



## Ethnoveterinary treatment of sheep in Marwar region of Rajasthan, India

M.L. Meena\*, N.K. Sharma<sup>1</sup> and Aishwarya Dudi

CAZRI, Krishi Vigyan Kendra,  
Pali-Marwar-306 401, Rajasthan, India

Received:24-04-2013

Accepted: 30-04-2014

DOI:10.5958/0976-0555.2015.00076.X

### ABSTRACT

The present study was carried out in the purposively selected Marwar region of Rajasthan. A multistage stratified random sampling design was used to select the districts, blocks, villages and sample households. A sample of 240 households was selected for the present study. Data were collected personally through a well structured and pre-tested interview schedule. It was found that majority of the households (66.25%) were initially providing self medication using traditional practices and in cases of severity of disease/ailment, village quack was consulted. Vaccination of sheep was followed in only 48.75 per cent of the selected households. In addition, in only 36 households (31.25%) the sick animals were isolated from the flock. A variety of traditional practices were observed being followed for treatment of various ailments and diseases of the goat and sheep with the use of locally available material, herbs, etc.

**Key words:** Ethnoveterinary practices, Sheep diseases, Traditional treatment

### INTRODUCTION

Traditional animals' healthcare practices, also called ethno-veterinary medicine, provide low cost alternatives in situation where western type drugs and veterinary services are not available or are too expensive. These practices were developed and practiced through trial and error methods and deliberate experimentation and is therefore, less documented and not universally recognized and for these reasons, it has had no place in mainstream veterinary medicine. Marwar region of Rajasthan comprises of four districts viz., Jodhpur, Jalore, Pali and Barmer state of Rajasthan. This region is located between 24.45 to 26.75 degree N latitude and 72.48 to 74.20 degree E longitude at an altitude ranging between 212 m to about 220 m above mean sea level with a total geographical area of 51,387 square kilometers (DOA, 2010).

Livestock rearing forms an important occupation in rural areas of this region. The contribution of livestock sector is as high as 50–65 per cent of the total income from agriculture in the region (Prasad et al. 2013). Sheep farming forms an important component of livestock rearing system in the region. Besides providing benefits of nutrition, additional income and employment to the rural households, the importance of this enterprise is highlighted in light of the direct bearing it has on the agriculture of the region. This enterprise provides farm families the farmyard manure for maintaining the fertility of the saline and salt affected

soil and draught power for performing the farming operations in the rainfed condition and important by it provides insurance against frequent crop failures in the region. The goat and sheep farming though holds immense importance in regional rural economy, it is still a household enterprise. The size of the goat and sheep flock maintained in the region is small varying from 25-50 animal heads including the young one also (Sah, 1999). The relatively difficult terrain and poor accessibility to the remote villages have led to a lesser influence of scientific sheep farming technologies in the region. In areas where these technologies find accessibility, small flock owners operating in difficult biophysical conditions usually prefer cheaper veterinary aid in order to keep the goat and sheep farming enterprise cost effective. The modern veterinary options are in most cases are cost intensive as well as several issues as that of accessibility, availability, regularity, etc. are involved. The Government veterinary aid available in the region is too meager to support all the sheep keepers. This all have ultimately lead to development of an alternative knowledge base among the sheep owners of the region for the treatment of their sheep which is commonly called as indigenous or traditional knowledge. These traditional methods of treatment besides being cheaper, accessible and prepared from locally available material, are also better adapted to the local conditions. The very fact that traditional methods or knowledge base has its base in the years of experimentations by the local people in

\*Corresponding author's e-mail: moti2007m@yahoo.co.in, <sup>1</sup>SKN, COA, Jobner, Jaipur (Rajasthan)-30290, India

their own conditions on sustained basis makes them worth the attention of the research system by means of documenting and validating them. Keeping these facts in view, the present study was conducted with the following specific objectives:

1. To document the consultation and vaccination pattern followed by the sheep farmers of the region for the treatment of their sick animals as well as their isolation.
2. To document the traditional methods of treatment followed for the various ailment/diseases of sheep.

## MATERIALS AND METHODS

The present study was carried out in the purposively selected Marwar region of Rajasthan. A multistage stratified random sampling design was used to select the districts, blocks, villages and sample households. On the basis of composite index of agricultural development calculated by Narain et al. (1995), then 2 districts of the region were classified into two strata - one of the developed district and second of poorly developed district. From each stratum, one district was selected randomly. Thus, the district Jodhpur represented developed and district Pali poorly developed district of the study area. Further, for the next two stages of sampling, i.e., blocks and villages, two strata on the basis of distance from the respective headquarters were formed and random selection of 4 blocks and 8 villages was done. From each of the selected 8 villages, 30 households representing the small, medium and large flock size categories were selected randomly and probability proportionate to the size. Thus, a sample of 240 households was selected for the present study. The data were collected personally through a well structured and pre tested interviewed schedule. This was also supported by the informal discussion with farmers as well as the guided field walk with them. The data thus collected were compiled, tabulated and subjected to the appropriate statistical tools to draw meaningful conclusions.

