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AGRIBALKAN 2021

III. BALKAN AGRICULTURAL CONGRESS



29 AUGUST – 01 SEPTEMBER 2021,
EDIRNE, TURKEY

III. BALKAN AGRICULTURAL CONGRESS

<http://agribalkan.net/>

**29 AUGUST – 01 SEPTEMBER 2021,
EDİRNE, TURKEY**



In Trakya University Balkan Congress Center, Edirne, Turkey

Organized by Trakya University

with

Trakya Universities' Union, Balkan Universities' Union, Namık Kemal University, Onsekiz Mart University - Turkey, Uludag University, Turkey, Agriculture University of Plovdiv, Trakia University-Stara Zagora - Bulgaria, Democritus University of Thrace – Greece and with contribution of other Balkan Institutions...



Dear Colleagues,

You are welcome to our congress will be organized by Trakya University supporting with Trakya Universities Union, Balkan Universities Association and together with other Balkan Universities and Institutions.

The aim of our international congress is to present the newest research results and research goals, analyze current conditions and perspectives in agriculture.

Conference activities;

Plenary sessions with oral and poster presentations are on 29 August – 01 September 2021.

You are welcome to our congress and Edirne, TURKEY,

Yours sincerely,

Prof. Dr. Erhan TABAKOĞLU

Rector of Trakya University
Honorary Chair of Congress

Prof Dr Yalcin KAYA

Head of Organizing Committee

FOREWORD

Agriculture is so important sector feeding all humankind, but it needs new developments and technologies to supply enough food for increasing world population year by year. Turkey is one leading agricultural economy in the world. Balkan region is one the important agricultural areas of the world having rich soils producing different crops vastly and keeping enormous biodiversity for our future.

As there have been many different scientific meetings around the world, we intended to bring three communities together, namely science, research and private investment, in a friendly environment of Edirne / Turkey to share what they have and get benefit from each other. Trakya University intended to aim that agricultural community in Balkan areas should come together in that important event. Our congress goal is the agricultural subjects should be kept broad in order to provide opportunity to the science community to present their work that can be off value for agriculture.

First Balkan Congress was organized by Trakya University in 2014 as the biggest agricultural congress in Turkey and Balkan region. In the first congress, over 700 participants were presented total 830 papers (650 poster and 180 oral presentations) and invited speakers presented country reports from all Balkan countries. 2nd Balkan Agriculture Congress was organized by Tekirdağ Namık Kemal University in 2017.

As third one, Trakya University hosted again in Edirne, Turkey in 2021. We would like to thank all participants for great interest to our AGRIBALKAN 2021 congress even in Covid 19 pandemic. There is a worldwide participation from 41 countries with 406 papers contributed by 988 authors. Our AGRIBALKAN Congress will be organized with 288 oral, 118 e-poster presentations.

We hope that this congress will help to solve our problems with establishing good network collaborations, joint projects and better relationships among countries with sharing our knowledge and experiences together. We wish success for this meeting and hope a great scientific achievement with your contributions.

Edirne is very nice, lovely and historical city at just the edge of Europe, but just right at the heart of Balkan region and history endowed with monuments reminding imperial past. We are much pleased to host you all in Edirne and in Turkey.

We would like to thank you to join this congress and we would like to give also special thanks our sponsors and collaborators for giving us big supports to organize this event.

We wish you nice stay in Edirne for truly rewarding days.

Prof. Dr. Erhan TABAKOGLU
Rector of Trakya University
Honorary Chair of Congress

Prof Dr Yalcin KAYA
Director of TU Plant Breed. Res. Center
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HISTORICAL DEVELOPMENT OF HORSE BREEDS

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ABSTRACT

This study was conducted to examine the historical development process of modern horse breeds. Horses are among the few species that have managed to become domesticated on earth. The domestication of horses took place after dogs, goats, sheep, pigs, reindeer and poultry. It is accepted that the first ancestor of the horse species existed in the Eocene geological period (55 million years ago). In the fossil record, 13 genera have been identified in the equine family. Of these, *Equus* is the only surviving genus today. Different ecological regions, climates and cultural conditions have led to the development of well-adapted horse breeds. In addition, the changing needs of human beings have had important effects on the formation and development of these breeds. The changing needs of people have been effective in the differentiation of horses in areas such as hunting and food source, battlefields, agricultural activities, cargo transportation, transportation, show, entertainment, hobby, sports, horse racing and finally therapy and support. As mechanization increases as a result of technological developments in the world, there is a decrease in horse population and genetic diversity. In order to prevent these, measures should be taken such as doing more studies on horse breeds, drawing attention to the relationship between human and horse in the historical process, and protecting genetically endangered breeds.

Keywords: Horse breed, historical development, horse coat color

1. INTRODUCTION

In the domestication of the horse, human beings have made important contributions, and the development and formation of the breeds has been directed in line with the desired characteristics. Features such as hunting and food source, battlefields, agricultural activities, cargo transportation, transportation, show, entertainment, hobby, sports, horse racing and finally therapy and support have been effective in the domestication of the horse and the formation of breeds.

