

Veterinary Medicine and Animal Keeping in Ancient India

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Abstract

Domestication of dogs, buffaloes (?), elephants, and fowls occurred in India between 6000 and 4500 BC. Strong archaeological evidence is available for existence of an advanced civilization in Mohenjo-daro, Harappa (now in Pakistan) and certain other places in northern India around 2500 BC. The people of these civilizations had both humped and humpless cows, buffaloes, elephants, goats, fowl, etc. Cattle husbandry was well developed during the Rigvedic period (1500–1000 BC) and the cow (Kamdhenu) was adored and considered the 'best wealth' of mankind. Aryans laid great emphasis on protection of cows. Atharvaveda provides interesting information about ailments of animals, herbal medicines, and cure of diseases. Shalihotra, the first known veterinarian of the world, was an expert in horse husbandry and medicine and composed a text Haya Ayurveda. Sage Palakapya was an expert dealing with elephants and composed a text Gaja Ayurveda. During Mahabharata period (1000 BC), Nakula and Sahadeva, the two Pandava brothers were experts of horse and cattle husbandry, respectively. Lord Krishna was an expert caretaker and conservator of cow husbandry. Gokul and Mathura were famous for excellent breeds of cows, high milk production, quality curd, butter, and other products. Buddha was a great protector of all kinds of animals and birds (including game) in ancient India as he preached lessons of non-violence to masses. Graeco-Romans imported livestock from India after invasion by Alexander. These descriptions are available in Indika, a book authored by Megasthenes, the ambassador of Seleucus Nikator, king of Mecedonia in the court of Chandragupta Maurya. The great king Ashoka (300 BC) erected the first known veterinary hospitals of the world. He arranged cultivation of herbal medicines for men and animals in his empire and adjoining kingdoms. In a famous text, the Arthashastra (science of economics) composed by Kautilya, the guide and political advisor of emperor Chandragupta Maurya, a lot of information is available about different animal (elephant, horse, and cow) departments, grazing lands, rules of meat science, livestock products like skin and fur, and veterinary jurisprudence. This knowledge flourished during the great Hindu kings of the Gupta period up to 800 AD before Islamic followers invaded India.

More than an economic enterprise, livestock keeping is a centuries-old, inviolable tradition of ancient India. Some of the most important cultural and religious institutions and traditions of the Hindus are linked to domesticated animals. There is ample evidence to suggest that animals were domesticated before the beginning of the written history. The ancient history and its recording by written or unwritten sources is somehow seen as sacrosanct and therefore not open for any revision. History can be traced from excavation findings, old scriptures, and edicts. Ancient Indian literature in the form of the holy Vedas, Puranas, Brahmanas, epics, etc. is flooded with information on animal care, health management, and disease cure. India has lived a life concentric with religion at its center and the cow occupied an important place, not merely for the nutritive lacto-products they offer, but also for cultural ethos.

Paintings of cave men and animals

Being a member of the Mammalia class, Primate order, and Hominoidea superfamily, man also may be considered as an animal, but with a difference of wisdom and culture. Although bones of several species of animals have been found at the campsites of early man, but it is through his artistic creations that we know a lot about his relationship with animals. The oldest art belonging to the Upper Palaeolithic period, in the form of chattel objects or rock paintings, is therefore called 'Zoomorphic'. In the earliest phases, natural images of animals are found, whereas the depiction of human figures is very rare. In a hunting-foraging economy, animals were valued for their protein-rich meat, skin, bone, horn, and antlers. But they were not the sole items of their diet as there were many other easily available edibles in the forests. During the Proto-historic time, with the beginning of a sedentary lifestyle, animals were reared for their products, transportation, and farming. It was only during the Early Historic time that man enslaved animals and misused them even in the battlefield. All these stages of man-animal relationship from the Pre-historic time to Early Historic time are depicted in the art of the cave dwellers (Mathpal,1984).

Animal husbandry in Harappan culture

Excavations of Harappa in Montgomeri district, Punjab and Mohenjo-daro in Larkana district, Sindh (now in Pakistan) in 1920–22 provided valuable archaeological evidence of a well developed civilization, which was 5000 to 6000 years old. The famous Indus Valley civilization was better known for highly developed culture and organized society. People of Indus Valley civilization were familiar with dogs, bulls, sheep, goats, buffaloes, horses, and elephants. They were also aware of a number of wild-game and animal products, such as milk, curd, ghee, and meat. Fish was their main animal food. These people were fond of mutton, beef, chicken, and meat of tortoise. Seals recovered from Indus valley provided knowledge of bulls, buffaloes, goats, elephants, ibex, and many other animals. The script on these seals has not been fully deciphered so far.