## RESULTS AND DISCUSSIONS

An in-depth understanding of existing sheep farming practices would help not only in getting a comprehensive account of the level of development of livestock in the locale, but also in planning and taking up any research or development activity. An attempt, therefore, was made, to study the traditional practices of treatment followed for sheep farming being followed in the study area. In addition, the consultation pattern adapted for treatment of sick animals, their isolation and vaccination pattern was studied. The results are discussed under the following subheads:

**Consultation pattern for sick animals:** The data presented in Table 1 clearly indicated that majority of the households (66.25%) were initially providing self medication using traditional practices and in cases of severity of disease/ailment, village quack was consulted. While 11.25 per cent of the household resorted to self medication only and depended on village quack. However, in 09.17 per cent of the households village quack was initially consulted, and when the cases were beyond their comprehension, LEO/veterinarians were consulted. Veterinary staffs including veterinarians and livestock extension officers (LEO) were reported consulted by 8.33 per cent of the selected households only.

**Vaccination of sheep:** Vaccination of sheep was followed in only 48.75 per cent of the selected households. Further, a considerable difference could also be observed between the number of households following vaccination of sheep in district 1 (83) and district 2 (34). Findings lead to infer that as high as about 75 per cent of the households in district 2 did not vaccinate their animals as mentioned in Table 1.

TABLE 1: Frequency distribution of the selected households on basis of existing methods of treatment of sheep

S. No.	Particulars	Frequency and percentage distribution		Pooled(N=240)
		Jodhpur(N=120)	Pali(N=120)	
I	Consultation pattern for sick animals			
1	Veterinarian	7 (05.83)	2 (01.67)	9 (03.75)
2	Livestock extension officer (LEO)	13(10.13)	7(05.83)	20(8.33)
3	Village quack	15 (12.50)	7 (05.83)	22(09.17)
4	Self medication	11 (09.17)	16 (13.33)	27(11.25)
5	Self medication followed by village quick	85 (70.83)	74 (61.67)	159(66.25)
6	Village quick followed by LEO/Veterinarian	09 (07.50)	12 (10.00)	21(08.75)
II	Vaccination of sheep			
1	Yes	83 (69.17)	34 (28.33)	117(48.75)
2	No	41 (34.17)	90 (75.00)	131(54.58)
III	Isolation of sick animals			
1	Yes	49 (40.83)	26 (21.67)	75(31.25)
2	No	73 (60.83)	98 (81.17)	171(71.25)

Isolation of sick animals: It is evident from the same table that out of the 240 selected households, in only 75(31.25%) cases the sick animals were isolated from the flock. The number of households following isolation of sick animals was higher in district 1 (49) as compared to that in district 2 (26). The present findings are in line with those of Pandey (1996) and Mohanty (1999). The above results clearly indicated lack of awareness among the goat and sheep farmers and farm women of the region about the importance of isolating the sick animals from the flock to prevent spread of diseases.

**Traditional methods of treatment of various sheep diseases:** The appreciation of traditional wisdom of farmers has been operationalised through proper documentation by the researchers and development personnel. Traditional/indigenous herbs and practices for treating animals are locally available, easily accessible, culturally appropriate and, therefore, readily comprehensible. In the present section an attempt has been to synthesize the documented traditional methods of treatment followed by the selected households in the study locale.

**Diarrhoea:** A total of nine indigenous methods for treatment of diarrhoea in sheep were documented in the study locale. From the Table 2, it is evident that arvi (*Colocasia esculenta*) plant was of great use in treatment of diarrhoea of animals

in the study area. Paste of its dry leaves, frothed solution of green leaves and stem of this plant were used by 66.25, 55.83 and 55.42 per cent of the households respectively. Majority of the households were also reported giving frothed solution of soybean (*Glycine max.*) 55.41% and paste of soaked chickpea (*Cicer arietinum*) 36.67%, respectively. Paste of latjeera (*Aleurites moluccana*) root, ground tuber of gethi (*Dioscorea kumaunensis*), mustard oil and paste of dry leaves of bhang (*Cannabis sativa*) plant were also used in 31.25, 37.50, 33.33 and 26.67 per cent of the selected households, respectively. Use of paste of dry leaves of bhang, soaked chickpea, and stem of arvi plant, ground gethi tuber and mustard oil were observed to be higher in district Jodhpur as compared to another district. While, use of frothed solution of soybean and green leaves of arvi (*Clocasia esculenta*) plant, paste of latjeera (*Aleurites moluccana*) root were higher in district Pali. The indigenous methods of treatment of diarrhoea as identified in the study locale were found to be different from those reported by Gupta and Patel (1994), Pandey (1996), Hamed (1998), Mandal (1999) and Mohanty (1999).

