
Camelid genetic resources. A report on three Arabian Gulf Countries

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Camel breeds in the Gulf region resulted from a community of breeder's efforts for generations. This community dwells in the same area, keeps and breeds camels for specific purposes and exchanges camels among themselves. In some traditional societies, camels are associated with specific group such as a tribe or family. In the Gulf region, camels are used for meat, milk, transportation and racing. Arabian societies believe that camels are regarded as assets of the community as a whole that must be maintained for future generations; therefore, camels traditionally change ownership only when they are given as marriage dowry to the bride's family. Social aspects therefore, are important for keeping certain camel breeds that have become economically unviable.

The local breeders select their camels for their physical attributes, unique qualities, behavior and performance, therefore, they restricted the use of male camels until they have known what the offspring is like. Therefore most of the Arabian breeders avoided in breeding, certain types of color and performance or combinations produced for many generations. Generally, the breeders kept oral records of genealogies, tracing the ancestry of their herds in female lines. Every camel has a name and a female is usually named after its mother. Selection of male camels is done with utmost care, although, due to economic constraints, not all breeders can afford to use the highest standards. Features such as the looks, size, color, temperament and milk yield of the mother and other female relatives are taken into account. Male animals that produce calves that look similar to their father are regarded as "strong" genetically, and therefore, preferred as breeders. If a good quality male camel is available, it is obliged to be accessible for female camels to be mated.

Introduction

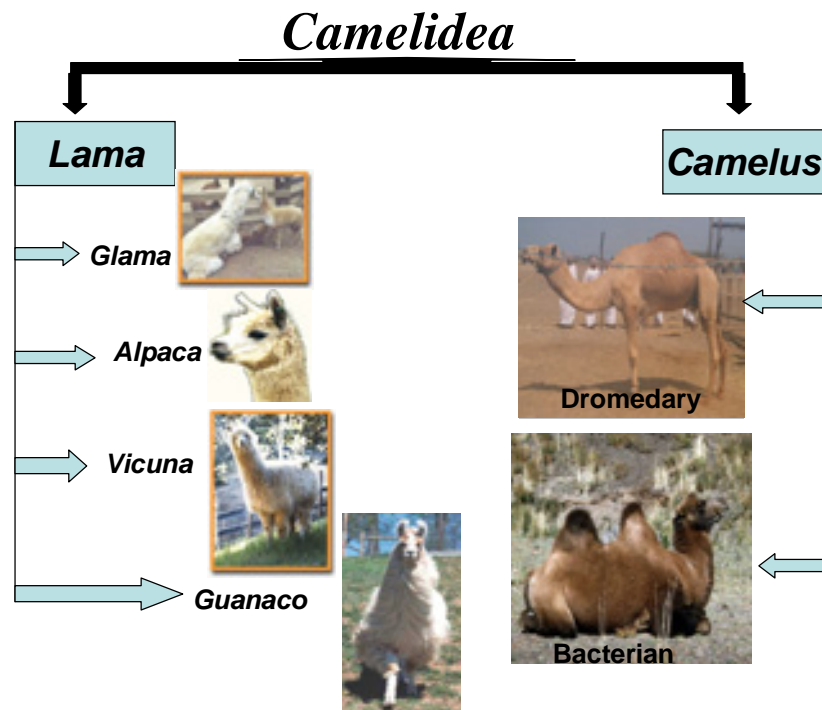


Figure 1. Taxonomy of the camelids

This paper will be overviews the classification of the Arabian camel in general then discuss the types and breeds in the Sultanate of Oman, United Arab Emirate and Saudi Arabia. The racing camel industry is getting well established in the region and recently it substantially developed in the whole region, therefore, the features of the Arabian racing camel breeds will be emphasized in this paper.

Taxonomy, origin and classification

Camelids belong to the order *Artiodactyla* (even toed ungulates), sub order *Tylopoda* (pad-footed), and Family *Camelidae*. They are pseudo-ruminants and have several unique features: they walk on pads rather than hoofs, do not have horns or antlers, and their red blood cells are oval in shape (Larson and Ho, 2003).

