

Indigenous Breeding and Management Practices of Dairy Animals – A Study On Documentation

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Abstract: Modern technology has today become indispensable for dairy development. However, the significance of indigenous knowledge (IK)/indigenous technical knowledge (ITK) should not and cannot be undermined if development has to be sustainable. It is essential to utilize local knowledge for increasing production in a manner, which does not disturb the ecosystem and environmental health. As a result indigenous knowledge (IK), ethno veterinary knowledge (EVK) has become an affordable alternative. In today's concept of IPR regime, it is all the more imperative to document and protect our valuable IK for posterity. Considering this, an attempt was being made to document IK regarding breeding and management aspects of dairy animals and to appraise the rationality of those IK. The study was conducted in purposively selected Birbhum district of West Bengal. Multistage stratified sampling was applied for selection of blocks (2) and villages (4). "Snow-ball" sampling technique was adopted in the selected villages for collection and documentation of IK. Participant observation, unstructured interaction and recording of oral case histories by tape-records were used for documentation of indigenous knowledge /traditional practices regarding feeding of dairy animals. For abstracting and appraisal of rationality of indigenous knowledge, the analysis by formal R and D system is essential. Such analysis was done in relation to some practices. Attempts were made to probe the farmers' rationality towards the IK. Thirteen IK related to breeding and management of dairy animals were collected and documented with rationality. Identifying, documenting, and rationalising IK in dairy are essential to achieve sustainable development.

Keywords: Documentation, Ethno Veterinary Knowledge, Indigenous Knowledge, Indigenous Technical Knowledge, Intellectual Property Rights and Rationality

INTRODUCTION

Modern technology has today become indispensable for dairy development. However, the significance of indigenous knowledge (IK)/indigenous technical knowledge (ITK) should not and cannot be undermined if development has to be sustainable. It is logical that we first ground ourselves in the knowledge that we already have. But in the mad race for modernization, we seem to have mortgaged our traditional wisdom [1]. The vested interests of industrial groups and resource rich dairy farmers, for their commercial reasons, bring to bear pressure on agricultural and dairy scientists to overlook the health and environmental consequences of the techniques they developed. It is time to think of alternatives in the interest of protecting the environment while still producing sufficient food and milk products for the foreseeable level of population. It is essential to utilize local knowledge for increasing production in a manner, which does not disturb the ecosystem and environmental health. For this purpose, we should know how to bring farmers and their indigenous knowledge back into the field of formal knowledge. Farmers are

often regarded as recipients of technology, advice and information rather than generators of technology. Over the last two decades, scientists preached while farmers applied what they preached. Scientists had little regard for farmer's knowledge production capabilities even though their capacity for generation of useful alternatives to environment had been obvious. As a result indigenous knowledge (IK), ethno veterinary knowledge (EVK) has become an affordable alternative. IK has long been the subject of anthropological research, but it is only recently that researchers have begun to explore the possibility of harnessing IK in development.

Indigenous knowledge in development context may relate to any knowledge held collectively by a population, informing interpretation of the world. It may encompass any domain, pertaining to natural resource management. It is conditioned by socio cultural, traditional, being culturally relative understanding inculcated into individuals from birth, structuring how they interface with their environments. Information on IK is seldom documented; it happens

that such information is lost, if not passed on from generation to generation or protected and practiced by the local people [2]. Hence, in today's concept of IPR regime, it is all the more imperative to document and protect our valuable IK for posterity. In the context of sustainability, IK is also required to be properly documented for the benefit of researchers, planners and development officials. Considering this, an attempt was being made to study the untapped, unwritten body of knowledge, which held in different brains and skills in as many groups of dairy farmers with the following objectives-

- i. To document IK regarding breeding and management aspects of dairy animals
- ii. To appraise the rationality of IK

