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RESEARCH ARTICLE

Traditional knowledge in veterinary medicine: A case study of Gorakhpur district, Uttar Pradesh (India)

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Abstract

The present study aimed at collection and documentation of the traditional knowledge about veterinary medicines for treating animal diseases and ailments in the district Gorakhpur of Uttar Pradesh. It is based upon survey of focus groups comprised of knowledgeable persons in selected villages. In all diseases, diarrhea, placenta related problems, irregularity in estrus cycle, foot and mouth disease, redness and mucous in eyes, anorexia, prolapse and fracture were found to be the most common animal diseases in Gorakhpur. A total 62 plant species, plant parts and other materials have been found to be used for medicinal preparations for treating 37 diseases and ailments of the animals in the form of 92 remedies. The choice of a farmer between the traditional and modern system of treating animal diseases revealed that half of the cases were treated by the sample households themselves (self-treatment), using traditional, shared community knowledge or advice of a knowledgeable person. The landless and poor livestock farmers use traditional veterinary medicine much more as compared to others. The choice of the farmers depends upon several factors such as household's judgment about how serious is the disease, accessibility of the sources, past experience about their effectiveness, and ofcourse resources available.

INTRODUCTION

India has a rich tradition of plant-based knowledge about healthcare. On the one hand, there is the codified knowledge in ancient Ayurvedic texts, which form the basis of modern herbal medicines, on the other hand, there is what is called 'folk knowledge', knowledge that particularly rural people use for home made remedies not only for themselves but also for their livestock. This knowledge is passed on orally from generation to generation and learned through practice. It encompasses knowledge about plants, plant parts and other ingredients, method of preparing medicine for a given disease or ailment, mode of administration or application, doses and likely time in recovery.

This folk knowledge about animal diseases and their treatment has been given the name of 'ethno-veterinary medicine'. However, this knowledge is not confined to ethnic groups or communities. It is widespread in the Indian villages. Even in an economically advanced state like Punjab villagers use this knowledge for treatment of animal diseases and ailments[1]. The high costs and inaccessibility, together with other problems associated with modern medicines, have helped maintain traditional treatment practices in the developing countries. In contrast traditional medicines are affordable, effective and easily available as these are prepared by using locally available plants, plant-parts and other organic and inorganic materials.

The traditional system of animal health care has survived in the face of increasing expansion and availability of the modern veterinary facilities. Traditions die hard. Secondly, if a remedy, a decoction prepared out of leaves of a plant growing in the village, is available at home, why not use it. However survival has not prevented erosion of the traditional veterinary knowledge. Today, the number of persons in the villages and the extent of their knowledge are expected to be far less than what it may have been half a century ago. With increasing modern veterinary facilities, and agriculture including livestock farming becoming more and more intensive, organized and commercial, there is indeed a threat of extinction of this knowledge.

Before the traditional knowledge becomes extinct it is necessary and desirable to document it, firstly to preserve it for posterity and secondly to make it accessible for scientific medical research in the form of written texts, photographs of plants and collection of specimens of ingredients used. During the last few decades interest in documentation of the traditional veterinary care knowledge has been growing, not only in India but in other countries as well. A vast body of literature on the subject has accumulated by now with a catchy prefix such as *'ethnoveterinary knowledge' 'ethnoveterinary medicine', 'ethnoveterinary medicinal plants',* and so on[2]. In this context it is also notable that the United Nations Biodiversity Convention, 1992 recognizes the importance of the 'traditional knowledge, innovations and practices' of the 'local and indigenous communities' for conservation and sustainable use of the components of biological resources. Furthermore, subject to national legislation the Convention calls for preservation of the traditional knowledge, innovations and practices and for equitable sharing of benefits with the local indigenous communities arising out of their wider utilization[3]. In the more specific context of traditional veterinary knowledge, the FAO has been actively involved in the documentation of medicinal plants in the tropics, apart from the fact that it has approved continued use of traditional veterinary medicines in the poor developing countries, for these are locally available and cheap compared to imported synthetic drugs[4].

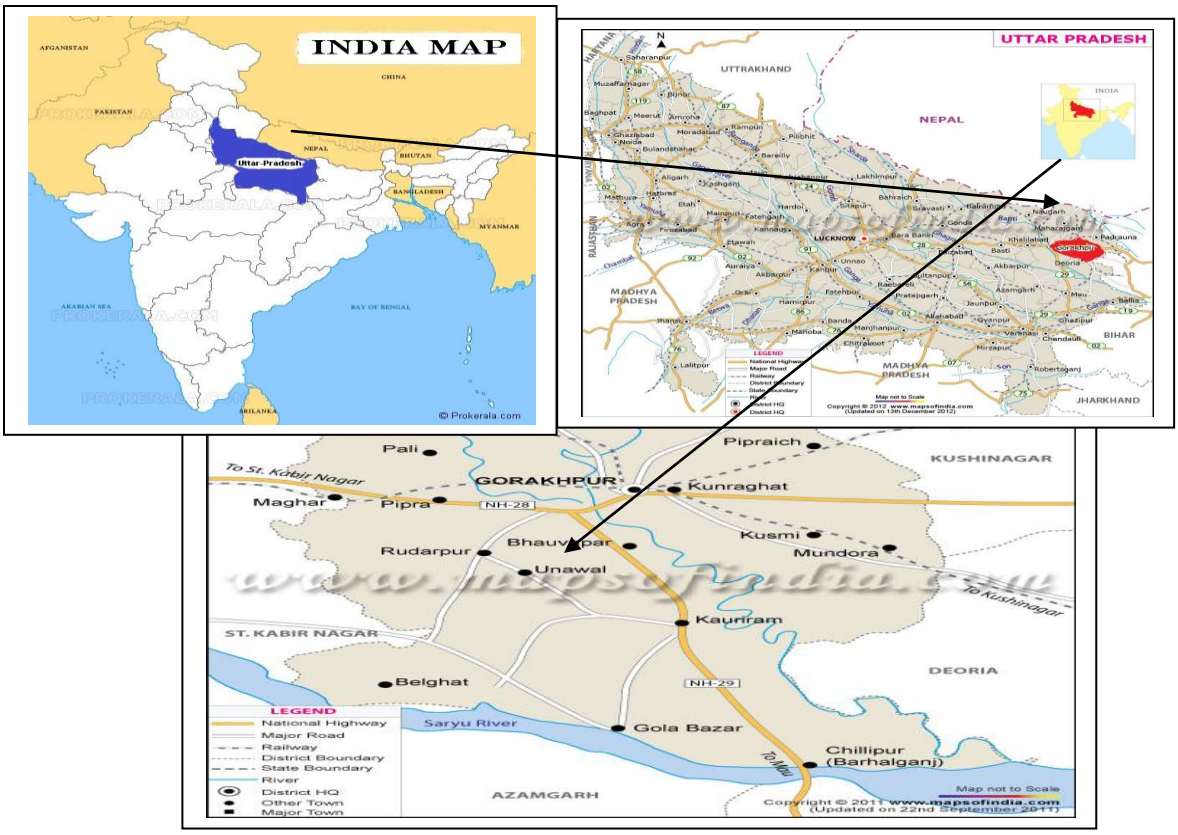
In the past many attempts have been made in India to document various plant species used for treating various ailments of animals. Similarly, attempts have also been made to document traditional veterinary medicines and health care practices of rural people in different parts of the country. For example, the information on folk veterinary medicine used by rural people in Karnataka has been collected[5]. Folk veterinary medicine in Sitapur and Jalaun district of Uttar Pradesh have been documented[6-7]. The utilization of medicinal plants in Kurnool district of Andhra Pradesh for ethnoveterinary purposes has been documented[8]. The information on ethno veterinary medicine in Uttarakhand-Himalaya has been collected[9], and so also medicinal plants have been recorded for ethnoveterinary purposes in Purulia district of West Bengal[10]. Various medicinal plants have been surveyed for animal health care in Rajsamand district of Rajasthan[11]. Ethnoveterinary practices have been documented for improving the living standard of poor farmers in Jaipur district of Orissa[12]. Traditional veterinary practices have been recorded in rural areas of Didigul district of Tamilnadu[13].