The Old World camels fall basically into two species, the Arabian (*Camelus dromedarius*) and the Bactrian (*Camelus bactrianus*). The Arabian camels have one hump and the Bactrian have two humps (Wilson, 1998). The Arabian camels (dromedary) prefer desert conditions characterized by a long dry and a short rainy season. There are still Bactrian camels in the Gobi desert as wild animals, but their numbers are dwindling due to human encroachment. The dromedary camels no longer have wild relatives. It has been suggested that they are actually derived from the Bactrian camels and lost one of their humps in the process of domestication. Introduction of dromedary camels into other climates has proven unsuccessful as they are sensitive to cold and humidity (Nowak,

1991). The Arabian camels are used as pack animals for human transport and as a source of hair, hides, meat and milk (Al-Ani, 2003). Today, there are several local camel breeds in the Gulf region, which have been mainly used in camel racing.

Scientists believe that ancestors of the modern camel lived in North America at least 40 million years ago, moving across the Alaskan 'land bridge' to Asia and eventually Africa. These migration probably occurred during the Pliocene or early Pleistocene between four and three million years ago (Wilson, 1998). In Asia, two groups separated to become the two chief types of camel known today: the one-humped longer-legged dromedary camel and the two-humped, shorter-legged Bactrian camel. There is little evidence for an exact time of dromedary camel domestication due to relatively little changes in camel morphology as a result of selection and also for the lack of archaeological evidence (Wilson, 1998). The earliest evidence for the dromedary domestication dates to about 4 000 years ago on a small island off the Abu Dhabi coast (on the Arabian Gulf). Northern Arabian tribes began to use dromedary camels as riding animals around 3 100 years ago (Kohler-Rollefson, 1991). The Arabian camel then spreaded into many parts of Europe and Asia by the Roman Empire. Similarly, the spread of the Islamic Empire led to wider use of these animals (Gauthier-Pilters and Dagg, 1981). With few exceptions, camels are found in areas where rainfall is low and occurs in a relatively short period followed by a long hot dry season of eight or more months. In Asia dromedaries extend from Gulf of Aden northwards into Turkey, the southern parts of Russia then Afghanistan where their overlaps with Bactrian camel. Dromedary camels occupy arid regions of the Middle East through northern India and arid regions in Africa, most notably, the Sahara Desert. They have also been introduced to arid regions of central Australia where some of the only feral populations now persist. The original range of their wild ancestors was probably south Asia and the Arabian peninsula.

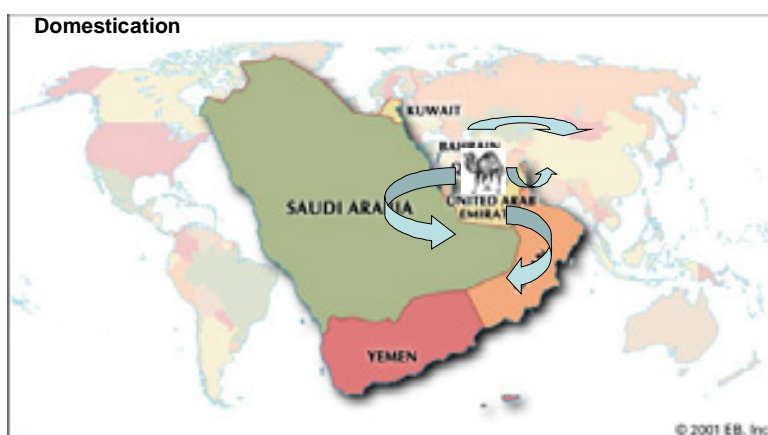


Figure 2. Domestication of the camels in the Arabian peninsula.

Breeds and types of dromedary camels in the Gulf Region

Although there has been relatively little differentiation into specialized types in the camels over years, there are many classifications of the dromedary camel throughout the regions of its traditional global habitat. In general, traditional breed classification divided the dromedary into three types: riding, transport and multipurpose camels. In most areas, camels are multipurpose animals with the females used primarily as milk producers, the males for transport or draught and both sexes providing meat. The lack of specialization can be attributed to the uniform harsh conditions, in which camels are bred and reared and therefore their owners' requirements for them to be multipurpose. If, indeed, specialization has occurred it is in the dichotomy of riding and pack types, both within the overall transport function. There is evidence that some camels have a finer confirmation and are considered to be the equivalent of the thoroughbred horse breed. They are much sought after by the camel racing fraternity in the Gulf region.