**Bloat (Affara):** Affara was one of the most widely prevalent health disorder reported by the respondents in Table 3. In a large per cent of the households, asofoetida (*Ferula assafoetida*) and ajwain (*Trachyspermum ammi*) (87.92%),

TABLE 2: Traditional methods of treatments of diarrhea in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Frothed solution of soybean ( <i>Glycine max.</i> )	44 (36.67)	89 (74.17)	133(55.41)
Frothed solution of green leaves of Arvi plant	49 (40.83)	85 (70.83)	134(55.83)
Paste of Latjeera ( <i>Aleurites moluccana</i> ) roots	19 (15.83)	56 (46.67)	75(31.25)
Paste of dry leaves of Arvi plant	66 (55.00)	93 (77.5)	159(66.25)
Stem of Arvi plants ( <i>Clocasia esculenta</i> )	80 (66.67)	53 (44.17)	133(55.42)
Paste of dry leaves of bhang ( <i>Cannbis sativa</i> )	39 (32.50)	25 (20.83)	64(26.67)
Paste of soaked chickpea ( <i>Cicer arietinum</i> )	43 (35.83)	45 (37.50)	88(36.67)
Ground Gethi tuber ( <i>Dioscorea sativa</i> )	53 (44.17)	37 (30.83)	90(37.50)
Mustard ( <i>Brassica compestris</i> ) oil	47 (39.17)	33 (27.50)	80(33.33)

TABLE 3: Traditional methods of treatments of bloat (affara) in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Ajwain ( <i>Trachyspermum anum</i> ) and block salt	97 (80.83)	93 (77.50)	190(79.17)
Asofoetida ( <i>Ferula assafoetida</i> ) and ajwain	108(90.0)	103 (85.83)	221(87.92)
Asofoetida and Ajwain with jaggry	55 (45.83)	81 (67.50)	136(56.67)
Tumba fruit powder ( <i>Citrullus colocynths</i> )	60 (50.00)	69 (57.50)	129(53.75)
Paste of fennel ( <i>Foeniculum vulgare</i> ),	43 (35.82)	73 (60.83)	116(48.33)
Chirayata ( <i>Swertia chirata</i> ), ginger ( <i>Zingiber officinale</i> )			
Powder of roasted Chamsur ( <i>Lepidium latifolium</i> )	37 (30.83)	83 (69.17)	120(50.00)
Paste of Gurju stem ( <i>Pistacia integerrima</i> )	25 (20.83)	77 (64.17)	102(42.50)
Sesame cake ( <i>Sesamum indicum</i> )	56 (46.67)	29 (24.17)	85(35.42)
Frothed solution of soybean	53 (44.17)	81 (67.50)	134(55.83)
Drumstick ( <i>Moringa plerygospermar</i> ) leaves with cow milk	20 (6.67)	50 (41.67)	70(29.17)

ajwain and black salt (79.17%), and asofoetida and ajwain with jaggery (56.67%), frothed solution of soybean (55.83%) and Tumba furit powder (*Citrullus colocynths*) (53.75%) were given to the sheep suffering from Affara. In a considerable per cent of households, powder of roasted chamsur (*Lepidium latifolium*) (50.00%), paste of fennel (*Foeniculum vulgare*), chirayata (*Swertia chirata*) and ginger (*Zingiber officinale*) (48.33%), paste of gurju stem (42.50%), sesame cake (*Sesamum indicum*) (35.42%) and Drumstick (*Moringa pterygospermar*) with cow milk (29.17%) were fed as a treatment of affara. Ajwain was used with many things like black salt, asofoetida, asafetida and jaggery for treatment of affara in a higher per cent of households in district Jodhpur as compared to district Pali. Similar was the case with use of sesame cake while the rest of the methods of treatment were in use in a higher per cent in district Jodhpur. Use of ginger, ajwain, asofoetida, hing and black salt for the treatment of bloat was also reported by De (1994), Pandey (1996) and Mohanty (1999). Anti-flatulence property of asofoetida and ajwain was confirmed by Singh et al. (1994).

**Sheep pox:** This disease occurs all year in which all sheep get equally affected. The whole herd gets this disease within a few weeks in Table 4. Lambs infected by this disease have high mortality due to development of pneumonia because Mata is perceived as being caused by Mataji. Applications of bottle guard (*Lagenaria siceraria*) leaves (22.50%), cowpea (*Vigna sinensis*) leaves (15.42%), Guarpatha (*Aloe vera*) pulp (43.33%) and onion (*Allium cepa*) paste (62.08%), fogging of neem leaves with turmeric powder (26.25%) for prevention of sheep pox. The findings are in line with the findings of Sah and Dubey (2010).

**Hemorrhage (Galgotu):** Application of the extract from Gaddi chamathi (*Tridax percombence*) leaves (36.67%), tea powder (40.23%), paste leaves of marva (*Origanum majorana*) 47.50%, paste of acacia (*Acacia nilotica*) leaves (55.87%), tulsi (*Ocimum sanctum*) leaves (47.08%), paste of Peepal (*Ficus religiosa*) tree leaves (55.83%), mango leaves (*Mangifera indica*) leaves (61.67%) and neem leaves (57.75%) to arrest hemorrhage in sheep as in Table 5. The findings confirm with the findings of Dudi and Singh (2007), (1995) and Singh and Chouhan (2010).