The horse is among the few domesticated species on earth (Rothe et al., 2005). It is generally accepted that the first ancestor of the horse species existed 55 million years ago in the *Eocene* geological period (Sakınç, 2007).

In the fossil record, 13 genera have been identified in the *equine* family. Of these, *Equus* is the only surviving genus and it has been found to contain about 30 species (*Equus ferus caballus*) (Waran et al., 2007). Today, 7 members of the *Equus* genus remain, apart from horses. These; Wild Donkey (*Equus ferus*), African Wild Donkey (*Equus africanus*), Onager 'Asian'

Donkey (*Equus hemionus*), Kiang (*Equus kiang*), Strike Zebra (*Equus scratchi*), Burçel 'Plain' Zebra (*Equus quagga*) and Mountain Zebra (*Equus zebra*) species (Yılmaz, O., 2012). The domestication of horses dates back 6,000 years. This process began in Dereivka, Ukraine, with their preservation as a food source in their natural habitat (Waran et al., 2007). In the process from *Eohippus* to the modern horse; loss of the soles of the feet, elongation of the legs, the formation of the ankle bones by fusing the independent bones under the legs with the knee, an increase in the size and complexity of the brain, and developments in the teeth suitable for grazing (Anonymous, 2021a). In addition, while they were the size of a fox and their feet were five-toed at the beginning; it was later determined that they grew in size and size, the number of fingers decreased, and the toe bones extended over time and their middle fingers developed (Anonymous, 2021b).

In the research of this subject, an overview of the adventure of the horse breed, which has always had an important place in the history of mankind, is aimed to be examined, although its usage area changes according to production and technological developments.

2. HISTORICAL DEVELOPMENT OF HORSES

Interventions shaped by human experience and needs, rather than natural ways, had an impact on the domestication process of the horse (Rothe et al., 2005). domestication of horses; after dogs, goats, sheep, pigs, reindeer and poultry (Koçkar, 2012).

We can summarize the development of the modern horse in the historical process chronologically as follows (Sakınç, 2007; Koçkar, 2012):

-Little horses (55 million years ago)

- ✓ *Hyracotherium (Eohippus)*
- ✓ *Orahippus*
- ✓ *Epihippus*

-Leaf-fed, low-crowned teeth, medium-sized horses (45-24 million years ago)

- ✓ *Mesohippus*
- ✓ *Miohippus*
 - Anchitherium*
 - Kalobatippus*
 - Archaeohippus*
 - Hypohippus*
 - Megahippus*

-The arrival of horses on the plains (18 million years ago) and horses with slender legs and high-crowned teeth

- ✓ *Parahippus*
- ✓ *Merychippus*

- One-toed horses (10-1 million years ago)

- ✓ *Pliohippus*
- ✓ *Dinohippus*
- ✓ *Astrohippus*
- ✓ *Neohipparion*
- ✓ *Equus*

-Modern horses (4 million years ago)