Riding Camel

The dromedary camel bears a remarkable similarity to that of the thoroughbred racehorse. The head is small with fine muzzle, small lips, small ears, set close together, alert eyes and lower jaw deep below the eye. Therefore, they have been used for military purpose to protect the desert border. The neck is fine and supple and joined down to the trunk. The shoulder is long and fine, the chest very deep, ribs well sprung and terminating not far from the pelvic bone. The fore legs should be set close together, be straight, not brush at the knees and the feet not turned out. The quarters are well muscled and the tail set high, the feet medium sized, the skin fine and supple. According to Al-Ani (2003) the highest point from the tip of the hump to the ground is estimated between 1.8 to 2.2 meters with 450 to 600kg weight of the male. This type of camel can carry a rider and walk for 10-12 hrs continual without water or feed. They can also walk at speed 15-20 km/h for three days without rest.

Baggage camel

Baggage camels are much tougher than riding camel, with heavier head and neck, shorter legs, heavier bone and larger feet. Their pace is slower and shorter than that of the riding types but equally tireless. This type of camel measures 1.4 to 1.9 meters from the tip of the hump to the ground and average weight between 550-700 kg. They can carry 160 to 290 kg and walk between 4-6 km/h (Al-Ani, 2003).

Traditional breeds in the Gulf Region

Little appears to be known about types and breeds in this part of the world. Although, there is little justification for the present classification, camels were named after the tribes that breed them or due to their colour. However, recently, attempt has been made in some countries to categorize camels into conventional types such as meat producer, milk producer, dual purpose and racing.

Modern advances in the technology for studying genetic variation provide a powerful tool in the study of evolution of camel breeds. There are little quantitative production parameters that are now so important in other species to the breed description, such as riding, transport, milk, meat and double purposes camels. Selection programme can be used to clarify the ancestry of domestic camel breeds in the region and provide a valuable aid to animal breeders to genetically improving production of the local breeds.

Generally, the camels in the Gulf region can be classified according to their productivity into four classes according to their foundation:

1. meat producers;
2. milk producers;
3. dual purpose; and
4. racing camels.

Large size camels characterised by a long neck, bulky muscles, large single hump and rapid growth rate. The best camel meat comes from young male camels. It is regarded as a delicacy in the Arabian diet, and is gaining popularity in arid lands where it is difficult to herd sheep, cattle and goats. Camel meat is started to have its own way through the meat industry in the gulf region.

**Meat
production
camel**

Al-Dowasir breeds, which, reared in Saudia Arabia, are medium sized camels with good size udder and uniform body with moderate to high milk production according to the nutrition status of the animals. Al-Dowser has the highest milk yield of all breeds in the Gulf region. Camel milk is much more nutritious than that from a cow. It is lower in fat and lactose, and higher in potassium, iron and Vitamin C. It is normally drunk fresh, and the warm frothy liquid, heavy and sweet, is usually an acquired taste for the Western palate. Most the Arab Gulf Countries camels are females reared for their milk in dairy herds.

**Milk
production
camel**

Al-Kawar breeds are medium to large size camels. They can produce a moderate amount of milk. Al-Kawr camels are found in United Arab Emirate.

**Dual purposes
camel**

Camel racing in the Arab Gulf Countries is a traditional sport comparable to horse racing in the Western World. Selective breeding of racing camel has taken place by individual camel owners in these traditional areas of the world. However, over many years of natural breeding in the arid areas of the Arab Gulf countries, the camel has evolved to produce a typical racing animal. This is still basically slim, lightweight with high-speed type of camel and is unique only in that it is derived from the dromedary camels.

Racing camel

According to FAO (2003), the number of camels in the Arab Gulf Countries is about 665 620 in 2002, distributed over six countries. The traditional classification of camel's breeds in this region, according to the coat's colors, is Al-Majahem, Al-Wathah, Al-Hamrah, Al-Safrah, Al-Zarkah, Al-Shakha, Al-Shalah, Al-Kimta and Al-Malhah camels. Variety of local camel breeds are available in different Gulf countries, therefore, the camel breeds will be classified according to each individual country in the region.

