

# ANIMAL PRODUCTION

Plant domestication  $\rightarrow$  10.000 years ago

Intensification: Indoor animal housing, high animal densities, high mechanization. Housing units.

Specialization: Only one species is kept in special buildings, for ex. farm.

## Animal Breeding

For more efficient animals, genetics is used, Study of heredity, additive or non-additive gene effects

Trait is there or not, coat color.

Qualitative  $\rightarrow$  horned or polled, gender etc.

Quantitative  $\rightarrow$  Height, IQ, measured numerically.

$aa \rightarrow$  homozygous       $Aa \rightarrow$  heterozygous  
 $A\text{---}a$

Heritability  $\rightarrow$  Proportion of population distribution.

$$\text{Total variation} = \frac{\text{Genetic variation}}{\text{(phenotypic)}} + \frac{\text{Environmental variation}}{\text{}} \quad h^2 = \frac{VG}{VP}$$

## Selecting breeding stock

↳ Tandem    ↳ Independent culling levels    → Selection Index

### Tandem

Selection is for one trait at a time.

Most profitable production

Simple but not recommended.

Less effective.

### Independent Culling Levels

More than one trait

Most effective when only small numbers of traits.

Most widely used.

### Selection Index

Discriminable against a trait  
extensive records are used.

Most effective.

Heritability estimates for some traits

- Age at puberty
- Birth weight
- Carcass grade
- Mature weight
- Milkling ability
- Egg weight

Genetic Progress in a Year

$$\Delta G_y = \frac{i \times h^2}{G.G.} \downarrow$$

Heritability

Superiority of Selection      Heritability

Generation Gap → The time passes from an animal's birth to the time they become parents. (Not able to be a parent, becoming parent)

Horse → 8-12 year

Cow → 4-6 year

Sheep → 3-5 year

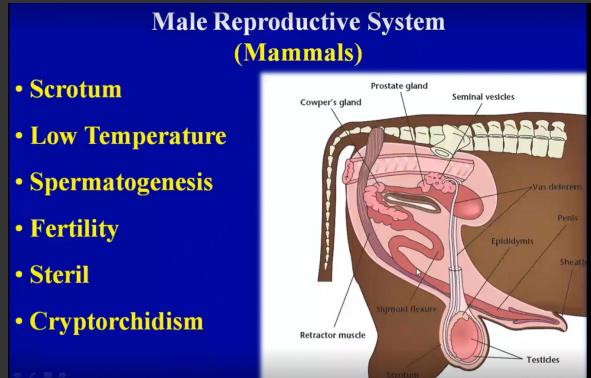
Chicken → 12-18 month

Pig → 18-24 month

## REPRODUCTION

Testicles descend to scrotum because spermatogenesis can not occur in body temp.  
(except birds)

Epididymis is the tube where sperms mature.

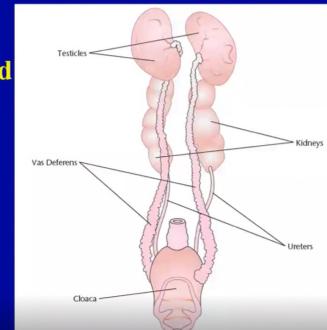


Cloaca is the main canal in birds for the exit of feces, urine, egg / sperm.

Ducks and geese have pseudopenis structure.

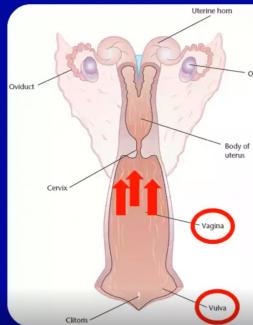
## Male Reproductive System (Poultry)

- Testicles
- Sperm & seminal fluid
- Vas deferens
- Cloaca
- Papilla (phallus)
- NO-Accessory glands



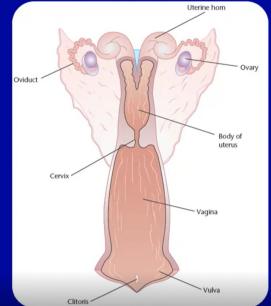
## Female Reproductive System (Mammals)

- Uterine horns
- Cervix uterus
- Vagina
- Vulva
- Clitoris

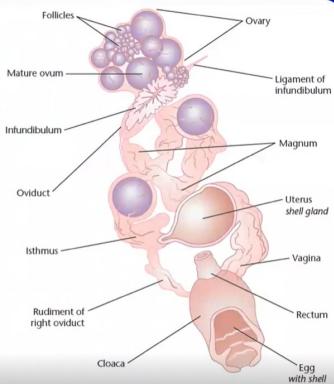


## Female Reproductive System (Mammals)

- Embryo
- Ovary
- Uterus
- Fallopian tubes
- Infundibulum
- Oviduct



## Female Reproductive System (Poultry)



Egg white → magnum

Only left ovary and oviduct are active in avian species.

Infundibulum receives the yolk from ovary, magnum secretes the thick white to egg, then it goes to isthmus, then the thin white and outer shell is added in uterus. Then it moves to vagina.

In reproductive canal, egg moves small end first.  
in vagina it turns end large end becomes first.

egg production

inside the reproductive canal  $\Rightarrow$  23-26 h

yolk production  $\Rightarrow$  6-10 days  
inside the ovary

stigma  $\rightarrow$  part of the yolk that doesn't contain any vessels.

oviposition  $\rightarrow$  process of laying eggs.

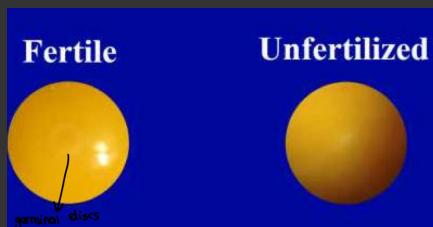
Sperms of chickens are longer and faster than mammals.

They may be abnormal.

Near the junction of shell gland and vagina are deep glands known as sperm host glands that can store sperm for 10 days to 2 weeks.

Chickens store sperm for 2-3 weeks

Turkeys can store up to 10-15 weeks.



## Estrus cycle

- Estrogen ↑
  - Swelling of vulva
  - frequent urination
  - Mucus discharge from vulva.
- Inflamed appearance around the lips of vulva

Ovulation : End of estrus period

After ovulation Corpus Luteum occurs.  
Secretes progesterone.

**Progesterone** → fertilized eggs are implanted in uterus, stops another egg development, pregnant conditions are maintained, mammary glands develop.

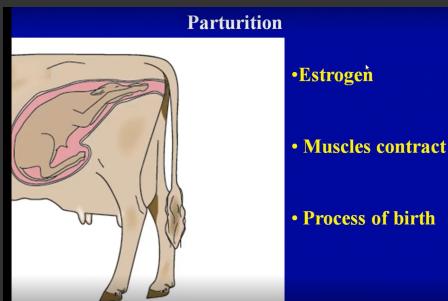
No fertilization → Corpus Luteum doesn't grow.