In this context, it is notable that as part of a large research project on *mapping of animal diseases and veterinary care systems* sponsored by the Department of Science and Technology (DST). Government of India, we conducted a survey in six districts of North-West India, one each in Punjab and Haryana and four in different regions of Uttar Pradesh, where, *inter alia*, traditional veterinary knowledge was collected, Gorakhpur in Eastern U.P. being one of them. A brief description of Gorakhpur district is given in the following section. The survey approach to collection of information is described in section-3. The findings are reported in section-4, followed by a discussion in section-5. Summary and conclusions are given in the last section.

2. The study area

Gorakhpur district is located on the bank of river Rapti and Rohani, tributaries of the Ganga river system, originating in Nepal. It occupies an area of 3484 KM^2, with a population of about 4.44 million as of 2011 census and a density of 1337 persons per sq. km. It lies at the border with Nepal, has a humid sub-tropical climate, the average annual rainfall being 1221 millimeters. Soils in the district are made up of old and young alluvium, and silts along the river courses brought down from the Himalayas. Between 75-80 percent of the district's total area is cultivated. Main crops grown are rice, wheat and sugarcane. It is divided into seven Tehsils, and nineteen Community Development (CD) Blocks as shown in the map below.

Location of the study area



The livestock population of the district predominantly consists of cattle and buffaloes. Together these account for 70 percent of the district's livestock population. According to 2007 livestock census, Gorakhpur had 716 thousand heads of livestock, of which 287 thousand were cattle (72 per cent indigenous cattle) i.e. about 40 percent of total livestock, followed by 215 thousand buffaloes (30 per cent). Goat and sheep come next in order, their number being 179 and 12 thousand respectively. Others like horses & ponies (558), camels (33), donkeys (783), pigs (19,233) are few in number. According to our sample survey of households having livestock in the district most of the animals (cattle, buffaloes and goats) were owned by marginal and small farmers. The landless households mainly maintained goats and a few of them indigenous cows.

To take care of animal health, Gorakhpur is well provided with veterinary health facilities in the public sector. In the year 2011-12 there were as many as 50 veterinary hospitals and polyclinics, and 56 veterinary dispensaries in Gorakhpur. Thus, there are more than 1 modern health care facility per 10,000 animals in Gorakhpur.

3. The survey methodology

The traditional veterinary knowledge the so called 'folk knowledge', be it in a village, ethnic group or tribe is not possessed by every one, but only by a few who may be called *knowledgeable persons.* They ought to be the focus of enquiry. Accordingly, for collection and documentation of traditional veterinary knowledge we carried out a *focus group survey* in Gorakhpur. A *focus group* consists of persons in a village, who are known to the villagers as being knowledgeable about traditional remedies for animal diseases and ailments. The survey was carried out from August 2008 to February 2009. In order to form focus groups for interview purposes following procedure was adopted.

District Gorakhpur has 19 Community Development Blocks. For purposes of our household survey, mentioned earlier 10 CD Blocks had been randomly selected and at the second stage two villages from each Block

were selected. In these 20 selected villages we made attempt to form 4 to 5 focus groups for purposes of enquiry. Field investigators who were familiar with these villages were instructed to search for and identify villages or village-clusters, where at least 4-5 knowledgeable persons had been living. This way they were asked to form the *focus groups* in such a way that no two focus groups were located in the same CD Block. They were provided a format for listing of the focus groups, giving the names of persons included in each group along with the names of their villages.

The procedure for collection of information from the *focus groups* is as follows. Each focus group was collectively interviewed with the help of a semi-structured questionnaire. In order to avoid cross-purpose talking. Different species of animals were taken up for interview one at a time. And, the group was asked to speak about the diseases/ailments of different body-parts/organs of animal of the species in question and their remedies, proceeding one by one in accordance with a list of body-parts/organs we had prepared for the purpose.

As regards the remedy for a given disease/ailment the *focus group* was asked the following questions: (1) what medicinal ingredients plants, plant parts, other organic and inorganic materials-are used in preparation of the required medicine, (2) what is the method of preparation of the medicine, (3) what is its mode of application or administration, and (4) how many days does it take in recovery from the disease. The interview with a *focus group* was recorded on a digital recorder. At the same time the responses to the above questions were noted down in a register. These two sources were compared and collated in order to reconfirm the information collected. We also attempted to photograph local plants/plant-parts used in veterinary medicine.

4. Findings of the survey

The traditional veterinary knowledge about animal diseases/ailments and their treatment collected from the focus groups in Gorakhpur district is presented in this section. For convenience of the reader we have divided the information into three groups: (1) stomach related diseases and remedies, (2) reproduction related diseases and remedies, and (3) diverse diseases and remedies. These three sets of animal diseases, ingredients used for preparation of medicines, methods of preparation and mode of application for treatment are described in the following tables. The scientific names of plants, other organic and inorganic materials used in preparation of medicines are given at Annexure-I for reference.

4.1 Stomach related diseases and remedies

The stomach related diseases and their remedies are given in the Table 4.1. The listing of diseases is in alphabetical order. For 8 listed diseases/ailments a total of 20 remedies were suggested, with maximum number for diarrhea and anorexia. These are treated in variety of ways (with 4 formulations each), followed by constipation and indigestion (3), dysentery and round/tape worms (2). All stomach related diseases were reported to take 2-3 days for recovery.

