color and Pigmentation

There are white breeds (Texel, Ouled-Djellal), others are black (Ouessant, Daraa, Noire du Velay, Noir de Thibar) or brown (Solognote breed), or have more or less large spots. The more or less pronounced pigmentation of the skin without hair coloration is very common in certain white breeds.

b. Variations of the fleece

Variation dans l'extension de la laine

The extent of the body surface covered by wool varies depending on the level of breed selection for their wool traits. According to the extent of the wool, the following varieties are distinguished: Very invasive fleece, Invasive fleece, Semi-invasive fleece (With wool tuft; With uncovered head), Non-invasive fleece.

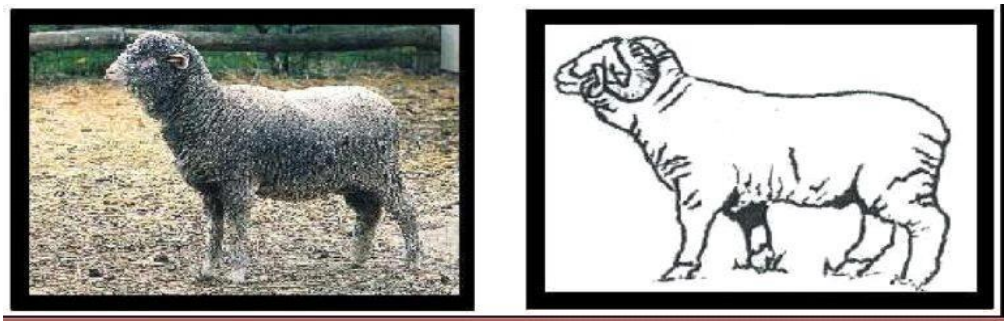

Figure 5 : Very invasive fleece in Rambouillet Merino(Craplet and Thibier, 1984 Cited by Khedir and Bendir, 2022).

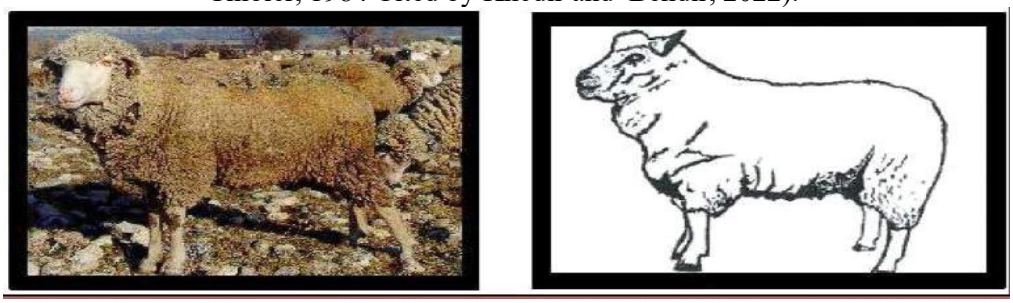

Figure 6 : Invasive fleece in Merinos of Arles (Craplet and Thibier, 1984 Cited by Khedir and Bendir, 2022).

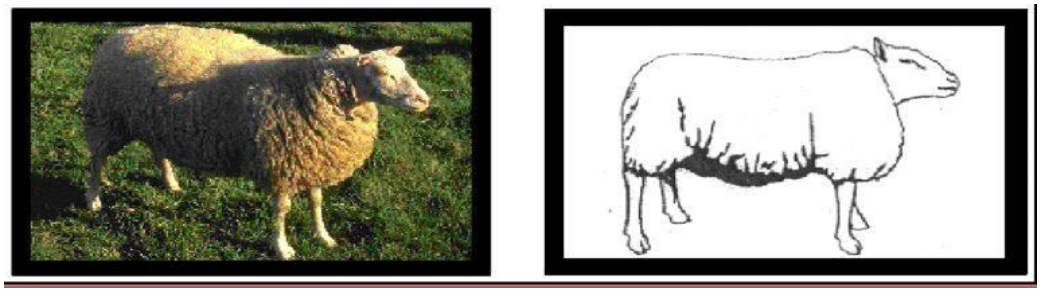

Figure 7 :Semi invasive fleese in the charmoise breed (Ouali hani,2016 Citeed by Khedir and Bendir, 2022).

