Indian Agriculture after Independence

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3
Chapter

Animal Husbandry in Pre-Independent India

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Summary

Human-animal relationship dates back to the Harappan Civilization as evident by the cave arts. Since then, animals have been used as a source of food, draft-power, skin, games and recreation. Sheep and goat were the first domesticated animals in the Indian sub-continent. Cattle gained more importance during the Vedic period leading to initiation of professional cattle breeding. The science of animal Ayurveda was also documented in this era while the use of cow dung manure in the agricultural fields was first observed in the Iron Age. Later on, buffalo was recognized for dairying in the Mauryan period. Horses and elephants received special attention during this period as they were required in battle and transportation. Their importance can be observed from the fact that specific feeding schedule was followed for horses and there was a ban on killing the elephants for their tusks. Use of animals for food, religious purposes and transport continued in the pre-Mughal era dynasties. Literature of Mughal era shows that people by then were aware about the best animal breeds and feed management practices. They used oxen for traction and milk as an important ingredient of various cuisines. This period is also known for the science related to horse rearing and breeding. Horse breed improvement followed by scientific developments in the field of cattle rearing and management continued with the advent of colonial rule. Formal veterinary education, establishment of agricultural research institutes, setting up of processing plants and development of vaccines/treatments for various animal diseases can be counted as important achievements of the British era.

1. Introduction

Animal rearing in India is centuries-old and there are sufficient evidences that suggest domestication of farm animals happened even before the beginning of the written history. "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). Ancient Indian literature Vedas, Puranas, Brahmanas, epics, do mention about animal care and disease management. It is believed that man-animal relationship or domestication was initiated during Mohenjo-daro and Harappa period of Indus Valley Civilization. Domestication of animals started simultaneously at around 2500 BC in certain places of northern India. Excavations from the Bronze Age Civilization revealed animal husbandry practices including care and

management of various types of livestock species including bovines, small ruminants, elephants, poultry etc. Early Historic man confined animals particularly to use/misuse them during battles. Humped Cattle breeding was more depicted during the Rig Vedic period (1500–1000 BC). The cow was then called *Kamdhenu*, the one who fulfils all daily needs, deriving its meaning from- '*Kamna'* meaning desire and '*dhenu'* meaning fulfilment. It was during Vedic period that the love for cow started (Somvanshi, https://www.vethelplineindia.co.in/veterinary-medicine-and-animal-keeping-in-ancient-india/). When the Aryans came, they advocated the protection of cows. Animal diseases and their cure using herbal medicines were well described in the ancient text 'Atharvaveda'. The text of '*Haya Ayurveda*' and '*Gaja Ayurveda*' written by Shalihotra and Palakapya, respectively describes the equine and elephant husbandry including care and treatment of some ailments. According to the ancient history, Shalihotra is considered as the first known Veterinarian of the world. Thereafter, animal husbandry in the country has passed a long way achieving various milestones and making the country one of the global leaders in this sector (Table 1). This chapter describes the major milestones in animal husbandry in the pre-Independent India.

Table 1. Milestones of animal husbandry in the pre-Independent India

Year	Milestone
9000 BC	Domestication of sheep and goat.
8000 BC	Domestication of cattle.
6000-4500 BC	Domestication of dog and fowl.
4000 BC	Domestication of water buffalo.
2000 BC	Domestication of Asian elephant.
1500–1000 BC	Humped Cattle breeding started.
1000-900 BC	Atharvaveda was composed. It provides interesting information about ailments of animals, herbal medicines, and cure of diseases.
300 BC	King Ashoka erected the first known veterinary hospitals of the world.
1794	Establishment of first Horse Stud at Pusa, Bihar.
1809	Establishment of Camel Breeding Farm in Hisar, Haryana.
1815	Cattle and Horse breeding started in the Government Cattle Farm, Hisar, Haryana.
1868	Cattle Plague Commission was formed.
1882	First veterinary college was established at Lahore (now in Pakistan).
1889	First military dairy farm was established at Prayagraj, Uttar Pradesh.
1889	Creation of Civil Veterinary Departments in the provinces.
1889	Establishment of Imperial Bacteriological Laboratory in Pune. It was later shifted to Mukteswar, Uttarakhand in 1893.