3. MODERN HORSE BREDS

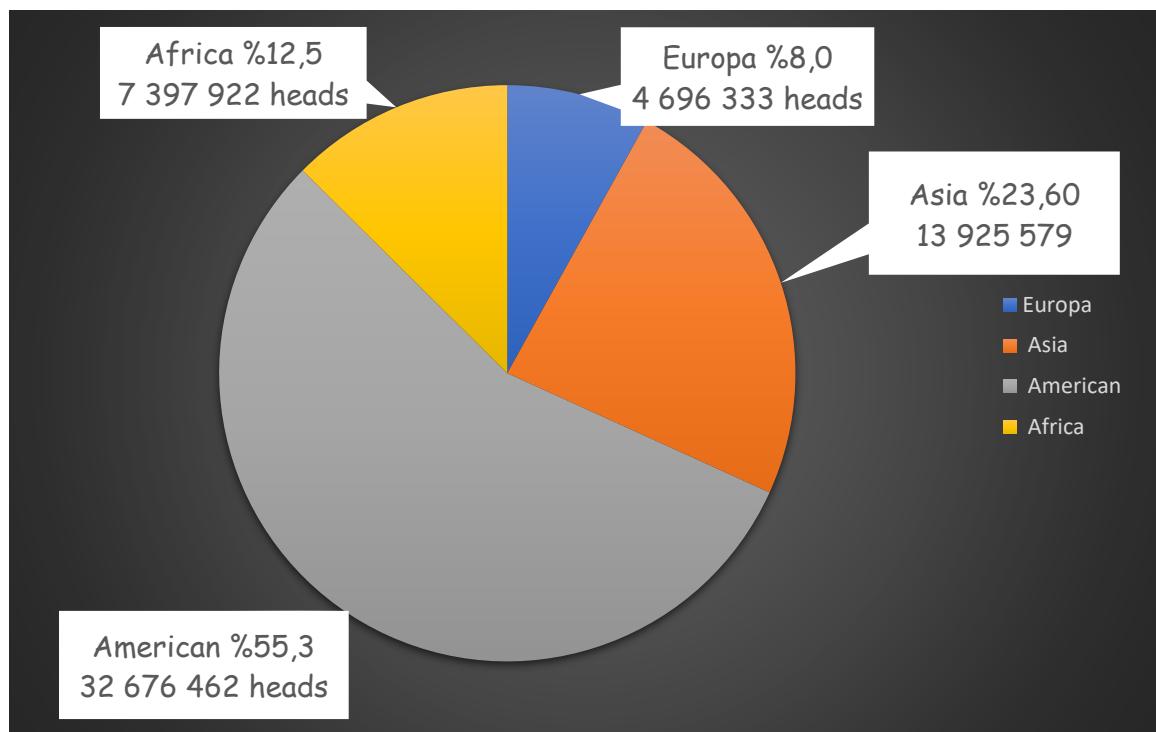


Figure 1. Distribution of Horse Population by Continent in 2019 (FAO, 2021).

In world horse breeding, the Americas constitute 55.3% of the total population with 32 676 462 heads (Figure 1). Other continents in horse breeding are ranked as Asia (23.60%), Africa (12.5%) and Europe (8.0%), respectively. As a matter of fact, as given in Figure 2, located in the Americas; USA (10 702 799 heads), Mexico (6 382 699 heads) and Brazil (5 850 154) are the most important countries in the world in horse breeding.

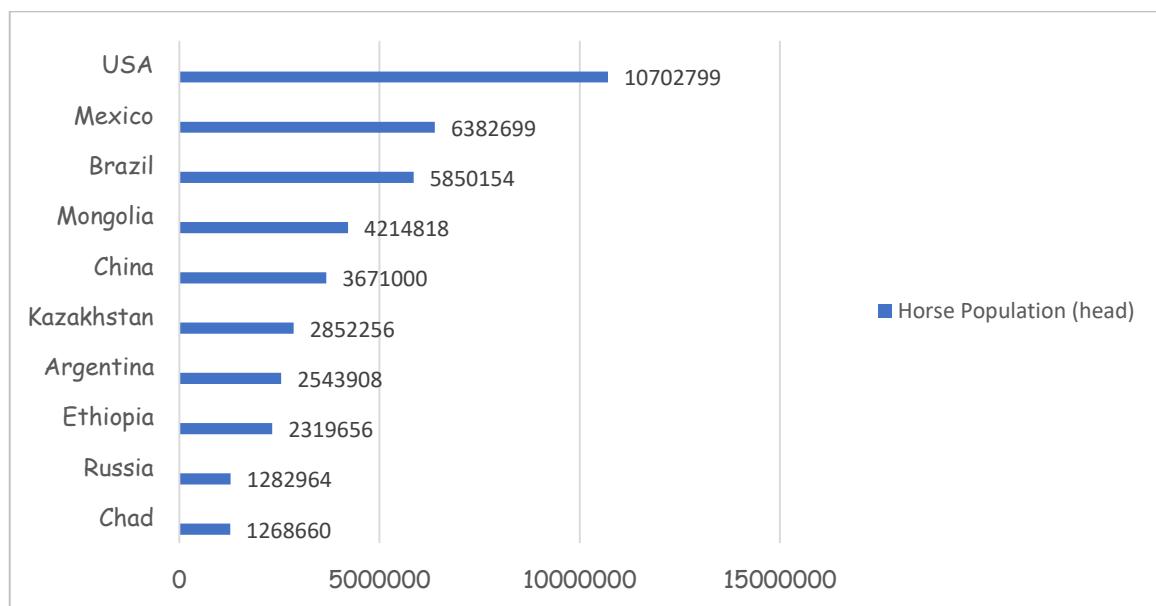


Figure 2. Top 10 Horse Breeders Country in the World in 2019 (FAO, 2021).

There are more than 300 breeds of horses and ponies in the world and they can be classified in several different ways. For example, horses can be classified as hot-blooded, cold-blooded, or pony. In addition, it can be grouped as light (light), heavy (draft) or pony according to size, weight and structure. Horses in these groups; It can also be further subdivided according to its uses, such as riding, racing, driving, jumping, or use. Horse classifications are also significantly dependent on the horse's withers height and weight (Parker, R., 2007).

All modern horses can be divided into three main categories: hot-blooded, cold-blooded and warm-blooded:

1. Hot-blooded Horses: Hot-blooded Horses: It has been reported that warm-blooded horse breeds originated from E. Tarpan (Köseman and Şeker, 2016). Fast and well-tempered, warm-blooded breeds are best suited for experienced riders. The most popular hot-blooded horses are the Arabian horse, originating from the Middle East and dating back thousands of years. Arabian horses are known for their noble appearance, intelligence and endurance over long distances. These horses are used for show purposes or as race horses (McIntosh, 2014). Another famous hot-blooded horse is the Thoroughbred, the classic racehorse. It is a special breed developed to reach speeds of 40 miles per hour in thoroughbred middle-distance running. They are trained to start racing at age two and often retire at age five. Thoroughbreds are suitable for equestrian sports such as horse shows and polo, although they are prone to a nervous temperament and health problems (McIntosh, 2014). Thoroughbreds have been bred in the UK for over 300 years and 5,000 thoroughbred foals are produced annually. There is also an important part of the breeding industry devoted to producing sport horses (Anonymous, 2005).