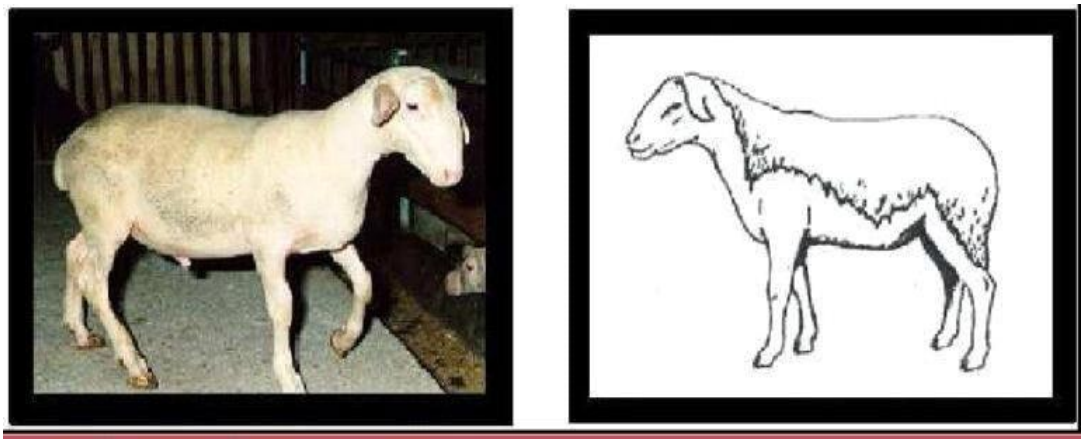

Figure 8 : non-invasive fleece in the Lacaune breed (Ouali hani, 2016 Cited by r Khedir and Bendir, 2022).

3.2. VARIATIONS IN ENERGY CONTENT

a. Wool Production

It is agreed that wool production varies between 2 and 8 kg per fleece. In Merinos, for example, it exceeds 4.5 kg per fleece.

b. Milk Production

Milk production ranges from 100 to 800 liters on average per lactation. Sheep's milk is more energy-rich than cow's milk (approximately 1100 kcal/L vs 705 kcal/L). It is used in the production of sheep cheese "Roquefort".

a. Meat production

There are **2 classes** depending on the weight of their carcass

- **Sheep**: Any male or female animal over **12 months old**, with a carcass weight of **20 - 35 kg**
- **Lamb**: Any male or female animal **under 12 month**s old, with a carcass weight between **14 - 18 kg** (Boukhechem, 2023)**.**

4. BREEDS OF SHEEP

According to sources; more than **800 breeds** of farm sheep have been selected for different productions, but these numbers cannot be verified. Almost all sheep are classified according to the production for which they are best suited: wool, meat, milk, hide, or a combination for mixed breeds. Other characteristics are used to classify sheep: face color (generally white or black), tail length, presence or absence of horns, topography of the region where the breed was developed.

4.1. MEAT SHEEP

4.1.1. Southdown

Figure 9: Southdown Breed (Mdcollins . 1984)

- **Origin**

The origin of this breed is the **Sussex** Hills in **England**.

•Performances

His lambs are fed exclusively on grass and produce highly sought-after meat: thanks to very good conformation, the cuts are meaty and the legs of lamb are of good quality.

•Selection

The breed has long been selected for taller and heavier animals, but selection is now more focused on improving conformation and dairy value.

•Expansion

It is a very ancient breed, which is today raised in several French regions (Auvergne, Limousin, Poitou-Charentes).

4.1.2. Race Suffolk

- **Origin**

Suffolk sheep are **large sheep**, well suited for black-headed meat; their wool is white and their limbs are covered with fine black hair. They represent more than 60% of the American flock and were imported to Canada since 1888. The Suffolk breed was developed in the early 1800s in the South of England.