MATERIAL AND METHODS

The study was conducted in purposively selected Birbhum district of West Bengal. Multistage stratified sampling was applied for selection of blocks (2) and villages (4). Mayureswar-I and Sainthia blocks were selected purposively from Birbhum district. The villages within each of the selected blocks were further divided into two strata viz. villages located within the area of Milk Cooperative Society and villages located beyond the area of Milk Cooperative Society. Mollarpur Milk Cooperative Society from Mayureswar-I and Taltala Milk Cooperative Society from Sainthia were selected randomly. Two villages were selected randomly from each stratum. Thus the study covered four villages, two each within and beyond the area of Milk Cooperative Society. Selected villages were Mollarpur (within the area of Mollarpur Milk Cooperative Society), Shibpur (beyond the area of Mollarpur Milk Cooperative Society) from Mayureswar-I block, and Rudranagar (within the area of Taltala Milk Cooperative Society), Kabirajpur (beyond the area of Taltala Milk Cooperative Society) from Sainthia block. On the basis of the above selection, the villages located within the area of selected Milk Cooperative Societies i.e. Mollarpur from Mayureswar-I block and Rudranagar from Sainthia block were clubbed together and termed as Area-I, and other two villages (Shibpur from Mayureswar-I block and Kabirajpur from Sainthia block), located beyond the area of Milk Cooperative Societies were grouped as Area-II.

“Snow-ball” sampling technique was adopted in the selected villages for collection and documentation of IK. Snow-ball sampling is generally considered as a non-probability sampling technique, Houten *et al.*, [3] have developed a strategy for drawing a probabilistic snowball sample, thus allowing computations of estimates of sampling error and use of statistical tests of significance. Snow-ball sampling, whether probabilistic or non-probabilistic, is conducted in several stages. In the first stage, a few persons having the requisite characteristics are identified and

interviewed. The following characteristics of the respondents were taken into account: -

- i. At least twenty-five years of dairy farming experience, i.e. usually senior and experienced dairy farmers
- ii. Having good knowledge about the historical background and all other aspects of dairy production of the study area
- iii. Suitability as instances of interaction of IK
- iv. Tribal farmers having dairy as secondary source of income
- v. “Go Baidyi” or local healers dealing with ethnoveterinary practices

The above persons are used as informants to identify others who qualify for inclusion in the sample. The second stage involves interviewing these persons, who in turn lead to still more persons, who can be interviewed in the third stage, and so on. Thus we get chains of respondents and hence, the technique is also called ‘Chain Referral Sampling’. In the process we do not miss interpersonal relations among individuals. Interview continued step-by-step up to the stage where, in a chain, a respondent or person who could not give further any new name worth including in the list although yet another two persons were interviewed to have it continued that no person had been left out. Thus the process was carried along up to a stage where it was fit to be regarded as having reasonably been exhausted. The sampling effected in this manner may be taken to yield a saturated sample. The term ‘Snowball’ stems from the analogy of a snowball, which begins small but becomes bigger and bigger as it rolls downhill.

Participant observation, unstructured interaction and recording of oral case histories by tape-records were used for documentation of indigenous knowledge /traditional practices regarding feeding of dairy animals. These techniques had also been used by Jorgenson [4], Rajeskaran[5], Parasar [6] and Pal [7] Participant observation is an omnibus field strategy in that it Simultaneously combines document analysis, interviewing of respondents and informants, direct participation and observation and introspection. Unstructured interaction would provide an in-depth understanding of the ‘emic’ perspective of local farmers. The ‘emic’ perspective involves putting oneself as much as possible into the farmers’ shoes to understand how they view their practices in both technical and socio-cultural terms [8]. In conducting the present study following procedures were adopted while observing and documenting IK.

- ♦ **Observing IK:** IK of dairy farmers in their respective farms was observed;
- ♦ **Documenting IK:** The observed IK was documented using a camera;

- ♦ **Analysing IK:** The salient features of IK were recorded in a pocket note book after carefully observing them, and
- ♦ **Titling IK:** Later on, an appropriate title for each of the IK recorded was decided through informal discussion either with the participant farmers or with local healers who are encountered on farm holdings.