Another follicle grows, new estrus period starts.

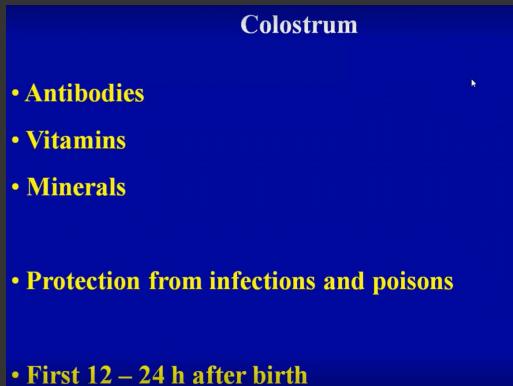
- nervousness
- standing when mounted by another cow.
- trying to mount other cattle

## Gestation period

Fetus develops, umbilical cord, placenta,  
Nutrient exchange occurs by diffusion.



Front feet first  
Nose  
Head  
Shoulders



# In Turkey

One person eats 224 eggs, 21.0 kg meat per year.

Egg contains HDL lipoproteins.

Color of the eggshell doesn't affect the contents.

Earlobe color is related to shell color.

Important for optimum hatchability:

Temperature, relative humidity, air movement, turning 45° every hour.

most produced meat since 2015 → poultry

Single comb type is the most common.

## Length of gestation

Cattle → 278 - 289

Horse → 310 - 370

Swine → 111 - 115

Goat → 140 - 160



# Cattle Breeding

## ■ Importance of Cattle Breeding

Compared with other dairy animals, cattle present many advantages in terms of:

- ease of milking,
- udder size
- milk yield.

In fact, cattle milk constitutes:

- the largest share of the total world milk production (more than 90%)
- approximately 20% of total world meat production.

Cattle farming in general is vital for a number of reasons. On top of the food sources (milk and meat), there are many other products from makeup, clothing and hundreds of other items which the general public has no idea that they're animal products (by-products).



# Cattle Breeding

## ■ Importance of Cattle Breeding

Cattle also provide us with many other by-products – parts of the cow that are used to make products for home, health, food and industry.

Byproducts are value-added products other than beef that come from cattle. They are of considerably less value than the primary product, which is meat and milk.

Cosmetics, Sandpaper, Film, Buttons, Leather, Violin Strings, Medicines for: Insulin and Cholesterol.

And MANY, MANY MORE products!

# Cattle Breeding

## ■ Cattle Breeds in Turkey

### Native Breeds

### Non-Native Breeds

- Dairy Breeds
- Beef Cattles
- Dual Purpose Breeds

# Cattle Breeding

## ■ Cattle Breeds in Turkey

### South Anatolian Red (Kilis)

**LOCATION :** As Kilis is center, it expands from Mersin to Şanlıurfa in the South Anatolian Region.

**BREEDING PURPOSE :** Dual purpose (milk and meat)

**BREEDING CONDITIONS :** The prevalent breeding is in primitive keeping, feeding and sheltering conditions as in the form of village-herds. Pasturing period includes three fourth of a year, in some places it carries on whole year. Feeding in barns is made only in winter. Barns are generally made of rushes and mud-bricks in the places such as Hatay and Adana where winter is warm. In the places as Şanlıurfa and Gaziantep, where winter is relatively harsh, the barns are made of stones.



# Cattle Breeding

## ■ Cattle Breeds in Turkey

### Anatolian Gray Cattle (Boz İrk)

**BREED CHARACTERISTICS :** It is resistant to feed changing. Its digestive system is fit for utilization of poor quality feeds. It has good endurance for every kind of harsh environmental conditions, insufficient feeding and diseases. If it gets sick, it is able to recover rapidly. It has strong and tough hoofs. It has violent temper and aggressive nature, also its instincts of defending herd and calves are very good. Milking is not possible unless she sees her calf.



	Male	Female
Wither height, cm	123-128	115-120
Body length, cm	120-125	110-115
Birth weight, kg	24-26	22-24
Mature body weight, kg	450-500	300-400
Breeding age, month		24-28
Daily live weight gain, g	1000-1100	1000-1200
Lactation milk yield, kg		210-230
Lactation length, days		4-5
Milk fat, %		



# Cattle Breeding

## ■ Importance of Cattle Breeding

- Cattle benefit the environment and help prevent range fires
- Just how do cattle turn grass and other forage into meat?
- They are special animals that are called ruminants. This means that their stomach is specially designed with 4 different parts.
- The different compartments help digest the lignin & cellulose that make up the plants they eat. Cattle are able to convert the energy in a way that humans could not do.
- Cattle keep the rangeland ecosystem healthy by grazing down old growth.
- Nationally the bee population is threatened by plant and insect diseases. The rangelands have been a safe haven for Bees.



# Cattle Breeding

## ■ Cattle Breeds in Turkey

### Native Breeds

- **South Anatolian Red (Kilis)**
- **East Anatolian Red (Doğu Anadolu Kırmızısı)**
- **Native Black Cattle (Yerli Kara Sığırı)**
- **Native Southern Yellow (Yerli Güney Sarısı)**
- **Zavot (Zavot)**
- **Anatolian Grey Cattle (Boz İrk)**



# Cattle Breeding

## ■ Cattle Breeds in Turkey

### South Anatolian Red (Kilis)

**BREED CHARACTERISTICS :** It has the largest body and the highest milk yield among the native cattle breeds of Turkey. It is resistant to diseases caused by ticks and blood parasites. It has an ability to walk long distances. It does not fit to machine milking because of some behavioural problems and small nipples. Maternal instinct is very good. Milking is not possible unless she sees her calf.



	Male	Female
Wither height, cm	140-150	125-135
Body length, cm	135-145	130-140
Birth weight, kg	25-27	23-25
Mature body weight, kg	550-600	350-450
Breeding age, month		24-26
Daily live weight gain, g	700-900	
Lactation milk yield, kg		1500-2500
Lactation length, days		200-250
Milk fat, %		3.5-4.5



# Cattle Breeding

## Cattle Breeds in Turkey

### Native Southern Yellow (Yerli Güney Sarısı)

LOCATION : The provinces from Mersin to Şanlıurfa, mainly between Mediterranean Sea and Taurus, Amanos mountains and their north and east sides.

BREEDING PURPOSE : Dual purpose (meat and milk)

BREEDING CONDITIONS : Breeding is generally executed in the form of village-herds. Rearing, feeding and sheltering conditions are mostly insufficient. The animals are dispatched to mountains in April and May then they stay there for about 6-7 months without any human intervention. They return back to their villages when snowy days begin.



# Cattle Breeding

## Cattle Breeds in Turkey

### Native Southern Yellow (Yerli Güney Sarısı)

BREED CHARACTERISTICS : Skin colour is brown close to black. It can climb up mountains like goats. It is resistant to diseases, and can survive in harsh environmental conditions. It is able to graze on rugged lands, thus well adapted to mountainous regions. Maternal instinct is very good. Milking is not possible unless she sees her calf.