**Snake/Scorpio bite:** Drumstick(*Moringa pterygoperma*) leaves and ground turmeric powder (60.33%), neem leaves, hibiscus leaves and Marva (66.09%) leaves, Burgad leaves (*Ficcuss bengalensis*), custard apple (*Annona squamosa*) leaves and mixture of 1 part of linseed oil (45.33%), 1 part of eucalyptus oil, 1 part of gingelly oil (22.44%) applied on the site of bite by snake/Scorpio Table6. The findings confirm with the findings of Amitendu, et al. (2004) and Sah and Dubey (2010).

**Internal parasites:** Six different treatments were reported by the respondents for tackling the problem of internal parasites in animals. Neem (*Azadirachta indica*) leaves, leaves of marva (*Origanum majorana*), roots of Latjeera (*Aleurites moluccuna*) and decoction prepared from leaves, roots and bark of karanj (*Artemisia hilagirica*) with jaggery and bran were used in 52.50, 49.58, 38.33 and 38.33 per cent of the selected households, respectively as mentioned in Table 7. Paste prepared from bark of simal (*Ceiba pentandra*) tree and wheat bran was also used by a sizable per cent of households for treatment of internal parasites. A considerable difference in use of paste of simal tree bark,

TABLE 4: Traditional methods of treatments of sheep pox in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Application of bottle guard leaves ( <i>Lagenaria siceraria</i> )	28 (23.33)	26 (21.67)	54 (22.50)
Cowpea leaves ( <i>Vigna sinensis</i> )	20 (16.67)	17 (14.17)	37 (15.42)
Alovera () pulp	59 (49.17)	55 (45.83)	104 (43.33)
Onion paste ( <i>Allum cepa</i> )	78 (65.00)	71 (59.17)	149 (62.08)
Fogging neem leaves	33 (27.50)	30 (25.00)	63 (26.25)

TABLE 5: Traditional methods of treatments of Hemorrhage (Galgotu) in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Gaddi chamathi ( <i>Tridax percumbence</i> ) leaves	45 (37.50)	43 (35.83)	88 (36.67)
Paste leaves of marva ( <i>Origanum majorana</i> )	59 (49.17)	55 (45.83)	114 (47.50)
Paste of Peepal ( <i>Ficus religiosa</i> ) tree leaves	68 (56.67)	66 (55.00)	134 (55.83)
Mango leaves ( <i>Mangifera indica</i> ) leaves	78 (65.00)	70 (58.33)	148 (61.67)
Neem leaves	77 (64.17)	71 (59.17)	141 (58.75)
Tulsi ( <i>Ocimum sanctum</i> ) leaves	60 (50.00)	53 (44.17)	113 (47.08)

TABLE 6: Traditional methods of treatments of Snake and Scorpio bite in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Drumstick ( <i>Moringa pterygoperma</i> ) leaves and turmeric powder	80 (66.67)	70 (58.33)	150 (62.50)
Hibiscus leaves and marva ( <i>Origanum majorana</i> )	85 (70.83)	75 (62.50)	160 (66.67)
Burgad ( <i>Ficcuss bengalensis</i> ), custard apple ( <i>Annona squamosa</i> ) leaves and mixture of one part of linseed oil	78 (65.00)	30 (25.00)	108 (45.00)
1 part of eucalyptus oil and 1 part of gingelly oil	78 (65.00)	30 (25.00)	108 (45.00)

TABLE 7: Traditional methods of treatments of internal parasite in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Wheat bran	33 (27.50)	23 (19.17)	56(23.33)
Leaves of Marva ( <i>Origanum majorana</i> )	53 (44.17)	66 (55.00)	119(49.58)
Neem leaves ( <i>Azadirachta indica</i> )	69 (57.50)	57 (47.50)	126(52.50)
Paste of bark of Simal tree ( <i>Ceiba pentandra</i> )	43 (35.82)	42 (35.00)	85(35.42)
Root of Latjeera ( <i>Aleurites moluccun</i> )	30 (25.00)	62 (51.67)	92(38.33)
Decoction of leaves, root, bark of Karanj ( <i>Artemisia bilagirica</i> )	19 (15.82)	73 (60.83)	92(38.33)

roots of latjeera and decoction of leaves, roots, bark of Karanj with jaggery and wheat bran was noted between the households belonging to the two districts. Feeding the extract of neem leaves as a treatment of internal parasites was also reported by Mandal (1999) and Singh et al. (2013).

**Ectoparasites:** Animals affected with ectoparasites were taken care of in a variety of ways in the households in the state. Rubbing of petrol (70.83%), burning of dry leaves and farm waste near animals (63.33%), roots of Goja grass (53.75%) and mustard oil (53.33%) on the body of affected animals were the most common ways to mitigate the

ectoparasites. Bara nimbu (*Citrus lemon*), salt and mustard oil were applied externally in 42.92 and 53.33 per cent of the households in Table 8. Application of paste of neem leaves (26.25%), burning of neem and akda (*Calotropis gigantean*) leaves near the sheep flock (45.42%), rubbing frothed solution of ritha (*Sapindus mukorossi*) fruit (43.33%), rubbing extract of tobacco leaves (40.00%), kerosene (38.33%), vinegar (37.92%) were also found. Further, paste of lemon leaves, dry leaves of dhatura (*Artemisia parviflora*), haldi (*Curcuma domestica*) with lemon and sesame oil were practiced by 49.58, 37.50, 33.33