Table 4.1: List of stomach related diseases and traditional veterinary medicines

S.No.	Name of disease/ailment	Medicinal ingredients used	Method of preparing medicines/mode of application	No. of days in recovery
1	Anorexia (Afara)	Alum	(i) Take 50 gm Alum, grind it and mix a little water and make the animal drink it	2
		Ghee	(ii) Take 100 gm Ghee and make the animal drink it.	-
		Sindoor and Mustard oil	(iii) Mix Sindoor in Mustard oil and massage it on whole body and beat the animal with a mango stick	2
		Barley and water	(iv) Boil the Barley in water and feed it to the animal	-
2	Constipation (Kabz)	Ashwagandha leaves, Ghee	(i) Grind Ashwagandha leaves and mix with Ghee and feed to the animal	3
		Ajwain, Black salt	(ii) Grind Ajwain and Black Salt make a	-

			powder and feed to the animal	
		Leaves of Rohina	(iii) Crush the leaves of Rohina in your palm and feed to the animal	-
3	Diarrhea (Dust/pokna)	Leaves of Sisam	(i) Crush the Sisam leaves and feed to the animals	-
		Butter milk (Mattha)	(ii) Take required quantity of the Butter milk and make the animal drink it	2
		Rasad (like Shakarkand), Ashwagandtha, Ajwain, Ghee	(iii) Grind Rasad, Ashwagandha and Ajwain and mix some Ghee and feed the mixture to the animal	-
		Fruits of Dhatura	(iv) Feed one fourth of the Dhatura fruit to the animal with chapati	-
4	Dysentery	Onion, Ghee, Gur	(i) Grind Onion, mix Ghee and add 500 gm of Gur and feed to the animal	-
		Ajwain, Salt	(ii) Grind Ajwain with water and add some Salt and make the animal drink it	-
5	Indigestion	Ajwain, Black salt	(i) Make a mixture of the Ajwain and Black salt, and feed to the animal	-
		Gum plant leaves	(ii) Boil leaves of Gum plant in water until water becomes thick and decant and make the animal drink the extract	2
		Gurmi plant fruit (Chibbad), Turmeric	(iii) Grind Gurmi fruit (called Chibbad) and add Turmeric powder and feed to the animal	2
6	Round worm/tape worm	Leaves of Neem tree	(i) Feed the Neem leaves to the animal	2
		Neem oil	(ii) Mix 10 drops of Neem oil in water and make the animal drink it	-
7	Stomach pain	Root of Bhadbhad plant	Extract juice from the root and Put it in the eyes of the animal	-
8	Vomiting	Bhedia grass	Take Bhedia grass and feed to the animal	2

4.2 Reproduction related diseases and remedies

The reproduction related diseases and their remedies are given in the Table 4.2. It may be noted that maximum number of remedies (7) were suggested for placenta related problems, followed by regularization of estrus cycle (4), prolapse (4) and mastitis (3). Approximately 24 species of plants, plant parts and other materials are used in the preparation of the medicines for treatment of different reproduction related diseases. According to focus groups, regularization of estrus cycle takes more than 15 days in recovery while other diseases take about 3 days in recovery.

Table 4.2: List of reproduction related diseases and traditional veterinary medicines

S.No.	Name of disease/ailment	Medicinal ingredients used	Method of preparing medicines/mode of application	No. of days in recovery
1	Brucellosis/premature abortion (Garbhpaat)	Alum, Gur, leaves of Neem	Wash uterus with Alum water and feed Gur and Neem leaves to the animal	-
2	Irregularity in estrus cycle (Garam nahi hona)	Wheat Grain	(i) Soak Wheat grain in water and feed to the animal	15
		Leaves of Mein plant	(ii) Take leaves of Mein plant and feed to the animal with fodder	-
		Excreta of Pigeon	(iii) Take Excreta of Pigeon and feed to the animal	-
		Brinjal fruit, Ghee, salt	(iv) Bake Brinjal fruit and mix it with little Ghee and salt and feed to the animal	-

3	Placenta did not fall (Jer nahi girna)	Leaves of Bamboo	(i) Feed the Bamboo leaves to the animal	3
		Whole paddy	(ii) Feed sufficient amount of Paddy to the animal	-
		Rasad plant, Gur, Ghee	(iii) Grind Rasad plant, mix it with Gur and Ghee and feed it to the animal	3
		Poi leaves	(iv) Grind Poi leaves and feed to the animal	-
		Methi, Gur, Mustard oil	(v) Grind 50gm Methi add 250 gm Gur and add 250 ml Mustard oil and feed the mixture to the animal	2
		Turmeric, Gur	(vi) Mix Turmeric powder in Gur, make a paste and apply the paste on the navel of the animal	-
		Bamboo leaves, Gur	(vii) Boil Bamboo leaves in water with Gur and make a concentrate and decant and make the animal drink it the extract	4
4	Prolapse (Garbhsay bahar ana)	Leaves of Bariar plant	(i) Grind Bariar plant leaves and mix with water and make the animal drink the extract for 2-3 times a day	2-3
		Raw kattha (Catechu), and Supari (Arcanut)	(ii) Grind Kattha and Supari and make a paste and apply on the uterus of the animal	-
		Tootmalanga	(iii) Grind Tootmalanga and feed to the animal in the morning	-44
		Leaves of Bariar plant	(iv) Grind Bariar plant leaves and feed it to the animal and also apply on the uterus of the animal	-
5	Mastitis (Thanela)	Patthar choor (Patthar chatta) plant leaves	(i) Grind Patthar choor plant leaves fine and add salt and apply on the teat and udder and bandage it	-
		Caustic soda, Coconut oil	(ii) Take little amount of Caustic soda and Coconut oil, make a paste and massage the teat of the animal with this paste	3
		Torai (Smooth) leaves	(iii) Grind Torai leaves fine to make a paste and apply the paste on the teat of the animal	-

4.3 Diverse diseases and remedies

The remedies for treatment of diverse diseases are given in the Table 4.3. The table includes remedies for 24 diseases and provides 51 remedies in all. Approximately 44 species of plants, plant parts and other materials are used in the preparation of the medicines for treatment of diverse diseases. According to focus groups, fracture takes more than 33 days in recovery while other diseases take 2-5 days in recovery.