	Male	Female
Wither height, cm	105-115	
Body length, cm	110-120	
Birth weight, kg	15-17	12-14
Mature body weight, kg	150-250	
Breeding age, month	30-36	
Lactation milk yield, kg	600-650	
Lactation length, days	180-200	
Milk fat, %	3-4	

# Cattle Breeding

## Cattle Breeds in Turkey

### Native Black Cattle (Yerli Kara)

LOCATION : The Central Anatolian Region

BREEDING PURPOSE : Dual purpose (meat and milk)

BREEDING CONDITIONS : It is raised in primitive conditions of feeding, keeping and sheltering in steppe climate.



# Cattle Breeding

## Cattle Breeds in Turkey

### Native Black Cattle (Yerli Kara)

BREED CHARACTERISTICS: It can survive in harsh conditions of keeping and feeding, and it is highly resistant to diseases and parasites. Maternal instinct is very good. Milking is not possible unless she sees her calf.

	Male	Female
Wither height, cm	100-110	
Body length, cm	110-120	
Birth weight, kg	18-20	17-19
Mature body weight, kg	300-400	200-300
Breeding age, month	24-28	
Daily live weight gain, g	700-900	
Lactation milk yield, kg	1000-1100	
Lactation length, days	240-260	
Milk fat, %	4-5	

# Cattle Breeding

## Cattle Breeds in Turkey

### East Anatolian Red (DoğuAnadoluKırmızısı)

LOCATION : Primarily the provinces of Erzurum, Kars and Ardahan, in the East and Northeast Anatolian Region.

BREEDING PURPOSE : Dual purpose (meat and milk).

BREEDING CONDITIONS : Breeding is carried on by small scale livestock farmers in primitive shelters and on rugged lands in steppe climate zones. Beginning from May, it is grazed on pasture of high plateaus, and kept on pasture for six months of a year. Supplement feeding is not provided during pasturing period.



# Cattle Breeding

## Cattle Breeds in Turkey

### East Anatolian Red (DoğuAnadoluKırmızısı)

BREED CHARACTERISTICS : It has a small but strong body, and well adapted to harsh environmental conditions. It can survive even with poor quality feeds. It is able to pasture on rugged lands, and its resistance to diseases is high. Its herd and maternal instincts are good. Milking is not possible unless she sees her calf.

	Male	Female
Wither height, cm	115-125	105-115
Body length, cm	130-140	115-125
Birth weight, kg	20-22	17-19
Mature body weight, kg	350-450	250-350
Breeding age, month	24-26	
Daily live weight gain, g	800-1000	600-800
Lactation milk yield, kg	900-1000	700-1000
Lactation length, days	200-220	
Milk fat, %	4-5	

# Cattle Breeding

## Cattle Breeds in Turkey

### Zavot (Zavot)

LOCATION : The provinces of Kars and Ardahan with the hinterland

BREEDING PURPOSE : Dual purpose (milk and meat)

BREEDING CONDITIONS : It is raised in primitive shelters on rugged lands in steppe climate zone by small scale farmers. Beginning from May, it is grazed on pasture and high plateaus, and kept on pasture for six months of a year. During the pasturing period, extra feed is not provided.



# Cattle Breeding

## Cattle Breeds in Turkey

### Zavot (Zavot)

BREED CHARACTERISTICS : It is well adapted to harsh steppe climate conditions and resistant to diseases.

	Male	Female
Wither height, cm	122-137	102-130
Body length, cm	127-164	117-145
Birth weight, kg	19-28	17-24
Mature body weight, kg	400-600	270-450
Breeding age, month	24-36	17-27
Daily live weight gain, g	900-1000	700-850
Lactation milk yield, kg	2300-3300	
Lactation length, days	275-300	
Milk fat, %	3.5-4.5	



## Cattle Breeds in Turkey

### Anatolian Gray Cattle (Boz Irk)

**LOCATION :** The Thrace, Marmara and North Aegean Regions  
**BREEDING PURPOSE :** Dual purpose (meat and milk)

**BREEDING CONDITIONS :** Its natural life space is generally inside of forests and rugged lands on mountainous regions. In such areas, it is able to survive and reproduce without human intervention.



## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Dairy Breeds (for milk production)

##### Holstein (Siyah Alaca)

Holstein breed of large dairy cattle originating in northern Holland and Friesland.

Its chief characteristics are its large size and black and white spotted markings, sharply defined rather than blended. These cattle are believed to have been selected for dairy qualities for about 2,000 years.

They have long been widely distributed over the more fertile lowlands of continental Europe, where they are valued highly for their milk-producing ability.

In Turkey the Holstein-Friesians outnumber other dairy breeds and produce nine-tenths of the milk supply. The milk, however, has a relatively low butterfat content.



## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Dairy Breeds (for milk production)

##### Jersey

Its color is yellowish, light brown and cream tones. It is thought to resemble a deer with its black eyes and body color. It has thick rooted horns.

Jersey cattle breed is a breed that has the characteristics of typical dairy breeds. It is the epitome of the dairy breed with its fine bones, plump breasts, thin skin, neck and head structure.

#### Jersey cattle breed yield characteristics

Milk yield: 2500-5.000 Lt / year

Fat ratio: 6%

Withers height: Male: 130 cm; Female: 120 cm

Live weight: Male: 350 - 450 kg; Female: 330 - 400 kg



## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Beef Cattles (for meat production)

##### Hereford

Hereford cattle is a breed of cattle that is widely bred for meat production in many different climatic conditions.

Its origin is Herefordshire, England, United Kingdom. Today, there are more than five million purebred Hereford cattle in 50 countries.

Hereford cattle exports first began from the United Kingdom in 1817 to Kentucky, the United States. After America, it spread to Canada and Mexico, reaching the major cattle breeding countries in South America.

Today, Hereford cattle are found in Israel, Japan, Turkey, continental Europe and Scandinavia from Australia to the Russian steppes and are widely distributed around the world.



## Cattle Breeds in Turkey

### Non-Native Breeds

#### - *Dairy Breeds (for milk production)*

Holstein

Jersey

#### - *Beef Cattles (for meat production)*

Angus

Hereford

Charolais

#### - *Dual Purpose Breeds (for both meat and milk production)*

Brown Swiss

Simmental

## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Dairy Breeds (for milk production)

##### Holstein

It can be fed both meat and dairy. But it is mostly accepted in terms of milk yield. milked every 8 hours

Milk yield is 5,000 to 7,000 liters during a lactation period. it can easily reach 10,000 liters of milk yield.

Withers height varies between 140 and 155 cm. The amount of fat in milk is between 3 and 3.5%. Mature live weight varies between 600 and 1,000 kg.

Holstein male calves are used in calf meat production due to their rapid development. Daily weight gain in good feeding can be between 800 and 1,200 gr.

It is possible to reach the slaughter weight at the age of 12-15 months for the males of this breed, whose daily live weight gain in fattening varies between 1000-1400 g.



## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Beef Cattles (for meat production)

##### Angus

Angus is a type of cattle that is used extensively in meat production. It has been obtained by crossing cattle native to Aberdeenshire and Angus regions of Scotland and is known as Aberdeen-Angus in many parts of the world.

They are naturally polled and in black or red to cover the whole body. The breast area may be white.



They are found naturally in black and red in the population, but in the USA, they are considered to be two species, Red Angus and Black Angus, in terms of this feature.

Black Angus is the most common beef cattle breed in the USA, with 324,266 animals according to records in 2005.



## Cattle Breeding

### Cattle Breeds in Turkey

#### Non-Native Breeds: Beef Cattles (for meat production)

##### Charolais

The typical Charolais is white in colour with a pink muzzle and pale hooves, horned, long bodied, and good milkers. There are now Charolais cattle being bred black and red in colour.



Charolais are medium to large framed beef cattle with a very deep and broad body. They have a short, broad head and heavily muscled loins and haunches.

Charolais have demonstrated growth ability, efficient feedlot gains and carcass cut-out values.



With excellent meat conformation, especially of the valuable parts and relative late maturity they are well suited to fattening for high finished weight.

They are well suited to all purpose cross breeding.

# Cattle Breeding



## Cattle Breeds in Turkey

Non-Native Breeds: *Dual Purpose Cattles*

(for both meat and milk production)

### Brown Swiss (Montofon)

There is a light-colored zone that runs along the ridge and is defined as the ester line. The color of the body varies from silvery gray to dark brown and dark ash. Nose tip is light color.



With good care and feeding, they provide 800 - 1000 g live weight gain per day.

Live weight in males 600 - 700 kg.

It is a combined breed in terms of milk and meat yield.

Lactation milk yield is 3500-4000 kg.

The fat content in milk is around 3.8%.

Brown Swiss are more resistant to harsh conditions than other culture races.



Gestation period for cattle's is 9 months and 10 days  
Generation gap for cattle's is

**Lactation Length (LL)** is the period of time that a cow secretes milk from her mammary glands.  
Ideal length is 10 months (about 305 days)

Calving interval must be 12 months

**Calving Interval (CI)** is the period of time between one calving and the next. In an ideal situation, cows calve every 12 months, as they must calve in order to be able to produce milk.

**Involution Length (IL)** is the period of time that the sexual organs of a cow shrinks or returns to the former size after calving. It takes about 38-45 days after calving.

**Servis Period (SP)** is the period of time between date of calving and date of successful conception. The optimum service period helps the animal to recover from the stress of calving and also to get back the reproductive organs back to normal. For cattle the optimum service period is 60-90 days.

**Dry Period (DP)** is the most important phase of a dairy cow's lactation cycle. During this phase the cow are not milked, the cow and her udder are prepared for the next lactation; hence any abnormalities during the dry period will have a negative effect on the cow's health and milk production after calving. Ideal time is the last 2 months of pregnancy

# Cattle Breeding

## Milking

**Milking** is the act of removing milk from the mammary glands of cattle. Milking a cow is considered a fairly simple task in the farming world but in actuality it requires many important and essential steps. Milking may be done by hand or by machine. Here are four steps to milking a cow by hand:

### 1. Timing and routine is everything

Cows are accustomed to routines and therefore you should get into one too. You should milk your cow twice a day at the same time every day. Also, following the routine part, always sit on the same side of the cow so she knows exactly what you're doing.

### 2. Cleanliness

Make sure that everything is clean. This includes your hands, the cow's udder, the cloth you use to clean the udder and the milk pail. Cleanliness should be one of your top concerns to help prevent your cow from getting diseases such as mastitis.

# Cattle Breeding

## Cattle Breeds in Turkey

Non-Native Breeds: *Dual Purpose Cattles*

(for both meat and milk production)

### Simmental (Sari Alaca)

Color is yellow-white or red-white pied. The head, forehead and eyelashes are necessarily white. The males and females are horned. It easily adapts to climatic conditions. They are long-lived. High fertility feature. The maternal instinct is high. Health problem is less. It is the primary choice of breeders due to its many features.

Live weight: Male: 1100 - 1400 kg;

Female: 600 - 900 kg

Withers height: Male: 150 - 165 cm;

Female: 138 - 150 cm

Live weight gain: 1350 - 1600 gr / day

Meat yield: 58%

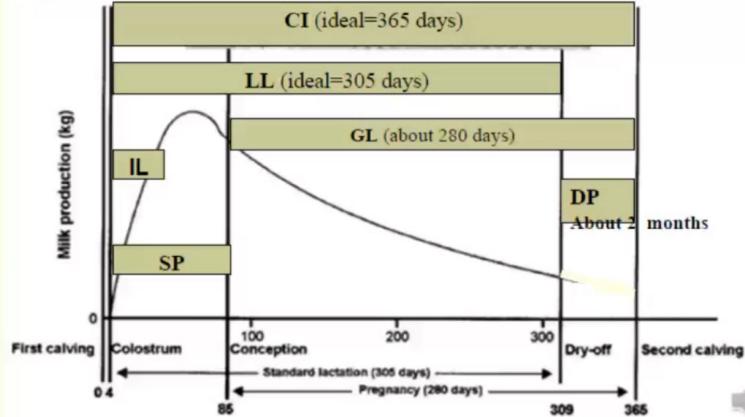
Milk yield: 4.500 Lt

Fat ratio: 4.2%



# Cattle Breeding

## CI, LL, GL, IL, DP, SP



# Cattle Breeding

## Milking

### 3. Safety

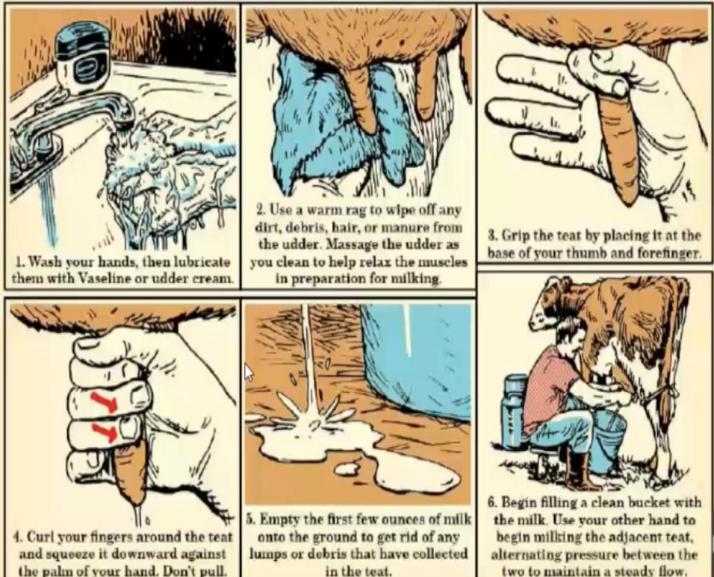
Remember, you are putting your body near the animal that has very powerful legs and might be willing to use them on you. If you are unsure of how your cow will act while getting milked, be sure to use a stanchion. Also, you should always be in a position to make a quick "escape." Don't even sit cross-legged on the ground when milking a cow. In most cases it's probably best to use a stool.