Year	Milestone
1889	Development of anti-Rinderpest serum at IVRI, Mukteswar, Uttarakhand.
1902	Anti-Anthrax Serum was developed.
1902	Indian Civil Veterinary Department was established.
1908	Black Quarter Vaccine and Polyvalent HS Vaccine were developed at IVRI, Mukteswar, Uttarakhand.
1913	Another branch of Imperial Bacteriological Laboratory was opened in Izatnagar, Bareilly which was later renamed as Indian Veterinary Research Institute (IVRI) in 1947.
1915	Polson dairy-the first large scale milk processing plant in India was established at Bombay.
1923	Imperial Institute of Animal Husbandry & Dairying was started in Bangalore. In 1955, its headquarters were shifted to Karnal, Haryana and it was renamed as National Dairy Research Institute.
1925	Use of Artificial Insemination (AI) for the cattle started in Military Dairy Farms.
1927	Goat Tissue Virus (GTV) Rinderpest Vaccine was developed at IVRI, Mukteswar, Uttarakhand.
1939	Poultry Research Section was established at IVRI, Izatnagar, Uttar Pradesh.
1940	Development of Ranikhet Disease Vaccine at IVRI, Mukteswar, Uttarakhand.
1940	Collection centres and distribution network were set up for linking the rural milk producers in Bombay with the urban consumers.
1946	Cooperative movement started in dairying with the establishment of the Kaira District Cooperative Milk Producers Union (AMUL) in Gujarat.

2. Animal husbandry in ancient India

2.1. Pre-vedic era and the Harappan ethos

Valuable information pertaining to ancient animal keeping were revealed from the archaeological evidences dating back to Harappa (Montgomeri) and Mohenjo-daro (Larkana) districts, from Punjab and Sindh province, respectively. People from these periods raised and used animals for games and recreation. Numerous livestock products were consumed namely, milk, curd, ghee, etc. The animal skin and hides were also documented for having important uses. Importance of cattle, pig, fish and other animals including tortoise as food is vastly mentioned during Harappan period although fish was the main animal food for people during this period. Excavations of various paintings, seals and stamps and scripts recovered from the Indus valley civilization provided tremendous knowledge about their culture and animal husbandry ethos but many of the scripts on the seals have not been decrypted fully.



Bull seal of Harappa

2.2. Vedic and post-vedic era

In the Vedic period, animals gained more importance. It was during Vedic period in India, cows were cherished as religious entity and were referred as '*Aghanya'* i.e., not to be killed. "Vedic people regarded cow as the source of their good fortune, happiness, and good health" - Rigveda (6.28.1, 6). We have plentiful information on the status of animal keeping, care and management in the Rigveda. According to it, people used to feed their cows on nearby pastures to their homes. If sufficient pastures were not available, there was a practice to generate pastures for cows by clearing the forest lands. It is written that the cows were milked thrice a day, indicating their utility for milk and availability of quality germplasm, pastures/grazing lands.

Cattle were considered as symbol of wealth. Aryans fought wars with local tribes for acquiring their cows, a valuable asset, and named these wars as "Gavishti". Evidence exists that Aryans also kept dogs for guarding houses and for hunting of boars and preferred cow over buffalo for giving milk. A 'Nandi' or the breeding bull was selected based on several characters of body and the mother's history of milking. Management practices like castration of male animals were also practiced during the Vedic era and oxen were used for farm transport, ploughing and irrigation of agricultural fields. Small ruminants and their importance had been clearly documented during this period, where goat was mostly kept for milk and sheep for wool. In the sacred text of Rigveda, material used to feed domestic animals are mentioned which includes barley, sugarcane, and deoiled sesame cake. The science of animal Ayurveda was also documented during the Vedic period. The information about curing the cow through medicinal herbs and dietary supplements is believed to be written in some of the Vedic hymns. Atharvaveda mentions the treatment of various cow ailments through the use of animal Ayurveda. Vedic people also used surgical methods such as grafting, removal of foreign bodies, treatment of dislocations, fractures and fistula for managing the animal diseases (NAVS 2015).

The Aryan people in later period of Vedic age, also known as Iron Age witnessed the composition of two great epics of Hindus - Ramayana and Mahabharata which also mention the management of animal diseases using medicine, oils, herbs, and also cure through surgical corrections performed by trained Vaidhyas. It was during this period, the use of cow dung as manure in the agricultural fields was noticed.