Table 4.3: List of traditional veterinary medicines for diverse diseases and ailments

S.No.	Name of disease/ailment	Medicinal ingredients used	Method of preparing medicines/mode of application	No. of days in recovery
1	Broken horn	Betel leaves, and Raw Kattha (Catechu)	(i) Grind Betel leaves and Raw kattha, mix together into a paste and apply it on the affected part	5
		Hair, soil	(ii) Mix soil and little water with the hair and apply the paste on the horn and bandage it	3
		Hair, Methi leaves	(iii) Grind Methi leaves, mix it with hair and apply on the horn and bandage	-
2	Redness and mucous	Leaves of Tulsi	(i) Extract juice from the leaves of Tulsi plant	3

	in eyes	plant	and drop in the eyes	
		Root of Gad plant, Black pepper	(ii) Extract juice from the root of Gad plant and mix powder of two and half Black pepper and put it in the ears of the animal	-
		Alum, Mustard oil	(iii) Wash the eyes with Alum water and put a few drops of Mustard oil in the eyes of the animal	2
		Salt	(iv) Make a salt solution in water and wash the eyes of the animal with this solution	-
		Kapoor and Mustard oil	(v) Mix Kapoor in Mustard oil and apply in the eyes	3
3	Running nose	Leaves of Gum plant and Karma plant	Grind leaves of Gum plant and Karma plant fine and make a paste and put in the nose of the animal	5
4	Loss of teeth/tooth	Dough of wheat flour	Put a little dough in the middle of teeth and press by hand	-
5	Swelling in gums	Salt	Put Salt in the mouth and rub it on the gums with a piece of wood	3
6	Cough	Leaves of Gum plant and Ghee	(i) Extract juice from Gum leaves and mix with Ghee and make the animal drink it	2
		Mustard oil or Ghee	(ii) Warm the Mustard oil or Ghee and make the animal drink it	-
		Eggs and Mustard oil	(iii) Take three eggs and mix with some Mustard oil and make the animal drink it	-
7	Hemorrhagic septicemia (Galghountu)	Khurdun plant fruit, Red chilly	(i) Grind Khurdun plant fruits with Red chillies and mix in water and make the animal drink it	-
		Ghee	(ii) Take 100 ml Ghee and make the animal drink it	-
		Mustard oil	(iii) Warm Mustard oil and massage oil on the neck and foment with warm cloth	-
8	Swelling in shoulder	Onion, Bhang, Turmeric, Mustard oil	(i) Grind Onion and Bhang leaves with Turmeric powder and make a paste in Mustard oil and apply it on the shoulder	2
		Root of Imarti plant, Alum, salt	(ii) Grind root of Imarti plant with Alum and add Salt to make a paste and tie it on the shoulder with the help of cloth	-
		Brinjal and Black salt	(iii) Grind Brinjal with Black salt and make a paste and tie it on the shoulder with the help of cloth	-
9	Foot and mouth disease (Muhpaka and khur paka)	-	(i) Make the animal stand in mud	-
		Crab	(ii) Tie Crab on the leg of the animal	-
		Leaves of Farhad plant, Heeng, Kapoor	(iii) Grind Farhad plant leaves with Heeng and Kapoor and apply on the leg and mouth	5
		Alum	(iv) Mix Alum in water and make the animal drink it and wash legs by this solution	-
		Kapoor, Kunain and Hair (Cotton) on soft Kernel of Bamboo shoot	(v) Grind the Kapoor, Kunain and Kernel of Bamboo shoot and make a paste and fill the hoof with the paste	5
		Neem leaves	(vi) Boil Neem leaves in water and wash legs and mouth of the animal and also make a smoke of the Neem leaves around the animals	-
10	Fracture	Bark of Semal	(i) Boil the Bark of Semal in water and decant and wash affected area with the extract	-

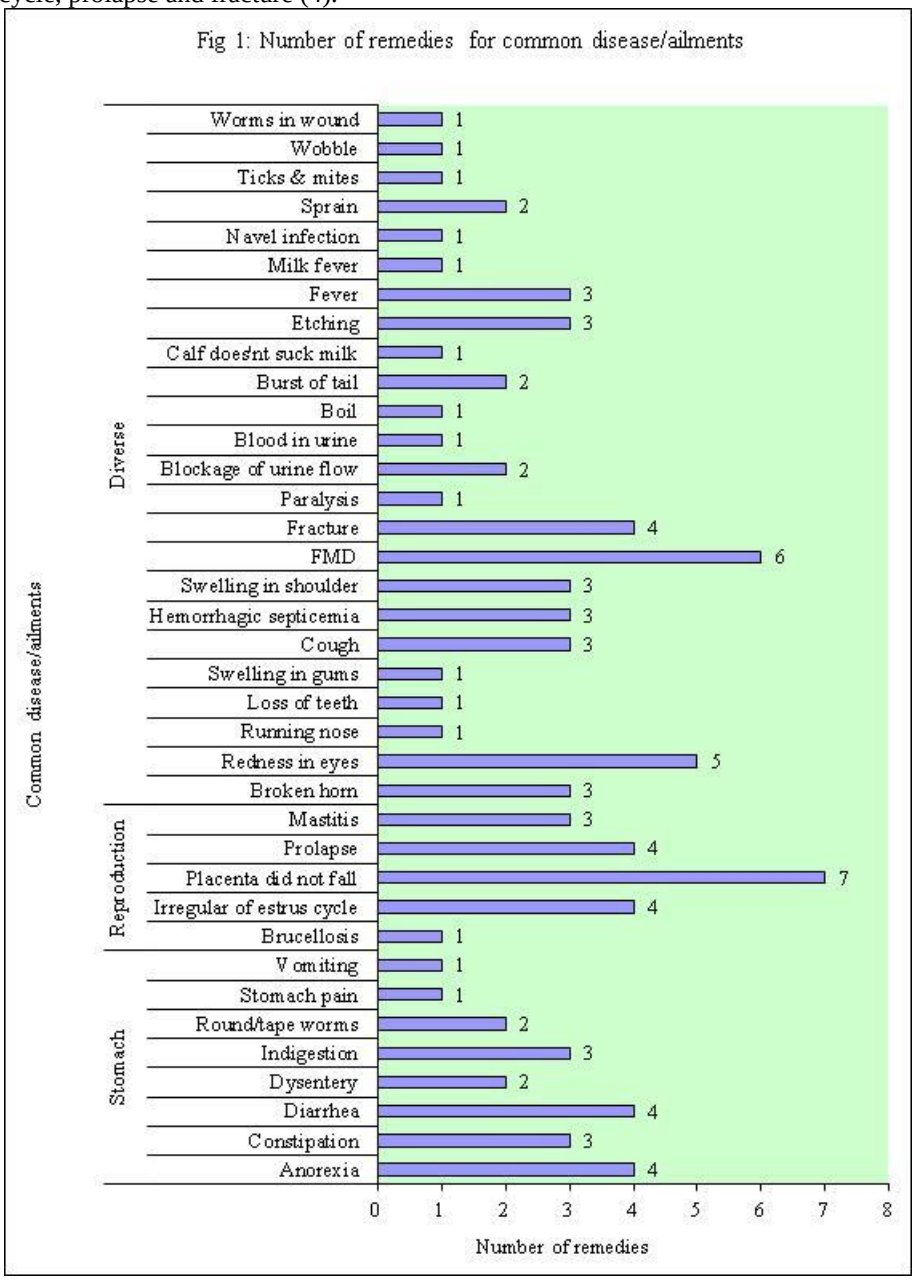
		Neem leaves and Gur	(ii) Grind Neem leaves and mix with Gur and feed to the animal	-
		Alum, Onion, Bhang, Turmeric	(iii) Grind Alum, Onion and Bhang, mix Turmeric powder and make a paste and wash affected part with alum water and apply the paste and bandage it	30
		Hadjudwa plant leaves, milk, Geru	(iv) Grind Hadjudwa plant leaves with Geru and mix some milk to make a paste and apply it on the fracture and bandage	35
11	Paralysis	Leaves of Besaram plant	Grind the leaves of Besaram plant fine, make a paste and apply it on the affected legs	2
12	Blockage of urine flow	Alum	(i) Mix 50 gm of Alum in water and make the animal drink it	-
		Leaves of Marigold	(ii) Grind the Marigold leaves and feed to the animal	3
13	Blood in urine	Leaves of Marigold	Crush Marigold leaves with water, extract juice and make the animal drink it	5
14	Boil	Plant of Mirmiri	Grind the Mirmiri leaves fine and make a paste and apply it on the boil	5
15	Burst of tail	Aak (Mandar)	(i) Extract milk from Aak leaves and apply Aak milk on the tail	-
		Mustard oil	(ii) Apply warm Mustard oil on the tail	-
16	Calf does not suck milk from mother's teat	Leaves of Neem tree	Grind leaves of Neem and make a paste and feed to the calf with fodder	1
17	Etching	Mustard oil	(i) Apply Mustard oil after bathing of the animal	2
		Leaves of Bhati	(ii) Boil leaves of Bhati in water to make a concentrate, decant and make the animal drink the extract	-
		Bhedia grass	(iii) Grind the Bhedia grass fine and apply on the leg of the animal	-
18	Fever	Leaves of Gum plant	(i) Boil the leaves of Gum plant in water and make the animal drink it	3
		Bhedia grass, Kapoor, Ghee	(ii) Grind Bhedia grass with Kapoor, add some Ghee and feed the mixture to the animal	-
		Giloy (Guruch)	(iii) Grind Giloy (Guruch) fine and feed to the animal with flour	2
19	Milk fever	Adhoosh plant leaves and Pipal leaves	Grind the leaves of Adhoosh and Pipal plant, boil in water, make a concentrate and make the animal drink it	-
20	Navel infection	Soft sprout of Bamboo, Alum	Burn soft sprout ob Bamboo untill it becomes ash and mix it with alum powder and tie it on the navel of the animal (Calf)	-
21	Sprain	Bark of Semal	(i) Boil bark of Semal in water and foment the affected area with this warm solution	-
		Meudi plant	(ii) Grind Meudi plant and boil it in water and make the animal drink it	3
22	Ticks & mites	Root of Tobacco, Curd, Meud plant leaves	Boil Tobacco roots and leaves of Meud plant in water, make a concentrate and make the animal drink the extract	-
23	Wobble (Kampana)	Geru, Sindoor, stem of Aak plant	Apply Geru and Sindoor on the whole body, beat the animal lightly by Aak plant stem	5
24	Worms in wound	Leaves of Kohbar plant	Grind the Kohbar plant leaves, make a paste and put on the wound and put burned mobile	3