- **Selection**

From crossings between the **Southdown breed** (terminal breed) and the **Norfolk** horned breed (practically disappeared nowadays).

- **Performances**

Superior growth performance of this breed as well as its widely recognized carcass quality now make it one of the most popular breeds in the heavy lamb market. **Adult male** weight **115-150 kg** and **female** between **80-115 kg**

- **Expansion**

Very ancient breed, which is today farmed in many regions (French, American, English, and Canadian)

Figure 10 : Suffolk Breed (Anonyme1).

4.1.3. Berrichon Sheep Breed

a. Origin

It is an ancient French sheep breed originating from Berry.

b. Selection

Derived from local sheep populations that may have been crossed in the 18th century with Merino animals, and later crossed with English breeds in the 19th century to improve their meat qualities, there are 2 types following the crossbreeding with the Ile de France breed in two different regions. The Berrichon du Cher is a good walker, its fleece is medium, and it can be used in crossbreeding to give other breeds the ability to cover long distances. The Berrichon de l'Indre is less interesting.

c. Performance

Rapid growth of lambs, 350 g average daily gain. Lambs are slaughtered between 100 and 130 days at 35–40 kg (Anonyme1, Villemin, 1984).

Figure 11 : Berrichonne breed (Anonyme1)

4.1.4. Hampshire Breed

- **Origin**

  It is a sheep breed originating from England, of good size, with white wool except for the head and limbs which are black.

- **Selection**

  It comes from crossbreeding between Southdown sheep and various other English horned white sheep breeds.

- **Performance**

  It is a breed well suited for meat. The lambs are generally fast-growing, combining strong growth performance (**Average Daily Gain; ADG = 350 g/day**) with a low feed conversion ratio (FCR). If they are slaughtered fairly early, around 16 to 18 kg, they have little fat and a carcass yield of 50%. The meat has a reputation for being tasty.

- **Expansion**

The Hampshire sheep is widespread throughout England. It has also developed well in the USA. In France, the males are used for crossbreeding throughout the country. The Hampshire is also exported throughout Europe, to South Africa, Brazil, and even to the Antilles (Anonymous1, Villemin, 1984)

Figure 12 : Hampshire breed sheep (Anonyme 1).

4.2. DAIRY BREEDS

4.2.1. Lacaune Breed

• Origin

An important **French** breed formed by the fusion at one time of many ancient breeds from central France (Camarés, Larzac, Lauragaise, Ségala**).**

• Performance

Its wool is not abundant but rather fine. The ewe is a **good milk producer**, and her milk is used to make "**Roquefort**" cheese.

Figure 13 : Lacaune breed sheep (Deviers Fabien, 2007)

4.2.2. Basco-Béarnaise Breed

- **Origin**

  French sheep breed originating from the Pyrénées-Atlantiques, present in Upper Béarn and the Basque Country.

- **Selection**

  Its ancient history is that of several local valley sub-breeds or types. The Basque and Béarnaise breeds, genetically close, merged to form the Basco-Béarnaise breed, which was officially recognized in the 1930s (Babo, 2000). The breed has had a genealogical register (flock-book) since 1975.

- **Characteristics and Performance**

  Large-sized, convex-line breed; withers height = 75 cm and weight 55 kg (ewe), withers height = 90 cm and 80 kg for the ram. White fleece, reddish-brown skin, is a breed well suited for meat. Average milk production is 180 L / 145 days with a fat content of 7.42% and a protein content of 5.39%.

- **Expansion**

The Basco-Béarnaise is raised in the Béarnese part of the Pyrenees range and in Haut-Soul in the French Basque Country.

Figure 14 :Basco-béarnaise breed (Anonyme 2)

4.2.3. Frisian Breed

• Origin

It is a dairy breed from the Friesland region, a small Dutch province.

• Selection

It originates from the coastal regions of the North Sea and has three varieties. East Frisian sheep were bred in the 19th century in the small Dutch province of Friesland, located northeast of Germany, on the shores of the North Sea. Over time, it spread to neighboring European countries and, by the end of the 20th century, it was introduced to North America.