### 4. Getting to the logistics

After placing your pail, it's time to start by milking the cow. Start by gently squeezing the teat at the top with your thumb and index finger. Slowly work your way down by adding one finger at a time to the teat until all of your fingers are on it. This will force milk into the pail. Continue until the milk flow has substantially slowed and the udder feels soft.

# Cattle Breeding

## Milking by Hand



## Cattle Breeding

### Milking

#### Place Suction Device

After stripping, release the machine's pressure and place each suction device on each teat of your cow.

And suction will begin as soon as you release the pressure buildup on the machine.

Adjust the devices so that they hang straight down from the udder when milk begins to flow from the teats into the suction device.



#### Keep the Machine On

Keep the machine on and leave it for around 5 minutes, and wait until the machine draws all of the milk out of the udder.

Although exact time can vary depending on the **cattle breed** you are raising, but most of them will be fully milked out within 5-10 minutes. Remove the device as soon as milk stops flowing.



# Cattle Breeding

## Milking

There are common parts in every milking machine as seen in the picture.



If it is a small family farm, the portable milking machine shown on the side can be used.

If it is a big scaled business then a milking house with a fixed milking machine is used like seen below.



alamy stock photo

## Cattle Breeding

### Milking

#### Clean the Cow's Udder & Teats

Perfectly clean the udder and teats of the cow after successful milking by machine. Because cow's teats are vulnerable to bacteria and infection immediately after having been milked.

So their teats should be properly cleaned and protected from bacteria. You can apply a post-milking disinfectant for protecting the cow.



### Fine Wool Breeds

used primarily for wool production  
Their body weight is low

The most common of the fine wool breeds are (1) Merino, (2) Rambouillet, and (3) Debouillet. These breeds were all developed from the Spanish Merino. They produce a fine wool fiber that has a heavy yolk, or oil content. Originally, these breeds did not produce good meat carcasses. However, through selection and breeding, the quality of the carcass has improved. Today, these breeds are still used primarily for wool production. They possess a strong flocking instinct, which allows herders in range areas to effectively look after and move large numbers of sheep. A high percentage of the sheep in the range areas are of the fine wool breeds. They have the ability to do well on poor-quality rangeland. Fine wool breeds will breed out of season and, thus, can produce lambs in the fall months.

### Medium Wool Breeds

The most common medium wool breeds are (1) Cheviot, (2) Dorset, (3) Finnish Landrace, (4) Hampshire, (5) Montadale, (6) Oxford, (7) Shropshire, (8) Southdown, (9) Suffolk, and (10) Tunis. Medium wool breeds were originally bred mainly for meat, with wool production secondary. The fleece is medium in both fineness and length, although these breeds are typically raised mainly for meat production. Medium wool breeds are popular in both range and farm flock production.

### Long Wool Breeds

The common long wool breeds are (1) Cotswold, (2) Leicester, (3) Lincoln, and (4) Romney. These breeds were developed in England and are larger than the other breeds of sheep. They produce long, coarse-fiber wool. They are hardy and prolific but tend to be late maturing. Depending on slaughter weight, the carcass quality may be poor, carrying too much fat. Excess fat may not be present at slaughter weights of less than 120 pounds. These breeds are used mainly in cross-breeding programs.

26-4 Since 1990, numbers of sheep and lambs have been steadily declining.

SDA Overview of the United States Sheep and Goat Industry

Many producers in the western states are now using mixed grazing—that is, raising cattle and sheep on the same land. Mixed grazing is most prevalent in the Northern Plains and Texas. Two-thirds of the sheep producers in these states also raise cattle. The practice of mixed grazing provides more opportunity to increase livestock production than raising cattle or sheep alone.

Sheep make a good second enterprise on a farm because:

- Wool and lambs provide extra income.
- The initial costs are low.
- The enterprise does not require expensive housing or equipment.
- Sheep make use of pasture crops that might otherwise be wasted.
- Sheep can be fed on roughages and small amounts of grain.
- Market lamb returns compete well with other meat animal enterprises.
- Sheep can improve the pasture mix.
- Lamb, wool, and beef prices fluctuate independently.

There are some major disadvantages related to the sheep enterprise:

- Predatory animals such as coyotes and dogs prey on sheep.
- Sheep are susceptible to internal and external parasites.
- There are increased labor and management requirements.
- Wool prices are quite variable.

## CLASSES OF SHEEP

There are a number of ways to classify sheep. The most commonly used classification is by type of wool (Figure 26-5). The wool type classifications are (1) fine wool, (2) medium wool, (3) long wool, (4) crossbred wool, (5) carpet wool, (6) fur sheep, and (7) hair sheep.

# BREEDS OF SHEEP

There are many breeds of sheep available to producers in the United States. Many of the breed associations register only small numbers with their purebred associations in any given year. In order of rank, Suffolk, Hampshire, Dorset, Dorper, Southdown, and Montdale have been the leading sheep breeds in the United States based on average numbers registered.

## Fine Wool Breeds

### Merino

Merino sheep originated in Spain and were first imported into the United States in 1793. There are at least 10 types of Merino sheep in the world. However, in the United States, the Delaine Merino sheep is the most common type. Delaine Merino sheep are practical for farms and are well adapted to range sheep production in western and southwestern states.

The fleece of the Delaine Merino is white and grows about 2.5 to 4 inches per year and must be 21.5 microns or finer (spinning count 64 and higher). The rams may either be horned or polled and the ewes are polled (Figures 26-6A and 26-6B). Merinos are medium in size and have angular bodies. The Delaine Merino is considered to be the largest of the Merinos. Merinos have a strong banding instinct and are able to do well on poor grazing land and in all types of climate. Merino ewes are exceptional mothers, and their traits are inherited uniformly to offspring. Merino wool demands high prices around the world and, therefore, is called the "Golden Fleece."

### Rambouillet

The Rambouillet originated in France, and was developed from the Spanish Merino. The first imports into the United States took place about 1840. About one-half or more of the crossbred sheep in the United States carry some Rambouillet blood. The breed is particularly popular in the western states and is the most popular of

inazurda surum var

### Leicester

The Leicester originated in England. It was developed and imported into the United States in the late 1700s (Figure 26-14). The Leicester is large and has a blocky body type. The breed is white, polled, and has no wool on the face. The fleece does not give Leicester sheep good protection from the weather. They tend to become wet and chilled and are only moderately hardy. This breed is not a popular breed in the United States.

### Lincoln

The Lincoln originated in England. It is an old breed and was first imported into the United States in the late 1700s. The Lincoln is large and has a blocky body type. It is white, polled, and produces a long, coarse fleece. It is a late-maturing breed. The Lincoln produces 12 to 16 pounds of wool. This breed has not been popular in the United States and has been used mainly for crossbreeding.