2. Cold-blooded Horses: It has been reported that the cold-blooded horse breeds originated from E. Preçevalski (Köseman and Şeker, 2016). Cold-blooded horses are heavy, solid and strong load horses with a calm temperament (Parker, 2007; McIntosh, 2014). As a result of the development of technology, machines have largely taken their place. The most famous coldbloods in the United States are the Clydesdales, popular at parades and shows. Derived from Scottish farm horses, these gentle giants weigh a ton, stand over six meters high, and have large feet (horseshoes the size of a dinner plate) with distinctive hairs hanging over their hooves. (McIntosh, 2014).

3. Warm-blooded breeds: The term warm-blooded is not related to horses with a certain blood temperature. It refers to the general temperament of light medium horse breeds. Warm-blooded horses are thin-boned and suitable for riding. In some countries, it is used for horses that have the gene for the warm-blooded Arabian horse breed. According to another opinion, all light horses are expressed as warm-blooded, while another opinion suggests that all breeds that are not purebred, heavy or pony can be classified as warm-blooded (Parker, R., 2007). Warm-blooded breeds combine the agility of the warm-blooded and the moderate temperament of the cold-blooded. There are many warm-blooded breeds in the United States. Good-natured and easy to handle, these horses are excellent pets and show horses. Originally herding cowboys in the western United States, these breeds are now considered ideal for riders of all levels and even for introducing children to the joys of horseback riding (McIntosh, 2014).

Grouping of horses by size, weight and structure:

A) Heavy Horse Breeds (Draft Horse):

Heavy horses have a height of 144-175 cm and a weight of 635 kg and above. They are mainly used for heavy work or towing loads (Parker, R., 2007).

1. Belgian Horse: The main area of use of this breed, which has been found to spread to 12 countries in the world, is towing works that require power (Khadka, 2010). Mainly used for heavy draft. The height of these Belgian-origin horses is 155.5-172.8 cm. They are massive and powerful animals. They have short and sloping shoulders and short, thick necks. It has a short back and wide legs (Anonymous, 2021a).

2. Clydesdale Horse: Although the Clydesdale is a heavy draft horse, it has the attitude and grace of a much lighter horse. In addition to being one of the most athletic breeds for their size, they have beautiful proportions. The withers height of these horses originating from Scotland is 163-183 cm. It is characterized by a well-curved neck with large eyes and a graceful head, high shoulders and a short, strong back, muscular rump, long, silky hair on long legs with sturdy legs. Available in true, black, grey, navy blue or red. White spots appear on the face and legs. It is suitable to be used as a heavy tow, farm work, equestrian, show and cavalry horse (Anonymous, 2021c).

3. Percheron Horse: It is a breed used in draft and sports fields spread over 15 countries worldwide (Khadka, 2010). It is of French origin. The height is approximately 163 cm. It is typically characterized by a gray or black color, high chest width and hairless legs (Anonymous, 2021a).

4. Shire Horse: Originated from England. Although it is usually around 173 cm, it has been reported to reach withers heights of up to 193 cm. It has a convex profile, relatively long neck, long, sloping shoulders, short back and heavily feathered ankles below the knee (Anonymous, 2021a).

B) Light Horse Breeds:

The height of light horses varies between 122-175 cm and their weight varies between 408-635 kg. They are primarily used for boarding, driving, show or racing purposes but are also suitable for use in farm and livestock work. Light horses are more active, agile and fast compared to heavy horses (Parker, R., 2007).

1. Akhal-Teke Horse: Akhal-Teke is one of the oldest, most remarkable and extraordinary horses in the world. These horses were first bred 3000 years ago around the oases of the Turkmenistan Desert in northern Iran (Ustyantseva et al., 2019). The height of Akhal-Teke is 150-170 cm. It holds its head upright, has a straight profile and a long, narrow, rather high neck. It also has a medium length, sometimes straight shoulder and a long, straight back (Anonymous, 2011d). It has long and slender legs (Anonymous, 2021a). It has small, stiff, hairless hooves and a rather sparse tail and silky-looking mane. Ears are longer and wider than other breeds and are slightly sickle-shaped. The eyes are usually almond-shaped (Anonymous, 2011d). These horses; The fact that it is fast, durable and easily trainable has enabled it to be used in a versatile way (Leisson et al., 2010). Akhal-Teke; The racehorse is a suitable horse for long-distance travel and equestrian sports riding (Ustyantseva et al., 2019).