Vedic age

A lot of information is available on keeping of animals in the Vedic Age in the Rigveda, which is the oldest holy book of Aryans. In Rigveda, animals were considered as wealth. Aryans maintained their cattle on pastures, which were near to their dwellings. They cut the jungles and grazed cattle there. The cows were milked thrice a day. Castration of males was practiced and oxen were used for farm transport. It appears that Aryans preferred cows. Buffalo was not a commonly used animal by them. They kept dogs for guarding houses and for hunting of boars. Sheep were kept mostly for wool and goats for milk. Oxen were used for plowing and irrigation also. The cow has been defined as *aghanya*, i.e., not to be killed, indicating the high sanctity of the cow in the Vedic period. In Rigveda, barley, sugarcane, and leftovers of sesame after extraction of oil were used for feeding of animals.

Masters of philosophy searched the secrets of life and the universe and developed "cow science". Virtually "cow science" is a unique gift of India to the whole world. Learned people of ancient India considered that whole cow family or "*gau vansh*" was essential for existence of humanity, its protection, nourishment, development, and culture. Cow milk provided special energy, strength, and intelligence. Cow dung and urine nourished agriculture farming. Bullock power helped in development of techniques in agriculture like carrying draft,

transportation, and cottage industry. Skin from dead animals supported the leather industry and handicrafts. Therefore, cow husbandry was always core-point in the Indian lifestyle and economy during the Vedic period.

Animal Ayurveda during Vedic period

The Vedic Society in India was dominated by the 'cow culture' and Vedic people adored the cow and regarded it as the source of their good fortune, happiness, and good health (Rigveda 6.28.1, 6). It is believed that the religious priests, who had the responsibility of maintaining cattle, were the first animal healers or veterinarians. A number of Vedic hymns indicate medicinal values of the herbs and it is likely that these priests were also apt to it and used their medical knowledge to keep the sacred cattle free from ailments. The Atharvaveda mentions about healing herbs and drugs. The Ayurveda (the science of life) deals with the knowledge of medicine possessed by the Vedic saints.

Epic period

In later Vedic period (2000–1000 BC, the age of Iron and painted Grey Ware), which includes the two epics, i.e., Mahabharata (c. 1400 BC) and Ramayana (c. 2000 BC), which depict the religious, social, political, and economic life of the Aryans during post-Vedic period. In the epic Mahabharata, references have been made to many domestic animals including cattle, sheep, goats, dogs, elephants, and horses and their uses. Cow dung was used as manure.

Ramayana is the oldest literature of Sanskrit, although no written history is available of that period. The treatment of various ailments using medicinal herbs and surgical procedures are described at length. Various uses of oil as preservative and treatment are mentioned. Surgical procedures like caesarean section, hysterectomy, etc. were known to be performed by trained *vaidhyas* or physicians. Fruit juices, flower extracts, and wines made from fruits were said to have great medicinal properties. Medicinal herbs like *arjuna* (*Terminalia arjuna*), *kutaja* (*Holarrhena antidysenterica*), *kadamba* (*Anthocephalus cadamba*), *sarja* (*Vateria indica*), neem (*Azadirachta indica*), *ashoka* (*Saraca asoca*), *asana* (*Pterocarpus marsupium*), etc. were used widely to cure ailments of men and animals. Diseases like leprosy, tuberculosis, mental disorders, etc. were described along with treatment. The herbs found in the mountains of Kanchanjunga and Kailash (now in China) are said to possess good medicinal quality.

Cow husbandry in Mathura during Krishna's era

One of the beloved Hindu deities, Lord Krishna belonged to the period 900–1000 BC. Cow husbandry was well developed in Mathura. Cow milk, curd, butter, whey, etc. were produced in sufficient quantities, in and around Mathura. People of Brij region paid tax to their king Kansa in the form of milk and milk products. Krishna started worship of cows on the day after *Deepawali* festival in place of Lord Indra. Since then this day is celebrated as *Gopastami* and cows are worshiped. During Krishna's era, a cow named Surabhi was famous. A lot of information about cow husbandry is available in Shrimad Bhagwat, poetry of Suradas and paintings of that era.

