Original Research

Indigenous Technical Knowledge (ITKs) Used by Farmers of Central Kashmir to Increase Production and Reproduction in Livestock

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Abstract

Indigenous technical knowledge is succor for people to solve most of their problems by using their logic and innovative mind. The shift towards the modern scientific drugs in livestock rearing has decreased the use of ITKs but they are still in use as a first aid to treat various animal diseases. The present study was conducted in Central Kashmir region of the Kashmir division. ITKs are part and parcel for day to day living and livestock rearing in the study area. ITKs were followed for increasing milk production, increasing fertility, retention of placenta, repeat breeding, prolapse, care of new born and for preparation of indigenous livestock products. Use of ITKs is decreasing day by day as the farmers are facing various constraints in their use. The availability of the raw materials is not adequate and accessibility is limited to certain seasons only. There is need for further documentation of ITKs from the every part of the country. Scientific validation of the documented knowledge is very important to harvest full benefit from this valuable asset.

Key words: Central Kashmir, Livestock, ITK, Production, Reproduction

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Introduction

Indigenous Technical Knowledge (ITK) is as old as the human civilization. It is the knowledge of local people that helps them to solve most of their problems at their own places, by using their logic and innovative mind. Indigenous technical knowledge (ITK) refers to the unique local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area (Grenier, 1998).The indigenous knowledge is locally available, cost effective, socially compatible and economically sustainable with the held belief among farmers that it is more efficacious

(Bhanotra and Gupta, 2016; Harun-or-Rashid *et al.,* 2010). It is based on the necessities, instinct, observation, trial and error and long experience of the indigenous societies of different regions (Majhi, 2008). The indigenous practices are considered to be the holistic approach for livestock management methodologies adopted by non-literate cultures. For local communities indigenous knowledge is considered as an un-separable part of their culture and history (Ghosh and Sahoo, 2011).

ITKs are playing a significant role both in human and animal health related issues ranging from nutrition to disease classification system (Prusti, 2002; Girach, 2007). To inquire about indigenous knowledge is an extremely challenging task as this knowledge remains stored in minds of people and is passed verbally to others due to lack of proper documentation (Devaki and Mathialagan, 2015; Mishra *et al.,* 2011). Indigenous knowledge is imperative in keeping a healthy livestock and to gain economic benefits but it is vulnerable to attrition if not recorded for storage and wider transmission (Borthakur and Singh, 2012; Sithole, 2007). Documentation of ITKs is extremely important as it will help in creating a way towards sustainable development, protecting the intellectual property rights and will give deep insight into livestock related social realities that generally go unnoticed.

Material and Method

For the present study Central Kashmir area of the Jammu and Kashmir State consisting of three districts viz. Budgam, Ganderbal and Srinagar was selected based on the evidence that farmers in this area are adopting ITKs in their day to day livestock rearing. From each district two blocks and from each block two villages were selected purposively for the study. Again from each village 15 respondents (at least rearing one livestock unit) were chosen by snowball sampling method to make a sample size of 180 respondents i.e. 60 respondents from each district. The blocks included Kangan and Wakura (Ganderbal), Harwan and Eidgah (Srinagar) and Chadora and Khansahab (Budgam). The snowball sampling was adapted to select the respondents of the study. On the basis of the pilot survey and discussion with various stake holders a list of the prevalent production and reproduction diseases of the area were enlisted. The ITKs followed in production and reproduction conditions of livestock were documented along with the awareness and adoption of most commonly used ITK from all categories. The selected respondents were personally interviewed with the help of specially designed and pretested interview schedule. Data so collected was statistically analyzed with the help of frequency and percentage.

Result and Discussion

In present study area the ITKs were used in various productive purposes of the animals i.e. for increasing milk production, for increasing fertility, for early discharge of placenta etc. For improving status of the poor

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farmers it is necessary that the production and reproduction of the animals should improve continuously that inturn helps to improve the socio-economic condition of farmers.

