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RESEARCH ARTICLE

Indigenous technical knowledge used in dairying by pastoralists of Jammu and Kashmir

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Abstract: The study was carried out in current Union Territory of Jammu & Kashmir (erstwhile state of Jammu & Kashmir). Two districts, namely Rajouri & Poonch from Jammu division were selected purposively because of being the districts of highest *Gujjar (transhumants primarily rearing cattle and buffaloes)* population; whereas, two districts, namely Anantnag & Baramulla from Kashmir division were selected purposively because of being the districts of highest *Bakarwal (transhumants primarily rearing sheep and goats)* population. Sixty respondents (*Gujjars*) from migratory tracts of district Rajouri & Poonch from Jammu division were selected randomly and sixty respondents (*Bakarwal*) from migratory tract of districts Anantnag & Baramulla from Kashmir division were selected randomly comprising a total of 120 respondents. Those pastoralists who were rearing at least 10 milch animals were selected for the study. Focus group discussion method was used for collection of data related to Indigenous Technical Knowledges (ITKs). The discussion revealed that the respondents were using ITKs primarily in breeding, feeding and health-care management practices. With regard to the induction of heat, thirty per cent of the respondents used chapatti of a mixture of *Gur* and *ghee* in the ratio of 2:1 in wheat flour and fed to animal once a day to induce heat. For retention of placenta, 34.17 per cent of the respondents fed extract obtained from tea leaves *(Camellia sinensis)* on boiling after sieving to animals. As far as ITKs regarding feeding practices are concerned 40.83 per cent of the respondents fed boiled *Ber* leaves *(Ziziphus mauritiana)* oncea day to increase milk production. The study reveals that 42.50 per cent of respondents fed10-12 leaves of *Katori (Xylosonalongifolium)* plant to animals having diarrhoea and 15.83 per cent fed fruits of *bel* (*Aegle marmelos*) to animals having diarrhoea.

Keywords: *Bakarwal*, Dairying, *Gujjar,* Indigenous Technical Knowledge, Pastoralism

Introduction

Pastoralists are people who depend primarily on livestock for subsistence. They inhabit in those parts of the world where the potential for crop cultivation is limited. There are about 120 million pastoralists in the world (Rass, 2006). Pastoralism makes a significant contribution to the economy of developing countries in terms of providing employment and in supplying nutrition to the rural poor. There are so many pastoral communities in India but Pastoralism in a country like India is under- researched and poorly documented. The pastoral communities of Jammu and Kashmir have retained all the typical characteristics of pastoral communities, viz. migration, having no land for tilling, having livestock as the sole source of subsistence and have no permanent structures. So, pastoral communities of J & K are a typical model to study. Pastoral communities use different ITKs for breeding, feeding and health-care management of the dairy animals. To identify the ITKs used by these communities regarding dairying, this study was undertaken in Jammu and Kashmir Union Territory.

Research Methodology

In the study, two districts Rajouri & Poonch from Jammu division were selected purposively because of being the districts of highest *Gujjar* population. Two districts Anantnag & Baramulla from Kashmir division were selected, purposively, because of being the districts of highest *Bakarwal* population. Sixty respondents (*Gujjars*) from migratory tracts of district Rajouri & Poonch from Jammu division were selected randomly and 60 respondents (*Bakarwals*) from migratory tract of districts Anantnag & Baramulla from Kashmir division were selected

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randomly comprising a total of 120 respondents. Pastoralists, who were rearing at least 10 milch animals were selected for the study. Focus group discussion method was used for collection of data related to Indigenous Technical Knowledges (ITKs). The respondents were asked about ITKs they were using related to dairy farming.

Result and Discussion

The discussion revealed that the respondents were having considerably vast knowledge regarding use of ITKs in rearing of their animals.

Breeding Practices

Induction of heat

It is very important for the dairy farmers to identify heat detection at right time to make dairy farming profitable by overcoming the loss due to extra feeding and long dry period in animals. It has been estimated through National Dairy Research Institute, Karnal study that farmer loses Rs.4000 when he misses each heat in dairy animal (Srivastava et al. 2013). Results in table 1 revealed that thirty per cent of the respondents used chapatti of a mixture of *Gur* and *ghee* in the ratio of 2:1 in wheat flour and fed to animal once a day to induce heat. Forty per cent of the respondents fed boiled *methi(Trigonella foenum-graecum)* grains empty stomach to animals for 3-5 days for inducing heat.

Retention of Placenta (ROP)

The results indicate that 34.17 per cent of the respondents fed extract obtained from tea leaves *(Camellia sinensis)* on boiling after sieving to animals. It was observed that 25.83 per cent of the respondents fed extract obtained after boiling rice to cure ROP (retention of placenta), 27.50 per cent of the respondents believed that cold water feeding expedited the process of shedding of placenta and 25 per cent of the respondents fed Gulkand in cases of ROP (retention of placenta).Lanset al. (2003) reported that in northern region paddy (*Oryza sativa*) cultivation is predominant and paddy is also called as a "heated substance" which means that heat of the paddy would help to break down the uterine lining that helps in easy expulsion of placenta.