2. American Quarter Horse: These horses are adept at short-distance (quarter-mile) racing. Its origin is based on horses brought to America by Spanish immigrants in the 17th and 18th centuries (Koçkar, 2012). Reported to have spread to 28 countries, this horse breed is the most popular breed in the USA (Khadka, 2010). They were used in cattle herding activities due to their athletic and courageous features, and while running these pursuits, they gained the ability to turn in the opposite direction and run quickly back. With the mechanization, its importance in agricultural activities decreased and it started to be used as a hobby and sports horse. Withers height is 143-160cm. Different colors are available. It has a short and broad head

structure, a small nose, large eyes, upturned ears, long and elastic neck structure, and rounded shoulders. The chest and abdomen are broad and the back is short. The rump is large, deep and muscular. Its legs are strong. Their nails are rectangular in shape, have a deep and wide nail structure (Koçkar, 2012).

3. American Saddlebred Horse: American Saddlebred horses were crossbred and selection with Morgan and Narragansett Pacer horses (Koçkar, 2012; Anonymous 2021e) of Pony (Galloway and Hobby horses) brought by immigrants from England to North America in the late 1600s. developed as a result of their breeding. Their average height is 145 – 170 cm. American Saddlebred horses have a broad forehead, straight profile and large black eyes. It has a thin neck and smooth mane. It has a deep and sloping shoulder structure. Their legs are smooth, muscular and strong (Koçkar, 2012). Their average lifespan is between 25-35 years (Anonymous 2021e).

4. Andalusian Horse: It originates from Spain. Its height is 155 – 160cm. It has large almond eyes. The nose is straight or slightly protruding. Their necks are strong, broad, beautifully curved and long. The neck is wide, the back is strong and the muscles are visible. Chest width is high. They have long tails, bushy and slightly wavy hair. It has long manes. It has short and strong legs. It has high and solid hooves. Although there is no standard color of Andalusian horses, 80% of them are gray. Other important colors are Doru, Dark Doru and Yağız (Koçkar, 2012).

5. Appaloosa Horse: It originates from the states of Idaho, Oregon and Washington in the United States of America. Claimed to be a cross between horses brought by Spanish explorers and native wild Mustangs, they were first bred in North America by the Nez Perce Indians. Some Appaloosas have a solid coloration interspersed with small, round spots of the same color as the body, except for a white patch on the hips. Others are covered with white spots in a solid solid color. Its height is 145-163 cm. Used as a riding horse (Anonymous 2021a).

6. Arabian Horse: These horses originate from the oases along the Tigris river in Syria, Iran and Iraq and from other parts of the Arabian peninsula (Koçkar, 2012). Today, this breed is cultivated in approximately 59 countries. They are widely used in different branches of equestrian sport (Khadka, 2010). Big eyes, upturned tail, short and straight back, muscular and broad chest, muscular legs, small nails enlarging on the heel are some of its characteristic features. Colors; it can be nutshell, iron grit, rain and light frost. Whiteness on the face and legs is common. It has a thin and silky skin, bushy mane and tails (Koçkar, 2012).

7. Criollo (South America) Horse: Criollo is a horse breed originating from Spain. These horses, which were released to nature in the USA, where they were brought, tried to adapt to the environment for 4 centuries and were subjected to natural selection (Koçkar, 2012). They have a broad forehead and sometimes convex profile, watchful eyes, small and pointed ears, neck muscular and slightly crested, broad and strong hindquarters, short, strong and strong legs (Anonymous 2021f), short and deep trunks and a muscular structure (Anonymous, 2021a). Its height is 140- 150 cm. It is used as farm work, draft, show and riding horse (Koçkar, 2012; Anonymous 2021f).

8. Hanoverian Horses: It is a noble warm-blooded horse breed originating from Germany and distributed in 12 countries of the world (Khadka, 2010). They are calm and dignified horses (Koçkar, 2012). It is one of the leading sport horse breeds in the world. This warm-blooded breed, which is the leader in horse breeding worldwide, is considered one of the main breeds of the modern sport horse (Anonymous 2021g). Show jumping, activity and recreational riding are other uses (Khadka, 2010). Its height is 155-172 cm. They have long and muscular necks, high chest depth and strong hindquarters structure (Anonymous, 2021a).

9. Lipizzan Horses: This breed dates back to the 16th century, when this breed was developed by the Habsburg family to meet their need for a strong but agile horse for use in the army and riding schools. In 1562, the Emperor brought Spanish horses to the palace and

established a stud farm. Likewise, he established a similar breeder in Lipizza in Slovenia. These two horse farms produced the basic stallions of the modern Lipizzan breed. The offspring of native Karst horses, originally crossed with Spanish, Barb, and Arabian stallions, were crossed with the now-extinct Neapolitan horse, Kladruber, Frederiksborg, and other Baroque horses of Spanish origin. Between 1765 and 1819, the parents of the Lipizzan horses known today were formed (Anonymous, 2021h). It has been found to spread to 18 countries, mostly in Europe (Khadka, 2010). Its height is between 145-155 cm. Their heads are long and large, their eyes are expressive, their ears are small and their nostrils are wide. They have a short, curved neck, broad and deep chest, solid shoulders and very rounded rumps. Their tails are high and very thick and long like a mane. They have short and strong legs and small and hard nails. The dominant color on most Lipizzan horses is gray (Anonymous, 2021h).