TABLE 8: Traditional methods of treatments of ectoparasite in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Bara nimbu ( <i>Citrus lemon</i> )	47 (39.17)	56 (46.67)	103 (42.92)
Crushed naphthalene balls in oil	32 (26.67)	40 (33.33)	72 (30.00)
Dhatura ( <i>Artemisia parviflora</i> ) leaves	37 (30.83)	53 (44.17)	90 (37.50)
Frothed solution of Ritha fruit ( <i>Sapindus mukorossi</i> )	34 (28.33)	70 (58.33)	104(43.33)
Paste of Goja grass	60 (50.00)	69 (57.50)	129(53.75)
Mustard oil	59 (49.17)	69 (57.50)	128(53.33)
Paste of haldi ( <i>Curcuma domestica</i> ) with lemon	33 (27.50)	47 (39.17)	80(33.33)
Petrol	89 (74.17)	81 (67.50)	170(70.83)
Kerosene	49 (40.83)	43 (35.83)	92(38.33)
Vinegar	37 (30.83)	54 (45.00)	91(37.92)
DDT with ash	25 (20.83)	17 (14.17)	42(17.50)
Gammoxene with cow dung	26 (21.67)	18 (15.00)	44(18.33)
Sesame oil	33 (27.50)	19 (15.83)	52(21.67)
Paste of custard apple leaves ( <i>Annona squamosa</i> )	28 (23.33)	49 (40.83)	77(32.08)
Paste of neem leaves	37 (30.83)	26 (21.67)	63(26.25)
Paste of lemon leaves	66 (55.00)	53 (44.17)	119(49.58)
Powder of dry leaves of Dhatura ( <i>Artemisia parviflora</i> )	39 (32.50)	50 (41.67)	89(37.08)
Burning dry leaves of neem and ank ( ) near the sheep flock	43 (35.83)	66 (55.00)	109(45.42)
Burning of dry leaves and farm waste near sheep flock	62 (51.67)	90 (75.00)	152(63.33)
Extract of tobacco leaves	55 (45.83)	41 (34.17)	96(40.00)

and 21.67 per cent of the households, respectively. Application of powder of dry leaves of pati (*Artemisia parviflora*), paste of leaves of custard apple (*Annona squamosa*), rubbing gammaxene with cow dung, crushed nephthalene balls in oil and DDT with ash on the body of affected sheep were also practiced in the study locale. Creating fumes by burning of neem leaves near affected animals for tackling the problem of ectoparasites was also reported by De (1994), Pandey (1996), and Mandal (1999). The finding is in line with that of Sah (1996) who reported burning of dry leaves and dry farm waste near such animals. Application of kerosene oil on the affected part of the animal was also reported by De (1994) and Pandey (1996).

**Mastitis:** Most commonly used methods of treatment of mastitis in the region involved application of honey (68.33%), paste of roots of doob grass (68.33%) on and inserting the root of doob grass (*Cynodon dactylon*) in the affected teat (78.33%). Paste of crushed kair fruits (*Capparis deciuia*) was also applied on affected teat in 53.75 per cent of the selected households mentioned in Table 9. A considerable per cent of households were found applying paste of molasses on udder and hip point (34.17%) and paste of green crushed leaves of pilu (*Salvaodora oleoides*) tree (29.17%). In 33.75 and 24.17 per cent of the households,

ash was thrown and paste of fresh rhizome of haldi was applied on affected udder, respectively. The indigenous methods of treatment of mastitis as explained above were different from those reported by Gupta et al. (1996), Sah (1996) and Mohanty (1999).

**Foot and mouth disease (FMD):** Foot and mouth disease locally known as 'Khuriya and Bang' was tackled in several ways in the selected households mentioned in Table 10. For foot lesions, the common indigenous treatments included application of muck on hooves of the affected animal or the animal is made to stand in the muck (55.00%), application of mustard oil and salt (51.25) and paste of haldi, doob grass and salt (44.17%). In substantial per cent of households, paste of marva (*Origanum majorana*) leaves (38.75%) and paste of leave buds of pilu (*Salvaodora oleoides*) and karanj (*Millettia pinnata*) tree (35.00%) were also applied. Pouring the lime solution, petrol, phenyl and kerosene on the hooves of the affected animal was practiced in 35.83, 27.92, 26.67 and 21.67 per cent of the selected households respectively. Similar to the present finding, i.e., making the affected animal walk in mud to control foot lesions was also reported by Gupta and Patel (1991), Sah (1996) and Mandal (1999). Pouring limewater on infected hooves as a treatment for foot lesions was also reported by Gupta and Patel (1991), Pandey

TABLE 9: Traditional methods of treatments of mastitis in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Honey applied on the affected teat	55 (45.83)	109 (90.83)	164(68.33)
Root of doob grass ( <i>Cynodone dactylon</i> ) into the affected teat	85 (70.83)	109 (90.83)	164(68.33)
Paste of roots of doob grass	85 (70.83)	103 (85.83)	188(78.33)
Paste crushed kair fruits ( <i>Capparis decidua</i> )	69 (57.50)	60 (50.00)	129(53.75)
Paste of fresh rhizome of haldi	27 (22.50)	31 (25.83)	58(24.17)
Paste of molasses applied on udder and hip point	49 (40.82)	33 (27.50)	82(34.17)
Paste of wood of pilu tree ( <i>Salvaodora oleoides</i> )	21 (17.50)	49 (40.83)	70(29.17)
Ash thrown on affected udder	43 (35.82)	38 (31.67)	81(33.75)