• Performance

It is an excellent dairy breed. The average daily weight gain (ADG = 300 g) and, under intensive fattening, it reaches 500 g. At one year of age, a lamb weighs between 80 and 90 kg. For a lactation period, 400 - 600 liters of milk are obtained per ewe. Its fat content is close to 7% and its protein content is 5%. Purebred sheep are used for dairy purposes.

Figure 15 : Frisian breed sheep (Lernender, 2006)

4.3. BREEDS CLASSIFIED ACCORDING TO THEIR WOOL TYPE

4.3.1. Merino breed

- **Origin**

  It is of Spanish origin, bred for its fleece of very fine fiber.

- **Selection**

  There are 3 varieties: Rambouillet, Early Merino, and Aries Merino; there are also other local varieties: Soissonais, Chatillonnais, etc. This breed has a Flock-Book. It is used to improve the performance of other breeds. For example: the American Columbia breed was developed by crossing Lincoln rams (a long-wool breed) with Rambouillet Merino ewes with fine wool.

- **Performance**

  Among wool breeds, it has dense and curly wool highly valued by users. Long-wool breeds are the largest, but they generally have a slower growth rate. For fleece weight according to the variety we have: Rambouillet (can reach 5kg), Early Merino and Aries Merino (between 3-4kg), Early Merino (between 4-5kg).

Figure 16 : Merino breed sheep(Anonyme1)

4.1. LOCAL BREEDS

Algeria has **20 million** sheep, including **8 breeds** characterized by remarkable hardiness adapted to their respective environments: Ouled Djellal (White), Rembi, Hamra, Berbère, D'Man, Sidaou (Targuia), Tazegzawt (Blue Ham), Srandi (Moula, 2018). There are main breeds and secondary breeds (Serai, 2023). According to Djaout (2017) there are 12 breeds in total; he adds four secondary breeds (Barbarine, Tâadmit, Ifilène, and Darâa).

4.1.1. PRCIPALS RACES (BREEDS)

Pricipals breeds (Races) are : Ouled-Djellal, Hamra, Rembi and Taâdmit breeds . (Serai, 2023)

a. Algerian Arabe breed

Figure 17 : Algerian Arabe breed (Djaout, 2017)

- **Varieties raised in Algeria**

➢ **Variety of Laghoua**t, Chellela, Taguine (Oued Touil), Boghari: this is the **smallest type** in size and with very fine wool.

➢ **Variety of Houdna** – Ouled Nail – Djelfa – Sidi Aissa – Bousaada – M'sila – Sétif – Ain M'lila – Ain Beida: this is the **heaviest type**, it resembles the Ile de France breed.

➢ **Variety of Ouled Djellal** – Zibans – Biskra – Tougourt: this is a **long-legged** sheep, tall with legs adapted to extensive nomadism; this is the type of walking sheep.

Cradle of the breed

It is an area extending from Oued Touil (Laghouat – Chellala) to the Tunisian border.

•Cradle of the breed

It is an area extending from Oued Touil (Laghouat – Chellala) to the Tunisian border.

•Characteristics

It is the most important breed in terms of numbers, it is an entirely white breed, with fine wool and tail, tall in size, with long, strong legs, suitable for walking. The age of puberty for ewes is 8 to 10 months, and the first lambing occurs at 15 months. Its fertility rate is 85% (Chellig, 1992).

Color: White over the entire body. Light straw color does exist, however, in some sheep (Safra ewes).

Wool: Covers the whole body down to the knees and hocks for the Hodna and

Chellala varieties. The belly and underside of the neck are bare for the majority of the Ouled Djellal variety.

Horns: Medium spiral-shaped, absent in ewes, except in a few cases, especially in the Ouled Djellal variety.

Shape: Well-proportioned, tall, height equal to length.

Ears: Medium-sized and drooping, placed in, placed in top of the head .

Tail: Fine, of medium length.