Sultanate of Oman

Omani camels are characterised by relatively small head, long body, narrow neck and deep chest, straight rear legs, with distant hocks and raised tail. They have smooth skin and light colors, fine bones and light weight (Wardah, 1989). Although there is no defined breed, certain types and sub types of this group have been recognized and developed by various families and tribes. A list of types of racing camels identified in Oman is summarised in Table 1. Omani tribes cross the borders and get their female camel mated by superior United Arab Emirate male camels. However, generally the government encourages camel owners to keep local breeds as pure as possible.

United Arab Emirate

Number of camels significantly increased in United Arab Emirate for the last two decades due to selection programme for racing camels. The government and private sectors is strongly supporting camel racing industry. The camels in the United Arab Emirate are mainly grouped into three breeds:

1. Al-Arabi. One of the earliest breeds in the region that contribute to well recognized subtypes including:
 - a. Al-Esseker
 - b. Wahbar
 - c. Al-Komry
 - d. Sokan
 - e. Om Sbeehan
 - f. Teban
2. Al-Kazmiat. It is a multipurpose heavily built breed, the camels of this breed are well known for meat and milk production. Al-Kowar is one of the most famous breeds belong to this group.
3. Racing camels. Racing camel has shown a market development during the last two decades. The government imported well-known racing camels from different countries and they were used for crossing with endogenous breeds. Therefore, new racing breeds have been established such as:
 1. Sokan
 2. Hamlol
 3. Msehan
 4. Al-Thenian

Table 1. Types and Sub-types of Omani racing camels.

Name	Origin	Color	Characteristics
Samha	Interior region	Brownish-Red	Walking long distances and known as good racing camel
Farha	Al-Sharkia Region	Red, blond or yellowish	Divided into 6 subtypes. It is beautiful with fine skeleton. Good for racing
Buwadah	Al-Sharkia Region	Whitish	Famous for long distance traveling and tolerate hunger for long period, easy to handle
Arjaa	Interior Region	Yellowish & blondish	Originated from Samha a good long distance racing camels and has good milk yield.
Musaiha	Batinah Region	Golden	Known for good breeding males and long distance racing
Shahbar	Batinah Region	Reddish to blondish	Famous for being intelligent, good milk producer and her body's is higher at the front than the rear
Al-Azkiyah	Al-Sharkia Region	Light yellowish	Famous for racing and milk production. It has a medium hump size.
Al-Bahree	Batinah Region	Reddish to yellowish	Famous for short distance racing
Al-Kawara	Batinah Region	Reddish to yellowish	It has long and big body size and used for long distance traveling. The front and rear ends have the same height.
Gazaella	Al-Sharkia Region	Reddish to white	It has a high and heavy body with long neck.
Al-Azbah	Al-Sharkia Region	Blondish	Easy to handle with fine skeleton and straight head. It has a big size body with fine legs. Good racing camel.
Kudsha	Al-Sharkia Region	Reddish-Blondish	Fast racing camel used for long distance. Have a medium body size with centrally located hump

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Name	Origin	Color	Characteristics
Dhibian	Al-Dhahira Region	Reddish	Al-Dhibian tribe breeds this camel. It has a short neck with large skeleton. Famous in long distance racing
Sadoorah	Interior region	Light red	Famous for short distance racing. It has a strong body.
Zabeia	Al-Sharkia Region	Blondish	Famous for long distance traveling. It has a long back and her body's is higher at the front than the rear
Al-Derehiah	Al-Zahra Region	Yellowish-Blondish	Subtypes descended from it such as Al-Esefer, Habar and Hamza's daughters and Al-Draae. It has a medium size body with lightweight with tolerate fatigue.

Source: The original of Omani Camels, Royal Diwan Court, Sultanate of Oman (1998).