### Romney

The Romney is also an old breed that originated in southern England. The first imports into the United States took place around 1904. The Romney is a large, hardy breed with a blocky body type that has been used in crossbreeding programs (Figure 26-15). The breed is white, polled, and produces a more compact, finer fleece than the other long wool breeds. The Romney is better adapted to wet, marshy areas than other long wool breeds of sheep.

## Crossbred Wool Breeds

### Columbia

The Columbia originated in the United States in 1912. The breed was developed from a cross of Lincoln rams and Rambouillet ewes. The Bureau of Animal Industry did the primary work in developing the breed in Wyoming and Idaho. The purpose of the cross was to produce a breed that would be better adapted to the intermountain regions of the West.

The Columbia is a large, blocky breed and is the largest of the crossbred wool breeds (Figures 26-16A and 26-16B). The face, ears, and legs are white, and the breed is polled. There is no wool on the face. The Columbia is slightly longer legged than other breeds. It shears a 9- to 13-pound fleece, and produces a lean market lamb with acceptable leg scores. The Columbia is often used in the Midwest in

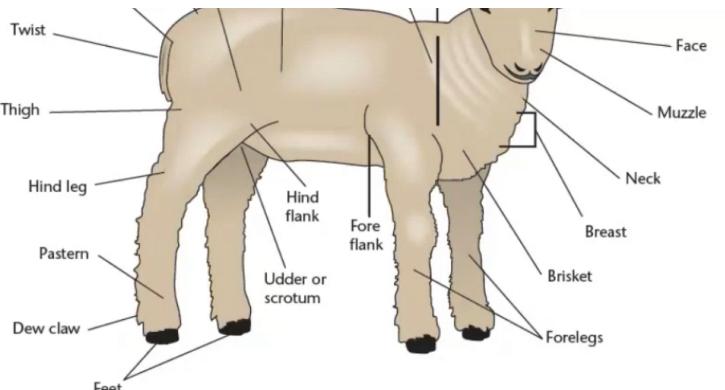
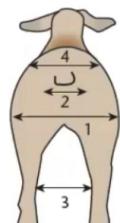


Figure 26-27 Parts of a sheep.

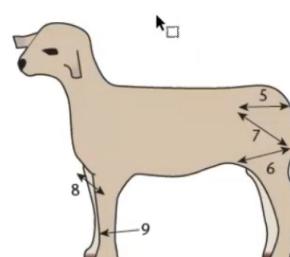
#### Look for width—

1. At the center of leg
2. At the dock
3. Between hind legs
4. Over back and loin



#### Look for—

5. Long rump
6. Long, bulging stifle
7. Depth of leg
8. Width at chest
9. Heavy bone



raçalar Duzenleme Dörtlüşür İmza

En az bir imzada sorun var.

### Cheviot

The Cheviot originated in the Cheviot Hills of northern England and southern Scotland in the 1800s. The first imports into the United States took place about 1838.

The Cheviot is small and has a blocky body type with a white face and legs and black nostrils. It carries its head erect and presents an alert appearance. The breed is polled. The fleece grows about 4 to 5 inches per year. The breed does not have a strong flocking instinct.

### Dorset

The Dorset breed originated in southern England in the early 1800s. The first imports into the United States took place about 1887.

The Dorset is of medium size and has a blocky body type (Figure 26-7). The ears, nose, face, and legs are white. There are both polled and horned strains of Dorset. They produce a medium-coarse and light-weight fleece averaging 5 to 6 pounds. They produce a muscular carcass. The ewes will breed out of season, so fall lambs can be produced.

### Finnish Landrace (Finnsheep)

The Finnsheep originated in Finland and was first imported into the United States in 1968. The Finnsheep is small in size. The ears, nose, face, and legs are white (Figure 26-8). The breed is generally polled, although some rams may have horns. The Finnsheep produces a medium-coarse fleece that averages 4 to 5 pounds in weight. The carcass characteristics of the Finnsheep are not as desirable as those possessed by some of the other breeds of sheep.

The Finnsheep is noted for its high lambing rate. Its principal use in the United States is in crossbreeding programs to increase lambing rate. Mature crossbred (one-half Finnsheep) ewes will commonly produce a 200 to 250 percent lamb crop—that is, 200 to 250 lambs are produced for every 100 ewes. Finnsheep crossbred lambs are small at birth but have a high survival rate. When Finnsheep are used in crossbreeding, the lambs produce acceptable carcasses.



Sheep Breed Magazine



Photo by Fred Ward USDA

Figure 26-7 Dorset

### Hampshire

The Hampshire breed originated in southern England during the late 1700s and 1800s. It was first imported into the United States prior to 1840. All of the imports disappeared during the Civil War. Later imports

### Katahdin

The Katahdin sheep (Figure 26-20) were developed in north central Maine by Michael Piel through crossing African hair sheep with various wool breeds. Katahdin sheep have an outer hair coat and wool undercoat that can be any color. The undercoat will thicken in the winter and shed in the spring. Lambs produce a well-muscled, lean carcass at 95 to 115 pounds live weight. Katahdin sheep have the ability to breed out of season and produce fall lambs. Lamb crop percentages are typically 200 percent. Katahdin sheep have increased resistance to internal parasites and have become very popular in the United States in recent years.

### Romanov

they produce lots of new sheep breeds

The Romanov originated from the Volga Valley close to Moscow, Russia. Romanov sheep have a black head with white on the poll, black legs, and a mixture of wool and coarse black hair on the body. Although the Romanov is considered a hair sheep, shearing is still required. Romanov ewes have very high lamb crop percentages; quadruplets, quintuplets, and sextuplets are common. Seven live, healthy lambs in one litter is the North American record for a Romanov ewe. Half Romanov ewes will produce a 250 to 300 percent lamb crop. Lambs are also typically very vigorous, but produce light-muscled carcasses.

### St. Croix

The St. Croix breed originated in the United States and British Virgin Islands. St. Croix have a solid white coat, with a mixture of hair and wool that sheds in the spring. Lamb crop percentages range from 150 to 200 percent. They have increased resistance to internal parasites.



they have  
a big  
fatty tail

## WHITE KARAMAN AKKARAMAN

**LOCATION:** Primarily in the Central Anatolia and neighbouring areas

**BREEDING PURPOSE:** Meat, milk and wool.

**GENERAL DESCRIPTION:** It is a large framed sheep among the native breeds. Body is narrow and long. Dorsal line is usually straight but sometimes a slight dent may be seen. Head is narrow and long. There is no fleece on the face. Neck is long. Sometimes there is fringe (bangs) in various sizes

on the forehead. Head of rams are slightly convex. It has long and pendulous ears. Legs are long and strong, hoofs are tough and strong. Colour is generally white. There are black stains on head, nose and hoofs. Fleece is mixed coarse and carpet type and also sparse. Head, underside of neck and legs are usually devoid of fleece. Ewes are polled and rams may have small or rudimentary horns. It has a S-shaped fatty tail; from the backside it





## KANGAL WHITE KARAMAN KANGAL AKKARAMAN

**LOCATION:** The Central Anatolia, especially Sivas and surrounding areas.

**BREEDING PURPOSE:** Meat, milk and wool.

**GENERAL DESCRIPTION:** Body is large framed. It has thin lips. Above nose is generally convex. Ears are long, large and pendulous. Both neck and

body are long and narrow. Chest is large especially in rams. Some females have 14 ribs. Legs are long and strong. Body is covered with white and coarse fleece. Around eye, nose and feet are generally in black colour. Head, the neck, underside of abdomen and legs are not covered with fleece. Ewes are polled but very rarely they have small horns. 10%



of the rams have weak horns. It is fat-tailed and the form of the tail resembles to White Karaman (S-shape).