Table 3: Body measurements of the three varieties of the Ouled Djellal breed (Chellig, 1992)

Breeds	Measurements	Ram	Ewe
Laghouat,Chellala, Taguine, Bougari	Weight (Kilogram) Height (meter)	73 0,75	47 0,7
Hodna	Weight (Kilogram) Height (meter)	82 0,82	57 0,74
Ouled Djellal	Weight (Kilogram) Height (meter))	68 0,8	48 0,7

b. Hamra, Red ,Béni-Iguil or Deghma, Breed

Figure 18 : Hamra, Red ,Béni-Iguil or Deghma, Breed(Djaout, 2017)

- **Origin**

The Béni-Iguil breed, called Hamra, is a Berber breed whose geographic area extends from Chott Chergui to the Moroccan border. It also covers the entire High Atlas in Morocco among the Béni-Iguil tribe from which it takes its name. It is **the second largest** breed in Algeria by **number**. It is the **best meat breed** due to the fineness of its bone structure and the roundness of its lines (legs and ribs). It is a **small-sized** breed with a fine bone structure and rounded shapes. **The head** and **legs** are **dark mahogany red**, the **fleece** is **white** and compact. The ewe becomes sexually mature at the age of 12 months, and their first lambing occurs at the age of 18 to 20 months (Chellig, 1992).

- **Varieties bred in Algeria**

El-Bayed – Mecheria variety: dark mahogany in colour.

El-Aricha variety – Sbdou: mahogany almost black in color, it is the most preferred variety.

Variety of chott chergui: light mahogany color.

- **Cradle of the breed In Algeria**, from the Chott Chergui to the Moroccan border.

- **Physical characteristics**

Colour: The skin is brown, the mucous membranes black, the head and legs are brown, dark red, almost black. The wool is white with a reddish-brown jar.

Horns: Spiral, medium-sized Ears: Medium, pendulous. Profile: Convex, hooked.

Tail: Thin, medium length.

Conformation: Small body, short and round leg, the skeleton is thin.

The body measurements of the Hamra breed are reported in Table No. 04.

Table 4: Body measurement of the Beni-Iguil breed (Chellig, 1992)

Measurements	Ram	Ewe
Height (meter)	0,76	0,67
Leinght (meter)	0,71	0,70
deepth (meter)	0,36	0,27
weight (Kilogram)	71	40

c. Rumbi or Chagra Sheep

Figure 19 : Rumbi or Chagra Sheep (Cité par Serai,2023)

- **Origin**

The Rumbi breed has always been designated as a breed resulting from **a cross** between the **Mouflon (Laroui)** of Djbel Amour and **the Ouled-Djellal breed**, because it has the

conformation of the Ouled-Djellal and the color of the Mouflon; it also has enormous horns (Chellig, 1992).

Cradle of the breed: Its cradle extends from Oued Taouil in the East to Chott Chergui in the West.

Place of distribution: The breed is mainly found in Tiaret, Souguer, Aflou, Djebel Amour, Djebel Nador, and Khenchla.

- **Characteristics**

The Rumbi breed has the same characteristics as the Ouled Djellal breed except for the color of the limbs and the head, which is fawn. The ewe reaches puberty at the age of 12 months, and their first lambing occurs at the age of 17 to 18 months (Chellig, 1992).

Color: Brown-pigmented but the wool is white.

Horns: Spiraled, massive, with medium-sized drooping ears.

Profile: Slim and medium.

The body measurements are reported in the following table.

Table 5: Body measurements of the Rumbi breed (Chellig, 1992)

Measurements	Ram	Ewe
Height (meter)	0,77	0,71
Leinght (meter)	0,81	0,76
depth (metr)	0,38	0,33
weight (Kilogram)	80	62

- **Varieties raised in Algeria**

There are two types of Rumbi varieties depending on their adaptation to pastures:

- **Rumbi of Djebel Amour**

  It is a mountain Rumbi (Aflou), more massive, very sturdy, with heavier massive horns, resembling the mouflon. Light brown color, adapted to the woody, bushy pastures of the mountains.