For abstracting and appraisal of rationality of indigenous knowledge, the analysis by formal R and D system is essential. Such analysis was done in relation to some practices. Attempts were made to probe the farmers' rationality towards the IK. Such kind of assessment was done by Parasar [6] and Pal [7]. Books like The Wealth of India [9], Encyclopedia of Indian Medicinal Plants [10] references were taken and K.S. Mhaskar, E. Blatterand J.F. Caius (ed.) were consulted, and the opinions of veterinary officers were also taken.

RESULTS AND DISCUSSION

Thirteen IK were collected, classified (breeding - IK₁ to IK₉ and management - IK₁₀ to IK₁₃) and documented with rationality.

Thematic area – Breeding of dairy animals

IK₁: Feeding of mustard oil cake to induce heat in animals

Description of IK: Mustard oil cakes (*Brassica campestris* L.) were given for a few days.

Purpose: To induce heat in animals

Rationale: Mustard cakes are rich in protein (30-35%). The mustard cake protein has a well-balanced amino acid composition, methionine, and lysine. The meal is good source of calcium, iron and phosphorus and also of niacin and choline. So mustard cake is considered as high energy feed stuffs. It helps to induce heat in animal.

Farmers' perception: It is considered as heat inducing agent.

IK₂: Feeding of germinated wheat/gram to induce heat in animals

Description of IK: Animals were provided with germinated wheat/Gram @ 250-500 g daily with other feeds for one week.

Purpose: To induce heat in animals.

Rationale: Germinated wheat (*Triticum aestivum*) contains 5.2g moisture 29.2g protein, 7.4g fat, 3.5g minerals, 1.4g fibre and 53.3g carbohydrate. Gram contains 9.8g moisture, 17.1g protein, 5.3g fat, 3.0g mineral, 3.9g fibre, and 60.9g carbohydrates. Due to high protein content, it induces heat in animal.

Farmers' perception: It is considered as heat inducing agent.

IK₃: Feeding of nutmeg induces heat in animal

Description of IK: Farmers believed that feeding of one nutmeg dust three times a day induces heat in animal.

Purpose – To induce heat in animal.

Rationale: Nutmeg (*Myristica fragrans* Houtt) contains myristicin. Myristicin and its companion constituents, impart stimulant and hallucinogenic properties to reproductive part resulting in heat in animals.

Farmers' perception: It induces heat in animals.

IK₄: Traditional heat diagnosis techniques of cow/she buffaloes

Description of IK: Dairy farmers used to diagnose heat period of animal by observing some physiological and behavioral symptoms. During this period, animals were restless and keep turning their tail up and down frequently. Their tendency was to climb on other animals or let other animals to climb on them. The unproductive parts slightly swelled and a sticky fluid flows out of it. Frequent urination in small quantities was another symptom. They used to smell the hinder part of other females and sniff the vulvas. In this period feed and water intake was stopped for a day. They swished tail and showed tendency to remain in close association with the bull and the bull smelled the vulva and attempted to serve her. The cows or the buffaloes were allowed to mate with the bulls kept for breeding within ten to twenty hours once they started crying due to heat. If one missed this it would be crying again within the next nineteen to twenty-two days.

Purpose: Heat identification in dairy animals.

Rationale: All these are symptoms, which indicate that the cow is in heat. If they are mated once, usually they become pregnant. These symptoms are due to increased ratio of estrogen, which leads to muscle contraction, pain and vasodilatation due to heat stress condition.

Farmers' Perception: These symptoms appear when the animal is in heat

IK₅: Indigenous methods of pregnancy diagnosis

Description of IK: Signs of pregnancy were not visible for some time. As the foetus was growing, the stomach was enlarging on the left side and the udder also swelled. Sticky fluid was coming out of the vulva. There was blackening around the eyes. Instead of keeping the tail straight, it kept the tail to one side. After the fifth month was over, one can actually notice the movement of the foetus after the cow drinks water. As the foetus grows one can notice the udder was getting filled with milk. The vulva and the navel got loosen out.

