Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Faculty of Veterinary Medicine and Animal Science
Department of Animal Breeding and Genetics

Global Horse Population with respect to Breeds and Risk Status

Rupak Khadka

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Supervisors:

Prof. Dr. Georg Thaller, CAU, Institute of Animal Breeding and Husbandry
Prof. Dr. Jan Philipsson, SLU, Department of Animal Breeding and Genetics

Examiner:

Birgitta Malmfors, SLU, Department of Animal Breeding and Genetics

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Rupak Khadka
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Institute of Animal Breeding and Husbandry, CAU
Department of Animal Breeding and Genetics, SLU

SUPERVISORS
Prof. Dr. Georg Thaller, CAU, Germany
Prof. Dr. Jan Philipsson, SLU, Sweden

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Abbreviations

AHC	American Horse Council
AnGR	Animal Genetic Resources
BC	Before Christ
CAU	Christian Albrechts University
CB	Cold Blood horses
CR	Countries Reporting
DAD-IS	Domestic Animal Diversity Information System
EAAP	European Association for Animal Production
EM-ABG	European Master in Animal Breeding and Genetics
EU	European Union
FAO	Food and Agriculture Organisation
FEI	Fédération Equestre Internationale
ITB	International Transboundary Breeds
IUCN	International Union for the Conservation of Nature and Natural Resources
LAC	Latin America and Caribbean
NZ	New Zealand
OSU	Oklahoma State University
SA	South Africa
SLU	Swedish University of Agricultural Sciences
UK	United Kingdom
UN	United Nations
UNPD	United Nations Population Division
USA	United States of America
WB	Warm Blood horses

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Summary

This study was performed based on FAOSTAT and DAD-IS database systems of Food and Agriculture of United Nations in order to describe the number of horses, horses per 1000 persons, number of horse breeds and the risk status of horse breeds in the world. In 2008, there are 58.7 million horses in the world, South America dominating (15 millions) followed by Asia (13.8 millions), North America (9.8 millions), Latin America and Caribbean (8.7 millions), Europe (6.3 millions), Africa (4.5 millions) and Oceania (0.41 million). Interestingly from the results of 2000 to 2008 data the population of horses is continuously decreasing in Europe, Asia and South America whilst gradually increasing in North America, Latin America and Caribbean, Africa and Oceania. The figure of horses per 1000 persons in the world was 8.7 for 2008. In the same year, Latin America and Caribbean, South America, North America, Oceania, Europe, Africa and Asia had 45.7, 38.9, 28.7, 11.8, 8.7, 4.6 and 3.4 horses per 1000 persons respectively. A total of 784 horse breeds have been reported in the world of which 655 are local, 62 are regional transboundary and 67 are international transboundary breeds. Europe makes up more than half of all horse breeds in the world while Latin America and Caribbean reported the least number of horse breeds. The majority of the reported horse breeds are unknown breeds. The Arab and Thoroughbred horses are the most diversed horse breeds in the world. A total of 22.6 % of the world's horse breeds are "at risk" while 11.5 % are extinct from the world. It was shown that 31.8 % of the horse breeds were not at risk while 34.1 % had an unknown status. This study reflects that Europe provides relatively good information of the horses to FAO as compared to other continents. It would be very informative to do further studies to determine the overall impression of the horses in the world.

1. Introduction

Horses are present throughout the world. Horses have been with humans throughout history and have served a variety of practical purposes. These include serving as a means of transport, a work animal in agriculture and in war. Horses were domesticated and utilized by humans since ancient times. Horses are the species most differentiated into breeds throughout the world (Hall & Raune, 1993). Nowadays because of their power, agility, gracefulness and speed, horses are mostly used for personal pleasure and in sport competitions. In recent years the globalization of horses has been widely recognized being developed as sports animal. The trade, breeding and sports significantly attracted the attention of people. Like other species of animals, horses are also an important component of global biodiversity. If the relationship of various populations is ignored, then remarkable genetic erosion can occur in the global population (Alderson, 2008). Failure to conserve domesticated genetic resources will definitely lead to a situation where a large portion of the horse genome will be on the verge of being lost. The use of the horse as a sport animal or for leisure helps to stimulate the maintenance of genetic diversity within the horse population. On the other, hand the wide use of selected popular stallions and their semen is seen as threat to genetic diversity within the horse population (Bowling and Ruvinsky, 2000).

The contribution of horse breeds to the total number of mammalian breeds in the world being 10.33 %, far outweighs their contribution in terms of animal numbers. Population data is not available for 36 % of all breeds. The population size and structure at breed level are inadequately reported in many parts of the world, especially in context of developing countries (FAO, 2007). As a result of mechanization and globalization, horses have been reinvented as sports and leisure animals while little interest has been placed on identifying the equine populations. Despite a wealth of scientific research in equine sciences, there has not been many studies conducted in order to describe the global population census, breeds and geographical distribution of the horse (Mellor et al., 1999). There are no direct measures at a genetic level, so the status of domestic horse breed populations provides the best available indication of trends in biodiversity.

A sound knowledge of the global horse populations is crucial to know parameters such as existing population size, type and use of the horses, breeds and breeding strategies, epidemiological studies, risk status etc. With regarding the lack of many studies in this field, the present study has been carried out which is based on the Food and Agriculture Organisation (FAO) databases: Domestic Animal Diversity Information System (DAD-IS) and FAOSTAT. The main objectives of this study were to describe:

a. the number of the horses in the world and by region
b. the number of horses per 1000 persons in the world and by region
c. the number of horse breeds in the world and by region
d. the risk status of the horse breeds in the world and by region

2. Literature Review

2.1. Domestication of the horses

The horse (*Equus caballus*) is a hoofed animal of the family Equidae. Horses, one of the most historically vital domesticated animals to humans, have a special place among our domestic animals and in our hearts. They have played essential roles in the history and developments of civilizations. Humans maintain a mutual trust and strong affiliation with horses, not only for riding and pleasure but also to maintain physical and mental health. They are highly social and intelligent domesticated animals. Horses are not as old as other domesticated species such as to sheep, goats, pigs, cattle and dogs (FAO, 1987). Horses acquired a special place next to dogs in recent times because of their close relationship with man. The evolution of domestic horses can be traced from its wild ancestors (Bokonyi, 1987). It is believed that different wild equids gave rise to the different breeds of domestic horses we see today. Many enormous heavy wild horses developed during the Pleistocene period (19th and early 20th centuries) and became extinct by the end of the Ice age (Epstein, 1971; Clutton-Brock, 1999 & Olsen, 2006). Forsten (1988) argued that out of many different varieties of horses in the Pleistocene period, only one species of wild horses survived. That small, single wild horse, referred as *Equus ferus,* is the ancestor of present day domesticated horses.