Saudia Arabia

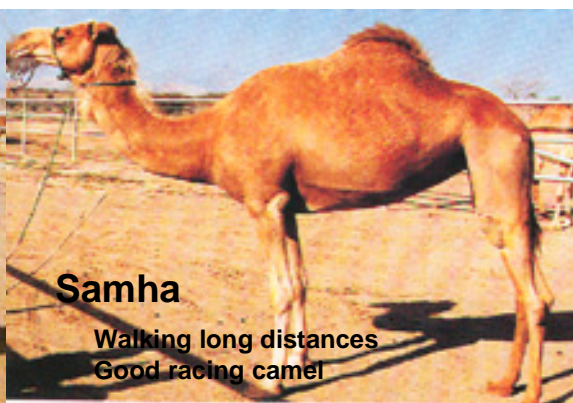
Camels are one of the main strength of animal production in Saudia Arabia. These are relatively larger with high milk production and located in the desert area used for riding and light baggage as well as being major source of meat and milk for owners.

The main camel breeds are:

1. Al-Majahem. The coat colour of this breed varies from dark yellowish to black with high milk production. This breed is located in the eastern south of the country. This group includes the following sub-types:
 - a. Al-Dawser. Large size black camel with high milk production.
 - b. Al-Sohib.
 - c. Shomer Al Enza.
2. Al-Makater. The coat colour of this breed is white and located in the northern part of the country. This group includes:
 1. Horat Al Madenia
 2. Al-Shiabeen and Okban
 3. Al-Shorarat
 4. Al-Shahab
3. Lorak. The coat colour of this breed varies from white to reddish brown and located in the Tohama and Aseer regions.
4. Racing camels, grouping the following:
 1. Al-Omaniat: Known as Jaish for its speed
 2. Al-Hurah (Al-Hararyer): The camels of this breed are of good height, strong in build with their nose tilt upwards and have smooth fur.
 3. Al-Sodaniat: Known as Sudanese Jaish for its speed



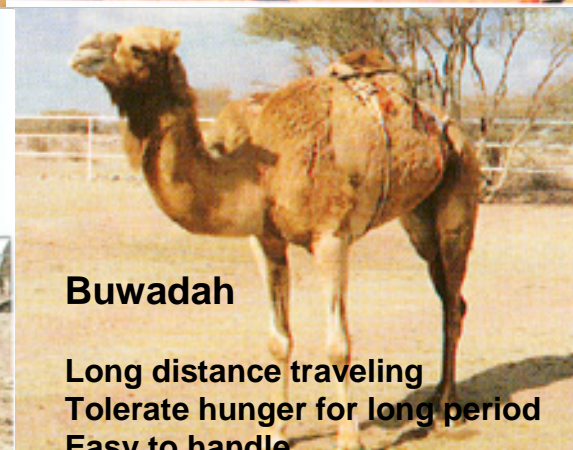
Farha
Beautiful with fine skeleton
Good for racing



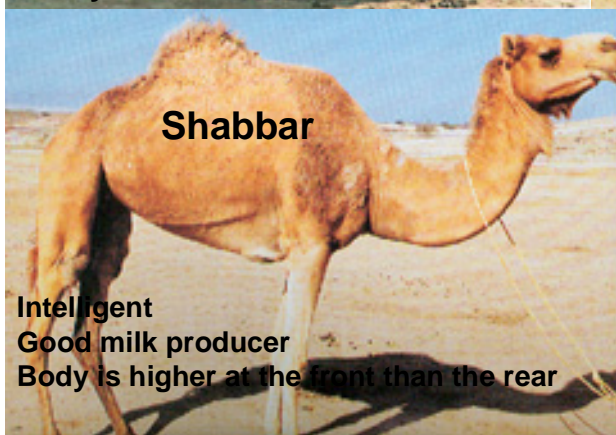
Samha
Walking long distances
Good racing camel