Failure of reoccurrence of heat after three weeks in cow and one month in buffaloes were considered the first indication of the onset of pregnancy. The milk of a pregnant cow turned sticky, thin and salty. The foetal movements could be observed on the right side when disturbed or when they got up from the position of rest. Some

animals totally refused milking at this stage of pregnancy. The urine turned whitish.

Purpose: Pregnancy diagnosis.

Rationale: It is confirmed by observing these symptoms that animal have conceived.

Farmers' perception: These are the symptoms of pregnancy diagnosis.

IK6: Indigenous symptoms of cow approaching parturition

Description of IK: Animals became dull and lethargic. Udder became distend with milk. The teats became distended and the vulva became enlarge and flaccid. The vaginal discharge started oozing out three to seven days earlier depending upon the condition of the animal. The animals in poor health exhibited this symptom just two days earlier where as among healthy ones it appeared earlier. The rump falls just before parturition.

Purpose: Symptoms of cow approaching parturition.

Rationale: All these are symptoms before actual parturition.

Farmers' perception: Farmers are also having same view.

IK7: Feeding of mango leaves to expel the placenta

Description of IK: Generally placenta falls two to three hours after parturition or may be delayed by twenty-four hours. If it was retained for a longer period, treatment was necessary. Farmers fed the animals with raw mango leaves in sufficient quantity.

Purpose: Parturition of placenta

Rationale: Mango leaves posses flavonol glycosides gossy-petin-8-0-beta-D-glucoside-3-sulphate and gossypetin -8-0-beta -D glucuronide -3-suphalc; mucilage and tannis. Leaves exert a laxative effect and it is having anti-hemorrhagic properties. Both the properties are essential of for removal of placenta where the presence of infective organisms is always expected.

Farmers' perception: It helps to expel the placenta.

IKs: Fenugreek and sugar feeding for disposal of placenta

Description of IK: The animals were closely guarded against ingesting the placenta. Ingestion of placenta reduces the milk yield and cow may die of chocking and may suffer indigestion. Farmers used to provide 50 g of fenugreek and 100 g of sugar mixing with milk for a week in case of ingestion of placenta.

Rationale: Fenugreek (*Frigonella foenune graecum*) seeds are aromatic carminative, tonic. It acts as emollient of the intestinal tract. The aqueous extract of the seeds shows antibiotic activity.

Purpose: Disposal of placenta

Farmers' perception: It helps to expel the placenta

IK9: Feeding of banana leaves to bring conception

Description of IK: Banana leaf extract or the actual leaves itself were fed to cattle to bring forth conception. This was practiced only once or twice after taking an animal in heat to a male for service.

Purpose: To bring conception

Rationale: Banana leaf has a slightly diuretic action hence if conception is hampered due to urinary problem banana leaves extract would be beneficial.

Farmers' perception: It helps to conceive the animals.

Thematic area: Management of dairy animals

IK10: Indigenous calf care practices

Description of IK: Just after the calf was born farmers used to blow air through the mouth and the nose. The naval cord was tied properly and turmeric was applied. Then colostrums feeding were done. Excessive colostrums feeding were avoided. Calves were not allowed to feed on mud or other unnecessary things. Calves were given enough exercise. Calves were kept separated from the mother by putting them in a calf pen. It was located at the inner portion of the cattle shed. The calf pen was provided with straw or with dry tree leaves.

Purpose: To take care of newborn calf.

Rationale:

- Blowing of air through the mouth and nose help in cleaning the respiratory passages and the calf breath properly.
- Turmeric on cord is applied to avoid infection.
- In colostrums, there are substances, which cause purgation, and as a result of this the intestines are cleared. It helps in the expulsion of meconium. Proper feeding helps to keep the calf disease free. Exercise helps to get healthy calf.
- Providing straw in calf pen give them protection form cold.