It's the Gopala or Krishna (900–1000 BC) era where we found the information about '*Gau-palan*' and '*Gau Sanrakshan'*. Govinda was another name given to Krishna (meaning the protector of cows). It was during this period when milk and its products especially milk-butter assumed importance and tax was paid to the king in terms of butter. *Gopashtami* was started by Krishna where worship of cows was done on a specific day after Deepawali. Panchagavya which includes five things, namely cow milk, curd and ghee prepared from cow milk, cow dung and cow urine, gained importance during this period and was practiced in religious rituals. The religious texts, namely, 'Shrimad Bhagwat', poetry and paintings of the era depicted the role and importance of cow husbandry in the society.

2.3. Mauryan era

Care and management of domestic animals is documented for the Mauryan period (322-232 BC). An important text written by Kautilya during the Mauryan period was *Arthashastra*, which discuss in detail the role and duties of a king in providing care and protection to cows. *Arthashastra* also recognizes the role of various domestic livestock, and it was during this period that buffalo was also recognized for dairying and difference in milk-fat with cow was documented, indicating that buffalo milk has a higher fat content. Texts of '*Arthashastra*' suggested the creation of separate department in the state for accounting the livestock and land maintained for pastures, by village-based accountants called 'Gopas'. Mauryan period is also known for the introduction of state funded veterinary services (NAVS 2015). The text describes optimum herd size, male to female ratio of cattle, feeds and fodder. It also mentioned the earnings and trade through different livestock products, skin and hide, fur and wool. The text mentioned the law (Veterinary Jurisprudence), and provision of punishments and penalties imposed on committing crime (robbery or on ill treatment to cows) and non-compliance to pay taxes related to animal husbandry. During the Mauryan period, the horses received special attention, as grading of horses based on their utility in battle or transportation has been documented. Thoroughbred horses were widely kept during this period. Besides feeding grasses, a good detail of their feeding schedules has been described which included the parched rice, drippings, minced meat, and red rice-powder. Elephants were the prized possession of the kings and were used in warfare, to storm the forts of enemy kings and smash open the massive doors of the forts. Kings and army used elephants to move even in dense forests and marshy lands. Provision for capital punishment was kept on killing the elephants for their tusks during this period. The great king Ashoka (300 BC) gave veterinary science a major thrust in India. It is described that "the first known veterinary hospital of the world existed in Ashoka's regime - Schwabe (1978). During the Gupta period, the knowledge documented in '*Arthashastra*' prospered until Islamic rulers invaded India in 800 AD.

3. Animal husbandry during the medieval era

3.1. Medieval Indian dynasties

The medieval India is the period between the end of the Gupta Empire in the 6th Century and the start of the Mughal Empire in 1526. During this period, Indian subcontinent was majorly ruled by 32 dynasties at different periods in different geographical regions. Many dynasties were contemporary with each other. Among 32 dynasties, the documentary evidence on animal husbandry is possibly available for 18 dynasties. In these dynasties, animals were majorly used for the purpose of military, transport, draft, food, ceremonial activities, maintenance of temples, and recreational fighting. As the elephants and horses were used in military and for the transport of royal class, veterinary science was well developed especially in Reddy dynasty (Reddy 1991). Cow ghee was used for perpetual lamps in temples. Specifically, during the Eastern Chalukya period, cows, sheep and goats were donated to temples for performing daily sacred activities. The numbers of

animals were donated according to the number of perpetual lamps in a temple and they were maintained by a community called "Golla or Boya". Apart from the milk and ghee, people used to consume meat. The meat of goats, sheep, pigs, poultry, hare and boar was commonly sold in Chalukya dynasty (Sastri 1955). Use of goats, sheep, pigs and fowl continued for meat purpose in Western Chalukya dynasty (Sastri 1955). Similarly, hides were the part of exports during Rashtrakuta dynasty, in which bullocks and horses were used for business travels (https://en.wikipedia.org/wiki/ Economy_of_Rashtrakuta_empire_of_ Manyakheta). Although, people used to eat meat, cows and horses were worshiped. For example, the cows were given almost equal rights as of humans in Chola Empire. In the same empire, the provision of feed to the cows was similar to the provision of food to humans during famines (https://en.wikipedia.org/wiki/Ellalan).