**BREED CHARACTERISTICS:** It is known as the animal of dry climates, but able to adapt to various conditions of environment. It is able to walk long distances and its herd instinct is good.

**BREEDING CONDITIONS:** Breeding mainly based on large and sparsely vegetated pastures without much rugged lands where steppe climate prevails. Feeding depends on pasture except for snowy days. During the snowy days, feeding largely depends on straw and a few grainy foods. It can be bred on insufficient feeding and keeping conditions. Kangal White Karaman rams are preferred by most of the White Karaman breeders.



## RED KARAMAN MORKARAMAN

**LOCATION:** The East Anatolian Region

**BREEDING PURPOSE :**

Primarily meat, also milk and wool.

**GENERAL DESCRIPTION :** It has a strong and large body. Rump is a little higher than wither. Neck is long, chest is narrow, rump is low and legs are long. Ears are big, wide, pendulous and semi-pendulous. Head is long compared to the body and becomes thin forward. On head profile there is a slight concavity between forehead and nose.

While ewes' nose are more or less convex, rams' nose is clearly convex. Body colour changes among red, maroon and violet, while around eye, mouth and nose are in light head and legs are in dark colour compared to the body. Generally the face and head is not covered with fleece. Belly and neck are generally bare or sparsely covered. Legs are bare from beginning of pastern. Fleece is mixed coarse and carpet type. Rams usually have big and spiral horns. Ewes are either weak horned or polled. It is



males have a horn  
females don't have a horn

## DAGLIC DAĞLİÇ

**LOCATION :** The eastern part of the Aegean Region

**BREEDING PURPOSE :**

Dual purpose (meat and milk)

**GENERAL DESCRIPTION :** Body is smaller than Karaman breeds. Dorsal line is straight, wither height is more than body length, chest and rump are narrow. Nose of rams are typically and of ewes are slightly convex. Generally it is white;

black or dark-brown stains may be seen around eye and mouth, on ears and legs. There may be oval black and dark-brown marks spreading from the eye towards the face. Black and dark stains may be seen on body and turn into gray afterwards. Belly and neck are covered with fleece. Generally rams are horned and ewes are polled. Horns are big, strong, thick, lateral, twisted and black pigmented. Fleece is coarse mixed and carpet type. It is fat-tailed and the tail is smooth, large, drooping and heart-



## AWASSI İVESİ

**LOCATION :** The Southeast Anatolian Region

**BREEDING PURPOSE :** Primarily milk

**GENERAL DESCRIPTION :** Body is strong.

Bones are thin but strong that conforms to milk type. Body is white-cream coloured. Head may be three different colours as yellowish-brown, black and white. Usually there is a white blaze on the

forehead. There are stains on ears and nose and pigmentation on feet. It is fat tailed. There is a fatless piece of tail on the main big and fatty chunk. There is an uncovered cavity starts from the base of fatty chunk and extends till the middle part. Rams' horns are turned forward and downwards in a spiral form. Also ewes with no horn or crescent horns

**LOCATION :**

Tokat province and the neighbouring areas.

**BREEDING PURPOSE :** Meat, milk and hide

**GENERAL DESCRIPTION :** It is a small framed sheep breed. Head is middle-sized, neck is short and thick, and legs are in average length. Wither height, dorsal side and rump are almost in equal height so dorsal side seems as a straight line in profile. Its prevalent colour is black. In addition to

black colour, some of them may be seen in brown, grey and white colour. Fleece is mixed coarse and carpet type. The quality of fibre varies between animals. Lambs have curly and bright fleece suitable for producing fur. Rams are horned, ewes are generally polled 13% of them are horned. Rams' horns are strong and twisted forward. Ewes' horns are weak and turned forward with only one curl beginning in the back of ears. It is fat tailed.



## NORDUZ

### NORDUZ

**LOCATION :** Gürpınar in Van province and Norduz locality

**BREEDING PURPOSE :**

Dual purpose (milk and meat)

**GENERAL DESCRIPTION :** It has a high body frame. Neck is covered completely with fleece.

Ram headed ewes with bangs and wattles may be found. Some of them have no ears. Basic colour is white, secondary common colour is ash, also gray-white and brown-white colours may be found. There are black stains on some parts of body, especially on the head. Rams and approximately half of the ewes are horned. It is fat tailed. Tail has



## TUSHIN

### TUJ

**LOCATION :** Kars, Ardahan and İğdır provinces

**BREEDING PURPOSE :** Meat, wool and milk

**GENERAL DESCRIPTION :** Generally, it has a small body frame. It has small head, smooth profile and pendulous ears. Forehead is covered with fleece till the eye. The other parts of head are

generally without fleece. Body is bright white colour. There is black pigment around the nose, eye and mouth, and on the legs. It is preferred if the colour around the eye and on the articulations of tarsus is dark. Cannons can be black or brown colour is also being found. Colour of hoofs



## CHIOS

### SAKIZ

**LOCATION :** Especially in Çeşme and also the provinces of İzmir, Aydın and the coastal locations of the Marmara and Aegean Regions

**BREEDING PURPOSE :**

Dual Purpose (milk and lamb)

**GENERAL DESCRIPTION :** Its body is narrow and high, legs are long. Body is white. There are

black stains around eye and mouth, on the end of nose and on ears and feet. Head, legs and underside of abdomen are without fleece. Fleece is mixed coarse. Rams have strong, spiral horns. Ewes are polled. Base of tail is a few fatty and triangular the end of tail is fatless, thin and long. Udder is glandular and suitable for high milk yield. Nipples are drooping and big.