IK11: Indigenous methods to take care of pregnant animals

Description of IK: The pregnant cows were kept separated from other animals. These cows were handled very gently. They were groomed by hand or by brush. They were normally petted by old men. The ticks were removed and any organism, which harboured itself in the udder, was also removed. Flies and mosquitoes were also removed. Farmers usually allow the pregnant animal to of out for grazing.

Rationale: Cows are handled very gently to avoid any type of injury. Grooming helps in proper blood circulation. Cleaning of pregnant animal help to get disease free calf. Walking of pregnant animal helps

in muscular movement during grazing, the exposure of animal to sunlight supplies enough vitamin –D, helpful for proper growth of developing fetus.

Purpose: To take care of pregnant animal.

Farmers' perception: Farmers are also having same view.

IK₁₂: Indigenous cattle care techniques

Description of IK: Farmers used to wash the feet of the cattle every day. They were given bath once a week. Those bullocks, which work in the fields, were allowed to swim once a week. Immediately after swim they were not given any work. Grooming of cattle was done with coconut fiber. Parasites like lice, ticks and mites were removed. In case of cracked hooves and if these were outgrown, proper prunning was done. Salt was mixed with hot water and then hooves were cleaned with this water once a week. Dust in hooves was removed with a cloth after dipping in hot water.

Purpose: To take care of animals.

Rationale: All these practices help to keep the animal healthy.

Farmers' perception: By taking proper care, animal will remain disease free.

IK₁₃: Indigenous cattle-shed management

Description of IK: The cattle shed was protected from rain, sun etc. It was properly ventilated and the animals were getting enough light. The straw or the grass was arranged properly. Farmers used to keep the floor clean and dry. Proper provision was there for drainage of urine. The dung was disposed properly and not left as it was. Animal was not tied too close to each other. Fumigation of cattle shed was done in every evening. In winter, gunny bags were hanged in the windows and doors.

Purpose: Management of cattle-shed

Rationale: This is helpful to avoid any disease for the animals and it keeps away the bad smell, parasites, mosquitoes, flies etc. Use of gunny bags helps to protect the animal from cold.

Farmers' perception: Farmers' are also having same opinion.

CONCLUSION

In contrast to sciences acquisition of knowledge through theories and methods, indigenous knowledge is acquired know-how and wisdom by observing specific natural and social phenomenon connected with the experience of super natural powers that influence life. Rather than be replaced by scientific knowledge, IK remains strong throughout developing countries particularly in rural areas to form a holistic, more often than not secret, hold view and valuable source of self-reliant cultural persistence in a period of rapid social change.

A systematic approach to protect and honour IK needs a series of logical steps, which are as follows:

1. Indigenous knowledge is potent, but the information on it is rare because most practitioners are getting old and many have in fact passed without entrusting their knowledge to interested persons. Indigenous knowledge, which is widely used, should be documented. Traditional healers tend to be illiterates and therefore they do not keep written records and this makes collaboration very difficult. Healers should be encouraged to have assistants who read, write and even keep records for them.
2. Publications of magazines on ethnoveterinary therapies in local language may be helpful to the users.
3. Emphasis should be given on traditional media for communication of IK. It must be remembered that through lacking access to the modern media, the rural masses have their own communication modes and processes to reach people. They have their mode of oral communication. So, transfer of IK should be encouraged through traditional means like puppet show, *kavi samelan*, drama, street plays, *kirtan*, etc.
4. Adequate compensation for the owners and custodians of indigenous knowledge should be considered. Traditional healers have been found to refuse giving out information for fear of loosing monopoly. If they are assured of compensation, they will surely open up and give out more information that will be useful.
5. Expansion of knowledge on the complexity of indigenous knowledge system to increase the rational use of local knowledge in the use of agro-biodiversity for sustainable livelihood.
6. Promoting micro- specific local management of indigenous practices.
7. Supporting joint problem solving process in indigenous farming system by ensuring the women and men participation through participatory approach in research.

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