Similar to the cow, horse was also considered as a sacred animal during Vijayanagara Empire. In Harsha Empire, animal slaughter was banned (https://en.wikipedia.org/wiki/ Harsha). To meet feeding needs of cattle, pasture lands and grazing fields were maintained in villages in Pala Empire. Particularly, Viasya community used to take care of cattle along with other trade articles (Targa 1999). Interestingly, cattle breeding was a separate profession and cattle breeders used to pay separate tax during Pallava dynasty (https:// factsberry.com/all-about-the-pallava-dynasty). Overall, animals played a major role in the economy of medieval dynasties, which was evident especially in Kakatiya dynasty, in which the economy was a mix of animal keeping (sheep, goat), crop husbandry (jowar and paddy) and trade including the export of 'wool' and cotton textiles. However, in Delhi Sultanate, not much development was seen in the farm animal sector but still taxes were imposed on the basis of number of cattle.

3.2. Mughal era

The Mughal reigned India from 1526 to 1857 during which the country was home to large cattle population. Historian Irfan Habib in his book *The Agrarian System of Mughal India* pointed out that there were more cattle in India than in Europe but with lower milk yields. Productivity of the cattle and buffalo varied from 1-5 seers and 2-30 seers, respectively (1 seer ~1 kg). Cattle of Gujarat and buffalo of Punjab were considered to be the best. Feeding management of the dairy animals was solely dependent on the milk productivity. Cattle with good milk production was considered as "*Khas"* class/breed and fed with near about 6 kg of grain and 15 kg of green grasses per day, whereas, remaining classes were fed with the half of this ration. But, peasants of the Mughal era used to take extra care of their buffaloes as they were the main milch breed. Around 8 kg of wheat flour, 500 grams of molasses, 1.50 kg of grain and 20 kg of green grasses were fed to the buffalo. Small ruminants like sheep and goat were the integral part of the animal husbandry out of which goat breed of Bengal and Coach Bihar are specifically mentioned in the literature. The Mughal emperor Akbar improved the irrigation facility throughout his dynasty and cattle/ ox was used for powering the *Sakia* or Persian Wheel to bring irrigation water. Beside traction, livestock were used for improving the soil fertility. Peasants of the southern India

used to keep goat and sheep flocks for few nights in the crop field for droppings which was considered to be a good source of quality manure. It was assumed that a flock of 1000 sheep / goats with five-to-six-night stay on a piece of land of 1.32 acres may maintain the fertility of the field for 6 to 7 years.

Milk was one of the important food items in the diet during the Mughal period. Narayanan (2015) argued that milk and various milk products including yoghurt, ghee and butter were also a fairly conspicuous part of the diet in many parts of the northern India. Therefore, many indigenous milk products like *rabri, phirni, khir,* etc. were very popular during Mughal period. *Kulfi*, a delicious frozen dairy dessert, often described as "traditional Indian ice cream" originated in the Mughal Empire in the 16th century. Krondl (2011) quoted from *Ain-i-Akbari* where Abu'l Fazl mentioned use of saltpeter for refrigeration as well as transportation of Himalayan ice to warmer areas to prepare delicious *Kulfi*.

The horses were regarded as a status symbol in the Mughal society (Chowdhury 2017). The Mughal paid great attention to the horses due to its military, economic and political importance. Throughout the dominant Mughal period, 1526-1707, the Mughals maintained a larger cavalry force and it was their main military strength (Irvine 1903). Therefore, the science of horse achieved ultimate heights during the Mughal period. Chowdhury (2017) argued that though the Indian climate was not suitable for the horse-breeding, then, also, numerous personal or institutional breeding centers and studs were established all over the Mughal dynasty with state patronage. State even promoted cross breeding of indigenous horse with the imported horse like *Arabian, Persian, and Turki* horses. *Baytars* (veterinarian) was considered as one of the gentleman professions. The state also provided protection and patronage to the writers of the equine veterinary literature i.e., *faras-namas* which tells about the skills of animal-medical-wisdom for caring, healing and managing horses in the stable during Mughal era.