Feeding Practices

As far as ITKs regarding feeding practices are concerned 40.83 per cent of the respondents fed boiled *Ber* leaves *(Ziziphus mauritiana)* oncea day to increase milk production, 43.33 per cent of the respondents fed Garna leaves *(Carissa opaca)* and shoots to increase milk yield in goats, 25.83 per cent of the respondents fed Massa *(Bulbostylisbarbata)* (cut into pieces) mixed in wheat flour to increase milk production and 53.33 per cent of the respondents fed one *paav*(250 g) *Jaggery (*Red

Table 1: Indigenous Technical Knowledge related to breeding and feeding practices

S NO	Breeding Practices	F*	%
	Induction of Heat		
1.	*Gur* and *ghee* in the ratio of 2:1 were mixed in wheat flour and then chapatti of this mixture was fed to animal once a day to induce heat in animal.	36	30.00
2.	Boiled *methi(Trigonella foenum-graecum)* grains were fed empty stomach to animals for 3-5 days to induce heat.	48	40.00
3.	Retention of Placenta		
4.	Extract obtained from tea leaves *(Camellia sinensis)* on boiling after sieving was fed to animals in case of retention of placenta.	41	34.17
5.	Extract obtained after boiling rice was also fed to animals in case of retention of placenta.	31	25.83
6.	Cold water feeding also expedited the process of shedding the placenta.	33	27.50
7.	Gulkand feeding is also effective in case of retention of placenta.	30	25.00
	Feeding Practices		
8.	*Ber* leaves *(Ziziphus mauritiana)* were boiled and fed to animal once a day to increase milk production.	49	40.83
9.	Garna leaves *(Carissa opaca)* and shoots were fed to increase milk yield in goats.	52	43.33
10.	Massa *(Bulbostylisbarbata)* (cut into pieces) mixed in wheat flour and fed to animal to increase milk production.	31	25.83
11.	One *paav*(250 g) *Jaggery (*Red sugar made of desi gur) mixed in dry flour and given to animal once a day helps in increasing milk production.	64	53.33

*F = frequency out of 120 respondents

sugar made of desi gur) mixed in dry flour to animal once a day to increase milk production.

Diarrhoea

The study reveals that 42.50 per cent of respondents fed10-12 leaves of *Katori(Xylosonalongifolium)* plant to animals having diarrhoea and 15.83 per cent fed fruits of bill (*Aegle marmelos*) to animals having diarrhoea. The study on plants belonging to different plant families such as Anathaceae, Anacardiaceae, Ceasalpinniaceae, Clusiaceae, Punnicaceae and Verbenaceae indicated anti-diarrheal activity (Panda et al. 2012) against pathogens causing diarrhoea in human being was tested successfully.

Constipation

Results show that 28.33 per cent of the respondents fed Gulkhand in case of constipation, 15.83 per cent fed mango pickle to relieve animals of constipation and 37.50 per cent fed Saunf*(Foeniculum vulgare)* powder mixed in wheat flour in case of constipation.

Tympany

Table 2 indicates that 55.83 per cent of the respondents used to cut upper ear tip with a razor in cases of tympany, 25.83 per cent fed one *paav* (250 g) Hing *(Ferulaasafoetida)* once a day in cases of tympany, 66.67 per cent drenched animals suffering from tympany with one *paav*(250 g) mustard oil *(Brassica compertris)* and 35.83 per cent fed leaves of *Tulsi*(*Ocimum sanctum*) in case of tympany.

Fracture

It was observed that fifteen per cent of the respondents appliedTil oil *(Sesamum indicum)* on the affected part after fixing it with bamboo splints in case of fracture and 9.17 per cent applied a cooled down suspension of Amla *(Emblica officinalis)* and piece of iron boiled in water.

FMD

As per the results obtained 15.00 per cent of the respondents applied the oil from the seeds of the mustardplant *(Brassica compestris)* after mixing with Haldi powder *(Curcuma longa)* and kerosene oil externally on the foot in case of animals suffering from FMD, 26.67 per cent of the forced animals suffering from FMD to walk on hot sand for 20 minutes and 36.67 per cent of applied extract from the stem of deodar tree *(Cedrus deodara).* The most frequently used plants for the treatment of foot and mouth disease were *Fagopyrum esculentum* and *Tamarindus indica.Fagopyrum esculentum* documented in the present study have not been documented for foot and mouth disease so far as no information regarding its use was available in the literature, however, it has been documented for the treatment of anaemia by Ratan et al. (2011). Similarly*Tamarindus indica* has been reported for the treatment of black quarter after mixing with soil of ant hill and applying it on the back or thigh region by Deshmukh et al. (2011) in early studies. Feeding of fish and snail to animals in order to prevent and treat foot and mouth disease was also reported from the study area which has also been reported for the treatment of foot and mouth disease in Sargodha district of Pakistan by Dilshad et al. (2009).