- **Rumbi of Souguer**

  It is a steppe Rumbi (from Djebel Nador), finer, smaller, closer to the Ouled Djellal breed. It makes very good use of the steppe pastures of Chih of Djebel Nador (Sougueur). Its color is darker than that of the first mountain type.

- **Natural environment**

  The Rumbi sheep is an animal well adapted to walking, capable of traveling long distances in the transhumance system. It adapts, especially to dry, poor, rocky soils, mountain soils of

the Saharan Atlas, in a hot and dry climate in summer, cold and humid in winter (Chellig, 1992).

- **Puberty**

Puberty appears at the age of 10 to 11 months in lambs.The appearance of the first heats in ewe lambs does not necessarily mean that they can be fertilized; they must reach 65 to 75% of their adult weight. The minimum age for the first mating is 17 to 18 months. At this age, the ewe lamb weighs between 26 and 30 kg, which corresponds to around two-thirds of the adult weight (Chellig, 1992).

d. Taâdmit Sheep

- **Origin**

It has a genetic origin from **a cross** between the **Eastern Merino** and an **indigenous breed from the Djelfa region**. This crossbreeding was undertaken as early as the 1860s at the Taâdmit experimental station, hence its name. The main objective of this cross was to improve the woolly traits of the Ouled-Djellal breed (Chellig, 1992).

- **Breeding area**

The Tâadmit breed, which was raised in the central region of the Algerian steppe, currently has only a few hundred animals in the Djelfa province, especially in the Taâdmit area, and a herd nucleus at the INRAA Research Station in Hmadna (Relizane province). It is being largely replaced by the Ouled-Djellal breed. Created with the aim of improving wool production, this is currently not the case; probably due to the high inbreeding present within the herd.

- **Characteristics**

This breed is characterized by a **white head** with a **convex profile** and large horns in males, a **long body**. The animal is tall on its legs, the fleece is extensive, covering the forehead and descending to the hocks and sometimes to the knees. The wool is superfine to fine. The tail is long (Djaout, 2017).

Figure20 : Taâdmit breed sheep(Djaout,2017)

4.1.2. Secondary breeds

They are represented by the D'men (D'man), Barbarine, Berber (Laine) and Targuia (Sidaou) breeds.

a. D'men breed

Figure 21 : D'men breed with 3 varieties: tricolor, brown and black (Djaout, 2017)

- **Origin**

This Saharan breed, widespread in the Oases of Western Algeria, is characterized by coarse wool covering the upper body and a thin tail.

- **Characteristics**

This breed is characterized by its high prolificacy (200%). The D'man animal is **small in size** with a fine skeleton; with a fine, narrow head, **concave profile**, a long and thin neck where the absence of wattles, the presence of a white spot on the forehead of the animals, and a long tail with a white tip are the dominant traits of the D'man breed (Djaout, 2017).

Distribution areas: The Algerian D'men is found in Bechar, Saoura, Gourara, and El-Goléa.

Table 6: Body measurements of the D'men breed (Chellig, 1992)

Measurements	Ram	Ewe
Height (meter)	0,75	0,60
Leinght(meter)	0,74	0,64
Depth(metr)	0,34	0,32
Weight (Kilogram)	46	37

b. The berber Sheep; Azoulai breed

Figure 22 : The berber Sheep; Azoulai breed (Djaout, 2017)

•Origin

It is a breed from the Tell Mountains (Atlas – Tellian),

•Characteristics

Small in size, shiny white (Azoulai). Comparable to that of Beni-Ighil except that the wool is locky.

Distribution area: Mountain range of Northern Algeria, Souk-Ahras, Maghnia, Tlemcen, Jijel, Dahra, Ouarsenis, Tiaret Mountains.

Table 7: Measurements of the Berber Zouali wool breed

Measurements	Ram	Ewe
Height (meter)	0,65	0,60
Leinght (meter)	0,70	0,64
depth (meter)	0,37	0,38
Weight (Kilogramme)	45	35

c. Oued Souf breed; The barbarine breed

Figure 23 : Oued Souf breed; The barbarine breedBarbarine (Djaout,2017)

- **Origin**

It is a Barbarian sheep with a large tail, its population is 50,000 head.