The domestication of horses is still an ongoing debate. Questions such as when, where and why the horses were first domesticated are still unclear. Horses had historically played an important role in the human progress. They became increasingly powerful components of Eurasian civilizations from the middle of the second millennium BC (http://www.imh.org/). The Tarpan (*E. ferus*), a wild European horse and the Przewalski (*E. przewalskii*), a wild Asiatic horse, are regarded as the ancestors of present day horses. Tarpans are small extinct horses with a mouse dun coat and a light underbelly, sooty to black limbs from knees and hocks down, short frizzled mane and a short tail with dark hair (Olsen, 2006). The last captive Tarpan died in Poland in between 1918 and 1919 (Bokonyi, 1974a) and the last wild Tarpan was killed in Ukraine in 1851 (Zeuner, 1963). The Przewalski horse is considered to be

the only remaining wild horse in the world and is the closest living wild relative of the present domestic horses (*Equus caballus*). Przewalski horses are robustly built with sandy tan, dun or reddish bay coat and dark brown upright mane, dorsal and shoulder stripe, barring in their legs, light coloring on their muzzles and bellies, a low set tail and smaller in size to the domestic horse (http://www.ansi.okstate.edu/breeds/horses/). Evidence from North Kazakhstan suggests that horses were domesticated in the era during the Copper Age - around 3700 to 3100 BC (Olsen, 2006). However, molecular studies suggest that the diversity of the horses on the maternal side probably originates from several populations in different geographical areas. Vila et al. (2001) suggested that a single point of origin was unlikely as there were multiple successful efforts for horse domestication in different regions. The domestication of horses might have taken a very long time to develop and wild genes have been introduced into domestic genes (Levine, 2006). Horse back riding supported a good indicator of horse domestication which first appeared in the steppes east of the Ural Mountains (Kavar & Dovc, 2008).

2.2. Utilization of the horses

Humans have conquered the world with the aid and sacrifice of the loyal horse in the past. The history of utilization of horses can be traced from the rise and fall of empires, the conquest of entire continents, great battles, developments of transport systems, mail, agriculture, forestry progress and in times of war and peace (Bowling & Ruvinsky, 2000). During the middle of the 19th century, heavy breeds of horses were developed for agricultural and forestry works, coal mines, as power to other pieces of heavy machinery and for pulling carts. With the advent of combustion engines the role of the horses became overshadowed. However, they are still being used in subsistence agricultural regions particularly in Eastern Europe, Asia, Africa, Central and South America. The importance of horses for agricultural work has decreased to insignificant proportions. The exceptions are the use of horses by sheep farmers when herding their grazing sheep (Arnason, 1984) and by “cowboys” at cattle ranches in Western (Iverson, 1994) and Latin (Jordan, 1989 and Bishko, 1952) America. Draft horses still play an important role in rural life, despite the increased mechanization of agriculture. Pack horses and ponies

are still the backbone for the means of transport in some developing countries. Horses have been also used by military forces for expeditions, riding, and transportation.

The mechanization of transport and agriculture increased the attention of many horse breeds for the development of breeds for sport and leisure activities. The role of the horses has mirrored the changes in the human society from war horse to draft horse to today's sport or companion animal (Waran, 2002). In recent times, one of the promising and emerging areas for the use of many breeds of horses is for competitive events or as sports animals. During the last few decades, the equestrian sphere has rather briskly emerged to become a field of wide diversification. The development of leisure riding, diversification of the utilization of horses, and increasing role of horses are of high concern for the developed countries.

The development of leisure activities for horses reflects a regular decrease in the number of draft horses and a constant increase in the number of blood/sport horses (Langlois et al., 1983). Sport horse breeds are intended to be used in competitions for the major international equestrian disciplines of dressage, jumping, three day eventing, racing, trotting, endurance, and vaulting. The development of sport horse breeds and participation at the Olympic level at Stockholm in 1956 had lead to the creation of a new horse market for equestrian sports. The elite horses of different breeds continuously compete at the Olympic Games and World Championship level. In recent years, horses are used in tourism, medical therapy, hobby, social rehabilitation, or social eventing, aesthetic and for cultural values. Horse breeding is characterized by a significant international exchange of breeding material. Besides this, horses are kept for meat purposes in all the regions of the world. Every year about 100, 000 horses are transported for slaughter over long distances within Europe (EU Equus, 2009). FAO estimated that 752, 913 tonnes of horse meat was produced in the world in 2008. Horses became progressively used for transportation, agriculture and forestry, leisure, recreation, sports, meat and therapeutic riding (Hausberger et al., 2008; Splan, 2004 & Anderson et al., 1999). Besides this, the equine industry plays a significant role in the socio-economic and environmental sector of a country.