Arjaa
Long distance racing camels
Good milk yield



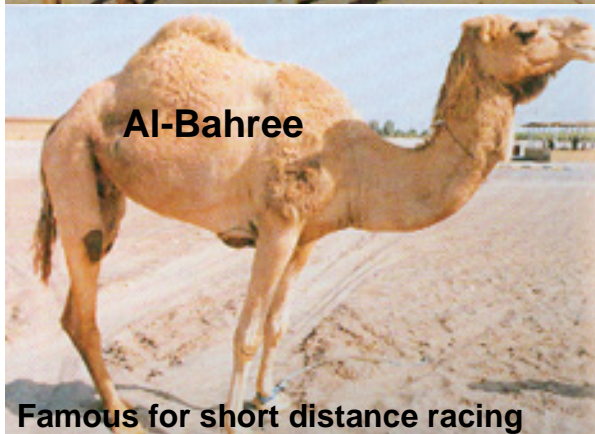
Buwadah
Long distance traveling
Tolerate hunger for long period
Easy to handle



Shabbar
Intelligent
Good milk producer
Body is higher at the front than the rear



Musaiha
Good breeding males
Long distance racing



Al-Bahree
Famous for short distance racing

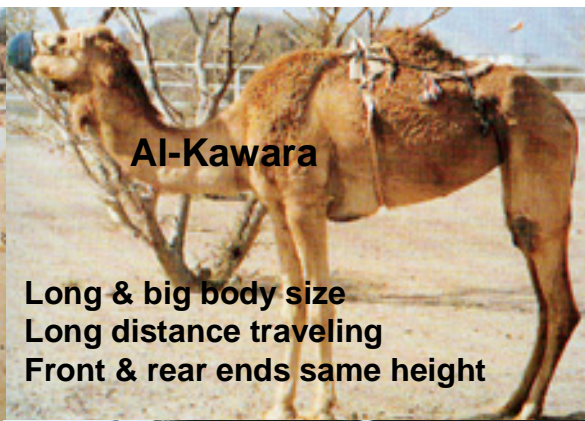


Al-Azkiyah
Famous for racing and milk production
Medium hump size



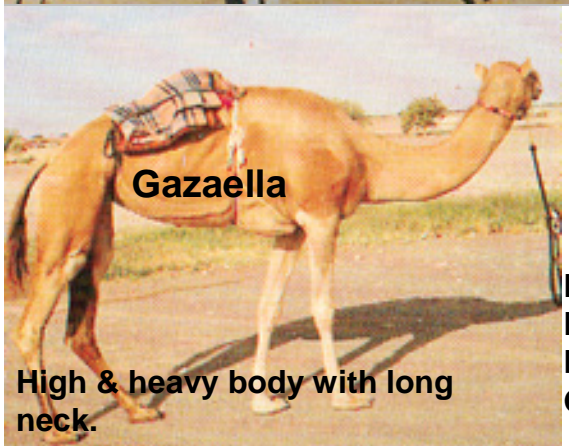
Kudsha

Fast racing camel
Medium body size
Centrally located hump



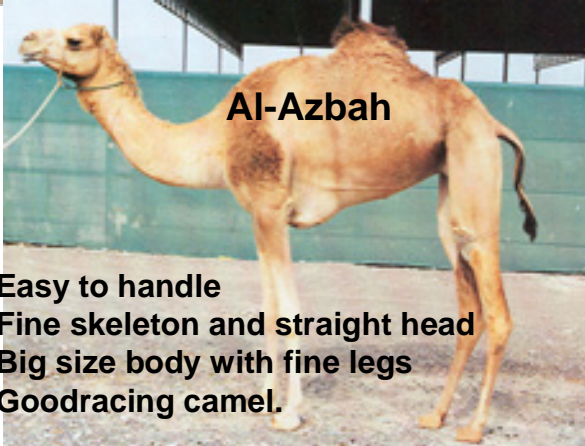
Al-Kawara

Long & big body size
Long distance traveling
Front & rear ends same height



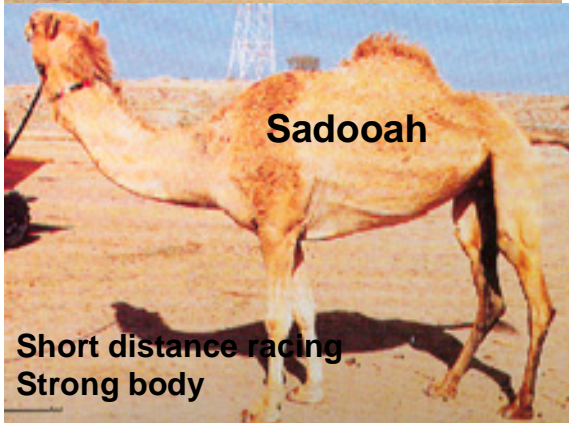
Gazaella

High & heavy body with long neck.