ITKs Used for Increasing Milk Production

Mixture of Soybean, Cowpea and Wheat Flour

This ITK is mainly practiced in cattle and buffalo in which 50 grams of each soybean *(Glycine max)*, cowpea (*Vigna unguculata*) and wheat *(Triticum aestivum)* are properly mixed and given to animal either with the normal concentrate feeds or in form of solution after boiling these ingredients in water.

Extracted Solution of Powdered Chora *(Anglica glauca)*

50 gram dried roots of chora *(Anglica glauca)* are boiled in 2-3 liters of water and the extract obtained is given to animal on daily basis to increase the milk production of the animal.

Bolus of Mazarmund (*Iris kashmiriana*) and Jaggery (Gur)

Half kg of Mazarmund *(Iris kashmiriana)* and half kg Jaggery (Gur) are grinded and bolus hence prepared is given to animals for increasing milk production and to overcome general body weakness.

Among the all above ITKs that are used for increasing milk production in animals mixture of "soybean, cowpea and wheat" was most common among livestock farmers. Awareness and adoption of this ITK as indicated in Table 1 was found to be 72.22 percent and 58.33 percent respectively. Soybean, cowpea and wheat are rich source of protein that helps to improve the body condition after parturition along with increasing the milk production. Similar results were found by Akhoon (2014) in his study area where pulses and wheat were given for the same purpose. Similarly use of Chora *(Anglica glauica*) is in agreement with the findings of the Khuroo *et al.* (2007). Feeding of soybean, gur and wheat for increasing milk production was also documented by Subramanyeswari and Chander (2013).

ITKs Used in Retention of the Placenta

Jaggery, Soybean, Turmeric and Sugar Solution

Half kg jaggery (Gur), half kg of soybean, 50 grams of turmeric (*Curcuma longa*) and 10 grams of sugar are boiled in 5-6 liters of water. This solution is given twice a day to affected animal**.** Some livestock owners also use black gram along with soybean.

Mixture of Ganhar (*Amarenthus gagenticus*) and Maize Flour

50 grams rhizome of the ganhar (*Amarenthus gangenticus)* are grinded first then are mixed with the maize *(Zea maize)* flour. This mixture is given to animal as bolus or a chapatti (bread) is made from this mixture is given to animal after parturation.

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Extracted Solution of Dried Leaves of Dandelion/ Haandh and Kadam

Half kg of dried leaves of both dandelion /Haandh *(Taraxacum officinale)* and Kadam/ Haaqh (*Brassica oleraceae* L. Var. acephala D.C) are boiled in water and the extracted solution is given to animal immediately after parturation to overcome the general body weakness and to help in early dropping of placenta.

Mixture of Salt and Oil

150-200 grams of common salt are fried in hot oil and given to animal 15-30 minutes after parturation.

Tying of Small Stone to Hanging Part of Placenta

After parturition usually a small part of placenta remains hanging outside the vulva of the animal and farmers tie a small stone to that hanging part that helps in early discharge of the placenta.

The most common ITK among livestock farmers for preventing retention of placenta in the study area was "Jaggery, soybean, turmeric and sugar solution". 150 (83.33%) respondents were aware about this ITK and 125 (69.44%) were the ones who adopted this practice to treat retention of placenta. Jaggery is a ready source of energy to the animal while other ingredients like turmeric acts as antiseptic and water keeps the animal hydrated at that challenging time. Similar results were documented by Singh (2004) and Rathi (2015) that solution of Gur and pulses are given to animal immediately after parturition for discharge of placenta. Feeding of sugar and warm water after parturition is also documented by Das and Tripathi (2009). Subramanyeswari and Chander (2013) and Jadeja *et al.* (2006) reported the use of turmeric in case of mastitis and wound respectively. Khuroo *et al.* (2007) reported the use of Dandelion in case of bone and body weakness.