2.3. Horse populations in the world

A population is a group of individuals that share one or more characteristics on which data can be collected and analyzed. A population can also be characterised as a group of organisms of one species that are interbred and live in the same place at the same time (http://www.biology-online.org/dictionary/Population). The distribution of different livestock populations and breeds across regions of the globe is affected by a range of agro-ecological, socio-economic, religious and cultural factors. According to production statistics of the Food and Agricultural Organization of the United Nations (FAOSTAT), in 2008 there were about 1,347 million cattle, 1,078 million sheep, 941 million pigs, 862 million goats, 180 million buffaloes, 18 billion chickens and 58 million horses in the world (http://faostat.fao.org/; cited on 15th, May, 2010). Recent data of FAOSTAT (2008) shows that there are 58.8 millions of horses in the world. Cattle are widely domesticated in all regions of the world followed by sheep. The population of horses seems to be quite low, compared to cattle because horses are not productive, but rather leisure or companion animals. According to the FAOSTAT (2006) report the United States reported the highest total number of horses with an approximate number of 9.5 million horses. The data provided by FAOSTAT is strikingly similar to the American Horse Council's own independent study which reported the US horse population to be 9.2 million in 2005. In 2006, the other countries with horse populations over one millions were China, Mongolia and Kazakhstan from Asia, Russia from Europe, Brazil and Argentina from South America, Mexico and Columbia from Central America and Ethiopia from Africa.

According to FAOSTAT (2005), there are 9.1 horses per 1000 persons in the world (Table 1). The figure is highest for Latin America and Caribbean with 46.4 horses per 1000 persons followed by South America with 41, North America with 28.7, Oceania 11.1, Europe 8.9, Africa 4.6 and Asia 3.7 horses per 1000 persons.

Table 1: Number of horses per 1000 persons by regions in 2005

Continents	Number of horses	Number of people (in 1000)	Horses per persons (in 1000)
Africa	4240612	921073	4.6
Asia	14256852	3936535	3.7
Europe	6489242	729420	8.9
Latin America & Caribbean	8562285	184854	46.4
North America	9586060	335175	28.7
Oceania	374657	33559	11.1
South America	15225273	371658	41
Total	58734981	6512274	9.1

Source: FAOSTAT & UNPD, 2005

EU Equus (2009) reported that there were 5.8 million horses in the European Union with Germany and Great Britian having the highest horse populations and Sweden has the highest number of horses per 1000 persons, i.e. 30.9. EU Equus (2001) study reported 4.4 million horses in the European Union member countries but there are not more than 6 millions equine animals or equidae (including horses, donkeys, ass, zebra and their crosses) in the whole of Europe (European Commission, 2010). The average number of horses per 1000 persons among the member countries in the European Union was 11.7 in 2000 (EU Equus, 2001) and 16.6 in 2008 (EU Equus, 2009). Tables 2 and 3 indicate that within the EU, Germany, the United Kingdom and France have the highest number of horses. Sweden, Denmark, Belgium and the Netherlands have the highest number of horses per 1000 persons while Greece, Portugal and Slovakia have the lowest number of horses and horses per 1000 persons.

Table 2 . Total number of horses in some European countries in 2008

Country	Number of horses	Number of people	Horses/1000 persons
Austria	100000	8 265 925	12.1
Belgium	300000	10511382	28.5
Czech Rep.	64126	10188000	6.3
Denmark	150000	5427459	27.6
Estonia	4900	1339000	3.7
Finland	77000	5266000	14.6
France	900000	62998773	14.3
Germany	1000000	82437995	12.1
Great Britain	1000000	60393044	16.6
Greece	27000	11122000	2.4
Hungary	60000	10058000	6.0
Ireland	80000	4221000	19.0
Italy	300000	5877800	5.1
Latvia	13600	2289000	5.9
Luxembourg	4490	461000	9.7
Netherlands	400000	16334210	24.5
Norway	45000	4668000	9.6
Poland	320000	38157055	8.4
Serbia	35000	2003358	17.5
Slovakia	8000	5388000	1.5
Slovenia	22000	2000000	11.0
Spain	559598	43886000	12.8
Sweden	280000	9047752	30.9
Total	7570714	455240953	16.6

Source: EU Equus, 2009

Table 3: Number of horses per 1000 persons in EU in 2000

Country	Number of horses	Number of people	Horses/1000 persons
Austria	81864	8200000	10.0
Belgium	200-250000	10200000	22.0
Denmark	150000	5300000	28.3
Finland	57400	5200000	11.0
France	452000	59100000	7.65
Germany	1000000	82200000	12.2
Greece	35000	10600000	3.3
Ireland	60000	3700000	16.2
Italy	323000	57300000	5.6
Luxembourg	NA	431000	NA
Netherlands	400000	15800000	25.3
Portugal	27000	9900000	2.5
Spain	350000	39600000	8.8
Sweden	250000	8900000	28.1
United Kingdom	965000	58800000	16.4
Total	4376264	375231000	11.7

Source: EU Equus, 2001

NA: Not Available

2.4. Breeds of horses

A breed is an interbreeding group of animals within a species with some identifiable common appearance, performance, ancestry or selection history (Oldenbroek, 2007). Breeds are regarded as the basic units of genetic resources in domesticated species. A breed is usually associated with a particular ecological zone, geographical area and farming system. Breeds have been developed according to the geographic and cultural differences and to meet human food and agricultural requirements. (FAO World Watch List, 2000).

Breeds are defined in different ways:

- "Animals that, through selection and breeding, have come to resemble one another and pass those traits uniformly to their offspring". (http://www.ani.okstate.edu/breeds/)
- "Either a sub specific group of domestic livestock with definable and identifiable external characteristics that enable it to be separated by visual appraisal from other similarly defined groups within the same species, or a group for which geographical and/or cultural separation from phenotypically similar groups have led to acceptance of its separate identity. Breed is very often accepted as cultural term rather than a technical term". (FAO World Watch List, 2000)
- "A race or variety of men or other animals (or of plants), perpetuating its special or distinctive characteristics by inheritance". (http://www.biology-online.org/dictionary/Breed)
- "A breed is a group of domestic animals, termed such by common consent of the breeders... a term which arose among breeders of livestock, created one might say, for their own use, and no one is warranted in assigning to this word a scientific definition and in calling the breeders wrong when they deviate from the formulated definition. It is their word and the breeders' common usage is what we must accept as the correct definition". (Lush, 1994; The Genetics of Populations)
- "A group of animals that has been selected by man to possess a uniform appearance that is inheritable and distinguishes them from other group of animals within the same species". (Clutton-Brock, 1987)

Local Breeds: Those breeds that occur only in one country. For example: Jumli is a local horse breed from Nepal.