			oil on it	

4.4 Graphical presentation of the diseases, ingredients used and recovery time

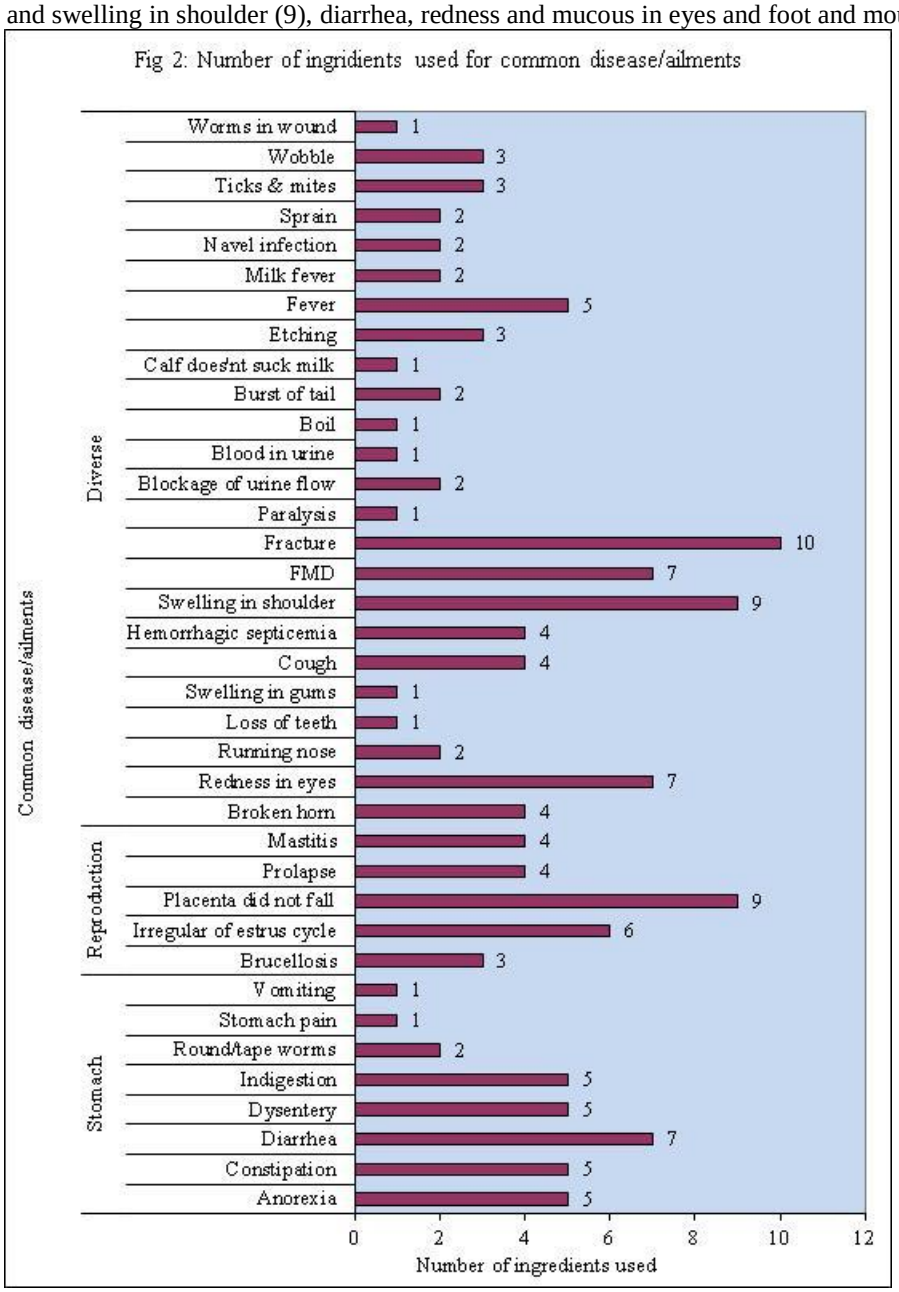
The graphical presentation of the diseases, ingredients used and recovery time are shown in Figure 1, 2 and 3. The Figure-1 shows that the focus groups emphasized on placenta related problems and suggested 7 remedies to treat the animal followed by foot and mouth disease (6), redness and mucous in eyes (5), diarrhea, anorexia, irregular estrus cycle, prolapse and fracture (4).