Mauryan age

Animal husbandry made great progress in the Mauryan age (322–232 BC). The Mauryan age preceded the period of Buddha and Mahavir, who preached non-violence towards animals. The earliest Buddhist text "*Suttanipata*" describes cattle as a giver of food, beauty, and happiness (*annada*, *vannada*, and *sukhada*) and therefore deserves to be protected. According to Kautilya's Arthashastra, cow was a worshiped animal. It was one of the first duties of the King to worship the cow with her calf and bull. The killing of cow was a deadly sin. Buffalo

also became a recognized dairy animal by this period. In the Arthashastra, goat has been described as an important milch animal like cows and buffaloes. Sheep were raised for wool. According to Arthashastra, in a breeding herd, 4 bulls should be provided for every 10 cows/buffaloes. Feeding of animals on pasture was the main practice. It was the duty of the King to identify and provide enough land for pastures near each village. The *Gopa* (village accountant) was supposed to keep the details of the pasturelands. In Arthashastra, there is separate mention of dry straw (*trina*) and green grasses (*yavasa*), indicating a clear concept about green and dry fodder in the feeding of animals. Feeding of oil cakes has also been recommended. Rations for cow, buffalo, mule, camel, etc. have been described separately at several places. Milking was done either once in the morning during summer and spring or twice, i.e., in the morning and evening during rainy season, autumn, and first part of winter. Difference in the fat content in buffalo and cow milk was well known. Milk fat was usually used as *ghee* or butter oil. There was capital punishment for stealing or hurting a cow. When a person caused a bull to fight with another bull, he was fined. If any person injured a bull, he was heavily fined. Veterinary services were essential services during the Mauryan period. In this period, asses were used to carry loads. Horses were used to yoke different kinds of chariots like festival chariots, battle chariots, and traveling chariots. In the stables, different kinds of horses were kept separately. Horses were regularly trained for warfare. There were horses of many breeds. Arthashastra has graded them as best, middle, and ordinary quality. Thoroughbred horses were recommended parched rice, drippings, minced meat, red rice-powder, and grasses. Mules have also been mentioned in Arthashastra, indicating their presence in the Mauryan period. Elephants were very important animals in the Mauryan period. They were used in warfare, as they were very useful for storming fortresses; breaking upon massive doors and to move even in dense forests and marshy lands. There were about 6000 elephants with Nandas and 9000 with Chandragupta Maurya. Elephants for war and riding were housed inside the fort. Whoever killed an elephant was sentenced to death. Tusks of an elephant were considered precious.

Ashoka period

The present-day Veterinary Council of India adopted its insignia, the sculpture of a bull and a part of the text of the stone edict from the period of Emperor Ashoka (around 300 BC), which projected the veterinary profession as its “best heritage” (Singh, 2002a). Ashoka, the grandson of Chandragupta, who turned to Buddhism after Kalinga war gave veterinary science a new turn in India. It is described that the first veterinary hospital existed in Ashoka’s regime (Schwabe, 1978). The ‘Baniyan Hospital’ of Suratis is believed to be one of them, which consisted of a large piece of land enclosed by high walls. Provision for keeping indoor patients was made inside to accommodate animals.

Graeco-Roman accounts on Indian animal world

According to Arora (1994), the knowledge about India to Greek world may be divided into: (1) Greek authors under Persian Empire (500–400 BC); (2) Accounts of Hellenistic authors (400–200 BC); and (3) Roman age accounts (100 BC–300 AD).

Animal surgery

From primitive therapeutics, the early man turned to primitive surgery. “Susruta Samhita” is the earliest known work dealing with surgery. According to evidence with Indian scholars, Dhanvantari’s direct disciple Susruta belonged to 600 BC. He made great improvement in the general techniques of surgery and performed many new and major operations. Susruta Samhita testifies to the great scientific knowledge of the ancient Indian surgeons. It was translated into Arabic before the end of 800 AD and was called ‘Kitab-Show-Shoon-a-Hindi’ or ‘Kitab-i-Susrud’; Cellars translated into Latin and Hassler into German. The students were

taught surgical techniques first on dummies and later on dead bodies. Before Susruta's time, knowledge and practice of surgery in India was more or less of the same standard as in contemporary civilizations like Egypt, Mesopotamia, and Greece.