Transboundary Breeds: Those breeds that occur in more than one country. Transboundary breeds are of two types:

a. **Regional Transboundary Breeds**: Those transboundary breeds that occur only within one region of the seven continents. For example: Hutsul is a regional transboundary horse breed found in Czech

Republic, Poland, Slovakia, Germany, Hungary, Romaina and Ukraine of Europe.

b. **International Transboundary Breeds:** Those transboundary breeds that occur in more than one continent. For example: The Arab horse is an international transboundary horse breed found in all seven continents of the world.

There are hundreds of horse breeds distributed throughout the globe. FAO's Global Databank for Animal Genetic Resources (AnGR) for Food and Agriculture (FAO, 2007) contains information on a total of 7,616 livestock breeds. The number of livestock breeds reported in the FAO databank includes both mammalian and avian species. A total of 786 breeds of horses were reported as of January 2006 which is 10.33 % of the total number of livestock breeds. Excluding 87 extinct horse breeds, there are 570 local breeds, 63 regional transboundry breeds and 66 international transboundry breeds. Out of the 570 local horse breeds, Europe reported the highest number of breeds with 269 local breeds followed by 38 out of 63 regional transboundry breeds. The other details are presented in Table 4.

Table 4: Total number of horse breeds† in the world in 2006

Geographic Region	Local	Regional transboundary	International transboundary
Africa	36	7	-
Asia	141	10	-
Europe & the Caucasus	269	38	-
Latin America & Caribbean	65	5	-
Near & Middle East	14	0	-
North America	23	3	-
Southwest Pacific	22	0	-
World	570	63	66

Source: The State of the World's Animal Genetic Resources for Food and Agriculture, 2007

† Excludes extinct breeds

As of June 2010, the breeds of livestock database system of Oklahoma State University (OSU) (http://www.ansi.okstate.edu/breeds/horses/) have reported 217 horse breeds. Hall and Raune (1993) reported 427 horse breeds. The EAAP Animal Genetic Data Bank contained 707 entries which include 110 horse breeds (Simon, 1992). The livestock dictionary of Mason (1988) includes 592 breeds of horses which also accounted for varieties of horse breeds. A different study illustrating the great diversity of horse breeds in the world is presented in Table 5 and suggests that there were 527 horse breeds in the world.

Table 5: Number of breeds of horses by geographic region

Geographic Region	Number of breeds	Breeds in %
Africa	60	11
Asia	148	28
Europe	209	40
Latin America/Caribbean	32	6
Pacific Islands	30	4
USA/Canada	58	11
Total	527	100

Source: The Genetics of the Horses, 2000

A number of breeds have been developed which illustrates the diversity of the breeds. The adaptability has allowed horses to survive in different environments over the time and to develop distinctive characteristics among breeds. The breed of the horse can be established into different types depending on the temperament (coldblood, warmblood and thoroughbred); nature of work (riding or draft); type of horse (light, heavy or ponies); type of breed (purebred or crossbred). No matter what the classification of horse breeds is, they are found in all regions of the globe. Coldblood or draft horses are generally heavily built with deep bodies, short stocky legs, small ears, large heads, thick coats and less reactive temperaments. These are well adapted for energy conservation and survival in cold climates. Warmblood or

riding horses and trotters are graceful with long slender legs, fine coats, small heads, large ears and other physiological adaptations to aid heat dissipation. They are fast, highly reactive and enduring and are adapted to life in a warmer environment (Hendricks and Dent, 1995).

2.5. Risk status of horse breeds

A total of 1,491 out of 7,616 breeds reported, 20 % were classified as being at risk. Cattle have the highest number of breeds at risk, followed by 23 % for horses. According to Signorello and Pappalardo (2003), 10% of domesticated breeds have been lost in the last century, and a further 20% are at risk of extinction. For more than one-third of all reported breeds, risk status is not known because of missing population data or unreliable information that can only be estimated (FAO, 2007). For example in Africa and Southwest Pacific the population size has not been reported for over two thirds of the breed populations. The lack of knowledge hinders concerted actions and the setting of conservation priorities. There are several important reasons for classification of the risk status of breeds: genetic uniqueness (Raune, 2000), a high degree of endangerment (Gandini et. al, 2004), economic, cultural, scientific, ecological value and optimal allocation of funds (Simianer et. al, 2003). However, the prospects of the breeds of any species largely depend on their present and future functions in livestock systems. When circumstances change, certain breeds are set aside and are faced with the danger of extinction unless alternative strategies are adopted (Oldenbroek, 1999).

2.6. Risk status classification of FAO

Critical: a breed is categorized as critical if the total number of breeding females is less than or equal to 100 or the total number of breeding males is less than or equal to five; or the overall population size is less than or equal to 120 and decreasing and the %age of females being bred to males of the same breed is below 80 %, and it is not classified as extinct (Table 6).

Critical-maintained: are those critical populations for which active conservation programmes are in place or populations are maintained by commercial companies or research institutions.

Endangered: a breed is categorized as endangered if the total number of breeding females is greater than 100 and less than or equal to 1,000 or the total number of breeding males is less than or equal to 20 and greater than five; or the overall population size is greater than 80 and less than 100 and increasing and the %age of females being bred to males of the same breed is above 80 %; or the overall population size is greater than 1,000 and less than or equal to 1,200 and decreasing and the %age of females being bred to males of the same breed is below 80 %, and it is not assigned to any of above categories (Table 6).

Endangered-maintained: are those endangered populations for which active conservation programmes are in place or populations are maintained by commercial companies or research institutions.

Breed at risk: a breed that has been classified as critical, critical-maintained, endangered, or endangered-maintained.

Extinct: a breed is categorized as extinct when there are no breeding males or breeding females remaining. Nevertheless, genetic material might have been cryoconserved which would allow recreation of the breed. In reality, extinction may be realized well before the loss of the last animal or genetic material (Table 6). Extinction is absolute when there are no embryos remaining (Signorello & Pappalardo, 2003).