Al-Azbah

Easy to handle
Fine skeleton and straight head
Big size body with fine legs
Good racing camel.



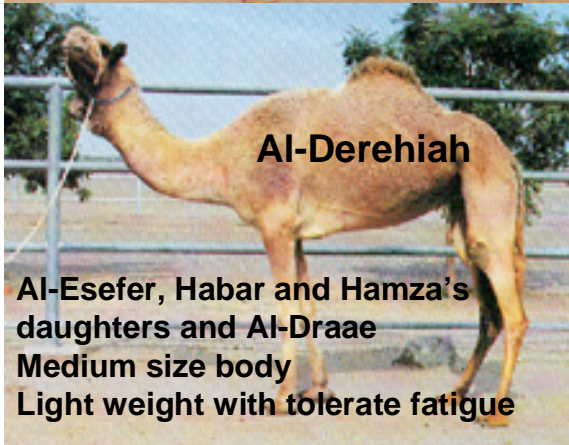
Sadooah

Short distance racing
Strong body



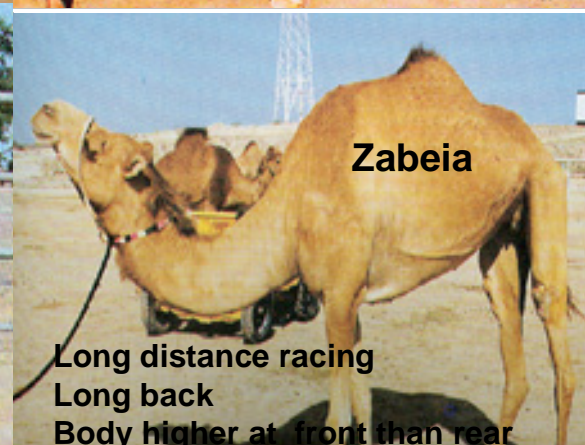
Dhibian

Short neck with large skeleton
Long distance racing



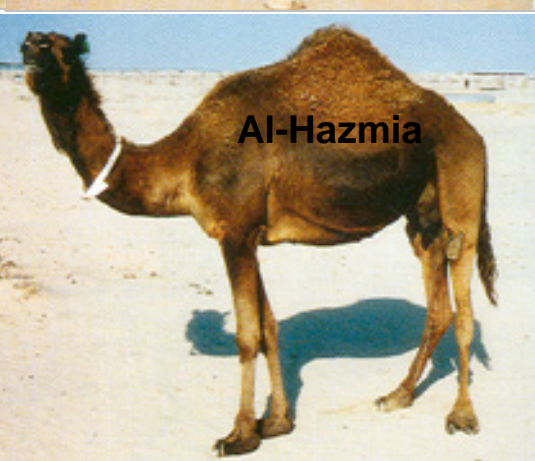
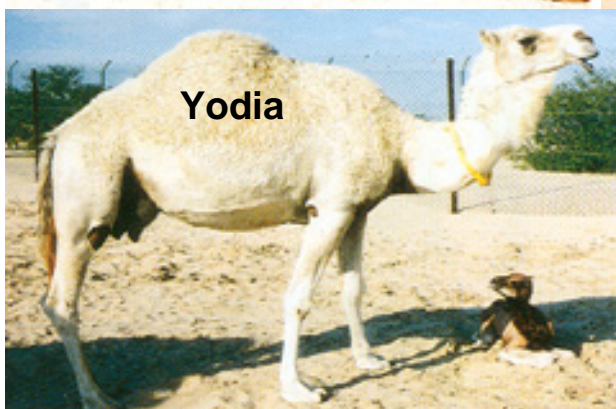
Al-Derehiah

Al-Esefer, Habar and Hamza's daughters and Al-Draae
Medium size body
Light weight with tolerate fatigue



Zabeia

Long distance racing
Long back
Body higher at front than rear



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