Distribution areas: East of Algeria, East of Oued R'ir, and in the border regions of Tunisia.

- **Characteristics**

The measurments of ths boddu of this breed is rapported in the table n° 08.

Table 8: Body measurements of the barbarine breed (Chellig, 1992)

Measurements	Ram	Ewe
Height (meter)	0,70	0,64
Leinght (meter)	0,66	0,65
depth (meter)	0,32	0,29
Weight (Kilogram)	45	35

d. Race Targui-Sidaou (Targui breed; Targui-Sidaou breed

Figure 23 : Targui-Sidaou breed (Chekal cited by Djaout, 2017

- **Origin**

This breed is called Targuia because it is raised by the Tuaregs who live and roam in the Sahara between Fessa in Libya, Niger, and southern Algeria in Hoggar-Tassli. **Characteristics** of the breed The body is covered with hair, not wool, the tail is long and thin.
Cradle of the breed It seems that the origin of the Targuia breed is Sudan (the Sahel).

Characteristics

The body measurements are reported in Table No. 09.

Table 9: Body measurements of the Tergui breed (Chellig, 1992).

Measurements	Ram	Ewe
Height (meter)	0,77	0,76
Leinght (meter)	0,76	0,64
depth (meter)	0,33	0,32
Weight (Kilogram)	41	33

e. Srandi or Sordi or Sardi breed

- **Origin**

The Srandi breed, along with its Moroccan counterpart Sardi, the Ripollesa breed from Spain, and the French Causses-du-Lot breed, exists on Algerian territory, with a fairly significant population in regions near the Algerian-Moroccan borders, its origin is not really defined.

- **Characteristics**

This breed is highly sought after by breeders and citizens in this region, particularly at the time of Eid al-Adha.

It has a white head without wool with black spots around the eyes, muzzle, ear tips, legs, and at the joints (knees and hocks). This phenotype gives it the name "**glasses breed**." (Chikhi and Boujenane, 2005)

The nasal bridge is slightly **convex** in males, straight in females. Horns are absent in females and present in males but are smaller in size than those of the Sardi breed from Morocco. The wool is closed to semi-closed. The height at the withers of these animals ranges from 70 cm to

80 cm with a body weight of 50 to 70 kg. The tail of the animals is medium or short; this is the main characteristic that differentiates the Srandie from Algeria from that of Morocco, where the latter has a long tail (Boujenane, 1999; Boukhliq, 2002; MADRPM/DERD, 2007; Chikhi and Boujenane, 2005).

There are 3 varieties:

- Variety that has **black glasses** and **black spots** around the muzzle and at the tips of the ears and paws (this is the typical Moroccan type, with a medium or short tail).
- Variety that has the **same characteristics** as the first variety **except** that the color of the **spots is brown**; these brown-colored spots are considered disqualifying traits for the Moroccan Sardi breed.
- Variety that has extensive black spots around the eyes; these spots cover almost the entire head, with black pigmentation around the tips of the ears and paws.

Figure24 : Srandi breed (Djaout and Rabhi, 2015)

f. DarâaBreed ; Black breed

Origin

This breed exists throughout the Algerian territory but in small numbers; it is found in herds with other 'breeds.' It closely resembles the French Noire du Velay breed, the Tunisian Noire de Thibar breed, and a variety of the D'man breed. Its population is estimated to be between 2 and 5% of the livestock.

Characteristics:

It is characterized by a **head** and **limbs** that are entirely **black** (hence its name Darâa) with closed or semi-closed brown wool. The wool of this breed is used for the making of the

Bernousse. The head is short and fine, the nose bridge **is straight**, the limbs are thin, the tail is medium or long, and the horns are absent in females but may exist in males.

Figure 25 : Daraa or black breed sheep (DJaout and Rabhi, 2015)

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