Cough

It was found that 25.83 per cent of the respondents burnt blue colour cloth and its fumes were given to affected animals and 31.67 per cent fed *kali mirch (Piper nigrum), ,badielaichi*(Cardamom) and *ajwain(Trachyspermumammi)* in equal proportions ground and mixed in water twice a day in case of cold and cough.

Ectoparasites

The results reveals that forty five per cent of the respondents applied salt added to mustard oil *(Brassica compertris)* over the body of affected animals for control of ectoparasites and 19.17 per cent of the respondents fed Shambar leaves *(Artemisia nilagirica)* to animals for removing internal as well as external parasites. A similar study found that Cow urine and black ash; cloth dipped in petrol; camphor application; red soil on legs (Subrahmanyeshwari and Chander, 2013) in cases of ectoparasites. The most frequently used plant for helminthosis and external parasites was processed resin of *Cedrus deodara* used almost in all the species. *Cedrus deodara* has been reported to be used for external parasites in Jammu and Kashmir by Slathia et al. (2007) and in Pakistan by Sindhu et al. (2010). *Aconitum deinorrhizum and Sarcococcasaligna*were other widely used plants in almost all the parasitic and other skin conditions in animals. Use of *Rabdosia rugosa* and *Gentianakurroo*as remedy of helminthiosis in livestock has also been reported in Jammu and Kashmir by Kumar et al. (2009). *Nicotiana tabacum* reported from the study area for treatment of maggots has been documented earlier in the literature by Nfi et al. (2001) for the same ailment. *Saussureacostus*reported for maggot infestation has also been reported for the same condition in Jammu and Kashmir by Khan et al. (2004) and in Uttaranchal by Bisht et al. (2006).

Mastitis

Majority (72.50 %) of the respondents applied common salt on teats in case of mastitis, 55.83 per cent of the respondents applied turmeric *(Curcuma longa),* alum and black pepper were ground and then applied on teats in case of mastitis and 62.50 per cent applied alum or phitkari on teats in case of mastitis. Similar study revealed that 100 gm turmeric (*Curcuma longa*) 10 gm alum or *phitkari*and 10 gm black pepper grind and massage on teats

Table 2: Indigenous Technical Knowledge related to health-care prac

S. No	Health Care Practices	F*	%
Diarrhoea			
1	10-12 leaves of *Katori(Xylosonalongifolium)* plant were fed to animal having diarrhoea.	51	42.50
2	Fruits of bill (*Aegle marmelos*) were fed to animals having diarrhoea.	19	15.83
Constipation			
1	Feeding of gulkand also was effective in cases of constipation.	34	28.33
2	Mango pickle was also fed to relieve constipation.	19	15.83
3	Saunf*(Foeniculum vulgare)* powder mixed in wheat flour was also used in treating constipation.	45	37.50
Tympany			
1	The upper ear tip is cut with a razor in case of treating tympany and this is one of the most widely used.	67	55.83
2	One *paav* (250 g) Hing *(Ferulaasafoetida)* fed once a day is also effective against tympany.	31	25.83
3	One *paav*(250 g) mustard oil *(Brassica compertris)* drench is very effective in cases of tympany.	80	66.67
4	Feeding leaves of *Tulsi*(*Ocimum sanctum*) is also effective in tympanitis.	43	35.83
Fracture			
1	Application of Til oil *(Sesamum indicum)* on the affected part after fixing it with bamboo splints in case of fracture.	18	15.00
2	Amla *(Emblica officinalis)* and piece of iron is boiled in water. When this suspension was cooled down, it was applied on the feet of affected animal in case of FMD.	11	9.17
Foot and Mouth Disease (FMD)			
1	The oil from the seeds of the mustardplant *(Brassica compestris)* after mixing with Haldi powder *(Curcuma longa)* and kerosene oil was applied externally on the foot in case of animals suffering from FMD.	18	15.00
2	Affected animals were forced to walk on hot sand for 20 minutes.	32	26.67
3	Extract from the stem of deodar tree *(Cedrus deodara)* was applied externally to cure FMD.	44	36.67
Cough			
1	Blue colour cloth was burnt and its fumes were given to affected animals in case of cough.	31	25.83
2	*Kali mirch (Piper nigrum), ,badielaichi*(Cardamom) and *ajwain(Trachyspermumammi)* in equal proportions is ground and mixed in water and fed to animals twice a day in case of cold and cough.	38	31.67
Ectoparasites			
1	Salt added to mustard oil *(Brassica compertris)* was applied all over the body for control of ectoparasites.	54	45.00
2	Kerosene oil or petrol applied all over the body in case of ectoparasites.	59	49.17
3	Shambar leaves *(Artemisia nilagirica)* were fed to animals for removing internal as well as external parasites.	23	19.17
Mastitis			
1	Application of common salt on teats helps in mastitis.	87	72.50
2	Turmeric *(Curcuma longa),* alum and black pepper were ground and applied on teats in case of mastitis.	67	55.83
3	Alum or phitkari was applied on teats in mastitis.	75	62.50