Fig 1: Number of remedies for common disease/ailments

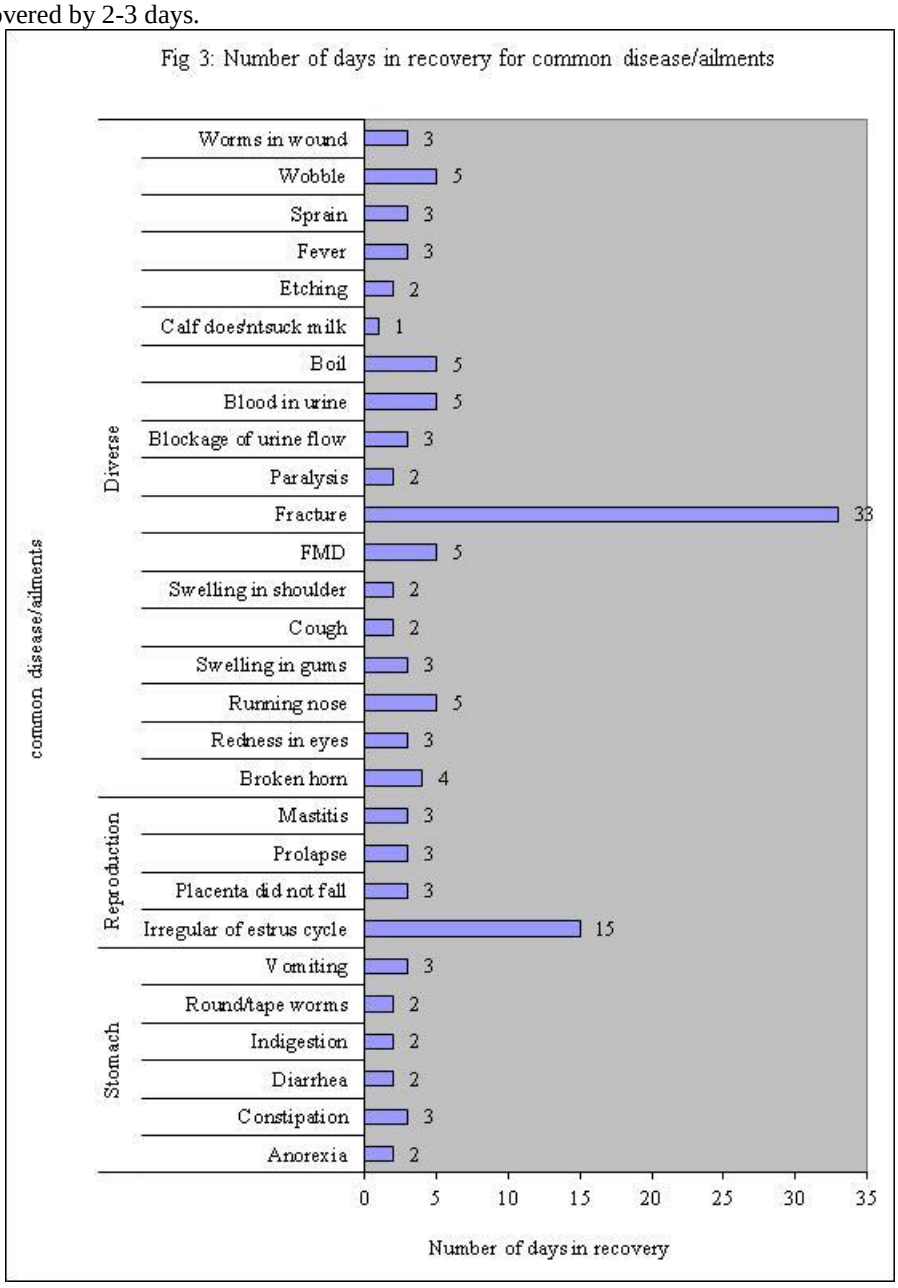


The graphical representation of ingredients used are shown in Figure-2. Medicines for some disease require more ingredients than others. The figure shows that the fracture requires more ingredients (10), followed by placenta related problems and swelling in shoulder (9), diarrhea, redness and mucous in eyes and foot and mouth disease (7).

Fig 2: Number of ingridients used for common disease/ailments

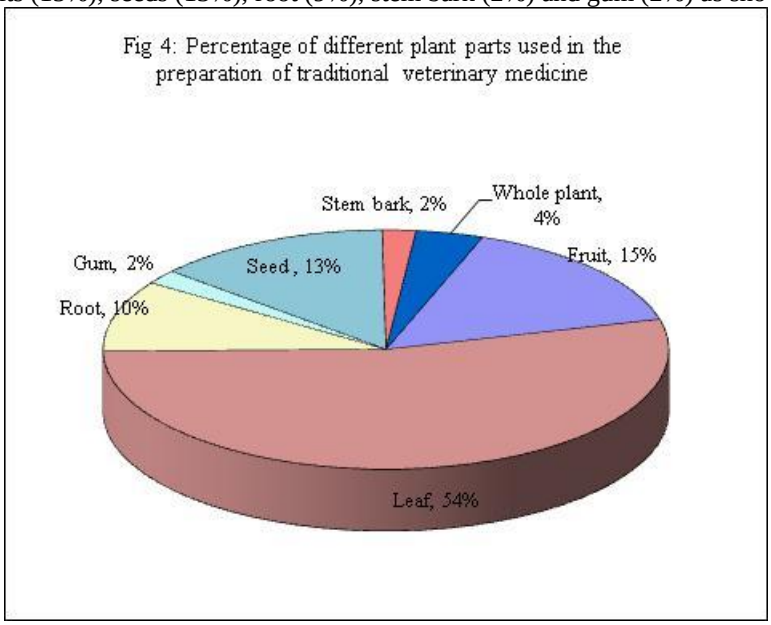


The Figure-3 shows that the fracture takes 33 days in recovery followed by irregular estrus cycle (15), running nose, foot and mouth disease, blood in urine, boil and wobble and broken horn (4-5 days) and remaining diseases are recovered by 2-3 days.