4. Animal husbandry during the British era

The Company rule in India effectually started from 1757 and ended with the 1857 rebellion after which the British government directly ruled the country until the independence in 1947. Development of animal husbandry in India during the colonial era was as per the military and economic needs of the British Empire. They were initially interested in breeding and health care of only horses which were important for maintaining the cavalry. Later on, cattle rearing gained attention due to increase in demand of military establishments for animal food (milk and beef) leading to the establishment of Military dairy farms. Much of the scientific developments in the field of dairying in India started from these farms. The Britishers were least concerned about the requirements of common Indian people; however, they had to take steps for overall development whenever their interest was connected with the common people. One such example is setting up of research institutions for controlling the spread of animal epidemics in the country so that it does not affect the herds of Military Dairy Farms. These institutions developed a number of vaccines and treatments for various animal diseases. Formal veterinary education in India also started during the colonial period

which helped in developing skilled man power. Another important development during the colonial era was commercialization of milk. New dairy processing plants, marketing organizations and dairy cooperatives were established for linking the rural producers with urban consumers. Besides horses and cattle, the Britishers were also interested in camels, mules, zebra and poultry for fulfilling their various requirements.

4.1. Horse breeding

The preliminary work related to the improvement of horses in India started as early as 1793. William Frazer, an army officer presented a plan for improving the horse breeds of the Ganges valley by setting up a stud and assembling the best mares from different parts of the country. In his view, the horses from Cutch in Gujarat were at par with the Arabic horses and he offered to breed them with best Arab stallions (Randhawa 1983). His proposal was approved and a board was formed in late 1794 for supervising operations related to horse breeding in India. The first stud was established in Pusa (1794) and subsequently different forage crops like Alfalfa, Bermuda grass, Clover and Guinea grass were introduced in the region. Thereafter, more studs were established in Ganjam, Hisar and Hapur. The work of Frazer was carried forward by Moorcroft who introduced better feeding and health management practices in the studs. In 1815, horse breeding started in a farm in Hisar, Haryana which was established in 1809 for breeding of camels. The responsibility of imperial horse breeding was entrusted to the Army Remount Department in 1904 while the local bodies were in charge for provincial horse breeding.

4.2. Establishment of military dairy farms

The Britishers established military dairy farms in order to ensure sufficient availability of quality milk and milk products for military and British families in India. The first military dairy farm was established at Allahabad in 1889. Later, more farms were established across the country and there were around hundred such farms at the time of independence in 1947. Improved milch animals with higher productivity were reared and proper records were maintained in these farms (Wieser 2000). The use of artificial insemination for the cattle in these farms started in 1925 which assisted in herd improvement to some extent. Besides milk production, some of these farms helped in preservation of local breeds. Military Dairy Farms can be considered as the first step towards organized dairy farming in India.

4.3. Cattle improvement and management

The common people in India during the colonial period used to prefer buffalo over cow for dairying due to their higher milk yield as well as more fat content in the milk. The yield of buffaloes was somewhere around 2.27 litre per day. Cows were specifically preferred in those areas where pastures were present. The average milk yield of cow in the country ranged from 0.4 to 1.8 litre per day depending on the breed, place of rearing and management practices. Moreover, the length of their lactation period was only six months (Randhawa 1983). Some cattle breeds like Gujarat, Sind, Ongole and Nellore were considered better

than others while there was a vast scope for improvement of other local cattle. Good dairy animals were fed with oilcake and cotton seed for maintaining their productivity.

During late eighteenth century, William Frazer suggested breeding of indigenous cattle with the bulls of Nagore breed. Afterwards, cattle breeding started in the Government Cattle Farm of Hisar in 1815. The major focus of the farm was on Hariana, a dual-purpose cattle breed. In order to improve the milk yield, Mysore cattle was also crossed with Sind, Gujarat, Ongole and Nagore breeds in the Hisar farm. Moreover, the Gujarat cows were studied in detail in Pune. The Royal Commission on Agriculture (1928) reported poor health and low milk yield of Indian cattle as a major constraint in dairy development following which exotic breeds were introduced in the country for breed improvement. For increasing the milk yield, Ayrshire and Friesian bulls were recommended for crossing with the native cows. Gradually, provincial agricultural departments took the responsibility of cattle breeding and some of the provincial governments further encouraged the projects related to livestock improvement.