## ACIPAYAM

### ACIPAYAM

**LOCATION :** The Provinces of Denizli, Afyon, Isparta and Antalya

**BREEDING PURPOSE :**

Dual purpose (meat and milk)

**GENERAL DESCRIPTION :** It was developed in Acipayam State Farm and carries 50% Awassi, 25% Daglic and 25% Ost Fries genotype. Body is

big structure and white colour without stains. Head is generally white but some animals with brown or black stains can also be found. It has coarse fleece. Both rams and ewes are polled. Tail is oval, fatty, and it droops down

**BREED CHARACTERISTICS:** It is resistant to harsh environmental conditions and infectious



## MALYA

### MALYA

**LOCATION :** Kirşehir and neighbourhood in the Central Anatolian Region

**BREEDING PURPOSE :**

Dual purpose (meat and wool)

**GENERAL DESCRIPTION :** It was developed by crossing of White Karaman and German Mutton Merino breeds. Malya Type is formed by mating of

Merino x White Karaman G1 ewes and White Karaman rams. Legs are long and body is bigger than the body of White Karaman. Its colour is white, black stains may be found on head and legs. Underside of the head and neck are covered with fleece, the bottom of legs has no fleece. Both males and females are polled. It is semi-fat tailed. Base of



## KIVIRCIK

### KIVIRCIK

special for  
meat  
production

**LOCATION :** Thrace, Marmara and North of the Aegean Region

**BREEDING PURPOSE :** Meat, milk and wool

**GENERAL DESCRIPTION :** There are two types within the breed: meat and milk. The meat type has large circular and muscular body. Rump is slightly slanting, legs are relatively short. In the milk type, body and chest is narrow and legs are long.

Dorsal line has slight concave, rump is slightly low and it becomes narrow as coming close to back. Body is generally in white colour and also black and motley colours may be seen. Head, belly, legs and neck are not covered with fleece. Fleece is coarse mixed. Males have spiral horns turned towards. Females are polled. Tail is long, thin and fatless which covered with long fibres and lies down to the articulation of tarsus.





## KARAYAKA

### KARAYAKA

**LOCATION :** Along the coast between Sinop and Trabzon and mountainous areas of the Black Sea Region, the areas around Tokat and Amasya.

**BREEDING PURPOSE :** Meat, wool and milk

**GENERAL DESCRIPTION :** Body is small but it is long, wide and deep compared to its height. Head is small-middle sized, narrow and its view is coarse. There is fringe on the forehead. Neck is short and thick, shoulders are narrow. Legs are

relatively short. Body is generally in white colour. Brown and black stains in various sizes are found mostly on the head and neck. Males have strong and thick horns turned towards by curls. Generally, females are polled. Tail is long and thin. Rarely, at the base of the tail is rather fatty. Udder is glandular and less developed.

**BREED CHARACTERISTICS :** The form of hoofs and legs are strong so that it acts rather fast on the rugged and slant pastures. Its management is



most Turkish sheep breeds are used for dual purposes

## TURKISH MERINO

### KARACABEY MERİNO SU

merino = first production comes from the wool

**LOCATION :** The Marmara Region, mainly in the South Marmara

**BREEDING PURPOSE:**

Dual purpose (meat and wool)

**GENERAL DESCRIPTION :** It was developed by crossing German Mutton Merino, and Kivircik breeds so it carries Merino genotype over 90%. Body is large and deep. It has circular form and

middle-length. Dorsal line is straight and back and loin are wide, the rump is large and a little low, and legs are middle-length. Rumps are plump and deep. Face and end of legs are not covered with fleece. It is in white colour. Tail is fatless, long and thin 10-15% of males are horned, females are polled. Fibre is fine, uniform and appropriate for textile.



## CENTRAL ANATOLIAN MERINO

### ORTA ANADOLU MERİNO SU

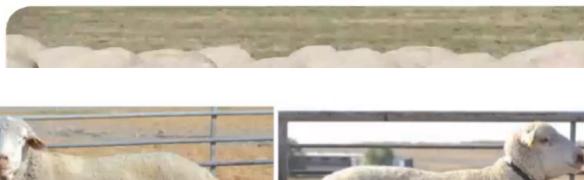
**LOCATION:** The Central Anatolian Region

**BREEDING PURPOSE:**

Dual purpose (meat and wool)

**GENERAL DESCRIPTION:** It was developed by crossing between White Karaman and German Mutton Merino breeds. It carries approximately

80% German Mutton Merino genotype. Head is medium sized, lips are thick, ears are horizontal and large, neck is short and thick, body is big and long and rumps are plump. Legs are long and strong. Colour is white. Face and the end of legs are not covered with fleece. Fleece is formed by



## POLATLI

### POLATLI

Big sheep

**LOCATION :** The Central Anatolian Region and surrounding areas

**BREEDING PURPOSE:**

Dual purpose (meat and wool)

**GENERAL DESCRIPTION :** It was developed by crossing Ile de France and White Karaman breeds in Polatli State Farm in Ankara. It carries 75 % Ile de

France genotype. Body is large and deep, back and loin are wide, and rumps are plump. It is open face and the upside of nose is slightly convex. Ears are large and semi pendulous. It is white. Its wool is suitable for carpet, blanket and tricot production. Both females and males are polled. Tail is fatless, thin and long. Udder is glandular and well attached to the body.



## BAFRA

### BAFRA

used for meat and milk

**LOCATION :** Primarily the Central Black Sea Region and many other regions in Turkey

**BREEDING PURPOSE:**

Dual purpose (lamb and milk)

**GENERAL DESCRIPTION :** It was developed by crossing Chios and Karayaka breeds. It has milk type body conformation. Head length and width

are middle-sized, ears are lateral and large, neck is long and thin. Body is white but black stains around mouth, eye and on ears can be seen. It is not permitted to have stains elsewhere. Head, belly and legs are generally without fleece. Males have strong and spiral horns grow to sides. Females are generally polled but there may be seen rudimentary horns.



## ANGORA GOAT

### ANKARA KEÇİSİ

**LOCATION :** Primarily in the province of Ankara, Central Anatolia and in some parts of Southeast and East Anatolian Regions

**BREEDING PURPOSE :**

Dual Purpose (mohair and meat)

**GENERAL DESCRIPTION :** Body is small framed, thin and elegant. Side view of does' head is slightly concave or smooth, and bucks' is convex.

Hind is a little higher than wither. Hind legs are a little longer than forelegs. Except for face and legs, whole body is covered with white, fine, soft, lustrous and curly mohair. Rarely coloured animals can be seen as cream, yellow, silver-gray, brown or black. Both does and bucks are horned. In bucks, horns are long, strong, screw shaped and turned slightly backward, and does, horns are weaker and shorter and extend towards posterior.



ears.

**BREED CHARACTERISTICS :** It has a big body and long legs. The bottom jaw bone is longer than the top jaw bone (undershot jaw or monkey mouth). Its eye are clearly big and vivacious. Ears are small and thick. Nose is clearly convex. It is a submissive breed and so familiar and submissive.

**BREEDING CONDITIONS :** Extensively, it is bred by nomads (Yörük) with scrubs, stubbles, plants formed like shrubs, pastures inside the forests almost with no expenditure. It is a breed that can be bred on pastures for whole year. However, it cannot make use poor pastures because of its mouth structure. Its breeding is successful on rich pastures or in managements with possibility for extra feeding.



Body Measurements and Production Performance

	Male	Female		Female
Wither height, cm	91	85	Lactation milk yield, kg	175
Body length, cm	93	84	Lactation length, days	270