Almost all aspects of surgery were dealt in ancient medical veterinary treatises. Some of these aspects were preliminary surgical methods, dressing and bandaging of wounds, symptoms to predict prognosis of the surgical cases, etc. Special methods include application of cautery, removal of foreign bodies and obstructions, surgical grafting, and treatment of fractures, dislocations, and fistula. Methods of suturing and plastering and duties of physicians, surgeons, and nurses have been dealt in detail. General principles of surgery described include preparatory measures and principal measures (including surgery and post-operative measures). However, there appears to be no mention of anaesthetic techniques. Surgical treatment of animal disease was very much developed during Vedic period. Skilful surgeons treated animals with precision and great perfection. Various techniques of surgical operations along with instruments have been dealt in detail in Shalihotra's and Palakapya's works. Treatment of sinus fistula, burns and scalds, snakebite, fractures, ailments of ligaments/tendons, dystocia, removal of dead foetus, extraction of teeth and fractures were routinely done during Vedic period (Singh, 2002b).

Cure of animal diseases

Animals received good medical care in ancient India. Physicians treating human beings were also trained in the care of animals. Indian medical treatises like Charaka Samhita, Susruta Samhita, and Harita Samhita contain chapters or references about care of diseased as well as healthy animals. There were, however, physicians who specialized only in the care of animals or in one class of animals only; the greatest of them was Shalihotra, first known veterinarian of the world and the father of Indian veterinary sciences. The treatment of animal diseases in ancient India was well developed and carried out with great care and precision by well-trained personnel.

The treatment of animal diseases using Ayurvedic medicine has been mentioned in Agni Purana, Atri-Samhita, Matsya Purana and many other texts. The treatment of a variety of ailments: infection of horns, ears, tooth, throat, heart, and navel, rheumatism, haemorrhagic enteritis, dysentery, digestive ailments, cold, parasitic/verminous diseases, stomach worms, rabies, abscess, anaemia, wounds, medicines to increase milk production, epistaxis, retention of urine, urinary colic, constipation, lacrimation, arthritis, rhinitis, sprain, haematuria, and skin infection has been given in detail (Somvanshi, 1993).

Ethno-veterinary medicine

Before the advent of modern allopathic system of medicine, it seems possible that the healing art was almost the same throughout the world including India. This system of medicine has given the term ethno-medicine (when implied to human treatment) and ethno-veterinary medicine (in the context of animal treatment). In India, ethno-veterinary practices were in vogue since time immemorial. In ancient India, the Vedic literature, particularly Atharvaveda is a repository of traditional medicine including prescriptions for treatment of animal diseases. Scriptures such as Skanda Purana, Devi Purana, Matsya Purana, Agni Purana, Garuda Purana, Linga Purana, and books written by Charaka, Susruta, Palakapya (1000 BC), and Shalihotra (2350 BC) documented treatment of animal diseases using medicinal plants. Vedic texts also describe divine healing powers. Yajurveda cites importance of growth and development of medicinal plants and Atharvaveda mentions about the value of medicines in curing the diseases. Shalihotra undoubtedly appears to be the first veterinarian of pre-historic times. The ancient Indians were so apt with the knowledge of herbals, even Alexander acquired some of the skills used by Indians, particularly for treatment of snakebite.

Snake venom as a valuable medicine

Ancient India had the distinction of having the advanced center of toxicological and herbal research in Taxila. As per Indian history, as mentioned in *Rasa Granthas* (books dealing with mercury and snake venom), Hindus were pioneers in the use of snake venom in medicine. During the ancient period, it was popularly known that in a very small dose, given by oral route, snake venom was one of the most powerful stimulants and if snake venom is mixed with bile of animals, its action becomes totally different. Few of the most important medicines prepared during the period from young and healthy black cobra, for the healing of sick humans and animals were: (1) *Suchikabharana* – a preparation of cobra venom containing mercury, sulfur, lead and aconite mixed in equal parts and soaked in the bile of *rohu* fish, wild boar, peacock, buffalo, and goat. This mixture was dried in a cool place and powdered. Administered in small doses (as “point of needle”), it was effective in a number of diseases such as plague, fever, coma, tuberculosis, etc.; and (2) *Ardhanarisvara Rasa* – It was prepared by mixing and triturating one part each of mercury, sulfur, aconite root, and borax. This mixture is then put in the mouth of black cobra and the mouth closed with mud. The head is covered with salt in earthen vessel. The pot is covered with mud and mild heat is applied constantly for 12 hours. The medicinal preparation is then triturated into fine powder for use as snuff for treatment of obstinate fever. Similarly, other medicinal agents, viz., *Brihat Suchikabharana*, *Aghorenrisingharana*, and *Kalanala Rasa* were also prepared with different snake venoms. At present, in the Homeopathy system of medicine, some excellent medicines (Lachesis, Cenchris Contortix, Toxicophis, Bothrops Lanciolatus, and Lachesis Lanciolatus) are also prepared from snake venom (Srivastava, 2002).