Not at risk: are those breeds for which the total number of breeding females and males is greater than 1,000 and 20 respectively; or the population size approaches 1,000 and the %age of pure-bred females is close to 100%, and the overall population size is increasing (Table 6).

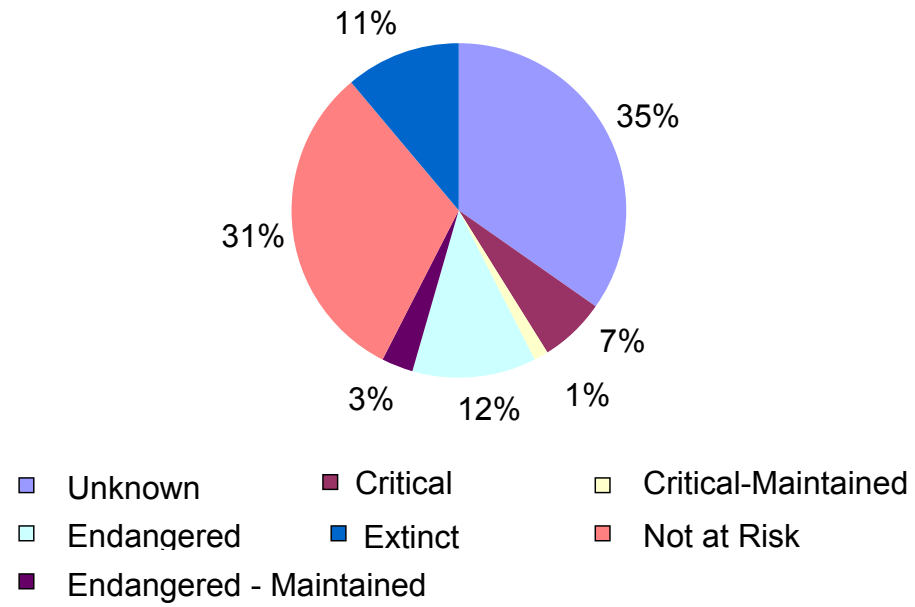
Unknown: a breed for which no data are available.

Table 6: Risk status used by FAO

Risk status	Females		Males		Total breeding animals	Additional criteria
Extinct	0	or	0			Impossible to re-establish the breed
Critical	< 100	or	< 5	or	< 120 and decreasing and < 80% pure breeding	
Critical-maintained						Critical + conservation or commercial breeding program in place
Endangered	<1000	or	< 20	or	between 80 and 100 and increasing and > 80% pure breeding	
				or	between 1000 and 1200 and decreasing and < 80% pure breeding	
Endangered - maintained						Endangered + conservation or commercial breeding program in place
Not at risk	>1000	or	> 20	or	>1200 and increasing	Other categories do not apply

Source: Scherf, 2000

There were 786 horse breeds reported to the FAO Global Data Bank until 2006. Out of 768 horse breeds, 272 (35 %) were unknown, 52 (7 %) were critical, 10 (1 %) were critical-maintained, 95 (12 %) were endangered, 24 (3 %) were endangered-maintained, 246 (31 %) were not at risk and 87 (11 %) were extinct breeds. Among 87 extinct horse breeds, Europe alone reported 71 breeds.



Source: DAD-IS, 2006

Figure 1: Risk status of horse breeds in the world

3. Methodology

The data generated for this study was derived by country or territory or concerning the delimination of its frontiers or boundaries of FAO from member countries of the world. The FAOSTAT and DAD-IS database systems of FAO are the primary sources for developing the information. The data included in the database may be official, semi-official or estimated. The database system of Breeds of Livestock – Oklahoma State University has also been reviewed especially during the study of horse breeds of the world. A World Dictionary of Livestock Breeds, Types and Varieties of I L Mason (1988) also provided a good source of information to input the horse breeds in this study.

3.1 FAOSTAT

http://faostat.fao.org/

FAOSTAT database was the main basis for deriving the horse population from 2000 to 2008. The world was divided into seven continents: Africa, Asia, Europe, Latin America and Caribbean, North America, Oceania and South America. Furthermore each continent was divided into sub-regions and from those sub-regions the data of each countries' horse population was collected. For example Africa was divided into East, Middle, Northern, Southern and West Africa; Asia was divided into Central, Eastern, Southern, South-Eastern and Western Asia; Europe into Eastern, Northern, Southern and Western Europe; Latin America and Caribbean into Central America and Caribbean and Oceania into Australia and New Zealand, Melanesia, Micronesia and Polynesia.

3.2 United Nations Population Division (UNPD)

http://esa.un.org/unpp/index.asp

World Population Prospects: The 2008 Revision Population Database system of the United Nations Population Division was followed to determine the total human population from each continent in the world for the year 2000, 2005 and 2008. The human population from each continent was assessed with UNPD database system and consequently the horse population in the world from each continent is also assessed from the FAOSTAT database system for

the years 2000, 2005 and 2008. In this way the horse per 1000 persons for each continent and for the world was calculated.

Horses per 1000 persons is the total number of horses in the world by the total human population in the world in the respective years.

3.3 Domestic Animal Diversity Information System (DAD-IS)

http://dad.fao.org/

The Domestic Animal Diversity Information System (DAD-IS) is the first globally accessible dynamic multilingual database of Animal Genetic Resources. This database system was the main basis for generating the breeds and risk status of horses for this study. It provides a summary of national breed level information on the origin, population, risk status, special characteristics, morphology and performance of breeds of FAO member countries. It contains more than 14,000 national breed populations of 35 species from 181 countries. Besides breed level information, it provides a virtual library containing a large number of selected technical and policy documents, including tools and guidelines for research related to animal genetic resources.

3.4 Breeds of Livestock Database– Oklahoma State University

http://www.ansi.okstate.edu/breeds/horses/

The Department of Animal Science of Oklahoma State University has maintained the breeds of livestock database system since 1995 as an educational and informational resource on breeds of livestock throughout the world. This database system is used to assess the number of horse breeds for this study. It provides a brief description of horse breeds in terms of origin, distribution, typical features, uses and population status. It displayed the information for 217 horse breeds out of 1,063 livestock breeds in the world.