TABLE 10: Traditional methods of treatments of foot and mouth diseases (FMD) in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
<b>Foot lesions</b>			
Application of muck/animals made to stand in it	63 (52.50)	69 (57.50)	132(55.00)
Paste of haldi, doob grass and salt	49 (40.83)	57 (47.50)	106(44.17)
Paste of leaves buds of pilu and karanj ( <i>Millettia pinnata</i> ) tree	29 (24.17)	55 (45.83)	84(35.00)
Paste of marva ( <i>Origanum majorana</i> ) leaves	40 (33.33)	53 (44.17)	93(38.75)
Pouring lime solution	55 (45.82)	31 (25.83)	86(35.83)
Mustard oil and salt	67 (55.82)	56 (46.67)	123(51.25)
Pouring kerosene	31 (25.82)	21 (17.50)	52(21.67)
Pouring petrol	40 (33.33)	27 (22.50)	67(27.92)
Pouring phenyl	43 (35.82)	21 (17.50)	64(26.67)
<b>Mouth lesions</b>			
Application of ash	63 (52.50)	85 (70.83)	148(61.67)
Rubbing of salt	63 (52.50)	74 (61.67)	137(57.08)

(1996) and Galav et al. (2013). For mouth lesions, in 61.67 per cent of the households, ash was applied and in 57.08 per cent salt was rubbed. Gupta and Patel (1991) and Mandal (1999) also reported application of salt solution inside the mouth as well as between the hooves of animal affected with FMD.

**Fever:** The most common indigenous practices followed in the study area for treatment of fever were feeding paste of kutaki (*Gentiana kurroo*) roots (60.00%), decoction of kilmodi (*Eerberis aristata*) roots and bark with sugar syrup (60.83%) and decoction of chalmodi (*Geranium pratense*) leaves, roots and bark (52.92%). Concentrate solution of haldi (*Abina cordifolia*), leaves and paste of onion (*Allium cepa*), ajwain, dhanian (*Coriandrum sativum*) and jaggery were also fed in 39.58 and 48.33 per cent of the households as in Table 11. In 54.17 per cent of the households animal was drenched with solution of soybean, while in 47.50 per cent of the households, paste of green leaves of brahmi (*Woodfordia floribunda*) was kept on forehead of animal for treatment of fever. The indigenous treatments provided to animals in case of fever in the study area were found to be different from those reported by Pandey (1996), Sah (1996) and Mandal (1999).

**Sprain/Fracture:** The indigenous treatments of sprain/fracture followed in the selected households in the descending order of their extent of use were, application of warm paste of haldi (66.00%); paste of maitha (*Polygonatum verticillatum*), bhang (*Cannabis sativa*) and ash (48.33%); paste of haldi, doob and leaves of arandi (*Ricinus communis*) tree (30.83%); paste of leaves and roots of shauriya

(*Elaeodendron glaucum*) (24.58%) and paste of haldi and lime (15.42%) as mentioned in Table 12. Use of haldi in the treatment of fracture was also reported by Darji (1993) and Mandal (1999).

**Wound:** Haldi heated in ghee, juice of Haldi leaves and powdered seeds of kusum (*Schleichera oleosa*) tree were used in 60.42, 52.50 and 27.08 per cent of the selected households, respectively, for treatment of wounds as in Table 13. Application of haldi and ghee as an indigenous treatment of wounds was also reported by De (1994) and Pandey (1996).

**Skin diseases:** In case of skin diseases, paste of neem leaves was applied on the affected area in 31.25 per cent of the households, followed by 17.92 per cent of households in which solution of roots leaves and bark of banbasa (*Viola biflora*) with honey was fed to affected animal Table 14. Whole plant of jharbari (*Zizyus jujuba*) was boiled in water and concentrated solution was fed to affected animal in 17.50 per cent of households. Paste of henna (*Lawsonia inermis*) leaves and paste of jangli piyaz (*Urginea indica*) were fed in 16.25 and 11.67 per cent households, respectively. The findings confirm with the findings of Karthikeyan and Chandrakandan (1996).