Combating parasitic diseases

In India, knowledge about parasites, their transmission and control was documented in Charaka Samhita, in the form of citations as teachings from the Great Guru or teacher, Lord Atreya to his disciple Agnivesa. Not much information is available on parasitic diseases, their characteristics, therapy, etc. prevalent in ancient India.

Meat science

Although milk, fruits, vegetables, and grains formed bulk of their food, Vedic Indians were meat eaters. Slaughter of animals was more or less a sacrificial act. Goat and sheep meat were consumed by men and offered to their gods. During Rigveda, cow slaughter was banned. However, horseflesh was eaten occasionally at the time of religious sacrifice called *Ashvamegha yagna*. Dogs were used for hunting wild boars. In later Vedic period, meat eating was fairly common but killing of cow was a deadly sin. Vedic Aryans did not prefer fish while the Indus Valley people had a special liking.

During Ashoka period, non-violence or *ahimsa* was a policy of the state but meat eating was not banned. Slaughterhouse was located at a distant place towards south of the palace and regulated by a superintendent. Pregnant or milking goat, sheep, pig, and piglets up to 6 months of age were banned from slaughter. Butchers selling meat derived from sick or dead animals and adulterated or spoiled meat were severely punished. This shows that meat science had a sound basis in ancient India.

Elephant medicine or Gaja Ayurveda

Palakapya, an ultimate authority on elephant medicine belonged to the Rigvedic period 2000–4000 BC. The Gautam Samhita, the Ashva Ayurveda, and Hastya Ayurveda are the only treatises on animal science till now. Palakapya wrote Hastya Ayurveda or Gaja Ayurveda

dealing with elephant medicine and dedicated to Lord Ganesha. Elephant medicine and surgery were divided into four parts by Palakapya, viz., *Maha Rogsthan* or major diseases, *Ksudra Rogasthan* or minor diseases, *Salyasthan* or surgery, and materia medica-diet and hygiene. He classified various ailments of elephants into: *Adhyatmika* (physical) and *Agantuka* (accidental or incidental); physical classes of ailments were called *Manasa* (caused by mental diseases) and *Dosaja* [caused by disorder of bodily humors – *vata* (air), *pitta* (bile), and *kapha* (phlegm)]. Hastya Ayurveda also mentions about anatomy of elephant, treatment of different kinds of diseases, training of elephant, and also classification of elephants on the basis of a number of characteristics.

Equine medicine or Haya Ayurveda

There is no legend of horses in the seal of Mohanjo-daro, Harappa, Kalibangan and in Indus Valley culture. Amongst 18 gems recovered in Samudramantran by gods and demons, the horse named Uchhasrava was possibly the first known horse of *puranic* (ancient) India. The Aryans introduced horses for rapid transportation. Pack, riding, chariot, war, race, and even plowing horses were frequently mentioned in the Vedic age (1500–1000 BC). The Aryans took advantage of the trained horses to march into the fertile land of Iran and Mesopotamia. The Aryan chariot (*ratha*) is depicted at Sanchi. In the later Vedic period (1000–600 BC), Buddhist period (600 BC), and Mauryan period (400 BC), the use of horses was well documented. In the Mauryan age (322–232 BC), equine husbandry made tremendous progress and these were used for riding and for war. The royal horses were under the charge of a superintendent of horses (*Asva adhyakacha*), who used to register the breed, age, color, and place of origin. Detailed accounts of housing and feeding of horses were mentioned in Arthashastra. Veterinary doctors and horse trainers were assigned free endowment. In the Gupta dynasty (300–550 AD), horses were given more importance than elephants in Samudragupta's army because of their speed and easy maneuverability. He also performed *Ashvamedha yagna* to proclaim his imperial power and issued a gold coin depicting a horse. Skandagupta (455–467 AD) was shattered by Huns, who were expert horse riders. The Kannauj empire (606–647 AD) has also been mentioned to use saddled horses in warfare.