ITKs Used for Increasing Fertility in Livestock

Onions Mixed with Salt

One kg of onions *(Allium sepa)* mixed with salt is given to animals on monthly basis for increasing fertility. It was found that livestock owners also used garlic along with onions for this purpose.

The Animal is made to Work in Fields

The animal is made to work in fields as farmers believe that there can be extra fat present in ovaries that can sometimes turn to be the possible cause of decreased fertility or late coming of estrous.

Mixture of Fenugreek and Almonds

20 grams of fenugreek/ meethi *(Trigonella foenumgraecum)* seeds and 10 grams of almonds are boiled in 1kg of milk, and is fed to the animal.

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Green Bhang (*Cannabis sativa*)

Green bhang *(Cannabis sativa)* leaves were grinded and fed to animal for timely estrus.

For increasing fertility most common ITK followed in study area was feeding of the onions mixed with salt. The awareness about this practice was about 77.22 percent and adoption was 61.11 percent (Table 1). Feeding of onions was in agreement with the observations of Khuroo *et al*. (2007) and Akhoon (2014). Use of onions can be justified by the fact that onions have presence of estrogens that may help in timely estrous of animals. However Subramanyeswari and Chander (2013) reported use of onions in case of the inappetance, use of *Cannabis sativa* in case of the haemorrhagic septicemia and use of fenugreek to increase the milk production.

Table 1: Distribution of respondents according to their awareness and adoption of ITKs used to increase production and reproduction in livestock.

Condition	Selected ITKs	Awareness and Adoption	Selected Districts			Overall
			Ganderbal (n=60)	Srinagar (n=60)	Budgam (n=60)	
Milk production	Mixture of Soybean, Cowpea and Wheat floor.	Awareness	45(75.00)	45 (75.00)	40 (66.66)	130 (72.22)
		Adoption	35 (58.33)	30 (50.00)	40 (66.66)	105 (58.33)
Expulsion of placenta	Jaggery, Soybean, Turmeric and sugar solution.	Awareness	50 (83.33)	45 (75.00)	55 (91.66)	150 (83.33)
		Adoption	40 (66.66)	40 (66.66)	45 (75.00)	125 (69.44)
Increase in fertility	Onions mixed with salt.	Awareness	48 (80.00)	42 (70.00)	50 (83.33)	140 (77.22)
		Adoption	35 (58.33)	35 (58.33)	40 (66.66)	110 (61.11)
Repeat breeding	Henna (*Lawsonia inermis*)	Awareness	42 (70.00)	40 (66.66)	48 (80.00)	130 (72.22)
		Adoption	35 (58.33)	22 (36.66)	33 (55.00)	90 (50.00)
Prolapse	Washing with cold water, sugar water.	Awareness	30 (50.00)	25 (41.66)	35 (58.33)	90 (50.00)
		Adoption	22 (36.66)	10 (16.66)	18 (30.00)	50 (27.77)

(Figures in the parenthesis indicate percentage)

ITKs Used in Case of Repeat Breeding

Henna (*Lawsonia inermis)*

50 grams of powdered Henna (*Lawsonia inermis)* are mixed with water and fed to the dam after artificial insemination (A.I) or natural service.

Use of Alum / Fitkiri

Alum /fitkiri is first heated until it melts and then settles down after that it is fed to animal twice a day.

Preference to Natural Service Instead of A.I

If the animal does not conceive even after repeated artificial inseminations (A.I.) the farmers prefer to breed their animal with a local bull or natural service is done.

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Repeat breeding is the most frequent condition encountered under field conditions. The most common ITK practiced by the livestock farmers for management of the repeat breeding was the drenching of Henna (*Lawsonia inermis*). The awareness and adoption of this practice in the study area was 72.22 percent and 50 percent respectively as shown in Table 1. Use of henna *(Lawsonia innermis)* is believed to help in conception by proper estrous cycle management. Use of fitkiri in case of eye ailments and FMD as an indigenous is also documented by Singh *et al.* (2012) and Kumar and Singh (2011) respectively.