Europe									
East Europe	4321725	3626349	3429791	304 088	296 912	293 488	14.2	12.2	11.7
North Europe	756121	851949	889580	94 359	96 439	97 918	8.0	8.8	9.0
South Europe	810171	783513	779128	145 119	149 711	152 316	5.6	5.2	5.1
West Europe	1109431	1227431	1276241	183 001	186 358	187 846	6.0	6.6	6.8
Total	6997448	6489242	6374740	726567	729420	731 568	9.6	8.9	8.7
Latin America & Caribbean									
Central America	7176500	7229250	7335300	135 171	144 288	149 580	53.0	50.1	49.0
Caribbean	1280449	1333035	1401020	38 650	40 566	41 629	33.1	32.9	33.7
Total	8456949	8562285	8736320	173821	184854	191 209	48.7	46.4	45.7
Oceania									
Australia & NZ	293000	298042	332511	23 039	24 505	25 304	12.7	12.1	13.1
Melanesia	60730	60740	63350	7 010	7 871	8 412	8.7	7.7	7.5
Micronesia	15	20	40	497	537	559	0.03	0.03	0.07
Polynesia	15844	15845	16065	614	646	662	25.8	24.5	24.2
Total	369589	374657	411956	31160	33559	34 937	11.9	11.1	11.8
South America	15389515	15225273	14971649	347 407	371 658	384 892	44.3	41	38.9
World	57116892	58734981	58770171	6 115 367	6 512 274	6 750 059	9.4	9.1	8.7

Source: FAOSTAT & UNPD, 2010

Appendix 3: Local horse breeds in the world

Africa
Abyssinian
Bahr-El-Ghazal
Basotho Pony
Beledougou
Bhirum Pony
Bobo
Bornu
Calvinia
Cape Harness
Cape Horse
Chadian
Cheval de Nioro
Djerma
Dombi
Egyptian
English WB
European WB
Fleuve
Fouta
Horse (Tanzania)
Horse (Uganda)
L'arabe-barbe
Locale
Logone pony
M'bayar
Mogods pony
Mossi
M'Par
Namaqua Horse
Namib horse
Nefza Pony
Poney
Rancher
SA Miniature horse
SA Sporting Horse
SA WB
Sahel
Somali Pony
Songhoi
Sudan Country breed
Sulebawa
Tawleed
Torodi
Tsawana
Vlampeerd
West African Pony
Western Sudan Pony
Yagha

Asia
Abeia
Anatolian
Azerbaijan Horse
Baguio light horse
Baguio pony
Bajau
Bakhtiari
Bali
Balikun
Baluchi
Bangladesh Native Horse
Basseri
Batak
Bima
Boeta
Bohai
Bose
Bose-Baise Pony
Burmese
Buzkashi
Cabadin
Cambodian
Canik
Chaidamu
Chakou
Cheju
Chyanta
Cukurova
Dahmaa
Dareshuri
Darkhad
Datong
Dawand
Deccani
Deliboz
Dilbaz
Dosanko
Ebian
Elenchus
Flores
Galshar
Ganzi
Garabarh
Gayo
Gemlik
Giawf
Guanzhong
Guba
Guizhou
Haddian
Heihe
Heilongjiang
Henan Light Draught
Hequ
Herati
Hinis
Hirzai
Horse (Indonesia)
Iyi
Jabe
Jaf
Jargalant
Jata
Javakhuri Harness Horse
Jawa
Jeju
Jianchang
Jilin
Jinjiang
Jinzhou
Jofi
Jumli
Karacabey-Halfbred Arab
Karacabey-Nonius
Kathiawari
Keheilan
Kerqin
Khilan
Kipriakis Ektrofis
Kirgiz
Kiso
Kohband
Kuda-Lombok
Kuningan
Kushum
Kustanai
Lichuan
Lokai

Appendix 3: Local horse breeds in the world

Lombok
Makasar
Makra
Malakan
Maneghi
Manipuri Pony
Marwari
Mazari
Megruli Horse
Merak Sakten ta
Minahasa
Miniature horse
Misaki
Miyako
Mongolian -Ujumqin
Mugalzhar
Mytilene Pony
Nanbu
Native Racehorse
New Kirgiz
New Lijiang
Ngua Noi
Ningqiang
Noma
Omarqoub
Pacu Indonesia
Philippine pony
Qatgani
Qazal
Rajshai Pony
Rumelain Pony
Samand
Sandel
Sanhe
Saqallwiya
Shan Pony
Shandan
Shirazi
Shirvan
Shweimaa
Sistani
Spiti Pony
Sri Lankan Pony
Sumbar-Sandel Arab
Sumbawa
Syrian
Taejung
Tagaytay light horse
Tagaytay pony
Tajik Riding horse
Taleshi
Tarai Pony
Taropud
Tattu
Tes
Thai pony
Tibetian-Sikang Pony
Tieling Draught
Tokara Pony
Tooraq
Tsushima Pony
Turkemin
Turkish Arab
Tushuri
Uzunyayla
Wenshan
Xiangfen
Xilinguole
Xini
Yabu
Yanqi
Yargha
Yiwu
Yomood
Yonaguni
Yongning
Yunnan
Yunnan-Lijiang
Yushu
Yuta
Zaniskari Pony
Zhangbei
Zhongdian

Europe

Akhal-Teke
Alpine
Altwurttemberg
American Miniature horse
Amurskaya
Anglo-Arabo-Sardo
Anglo-Normand
Arravani
Asino Baio Lucano
Asturcón pony
Augeron
Auxois
Avarskaya
Avelignese Tradizionale
Balkar
Banat
Bardigiano
Barra Pony
Barut
Bashkir
Belarus Coach
Belgian Draft
Belgian trotter
Belgium Riding Pony
Berrichon
Bessarabian
Bityug
Black Forest
Black Sea
Bohemian moravian belgien
Bosnian
Bosnian Mountain Pony
Brandenburg WB
Bulgarian Native
Burgdorfer
Burguette
Buryat pony
Busa Pony
Byryatskaya
Calabrian
Camarque
Carrossier Normand
Castillon
Catria
Charentais
Charolais
Charysh
Chilkov
Chumysh
Chuvash
CB Trotter
Comune
Corlais
Corse
Cremonese
Crete