Cow

Cows were regarded as wealth and were the backbone of the economy of ancient Indians, i.e., Aryans. Wars were fought for acquiring cows. Cattle were one of the most frequently used animals described in Vedas. Cows were regarded as mother (“*Gau-mata*”) and referred to as *Aghanya*. Prayers were offered to Agni (God of Fire) to kill with his flame all those evil dwellers, who stole milk of cows. Those demons may not get the nectar (milk of cows). Voluminous treatises are also available on cows, e.g., ‘*Gau Ayurveda*’. During *Pauranic* period, cow (*Kamdhenu*) emerged out of *Samudra manthan*, was considered so valuable that *devatas* fought with demons and acquired them.

Mantras in Vedas (*Shala Nirman* and *Goshth Suktas* of Atharvaveda) describe that the animal houses (*Goshth*) and their management were of good quality. *Pashu Samvardhan Sukta* of Atharvaveda indicates that Vrihaspati Deva knew the animal behavior and management well. Cows were high milk-yielders and were milked thrice a day by women (*Duhitras*). They knew the animal feeding practices and fed them with dry hay and green fodder. The herb *arundhati* (a climber, not identified) not only treated several disease conditions but also increased milk yield in cows. Prayers were offered to Aditi Deva to discover medicines for health improvement of humans and calves. It shows that Aditi was one of the researchers of medicine. Treatment of weak, infertile, and unproductive cows for making them productive was well described. Castration of males by crushing the testicles between two stones was also practiced.

Medicinal importance of *Panchgavya* or cow therapy

Panchgavya or cow therapy is a holistic approach of treatment mentioned in the holy Vedas. *Panchgavya* means five main materials received from cows including milk, curd, ghee, urine, and dung. They are known for remedial values when consumed or applied externally or sprayed in the environment. Scientific evaluation of these elements revealed individually or collectively that they enhance the immune responses of the body when used. The *Kamdhenu Ark* prepared from cow urine is effective in treatment of kidney disorders and diabetes mellitus. It has also been found to increase phagocytosis by macrophages and thus helpful in prevention and control of bacterial infections. The cow urine has antioxidant property and protects DNA damage due to mitomycin-C induced chromosomal aberrations. In Ayurveda, the cow urine is also termed as '*Sanjivani*'. Similarly, the cow dung keeps the environment free from pollution and does not allow any radiation effect. Most of the skin diseases can be cured by its application. The cow milk, curd, and ghee are known for high nutritive value and effective in a number of human ailments. Curd and buttermilk are good appetizers and keep the digestive system normal through sustainable maintenance of pro-biotic bacteria. Cow ghee has been reported to improve memory and reduce mental tension. However, *Panchgavya* therapy is useful only when the elements of *Panchgavya* are collected from a pastured Indian native or desi cow (Zebu cattle).

Cow prosperity and protection

Cow worship, cow keeping, and cow protection were the three stages through which the prosperity of the mother cow occurred from time to time. Beef eating in ancient India has been a controversial subject. Due to availability of natural facilities of breeding, feeding, and grazing, cattle flourished in the ancient times. Cow prosperity started declining with increasing human population and socioeconomic conflict. In case of buffalo, it is the utility of the buffalo that has increased its prospects.

Legends of cow-bulls in coins of ancient India

In ancient India, cow was addressed as "*Gau-mata*" or mother cow. Rulers from 600 BC used to inscribe pictures of bulls (rarely cows) on coins, which show their importance and utility. Round coins (occasionally rectangular or square) weighing 5–7 g made up of copper, silver, lead, or gold were used as currency. The best and rare inscription of cow was seen in the coins of King Anshu Verma, ruler of ancient republic of Lichavvi (Nepal). Inscriptions of standing right facing (rarely left facing) humped bulls are seen on the coins of punch-mark, Airan, Audumbar, Ayodhya, Kaushambi, Saatvahan, Ujjaini, Chatrapa, Yaudhey, Krishnaraj (Kalchuri), etc. (Somvanshi, 2002).