*F = frequency out of 120 respondents

once a day (Subrahmanyeshwari and Chander 2013) was applied in cases of mastitis.

Conclusion

ITKs amongst pastoral communities are treasures of knowledge maintained across generations which need to be documented on priority. Modernization has adversely hit these time tested remedies and these ITKs have taken a back seat. In the times of changing dynamics about treatment of different diseases and management of dairy animals, these locale specific indigenous ways of management need using locally available resources need to be validated on priority so that this time tested institution doesn't wither away. The reconsideration of traditional medicinal systems in the industrialized world and the fact that modern medicine was too expensive for many developing countries, the

World Health Organization (WHO) in the 1970's decided to promote traditional medicinal systems by checking scientifically the efficacy of plants used in traditional medicine and identifying the principles responsible for genuine therapeutic effects (Bizimana, 1997). ITKs on Mastitis management are the key area where the ITKs can be tried, tested and adopted so that the economic loss met by the dairy farmers is prevented. Another aspect of ITKs that need further exploration is multiple uses of single ITK products especially the plants. Researches can be guided towards delineation of the roles played by different ingredients present in the plant parts used in treatment of different diseases.

References

Bisht AK, Bhatt A, Rawal RS, Dhar U (2006) Prioritization and conservation of himalayan medicinal plants, *Angelicaglauca*: a case study. Ethnobotany Res Application 4:11-24

Bizimana N (1997) Scientific evidence of efficacy of medicinal plants for animal treatment, ethno-veterinary medicine: Alternatives for livestock development. Proceedings of an International Conference Held in Pune. 2:11-12

Deshmukh RR, Rathod VN, Pardesi VN (2011) Ethno-veterinary medicine from Jalna district of Maharashtra state. Indian J Traditional Knowl 10:344-348

Dilshad SMR, Rehman NU, Ahmad N, Iqbal A (2009) Documentation of ethnoveterinary practices for mastitis in dairy animals in Pakistan. Pakistan Vet J 30:167-71

Khan ZS, Khurro A, Dar GH (2004). Ethnomedical survey of Uri, Kashmir. Indian J Traditional Knowl 3:351-357

Kumar M, Yash P, Anand VK (2009) An ethnobotanical study of medicinal plants used by the locals in Kishtwar, Jammu and Kashmir, India. Ethnobotanical Leaflets 13:1240-56

Lans C, Brown G, Borde G, Offiah VN (2003) Knowledge o f traditional medicines and veterinary practices used for reproductive health problems. J Ethnobiol23:187-208

Nfi AN, Mbanya JN, Ndi CA, Kameni A, Vabi M, Pingpoh D, Yonkeu S, Moussa C. Ethno-veterinary medicine in the northern provinces of Cameroon. *Veterinary Research Communication.* 2001;25:71-76.

Panda SK, Patra N, Sahoo G, Bastia AK, Dutta SK (2012) Anti-diarrheal activities of medicinal plants of Similipal Biosphere Reserve, Odisha, India. Int J Med Aromatic Plants 2: 123-134

Rass N (2006) Policies and strategies to address the vulnerability of pastoralists in sub-Saharan Africa. PPLPI Working Paper No. 37

Ratan P, Kothiyal P (2011) *Fagopyrum esculentum.* (Common buckwheat) edible plant of Himalayas: A Review. Asian J Pharm Life Sci1:426-442

Sindhu Z, Zafar I, Muhammad N, Jonsson N, Muhammad S (2010) Documentation of ethnoveterinary practices used for treatment of different ailments in a selected hilly area of Pakistan. Int J Agric Biol12:3

Slathia PS, Bhagat GR, Singh S (2007) Traditional knowledge on utility of *Cedrusdeodara.* Indian J Traditional Knowl 6:518-520

Srivastava AK, Kumarsean A, Mohanthy TK, Shivaprasad (2013) Status paper on buffalo estrus biology. ICAR National Dairy Research Institute, Karnal. pp 1-24

Subrahmanyeshwari B, Chander M (2013) Integrating indigenous knowledge of farmers for sustainable organic farming: An assessment in Uttarakhand state of India. Indian J Traditional Knowl 62:253-58