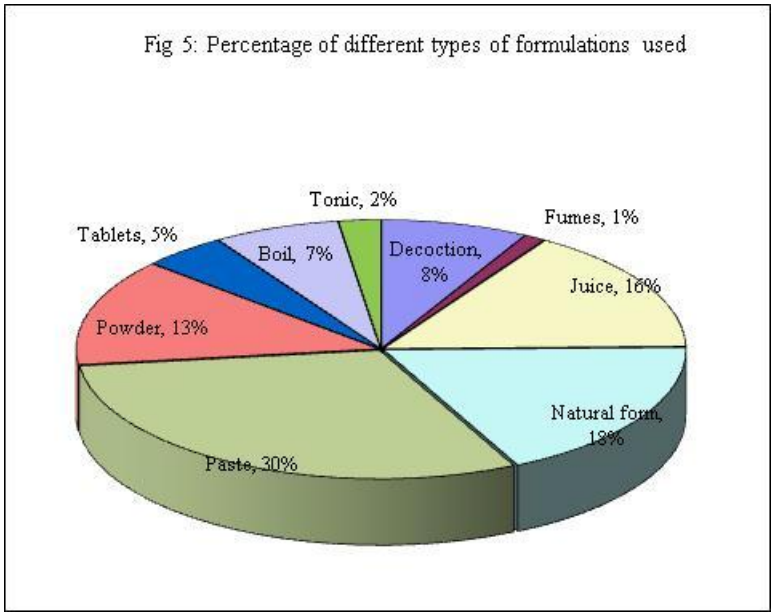


4.5. Plant part used in preparing medicines, type of formulations and mode of application

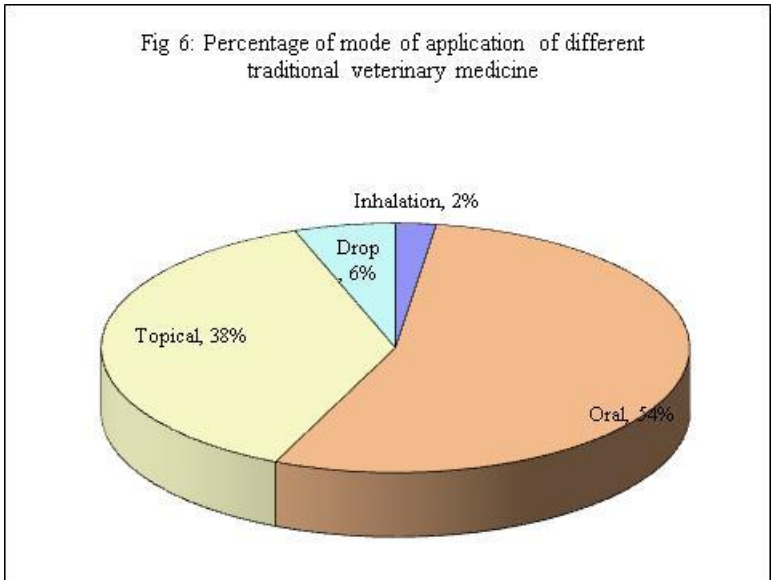
For convenience of the reader we present the information in the pie charts which show the contribution of the different plant and plant part in preparing the medicines, type of formulations prepared and mode of application. Among different plant parts used for treatment of various disease/ailments of animals, the share of leaves is largest (53%) followed by fruits (15%), seeds (13%), root (9%), stem bark (2%) and gum (2%) as shown in Figure-4.



Among different methods of preparation or forms of medicine, most prevalent are pastes (31%) followed by natural form (18%), juice (16%), powder (13%), decoction (8%), boiling (7%), tablets (4%), tonic (2%) and fumes (1%), as shown in Figure-5. The use of water as dilutant is most common. Other useful dilutants are mustard oil, ghee and cow milk.



The distribution of various modes of administration or application of medicines is show in Figure-6. It is notable that administration of medicines through oral tract is most common (54%). Topical application comes next (38%) followed by drops such as in the eyes and ears.



5. Discussion

As part of the household survey mentioned in section-1, we had explored the choice of the households as between the traditional and modern system of treating animal diseases. The idea was to see the relative importance of the traditional versus modern system of treating animal diseases. The results are given in Table-5.1. It is clear that 44 per cent of the cases reported were treated by the sample households themselves (self-treatment), using traditional, shared community knowledge or advice of a knowledgeable person. The landless livestock farmers used traditional medicine more as compared to other farmers. The choice of the farmer depends upon several factors such as household's judgment about how serious is the disease, accessibility of the sources, past experience about their effectiveness, and ofcourse resources available.

Table 5.1: Sample households' choice between traditional and modern system of treating animal diseases/ailments in Gorakhpur

(Number of cases)

S.No.	Size-class of holding	Number of sample households	Number of cases reported	Traditional system	Modern system	
				Self-treatment	Public veterinary facility	Private veterinary doctor
		(1)	(2)	(3)	(4)	(5)
1.	Landless	18	18 (100.00)	10 (55.56)	5 (27.78)	3 (16.67)
2.	Marginal (<1 ha)	69	58 (100.00)	25 (43.10)	28 (48.28)	5 (8.62)
3.	Small (1-2 ha)	12	11 (100.00)	4 (36.36)	6 (54.55)	1 (9.09)
4.	Medium (2-4 ha)	6	8 (100.00)	3 (37.50)	4 (50.00)	1 (12.50)
5.	Large (>4 ha)	-	-	-	-	-
	All	105	95 (100.00)	42 (44.21)	43 (45.26)	10 (10.53)

Note:

1) Public facility includes doctor, stockman, dispensary, clinic and hospital.

2) Figures in parentheses are percentages to total number of cases reported.

Now a days, people among the young generation do rely on modern facilities for treatment of their animals. This is because not only for shortage of time but also they do not have adequate knowledge regarding traditional remedies. For this reason, as time passes, traditional veterinary knowledge faces threat of extinction. That is why, there is a strong and urgent need for documentation of traditional veterinary knowledge. The present study is an attempt in that direction.

6. Summary and conclusions

The present study aimed at collection and documentation of the traditional veterinary knowledge about remedies for various diseases and ailments of livestock in district Gorakhpur of Uttar Pradesh. The study was carried out during 2008-09. It is based upon interviews with knowledgeable people in villages, who were formed into focus groups. A focus group consists of persons in a village who are known to the villagers as being knowledgeable about traditional remedies for animal diseases and ailments. Gorakhpur has 19 Community Development (CD) Blocks. For purposes of our household survey, mentioned earlier, 10 CD Blocks, had been randomly selected and at the second stage two villages from each Block were selected. In these 20 selected villages we made attempt to form 4 focus groups having 4-5 persons in each group for purposes of enquiry. Persons in a focus group were collectively interviewed.