There was a huge outbreak of Cattle Plague (Rinderpest) in 1865-67 and millions of bovines died in different parts of the country leading to a series of famines (Mishra 2011). In order to avoid spread of disease to the military farms, the government was forced to take concrete steps for its control. As a result, Cattle Plague Commission was formed in the year 1868 for proper disease management. Unfortunately, government was interested in disease management only when their own herd was under threat. However, between 1901 and 1904, lots of work was carried out for the treatment of anthrax and hemorrhagic septicemia and a vaccine was developed each against black-quarter and rinderpest.

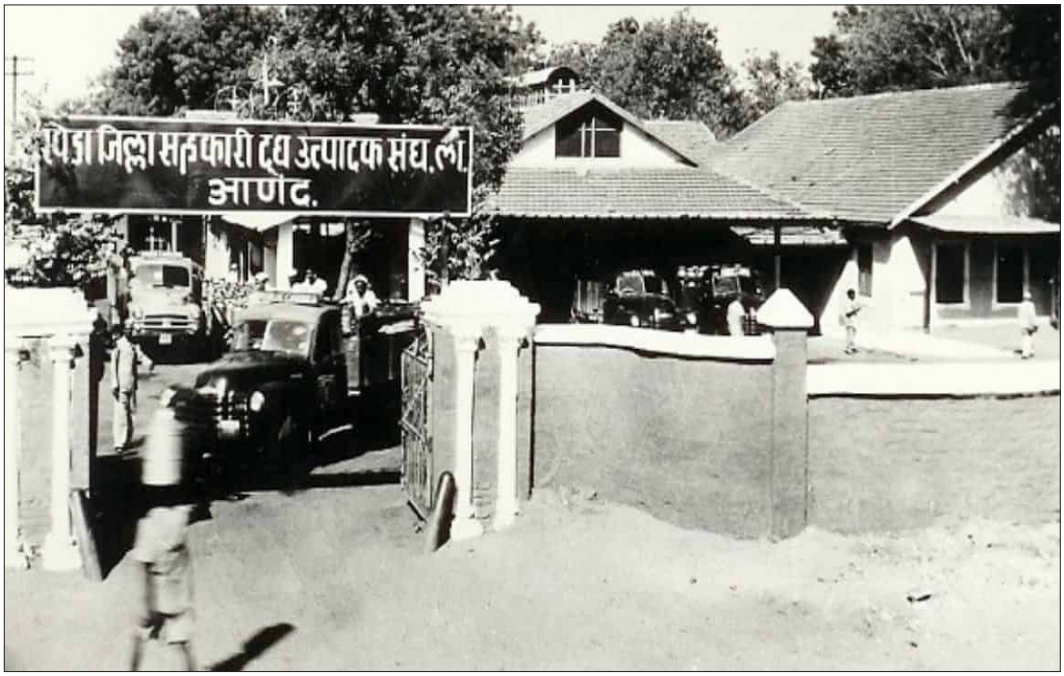
4.4. Effect on pastoralism

Animal husbandry was an important source of livelihood not only for the farmers practicing settled agriculture but also for the pastoral communities. The colonial rule affected the lives of pastoralists to a great extent. Most of the grazing lands were diverted for cultivation which led to the decline of pastures. Stringent forest rules further restricted the access of livestock to the grasses available in the forest. Grazing tax was introduced in the mid-nineteenth century and pastoralists had to pay tax on every animal they grazed on the pastures (NCERT 2006).

4.5. Commercialization of milk and market linkage

Commercialization of milk started in the early twentieth century. British troops and growing cities like Bombay were the main demand centres of milk. In the absence of fast transportation and chilling facilities, majority of the milk (68.8%) was converted into less perishable milk products like ghee, butter, khoa and curd. Liquid milk which used to fetch higher prices accounted only for 31.2% of the total sales while the share of ghee (52.7%) was highest. The collection centres and distribution network for linking the rural producers in Bombay with the urban consumers were set up in 1940. The well-organized milk

marketing organizations took the responsibility of milk distribution in other metropolitan cities like Delhi, Madras, Calcutta, Karachi, Kanpur and Nagpur. Polson dairy which was established in 1915 in Bombay was one of the first large scale milk processing plant in India. Keventers and Express Dairy were the other two popular dairy processors. Profit was the main motive of these plants and they were not concerned with the development of rural producers. Farmers were exploited due to dominance of middlemen and contractors in this system (Banerjee 1994) which led to larger discontentment among the milk producers. As a result, the cooperative movement started in dairying with the establishment of the Kaira District Cooperative Milk Producers Union in Gujarat in 1946, which was quite successful and encouraged formation of dairy cooperatives across the country after independence.