**Retained placenta:** A perusal of Table 15 revealed that a total of nine treatments were followed for expulsion of retained placenta, which were singly used, as well as in combination. In majority of the selected households, sugarcane (*Saccharum officinarum*) leaves (75.83%), bamboo (*Bambusa arundinacea*) leaves (69.58%), cotton

TABLE 11: Traditional methods of treatments of fever in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Paste of Kutali roots ( <i>Gentiana kurroo</i> )	47 (39.17)	97 (80.83)	144(60.00)
Decoction of Kilmodi roots ( <i>Eerberis aristata</i> )	48 (40.00)	98 (81.67)	146(60.83)
Decoction of Chalmodi leaves ( <i>Geranium pratense</i> )	54 (45.00)	73 (60.83)	127(52.92)
Concentrate solution of haldi leaves	40 (33.33)	55 (45.83)	95(39.58)
Paste of onion ( <i>Allium cepa</i> ), ajwain, coriander ( <i>Coriandrum sativum</i> )	49 (40.83)	67 (55.83)	116(48.33)
Animal drenched with solution of soybean	73 (60.82)	57 (47.50)	130(54.17)
Paste of green leaves of Brahmi ( <i>Woodfordia floribunda</i> ) kept on forehead of affected sheep	27 (22.50)	87 (72.50)	114(47.50)

TABLE 12: Traditional methods of treatments of sprain/fracture in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Paste of haldi, doob grass and castor leaves	33 (27.50)	43 (35.00)	76(31.67)
Paste of Maitha ( <i>Polygonatum verticillatum</i> ), Bhang ( <i>Cannabis sativa</i> ) and ash	46 (38.33)	70 (58.33)	116(48.33)
Warm paste of haldi	73 (60.83)	86 (71.67)	159(66.25)
Paste of leaves and roots of Shauriya ( <i>Elaeodendron glaucum</i> )	23 (19.17)	36 (30.00)	59(24.58)
Paste of haldi and lime	11 (09.17)	26 (21.67)	37(15.42)

TABLE 13: Traditional methods of treatments of wound in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Juice of leaves	60 (50.00)	66 (55.00)	126 (52.50)
Powdered seed of Kusum ( <i>Schleichera oleosa</i> )	28 (23.33)	37 (30.82)	65 (27.08)
Haldi heated in cow ghee	66 (55.00)	79 (65.83)	145 (60.42)

TABLE 14: Traditional methods of treatments of skin diseases in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Solution of roots, leaves, barks of banbasa ( <i>Viola biflora</i> ) with honey fed	17 (14.17)	26 (21.67)	43 (17.92)
Whole plant of Deshi ber ( <i>Zizyphus jujuba</i> ) boiled in water and concentrate fed	23 (19.17)	19 (15.83)	42 (17.50)
Paste of Neem leaves applied	48 (40.00)	27 (22.50)	75 (31.25)
Paste of Henna ( <i>Lawsonia inermis</i> )	12 (10.00)	19 (15.83)	39 (16.25)
Paste of Jangli piyaz ( <i>Urginea indica</i> )	11 (09.17)	17 (14.17)	28 (11.67)

TABLE 15: Traditional methods of treatments of retain of placenta in sheep by the farmers

Particulars	Frequency and percentage distribution		Pooled(N=240)
	Jodhpur(N=120)	Pali(N=120)	
Sugarcane leaves ( <i>Saccharum officinarum</i> )	83 (69.17)	99 (82.50)	182 (75.83)
Bamboo ( <i>Bambusa arundinacea</i> ) leaves	80 (66.67)	87 (72.50)	167 (69.58)
Kusa ( <i>Desmostachya bipinnata</i> ) leaves	39 (32.50)	36 (30.00)	75 (31.25)
Whole paddy ( <i>Oryza sativa</i> )	25 (20.82)	56 (46.67)	96 (40.00)
Dry leaves of chickpea and cluster bean	63 (52.50)	33 (27.50)	96 (40.00)
Whole barley ( <i>Horedeum vulgare</i> )	51 (42.50)	65 (54.17)	116 (48.33)
Cotton seeds ( <i>Gossypium arboretum</i> )	37 (30.83)	98 (81.67)	135 (56.25)
Kinna ( <i>Sapium insigne</i> ) leaves	25 (20.83)	88 (73.33)	113 (47.08)
Riu ( <i>Cotoneaster accuminata</i> ) leaves	31 (25.82)	49 (40.82)	80 (33.33)
A light weight tied at the end of the placenta to facilitate	12 (10.00)	82 (68.33)	94 (39.17)

seeds (56.25%) and whole barley (*Cotoneaster accuminata*) (48.33%) were used. However, in 47.08, 40.00, 40.00, 33.33 and 31.25 per cent of the households' kina leaves (*Sapium insigne*), whole paddy (*Oryza sativa*), chickpea and cluster bean dry leaves, Riu (*Cotoneaster accuminata*) leaves and kusa leaves (*Desmostachya bipinnata*) were used, respectively. In about 39.17 per cent of the households, for expulsion of retained placenta a lightweight was tied at the end of the placenta to facilitate the expulsion. Patel et al. (1993) also reported that for expulsion of retained placenta, a lightweight was tied at the end of placenta. However, Pandey (1996) reported that ban leaves were fed for easy and smooth expulsion of placenta unlike the present findings.

## CONCLUSION

It may be concluded that the relative difficult biophysical conditions and poor economic resource availability of the sheep and goat farmers operating in this

Marwar region of India have caused lesser influence of scientific goat and sheep farming technologies in the region. As of result of which, over the years of experimentations, sheep and goat farmers of this region have evolved an alternative knowledge base for the treatment of their animals. As presented in above paragraphs, a variety of traditional practices were observed being followed for treatment of various ailments and diseases of the animals with the use of locally available material, herbs etc. These traditional methods are of much importance because majority of goat and sheep farmers in the region were resorting to self medication using traditional practices only, while the other agents like quack and staff of formal veterinary services were consulted only in cases of severity of disease/ailment. In addition, less than half of the selected farm households were observed vaccinating their animals against diseases, while isolation of diseased animals was practiced in only 30 per cent of the household.