10. Missouri fox trotter horse: It is a horse breed that settlers developed in the Ozark Mountains of Missouri in the early 19th century by crossing the horses they brought with them with strong breeds. Its maneuverability and smooth walking on rocky terrains has earned it acceptance by the locals. It was used for plowing fields, logging and cattle work. Missouri fox-trotting horses; It has a flat facial profile, a muscular body and a short back. It is a strong horse breed with sloping and strong shoulders, and solid legs. Their heads and tails are almost always high and their ears are pointed. This breed has many color variations. Available in chestnut, gray, champagne, black and many more. Some horses have white spots on their legs and faces, while others have spots (Murphy, 2019).

11. Morgan Horse: This horse of American origin was born as a colt in 1789 and began to be named after its owner. Although it is not known for certain, the ancestors of this stallion were a mix of English purebred, Arabian, Welsh Cob and Dutch breeds. Its height is 141-152 cm. Its color is usually true, chestnut, oily. The head is wide forward. It has large eyes, short and erect ears, a slightly angled neck, and sloping shoulders. Its hindquarter is muscular and its tail is up. Their straight and strong legs have short and thin bone structure. It has a soft and bushy tail and mane (Koçkar, 2012).

12. Paso Fino: These horses are descended from Spanish horses brought by immigrants in 1493. Today it has spread from the Dominican Republic to the entire Caribbean and many countries of South America. In the 1960s, it was imported for the first time by the USA and used and cultivated in this country. They are often considered recreational horses as they are easy to ride, tireless and reliably carry their riders across trails with a comfortable, consistent gait at varying speeds. In addition to being a means of entertainment, they are also used as tracking horses, work animals and show animals. The height of Paso Fino horses varies between 132 and 152 cm. It carries its tails high like a flag. It can be any color except the leopard color (Anonymous 2021). Paso Poodle horses are well profiled. Head and body are proportional. The nostrils are large and wide. The neck, which extends harmoniously from the body, takes a sharp curve when it comes to the head and is arched. It has a muscular, round and strong hindquarter structure. It has muscular and strong legs, a long and hairy mane and tail (Koçkar, 2012).

13. Standardbred Horse: The Standardbred is a horse breed developed in the United States in the 19th century and used primarily for running races. This breed was developed using the English Thoroughbred Messenger (1780-1808), which was imported from England to the United States in 1788. With considerable strength and stamina, Standardbreds are very similar to Thoroughbreds, but are generally smaller and have straighter ribs and heavier bones (Anonymous, 2021a). The height of this horse is 142-163 cm. The color of these horses can be any color, mostly brown, bay, black and chestnut (Parker, 2007).

14. Tennessee Walking Horse: The Morgan horse has a significant genetic contribution to the formation of this breed (Anonymous, 2021a). Their weight is between 410-540 kg. It has a long neck, small ears that are placed in proportion to the head. It has a short back, muscular and moderately deep legs (Anonymous 2021k). Its height is between 145-173 cm. There are

sorrel, chestnut, black, white, gold, gray, bay and brown colors (Anonymous, 2021L). It was originally developed for use on farms and fields in South America. Later, it started to be used as a popular riding horse due to its calm stance, soft gait and solid feet (Anonymous, 2021k). It is used for entertainment, touring and show purposes (Anonymous, 2021L).

15. Thoroughbreds: Thoroughbreds are outstanding racehorses developed in the 18th century. Thoroughbreds have been racing since they were first bred. They got their speed from horses from Spain, Italy, Africa and Turkey. While there are many important stallions in thoroughbred history, the Byerly Turk, a Turkmen horse, Darley Arabian, a thoroughbred Arabian racehorse named after its owner, and the Moroccan horse Godolphin Barb are just a few basic stud stallions used. Thoroughbreds have very muscular shoulders. Normally, their necks are long and almost straight. Thoroughbreds have small but graceful heads with a neat profile. They have movable ears that are proportional to the head. Purebreds have large and lively eyes. The skin of these horses is thin and silky. They can be laurel, chestnut, black or gray in color. White spots are usually seen on their skin (Anonymous, 2021m).

C) Ponies

1. Connemara Horse: The Connemara pony is a world famous Irish horse with its athletic, intelligent and docile temperament. There are different rumors about the origins of this race. According to one view, the origin of the Connemara pony goes back to the Vikings, while another view traces its roots to the Irish Hoby horses, which became extinct in the 13th century. According to another rumor, it was formed by crossing Andalusian horses brought by Spanish ship in 1588 with Irish native breeds. Whatever its origin, the Connemara pony has become a hardy species that can thrive on the region's scanty vegetation (Hughes and O'Callaghan, 2015). Their height is between 132-144 cm. It is widely used as a riding and light draw horse. It has a tail that it carries above, a long neck with a full mane, and well-muscled legs with a bushy mane (Anonymous, 2021a).