Kaira District Cooperative Milk Producers Union in Gujarat

4.6. Development of other livestock

Horses and cattle received the major attention of the British government but some advancement also took place in the case of other animals like camel, mules, donkey, sheep, zebra and poultry birds. Camels were used by the Britishers for transportation and a government farm was established in Hisar for camel breeding in 1809. Later on, this farm was also used for breeding of bullocks, mules, zebra and sheep. Local ewes were crossed with Merino rams in the farm and an improved breed of sheep namely, Hissardale was developed which yielded superior quality of fleece. Status and scope of poultry was discussed in the report of the Royal Commission on Agriculture (1928) and subsequently, the Institute of Poultry Research was established at Izatnagar in 1938 (Sinha 2010).

4.7. Slaughter houses and the gaushalas

The Britishers started killing cows for beef soon after settling down in India. They established slaughter houses on the western pattern in different parts of the country. The cow slaughter and consumption of beef increased manifold in northern India during the colonial period. But soon after the first war of independence in 1857, many native people were mobilized and they collectively started a movement for protection of cows. After rescuing the cows from the butchers, they were reared in Gaushalas. Large numbers of Gaushalas were established in the country for this purpose between 1880 and 1893. This movement also received the support of Mahatma Gandhi in the year 1891. Prohibition of cow slaughter was one of the many objectives of Swaraj movement. The British Government imposed some restrictions on slaughter of cattle in 1944 and the army was not allowed to slaughter working cattle, pregnant and milking animals and the cattle fit for bearing offspring.

4.8. Establishment of veterinary colleges and research institutions

The first veterinary college was established at Lahore in 1882. Two years later, approval was granted for starting a three-year veterinary course in Parel, Mumbai. Afterwards, three more veterinary colleges were started in Madras, Calcutta and Bihar. Cattle Plague Commission which was appointed in 1868 after the severe outbreak of cattle plague epidemic led to the creation of Civil Veterinary Departments in the provinces in 1889. The Indian Civil Veterinary Department was established in 1902 and the responsibility of animal husbandry and dairying was entrusted to the provinces in 1919.



Mother campus of ICAR-Indian Veterinary Research Institute at Mukteswar, Uttarakhand

The Cattle Plague Commission submitted its report in 1871 (Hallen et al. 1871). Scientific work on animal diseases in India started in 1889 when an Imperial Bacteriological Laboratory was established in Pune where Dr. Alfred Lingard worked on diseases of camel and horses (Sinha 2010). This laboratory was later shifted to Mukteswar, Uttarakhand in 1893 as its cool climate was favorable for bacteriological research and vaccine preservation. In 1913, another branch of the laboratory was opened in Izatnagar, Bareilly for mass production of vaccines and serum. It was renamed as Imperial Institute of Veterinary Research in 1925 and later on as Imperial Veterinary Serum Institute, Imperial Veterinary Research Institute and Indian Veterinary Research Institute respectively in 1930, 1936 and 1947. Meanwhile, an institute for dairy specific research was started in Bangalore in 1923 by the name Imperial Institute of Animal Husbandry & Dairying. It was renamed as Imperial Dairy Research Institute in 1936. Its headquarters was shifted to Karnal,

Haryana after the independence in 1955 and again renamed as National Dairy Research Institute.

5. Conclusion

In the pre-independent India, animal husbandry was largely a subsistence activity. There was some knowledge about good animal breeds, feeding schedule and disease management. During colonial era, scientific developments like breeding, artificial insemination, food processing, record-keeping etc. started but these were mostly restricted to the Government farms and institutes. The common people were able to gain direct benefits from these advancements to a limited extent. Wide-spread poverty and low productivity of animals were the immediate challenges at the time of independence. India which is now the top milk producing country was suffering due to milk shortage in 1947; presents the complete picture of that period. Despite all this, developments like beginning of formal veterinary education, establishment of research institutes and initiation of dairy cooperative movement laid the foundation for the progress achieved in the post-independence era.

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