## REFERENCES

- Amitendu, A., Arya, H.P.S., Tudu, B. and Goswami, A. (2004) Indigenous technical knowledge in animal husbandry. *Livestock Research for Rural Development*, **16**(8):1-8.
- Darji, V.A. (1993) Livestock and animal husbandry. *Honey Bee*, **4**(4): 17.
- De, H.K. (1994). Identification and assessment of indigenous technologies in animal husbandry in Bankura district (W.B.). M.Sc. Thesis, NDRI (Deemed University), Karnal, India.
- Department of Agriculture (2010). Vital Agricultural Statistics, Govt. of Rajasthan, Panth Krishi Bhawan, Jaipur: 233-239.
- Dudi, A. and Singh, A.R. (2007). Traditional wisdom practices among rural women regarding health and care of infants. *Indian Res. J. Ext. Edu.* **7** (1):29-32.
- Galav, P., Jain, A. and Katewa, S.S. (2013). Traditional veterinary medicines used by livestock owners of Rajasthan, India. *Indian Journal of Traditional Knowledge* **12**(1): 47-55.
- Gupta, A.K. and Patel, K.K. (1991). Experimenting farmers, pastoralists and artisans - Report of a survey of local innovations in dry regions of Gujarat. *Honey Bee*, **2**(1): 21.
- Gupta, A.K. and Patel, K.K. (1994). Survey of farmers' innovations in Gujarat. *Honey Bee*, **5**(3): 14 15.
- Gupta, A.K.; Patel, K.K., Suthar, J.H., Chauhan, V., Koradia, D., Raval, A., Pastakia, A., Srinivas, Ch; Muralikrishna, S.; Patel, H.; Patel, R.; Sinha, R. and N. Joshi. (1996). Survey of grassroots innovation. *Honey Bee*, **7**(3): 17.
- Hamed, K.S. (1998). Traditional veterinary wisdom practices from rural Medak, A.P. *Honey Bee*, **9**(2): 17.
- Karthikeyan, C. and Chandrakandan, K. (1996). Indigenous technical knowledge of the tribes in agriculture. *J. Extn. Edn.*, **7**(2): 1417 1421.
- Mandal, M.K. (1999). Awareness about ethno veterinary medicines of livestock feeding and health care among dairy farmers in Bankura district (W.B.). M.Sc. Thesis, NDRI (Deemed University), Karnal, India.
- Mohanty, M. (1999). Study of the livestock feeding and health management systems in Mayurbhanj district of Orissa. M.Sc. Thesis, NDRI (Deemed University), Karnal, India.
- Narain, P.; Rai, S.C. and Sarup, S. (1995). Regional disparities in the levels of development in Uttar Pradesh. *J. Indian Soc. Agril. Stat.*, **47**(3): 288 304.
- Pandey, A.K. (1996). A comparative study of livestock rearing system among tribals and non tribals in Chotanagpur region of Bihar. Ph.D. Thesis, NDRI (Deemed University), Karnal, India.
- Patel, P.R., Kavati, F.S. and Patel, B.T. (1993). Traditional practices in animal husbandry. Paper presented at National Seminar on Indigenous Technologies for Sustainable Agriculture, 23 25 March, 1993, IARI, New Delhi.
- Prasad, R., Singh A.K., Singh, L. and Singh, A. (2013). Economics of goat farming under traditional low input production system in Uttar Pradesh. *Indian Res. J. Ext. Edu.* **13**(2):62-66.
- Sah, A.K. (1996). A descriptive study of existing dairy farming practices and constraints in adoption of improved dairy practices among dairy farmers in Banka district (Bihar). M.Sc. Thesis, NDRI (Deemed University), Karnal, India.
- Sah, U. (1999). An analysis of dairy animal breeding and management practices in hill zone of U.P.: A gender perspective. Ph.D. Thesis, NDRI (Deemed University), Karnal, India.
- Sah, U. and Dubey, S.K. (2010). Traditional methods of treatment of dairy animals in central Himalayan region of India. *Journal of Community Mobilization and Sustainability Development*, **5**(1):41-49.
- Singh, D., Kachhawaha, S., Chaudhary, M.K., Meena, M.L. and Tomar, P.K. (2014). Ethno-veterinary knowledge of Raokas Marwar for nomadic pastoralism. *Indian Journal of Traditional Knowledge* **13**(1):123-131.
- Singh, H., Kumar, A. and Chaudhari, P.C. (1994). Some important indigenous drugs usable in veterinary practice. *Veterinary Clinical Guide*, Kalyani Publishers, New Delhi.
- Singh, S.K. and Chauhan, J. (2010). Perceived effectiveness of ITK among livestock owners. *Indian Res. J. Ext. Edu.* **10** (1):12-15.