The findings of the survey are presented in three groups: (1) stomach related diseases and remedies, (2) reproduction related diseases and remedies, and (3) diverse diseases and remedies. For stomach related disease, 20 remedies were suggested for 8 listed diseases, with maximum number for diarrhea and anorexia. These are treated in variety of ways (with 4 formulations each), followed by constipation and indigestion (3), dysentery and round/tape worms (2). All stomach related diseases were reported to take 2-3 days for recovery.

Maximum number of remedies (7) were suggested for placenta related problems, followed by regularization of estrus cycle (4), prolapse (4) and mastitis (3). Approximately 24 species of plants, plant parts and other materials are used in the preparation of the medicines for treatment of different reproduction related diseases in Gorakhpur. For treatment of 24 diverse diseases, 51 remedies were suggested by the focus groups. Approximately 44 species of plants, plant parts and other materials are used in the preparation of the medicines for treatment of diverse diseases. According to focus groups, fracture takes more than 33 days in recovery while other diseases take 2-5 days in recovery.

The graphical representation of ingredients used shows that the fracture requires maximum number of ingredients (10), followed by placenta related problems and swelling in shoulder (9 each), diarrhea, redness and mucous in eyes (7 each). In case of recovery time, the fracture takes 33 days in recovery followed by irregular estrus cycle (15), running nose, foot and mouth disease, blood in urine, boil and wobble and broken horn (4-5 days) and remaining diseases required 2-3 days in recovery.

For convenience of the reader we have presented the information in the pie charts. The contribution of different plant and plant part in preparing medicines, type of formulations prepared, and modes of application as shown in pie charts are revealing. Among different plant parts used the share of leaves is largest (53%) followed by fruits (15%), seeds (13%), root (9%), stem bark (2%) and gum (2%). As for methods of preparation of medicines, pastes account for 31 per cent, natural form 18%, juice 16%, and powder 13%,. The distribution of various modes of administration of medicines shows that administration through oral tract is most common (54%). Topical application comes next (38%) followed by drops such as in the eyes and ears.

As part of household survey in Gorakhpur, mentioned in section-1, we had explored the choice of the households as between the traditional and modern system of treating animal diseases. About half of the cases reported were treated by the sample households themselves (self-treatment), using traditional, shared community knowledge or advice of a knowledgeable persons. The landless and poor livestock farmers use traditional veterinary medicine much more as compared to others. The choice of the farmers depends upon several factors such as household's judgment about how serious is the disease, accessibility of the sources, past experience about their effectiveness, and ofcourse resources available.

The relative importance of the traditional versus modern system of treating animal diseases indicates people in young generations rely more on modern facilities for treatment of their animals. This is because they have

not only shortage of time but also do not have adequate knowledge regarding traditional veterinary remedies. For such reasons traditional veterinary knowledge faces threat of extinction. That's why there is a strong need for documentation of traditional veterinary knowledge. Present study is an attempt in that direction. It is likely to be useful to ethnobotanists and veterinary pharmaceuticals in their scientific research in the field of herbal medicine. Furthermore, such documented knowledge is necessary and prior to any conservation effort towards plant species traditionally used in veterinary medicine.

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S.No.	Local name	Botanical name	Families
A.	Plant/plant parts		
1	Aak	Calotropis procera	Asclepiadaceae
2	Aajwain seed	Trachyspermum ammi Sprague	Apiaceae
3	Adhoosh	Adhatoda vasica	Acanthaceae
4	Ashwagandha	Withania somnifera	Solanaceae
5	Barley	Hordeum vulgare L.	Poaceae
6	Bhadbhad		
7	Bariar	Terminalia chebula retz.	Combretaceae
8	Bhediya grass	Urena lobata	Malvaceae
9	Bamboo	Bambusa sp.	Poaceae
10	Besaram	Ipomea erecta	Convolvuaceae
11	Bhang	Cannabis sativa	Cannabinaceae
12	Beetle	Piper betel	Pipraceae
13	Bhati	Clerodendrum indium	Vervanaceae
14	Brinjal	Solanum melongena	Solanaceae
15	Coconut (copra)	Cocos nucifera	Arecaceae
16	Dhatura	Datura stramonium	Solanaceae
17	Farhad	Sida codiofolia	Malvaceae
18	Giloy	Tinospora cordiofolia	Menispermaceae
19	Gad plant		
20	Gum	Leucas aspera	lamaceae
21	Gurumi	Pentanema indicum	Asteraceae
22	Hadjudwa	Equisetum diffusum	Equisetaceae
23	Heeng	Ferula asafoetida	Apiaceae
24	Imerati	Pithecellobium dulce	Mimosaceae
25	Karma		
26	Kalimerch/piper	Piper nigrum	Myretaceae
27	Kattha (Catechu)	Acacia catechu	Mimoseceae
28	Khurdun	Euphorbia fusiformis	Euphorbiaceae
29	Kohabar	Semecarpus anacardium	Anacardaceae
30	Merigold	Tagetes erecta	Asteraceae
31	Mustard oil	Brassica napus	Brassicaceae
32	Meudi		
33	Mein	Alocasia indica	araceae
34	Methi	Trigonella foenum graecum	fabaceae

35	Mirmiri	Polygonum barbatum	Pologonaceae
36	Neem	Azadirachta indica	Meliaceae
37	Onion	Allium cepa	Amaryllidaceae
38	Patthar chatta	Boerhavia diffusa	Nyctaginaceae
39	Pipal	Ficus religiosa	Moraceae
40	Paddy	Oryza sativa L.	Gramineae
41	Poi	Basella alba	Basellaceae
42	Rasad	Taraxacum officinale	Asteraceae
43	Rohina	Soymida febrifusa	Meliaceae
44	Redchilli	Capsicum annum	Solanaceae
45	Semal	Bombax ceiba	Malvaceae
46	Sisam	Rudbeckia hirta	Asteraceae
47	Supari	Areca catechu	Arecaceae
48	Tambaku	Nicotiana tubacum	Solanaceae
49	Torai	Luffa acutangula	Cucurbitaceae
50	Turmeric (haldi)	Curcuma longa	Zingiberaceae
51	Tulsi	Oxalis corniculata	Oxaliaceae
52	Wheat	Triticum aestivum L.	Poaceae
B.	Other materials		
53	Causticsoda	Sodium hydroxide	
54	Fitkari (alum)	Potassium alum	
55	Gur	Jaggery	
56	Geru	Oker red lumber stone	
57	Kunain		
58	Muskapoor	Cinnamomum camphora	Lauraceae
59	Salt	Sodium chloride	
60	Black salt	Anaqua sodi chloridum	
61	Sindoor	Red oxide of lead	
62	Tootmalanga		

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Annexure I: List of medicinal plants, plant parts and other materials used in traditional veterinary medicines in Gorakhpur district of Uttar Pradesh