Appendix 3: Local horse breeds in the world

Criollo
Croatian Busa Pony
Croatian CB
Curly Horse
Cushendale
Czech Arab Horse
Czech Riding Pony
Czech Trotter
Dales Pony
Danish Trotter
Danubian horse
Deli-Orman
Delta
Devon Pack Horse
Dobrogeana
Dole Horse
Dolny-Iskar
Donska
Draver
Dulmen Pony
Dutch draught horse
Dutch Lippizaner
Dutch Miniature Horse
Dutch Riding Horse/Pony
Einsiedler
English Thoroughbred (Czech)
English WB (Latvia)
Eriskay
Erlenbach
Esperia Pony
Estonian Heavy Draught
Estonian Native Horse
Exmoor (Dutch)
Falabella Miniature Horse
Finnish Riding Pony
Finnish WB trotter
Finnish WB
Flanders
Flemish Horse
Fox-trotter
Franches-Montagnes
Frederiksborg
French Saddlebred pony
French Trotters
Galloway Pony
Garrano
Gazal
Gelderland horse
German Bessarabian
German Riding Pony
German Sport horse
German Thoroughbred
German Trakehner
German Trotter
German WB
Giara pony
Glasinacki
Gocan
Goonhilly
Great Horse
Groningen horse
Halfbred of Mezohegyes
Heavy Draught (Bulgarian)
Heavy WB (Dutch)
Heavy WB (German)
Hebridean Pony
Henson
Hessen WB
Hispano-Bretón
Hungarian Cold-blood
Hungarian Draft
Hungarian horse
Hungarian Sport Horse
Hungarian Trotter
Ialomita
Icelandic Horse (Danish)
Icelandic horse (Dutch)
Irish Cob
Irish Hobby
Irish Pony
Irish Sport Horse
Irski poni
Italian Maremmano
Italian Saddlebreed
Italian trotter
Jaca Navarra
Jutland Horse
Kalmyk
Karakachan
Karatschaewer
Karelian Pony
Kerry Bog Pony
Kisber halfbred
Konik (Dutch)
Krk Island Pony
Kumyk Pony
Kun Kinsky
Kushum
Kuznet Horse
Landais Pony
Latvian Coach Horse
Latvian Draught
Latvian Harness Horse
Lenkoran
Leutstettener
Lewitzer
Lezgian Pony
Lithuanian Cart
Lithuanian heavy draft
Local Moldavian
Loire
Long Mynd
Losina
Lovets
Lundy
Maine
Majorcan
Mallorquina
Małopolski
Manx
Maremanno
Maremmano tradizionale
Mecklenburg WB
Medjimurje
Menorquina
Mezens
Miniature (Belgian)
Minusinsk
Misko
Moldavian horse
Monchina
Monte Horse
Monterufoli Pony
Moravian WB
Morvandeaux
Mountain Horse (Montenegro)
Mulassie
Murgese
Napoletano
Narym

Appendix 3: Local horse breeds in the world

Nivernais
Nogai
Nordland Horse
North Swedish Horse
Northern Ardennes
Norwegian Heavy trotter
Novoalexandrivska Cart
Novoaltaiskaya
Ob pony
Obva
Old Don/Cossack
Old Kladruby
Old Kladruby Black
Old Kladruby White
Onega
Ox-Araber
Paint Horse
Palatine Ardennes
Paso Peruano
Pedigree Saddle Horse
Pentro
Persano
Piebald and Skewbald
Pindos
Pineia
Pinto
Pleven's horse
Podveleski
Poitevin
Polesian
Polish CB
Polo Horse
Poni (Lithuania)
Pony of the Americas
Pugliese
Pura Raza Gallega
Rapid Heavy Draft
Rheinish German CB
Rheinish WB
Riding Horse (Finnish)
Rila Mountain
Romanian Draft
Romanian Mountain
Romanian Sport Horse
Romanian Trotter
Rostopchin
Rottaler
Russian (English)
Russian Ardennes
Russian Cart Horse
Russian Clydesdale
Russian Courser
Russian Draft
Russian Percheron
Russian Saddlebred
Sabih
Sachsen WB
Salernitano
Samolaco
Sanfratellana
Saône-et-Loire
Sarcidano
Sardo
Saxony WB
Schleswig CB
Schweres WB
Scottish pony
Senner
Shtumsky CB
Siciliano
Siglavi
Silesian horse
Skewbald and Piebald
Skyrose Pony
Slovak Sport Pony
Slovak WB
Slovenian CB
Slovenian Haflinger
Slovenian Trotter
Slovenian WB
Small German Riding Horse
Small Horse
Sokolski CB
Sorraia
South German CB
Soviet Saddle
Spotted
Stara Planina
Strelets
Styrian Horse
Swedish Ardennes
Swedish Riding Pony
Swedish WB Trotter
Swiss WB
Tarbésan
Tavda
Thessalia
Thuringian WB
Tiree
Tolfetana
Tolter
Tomsk
Tori
Torian
Toriyskaya
Tory
Transylvanian
Tuva
Tuva Coach
Ukrainian Saddle Horse
Ukranian Pony
Upper Yenisei
Vardy
Vendéen
Ventasso
Verkhoyansk
Vladimir
Vollblutarber
Voronezh Draft
Vyatka pony
Wels
Wielkopolski
Work Horse
Wurttemberg WB
Yakut
Yorkshire Coach Horse
Zabaykalskaya
Zangersheide
Zematukai
Zematukai(Modern type)
Zweibrucker WB

Latin America and Caribbean

Atheland
Caballo des trote
Crillo de Hondureno
Criollo Militar
Cuban Trotter
Galiceno
Horse (Saint Kitts & Nevis)
Media sangre

Appendix 3: Local horse breeds in the world

Mexican Pony
OISK
Patibarcino
Peruana
Ponny Welch
Pony (El Salvador)
Pony (Guatemala)
Pony (Honduras)
Trotte de andar
Warm blood (Honduras)
Warm blood (Mexico)