ITKs Sued for Management of Prolapse

Rope Tress

Prolapsed part was managed by applying rope tress to the animal.

Washing with Cold Water, Sugar Water

The prolapsed part was washed with cold water, sugar water and cleaned properly and manually put back by farmer or any experienced person of the locality. Sometimes mustard oil was used to lubricate the part so as to have ease in inserting the protruded part back into body for retention.

The adoption and awareness of the ITK i.e. washing with cold water, sugar water was 50 percent and 27.77 percent respectively. Farmers adopted the application of cold water, sugar solution and salt along with use of mustard oil to lubricate the prolapsed part. The cold water causes the constriction of the blood vessels of the prolapsed part while the sugar and salt is believed to cause the decrease in swelling of the prolapsed part. These results are in agreement with the findings of Singh (2004) regarding the management of prolapse.

ITKs Used for Care of New Born

Raw Eggs

After 2-3 days of birth the new born calf is given a raw egg daily for about a month to keep the animal in healthy condition.

Mixture of Raw Egg, Banana and Tea

When after the birth of new born animal is not able to drink the dam's milk due to death or any disease condition of the dam then the milk replacer given to calf by farmer that is prepared by mixing raw egg, banana and tea (traditional tea of Kashmir, pink tea).

Solution of Sugar, Salt and Sodium Bicarbonate

Electrolyte made by mixing salt, sugar, sodium bicarbonate in warm water is given to calf 3-4 times a day if calf is suffering from diarrhoea.

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Bolus of Common Mallow (Sutchal)

30-50 grams of Common mallow/ Sutchal *(Malva sylvestris)* are grinded and that bolus is given to calf once a day in case of constipation. In the study area the calves were fed raw eggs, banana, tea etc. Feeding of banana is also documented by Adedeji (2014) to cure diarrhoea in animals. Use of sodium bicarbonate is also supported by Subramanyeswari and Chander (2013) who found its use in case of haematuria in animals. Niwas *et al.*, (2013) documented the use of eggs and banana to treat anestrous in animals. Khuroo *et al.* (2007) reported the use of common mallow in case of respiratory disorders in animals.

Indigenous Livestock Products

Mash-e-krej/ Kaladi/ Indigenous Paneer

This indigenous preparation is usually made from the buffalo milk. Buffalo milk is first fermented or curd is made from buffalo milk. To this curd lukewarm buffalo milk was added and mixed. This mixture is kept over heat and removed before the milk starts to boil. During heating a thick layer is formed on the top surface. This top layer was taken out and put into a cotton cloth and a tight knot is made on the top. Over this cloth containing the mixture some heavy weight is kept to drain all its water. The end product formed is also sundried for increasing its shelf life. This product is mainly formed in the areas which are far from the market and has not well developed facilities for reaching markets on daily basis to sell the surplus milk. So these farmers in order to prevent the wastage and spoilage of the milk converted this milk in to a product that is not easily perishable and has longer shelf life of few weeks.

Mazarmund *(Iris kashmiriana)*

Dandelion *(Taraxacum officinale)*

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Bhang or True hemp*(Cannabis sativa)*

Fenugreek *(Trigonella foenumgraecum)*

Sutchal *(Malva sylvestris)*

Mash-e-krej/Kaladi/ indigenous paneer

Conclusion

The presence of the vast number of ITKs in the study area indicates the richness of the age old wisdom of the people. Inspite of the presence of the formal veterinary facilities people are still relaying upon ITKs and treat their animals themselves. All stake holders should take active part and create provisions for documentation and preservation of this precious knowledge. The need of the hour is to find the scientific rationale behind the documented ITKs so that their benefit can be harvested at a large scale. After documentation the ITKs can be integrated with the modern scientific knowledge that will be beneficial to the farmers, scientists, environment, and biodiversity and to the national economy.

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