2. Pony of the Americas: A good riding horse for children, the American pony was developed in 1954 by crossing Shetland ponies with Appaloosa mares. The little colt born from this union had a white body that looked like patches of black paint all over his body (Anonymous, 2021n). Its height is between 114-134 cm. It has erect ears and large eyes (Anonymous, 2021a).

3. Shetland Horse: The origin of Shetland is from the Scottish archipelago in the middle of the North Sea, off the coast of Scotland and Norway, from which it derives its name. In the past, the Shetland pony was used mainly by the inhabitants of the Shetland Islands to work in the fields and as a means of transportation. It was used as a horse carriage in coal mines with the industrial revolution in the middle of the 19th century. It has been used for entertainment purposes since the beginning of the 20th century. Harsh climatic conditions, nutritional instability and isolated conditions on the island have kept the Shetland pony small. Their height is 102-107 cm. Intelligent eyes, broad forehead; It has small ears and wide open nostrils. The mane and tail are covered with abundant and hard hairs. The neck is muscular. The chest is wide and deep, the back is short, the waist is strong and wide. It has strong legs, round, hard and durable nails (Anonymous, 2021o).

4. Welsh Pony: Welsh Pony horses are a pony horse bred in the Wales region of England. This horse was first domesticated by the Celtic people of ancient England. The harsh climatic conditions and food shortages in the region have increased the endurance of this small mountain horse. Thanks to the Arabian horses that the Crusaders brought on their return, Arab blood was also mixed. In addition to the Arabian horse, the blood of Hackney horses and Thoroughbred horses after the 1950s were added over time and 4 different types developed:

- ✓ - Welsh Mountain Pony: Known as the Welsh Mountain Pony. Its height is maximum 122cm. It is one of the most used horses in equestrian sports and horse-drawn carriage. With its large eyes, it has a round head that has not been influenced by Arabian horses, a short back with a large bone structure, and straight legs.
- ✓ Welsh Pony: The height of the Welsh Pony is 137cm. It is used a lot, especially in car driving races. He has a very harmonious body structure.
- ✓ Welsh Cob Pony: Its height is up to 137cm. It is a resistant, strong, calm and harmonious horse that can compete at a high level in equestrian sports. One of its most distinctive features is its silky skin. It has a long hindquarters, dark eyes, hard nails, deep chest and strong legs.
- ✓ Welsh Cob: No definitive figure for its height has been determined. According to some experts, they are the best horses for riding. It is a strong, durable and agile animal. He has a good temperament. Their head is smooth, their ears are small and erect, their hindquarter is round, their back is short, their legs are strong and their nails are hard (Koçkar, 2012).

4. COAT COLORS IN HORSES

The three basic colors formed by two pigments in horses are derived from the interaction of two genes (melanocortin-1 receptor (MC1R) and agouti-signaling protein (ASIP)). These colors are; straight, black and chestnut. Other genes (for example, dilution genes) determine variations of each of the three primary colors.

MC1R gene: Dominant allele genes (EE) determine eumelanin (brown-black) production; recessive (recessive) genes (Ee) determine the production of pheomelanin (yellow-red). According to the forms of this gene, it becomes a black color when there is at least one dominant allele ((E^EE^E or E^EE^e)) or a red color (reddish color) when the recessive allele genes are homozygous.

ASIP gene: Dominant allele (AA) encodes the production of agouti signaling protein, which has the ability to block the melanocortin receptor found in present melanocytes. When the receptor is blocked, eumelanin is not produced and only pheomelanin is produced.

Interaction results of MC1R and ASIP genes:

In the case of a dominant allele (A^AA⁻) at the agouti locus, the body color of an eumelanic (E^EE⁻) horse will have a bay color, which can be expressed as a reddish to brownish body colour.

A horse with the genotype E^EE⁻A^aA^a will be black. This color is quite common in the Percheron breed. Here, the superscript hyphen characters (-) are not used to mean "negative". This sign means that the allele at that locus is unimportant for the phenotype.

If the genotypes are located at locus as EeEe AaAa- or EeEe AaAa, the horse is chestnut.

4.1. Basic colors in horses:

4.1.1. Bay: It is believed to be found in primitive herds and to be an effective camouflage against predators (Neves et al., 2017). The horse's body color can range from brownish red to almost yellow, including shades of mustard or light reddish. Mane, tail and lower leg appendages are black or sometimes dark brown. The Bay is one of the most common colors and is usually seen in American Quarter horses. It is also frequently encountered in Viatka and Bashkir horses and other domestic horses. This color is rarely seen in some races originating from the Iberian peninsula, such as Andalusia and Lusitano (Kurskaya, V., 2017).