North America
American Cream Draft
American Miniature
American Walking Pony
Appaloosa Pony
Assateague Pony
Broomtail
Buckskin
Canadian
Canadian Hunter
Cayuse
Chickasaw
Chincoteague Pony
Colorado Ranger
Conestoga
Cow Pony
Cracker
French Coach
Frencher
German Coach
Indian
Lac la croix Indian pony
Missouri Fox Trotting Pony
Morocco Spotted
Narragansett Pacer
Newfoundland Pony
Quarter Pony
Rocky Mountain
Spanish Barb
St. Lawerence
Welara Pony

Oceania
Australian Brumby
Australian Draught Horse
Australian Pony
Australian Stockhorse
Australian Waler
Australian WB
Brumbie
Coffin Bay Pony
English Riding Pony
English Spotted Pony
French WB
German WB
Greenbank Army
Guy Fawkes RNP Brumby
Horse (Papua New Guinea)
Irish Sport horse
Kaimanawa 'Wild' Horse
Kosciusko Brumby
Local Horse (Tonga)
Miniature Horse
Miniature Pony
Namagdi NP Brumby
Palouse
Timor Pony

South America
Anglo Normando
Asno
Bagul
Brazilain Sports Horse
Brazilian Trotter
Caballo Deportivo Uruguayo
Campeiro
Campolina
Campolino
Cimarron
Criollo chileno
Criollo chilote
Criollo Colombiano
Criollo Parauguaya
Criollo Uruguaya
Crioulo
Fine English Blood
Fine French blood
Lavradeiro
Llanero
Marajoara
Marchador
Morochuco Chumbivilcano
Nordestino
Pantaneiro
Paulista
Pony (Parauguaya)
Pony (Brazil)
Pony (Peru)
Puno pony
Puruca
Serrana
Sunicho
Trocha y GR Colombiano
Trochador

Appendix 4: Regional transboundary horse breeds in the world

Africa
Bandiagara
Boer
Dongola
Hausa
Hodh
Koto-Koli Pony
Nooitgedacht Pony
West African Barb
West African Dongola

Asia
Adaev
Bhotia Pony
Chummarti
Dagestan Pony
Karabair
Kazakh
Kurdi
Mongolian
Tanghan
Tibetian Pony
Waziri
Yabu

Europe
Altai
Ardennes
Bavarian WB
Bosnain Pony
Boulonnais
Budyonny
Camargue
Comtois
Estonian Draft
Fell Pony
Finnhorse
French Saddlebred
Furioso-Northstar
Gidran
Gotland Pony
Hutsul
Kladruby
Knabstrupper
Merens Pony
Mur Island
Nonius
Noric
Norman Cob
Pinkafeld
Polish Konik
Posavina
Pottok
Silesian Nork
Tarpan
Tinker
Trakenher
Tuigpaard
Westphalian WB

Latin America & Caribbean
Azteca
Costarricense de Paso
Creole

North America
Canadian
Kanata Pony
Mustang
Sable Island Pony

South America
Criollo Argentine

Appendix 5: International transboundary horse breeds in the world

Akhal-Teke
American Paint
American Saddle Horse
American trotter
Andalusian
Anglo-Arab
Anglo-Kabarda
Appaloosa
Arab
Barb
Belgian draft
Belgian WB
Breton
Caspian
Cleveland Bay
Clydesdale
Colombiano
Connemara pony
Creole
Dales
Danish WB
Dartmoor Pony
Don
Dutch WB
Exmoor Pony
Falabella Pony
Fjord
Friesian
Hackney
Hackney Pony
Haflinger
Hanoverian
Highland Pony
Hispano-Arabe
Holstein
Iberoamericano
Icelandic Horse
Irish Draught
Kabarda
Karabakh
Karachai
Lippizaner
Lusitano
Mangalarga
Morgan
New Forest pony
Oldenburg
Orlov Saddle Horse
Orlov Trotter
Palomino
Paso Fino
Percheron
Peruvian Paso
Przewalski
Purebred Spanish
Quarter Horse
Russian trotter
Shagya Arab
Shetland Pony
Shire
Soviet Heavy Draught
Suffolk
Swedish WB
Tennessee Walking horse
Tersk
Thoroughbred
Welsh Pony

Appendix 6: Critical and Critical-Maintained horse breeds in the world

Critical Breeds

Africa
English WB
Horse (Uganda)

Asia
Burmese
Deccani
Sri Lankan Pony
Tieling Draught

Europe
Altwurttemberg
American Miniature horse
Anglo-Arabo-Sardo
Ardennes
Avelignese Tradizionale
Bosnian
Criollo
Curly Horse
Delta
Dulmen Pony
Finnish Riding Pony
Fox-trotter
Franches-Montagnes
Karakachan
Karatschaewer
Landais Pony
Leutstettener
Maremanno
Maremmano tradizionale
Mur Island
Napoletano
Old Kladruby White
Paint Horse
Palatine Ardennes
Paso Peruano
Persano
Polo Horse
Pony of the Americas
Romanian Draft
Romanian Sport Horse
Rottaler
Samolaco
Sarcidano
Senner
Slovak Sport Pony
Slovenian Trotter
Tarpan
Tolter
Ukranian Pony
Vollblutarber
Zematukai (Modern type)

South America
Sunicho

Critical-Maintained Breeds

Asia
Misaki
Miyako
Noma
Tokara Pony
Tsushima Pony
Yonaguni

Europe
Estonian Heavy Draught
Majorcan
Skyrose Pony
Sorraia
Zematukai

Declaration

To the best of my knowledge and belief, the work presented in this thesis is my own as a part of double degree program from Christian Albrechts University, Kiel and Swedish University of Agricultural Sciences, Uppsala. I, hereby, declare that I have not previously submitted this material either in whole or in part for a degree at this or any other institutions. Where other sources of information have been used, they have been highly acknowledged.

…… …….
Place and Date Signature

Rupak Khadka
Matriculation Number: 486022