Buffalo

Reference of buffaloes in the form of a furious demon, Mahishasur and docile beast, the ride of death God Yamraj has been made in the prehistoric ancient Indian literature. Taming and domestication of buffalo has been mentioned during the epic era of Ramayana and Mahabharata and true domestication during the Indus Valley civilization. Several types of buffaloes have been described in different parts. The Indian subcontinent is the richest habitat of riverine buffaloes (dairy) whereas East and Southeast Asian countries are dominated by draft type swamp buffaloes. In South India buffaloes were used for plowing lands after which they wallow in the pond to reduce tiredness. Buffalo keeping was a symbol of prosperity in Southern India.

Goat

Palaeolithic man hunted animals for food, which had evidence in Belan Valley of Mirzapur in the provincial state of Uttar Pradesh in North India. His successor, the Neolithic man tamed and confined the animals and were mostly found in South India, around 2500 BC. Goats and sheep were first domesticated near Iraq and United Arab Emirates 8700 years ago, much earlier than the advent of agriculture. People who belong to Chalcolithic age were found in the Indian states of Madhya Pradesh, Maharashtra, and Rajasthan and they reared goats and other animals. Goats were domesticated earlier, and served mankind for longer period for their milk and other products. During Pre-Harappan period, wild ancestors of goats were found in barren hills of Baluchistan and Western Sindh. Gaddi goats resembling the ancestral wild goats are still used for carrying goods in the higher Himalayan region of India. The greatest artistic creations of Harappan culture are seals resembling goats, which greatly supported the animal husbandry in Indus Valley civilization. Goats serve mankind providing meat, milk, fiber and therefore, appropriately called poor man's cow.

Sheep

Sheep was one of the early animals, which was domesticated about 8700 BC. The original center of domestication was the Aralo-Caspian steppe and Turkestan. From there, sheep keeping spread early into Iran and later into Mesopotamia and Baluchistan. The sheep kept in India, Tibet, and other countries of East and South Asia were of western derivation and basically of Urial stock. In India, sheep keeping was practiced evidently from Pre-Harappan period through to Mauryan Age. The dominant form of sheep rearing still remained of nomadic nature. Domestication of sheep, besides ensuring a permanent meat supply, also improved the supply of skin, hair (wool), fat, and bones. Although these animal by-products are available from other sources, production of wool, however, remained a monopoly of the sheep. Sheep rearing is an exclusive occupation of a class of herders traditionally marked out as a pastoral caste.

Fowl

The family Gallus comprises of four species of birds. Of these, domesticated hen's (*Gallus gallus murghi*) ancestor was red jungle fowl (*Gallus sonarati*). These birds are found from Kashmir to Godavari, the southern corner of the country. It is believed that today's poultry evolved from the red jungle fowl. People of the Indus Valley civilization were quite familiar with domesticated fowl. According to McKay (1930), in the seals of the Indus Valley, two Sonarati red cocks with fighting gesture were identified; however, Gandert (1953) considered them as red jungle fowl (from Randhawa, 1980). At the same place, small pieces of earthen hen toys were recovered. One of these birds, which was adjoining to feed pot, was considered as hen. This indicates that captive breeding of birds was practiced during those days. These facts were confirmed by study of bones by Sewell and Guha (1931). Domestic fowl was also found in Harrappa. From this place, two earthen birds (one male and the other female) were recovered. From Kanhudaro also, small-sized figures of birds belonging to the family of domestic fowl were recovered. Possibly these were the images of quails. It is accepted that Indus Valley people kept birds for games and breeding for meat, possibly started afterwards. When Aryans invaded India around 2500 BC, they appreciated cocks. Cock is mentioned in Atharvaveda and Yajurveda, but not in Rigveda. During 1000 BC, eating hen meat was prohibited, possibly for religious reasons. The study of Northwest Indian coins indicates that cocks were favored. During 310 BC, Softitus, a Prince of Punjab presented a few silver coins to Alexander, which had legends of cocks along with spur. Satyamitra (100–200 AD) engraved fowl on coins with palm leaves. During this period, India had trade with Western Asia, Arabia, and Egypt through sea and land route, which was instrumental in the dissemination of red jungle fowl throughout the world.

Conclusions

From the foregoing discussion, it seems logical to conclude that the Indus Valley civilization is one of the foremost contributors in the history of development of veterinary science and animal husbandry. The brief review of the prehistoric developments in this area may be viewed as a window that reveals how the tradition of keeping animals is intimately connected to the ways of improvement of the quality of life of people in the modern era.

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