4.1.2. Black: The skin, mane, tail and body hair are all black. Whiteness can only be found on the face and legs (Anonymous, 2021p). It is a rare color in horse populations. Black

color in horses; dark glossy black, dull black and dirty black tones are available (Yilmaz and Ertuğrul, 2011).

4.1.3. Chestnut: It is characterized by the horse's appendages (mane, tail and legs) and all the hair on its body being red or different shades of red. Chestnut color in horses; It has normal (ordinary) red, light red, cherry red, whitewing, dark red and burnt red tones (Yilmaz and Ertuğrul, 2011).

4.2. Other Colors: Occur when proteins determined by specific genes change the amount of pigment in receptive structures (keratinocytes and hairs). The effect creates a dilution in the intensity of the original color due to its pigment lightening feature (Neves et al., 2017).

4.2.1. Gray: Involves the gradual whitening of all hairs on the horse's body, but the skin may remain dark for many years. Sometimes, the skin may remain unpigmented gradually (for example; Lipizzan). In such cases, at each shedding time, the horse's true color will be replaced by white hairs. When animals are born, their feathers have distinctive colors. Graying first begins around the eyes. Whitening can take years from horse to horse individually. This mutation causes excessive melanin production. This is why horses that turn gray are born with more vibrant dark colors. This feature is clearly observed in foals with jet black fur, unlike the mutation-free black foals that are born with a grayish color. It is common among various breeds such as Thoroughbred, Arabian, Percheron, Andalusian and is the only color seen in Lipizzan (Neves et al., 2017).

4.2.2. Cream: In these, the hairs covering the body are in different shades of yellow, while the hairs on the extensions are observed in light colors close to white. The "C" (Cream) gene, which has a color dilution feature, is active in the formation of this color (Yilmaz and Ertuğrul, 2011).

4.2.3. Champagne: The champagne gene sometimes gives the skin color a metallic sheen; it also causes the skin to change to a light brown color and amber eyes (Neves et al., 2017).

4.2.4. Dun: It is observed in horses with red coats. It is the covering of the whole body with white hairs and the formation of a red-white mixture. If the white hairs are more than the red hairs, they are called light gray, if they are equal, they are called ordinary gray, and if they are less, they are called dark gray (Yilmaz and Ertuğrul, 2011).

5. CONCLUSION

The relationship between horse and human, which started as a food source before domestication, has developed as a service tool that facilitates the work with domestication. This union, which has an important place in the historical adventure and existence of human beings, has been interrupted due to technological developments and there has been a significant decline in the horse population in the world. It is inevitable that these decreases will continue as the technological development in the world increases and becomes widespread. However, as a result of the demand for horse breeds suitable for new needs, there is also the danger of genetic extinction of a significant number of breeds. In order to prevent these, measures should be taken such as doing more studies on horse breeds, drawing attention to the relationship between human and horse in the historical process, and protecting genetically endangered breeds.

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II. BALKAN AGRICULTURAL CONGRESS

<http://agribalkan.org/>

29 August - 1 September 2021, Edirne, Turkey



CERTIFICATE OF ATTENDANCE

Selçuk Seçkin Tuncer

Historical Development Of Horse Breeds
Selçuk Seçkin Tuncer, Süleyman Kozat

ORAL PRESENTATION

Organizing Committee of our conference acknowledges
with gratitude participation and contribution.

Prof Dr Yalcin KAYA
Chair of Organizing Committee



**III. BALKAN AGRICULTURAL CONGRESS
AGRIBALKAN 2021**
29 August - 1 September, 2021, Edirne, Turkey
www.agribalkan.net



: 01

09.09.2021

Konu: Yabancı Katılımcı Oranı

ILGİLİ MAKAMA;

29 Ağustos - 1 Eylül 2021 tarihlerinde COVİD_19 pandemi süreci nedeniyle online ve sınırlı katılımlı olarak, Trakya Üniversitesi'nce düzenlenen III. Balkan Tarım (AGRIBALKAN 2021) Kongresi sunum programında yer alan 406 bildirinin, 205 adedi, 41 farklı ülkeden katılan yabancı katılımcılar tarafından sunulmuş olup, yabancı katılımcı oranı % 51'dir. Tüm sunumlar <https://agconference.konfium.com> web sitesinde kongre online programı yardımıyla canlı olarak sunulmuştur.

Gereğini arz ederim.

Prof Dr Yalcin KAYA

**Kongre Organizasyon Komitesi Başkanı
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ACCEPTING LETTER

Dear **Selçuk Seçkin Tuncer**,

Thank you for submitting your paper to our congress. Your abstract "**HISTORICAL DEVELOPMENT OF HORSE BREEDS**" has been accepted as "**Oral Presentation**" after per-reviewing by our Scientific Committee then it will exist in our conference program and will direct to printings for our congress book of abstracts.

We will be so happy to see you in our event.

Best Regards.

A handwritten signature in blue ink, appearing to read "Yalcin Kaya".

Prof Dr Yalcin KAYA
Chair of Organizing Committee
The Director of TU Plant Breeding Research Center

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