Inventory of indigenous healthcare practices of dairy animals

A Saha*, SB Mukhopadhyay & D Das Gupta

Department of Agricultural Extension, Agricultural Economics & Agricultural Statistics, Institute of Agriculture,
Visva Bharati, Sriniketan 731 236, West Bengal
E-mail: root@vbharati_ernet.in

Received 20 August 2007; revised 17 July 2009

The development of indigenous knowledge (IK) and the associated technology has a logic of its own as also some kind of rough and ready methodology that is not altogether without merit and further that there is much to be learn from the vast structure of such IK as offered by various cultures all over the world. Research on IK and on farmers’ experimentation is still in its infancy. Keeping these in view, an attempt has been made to prepare an inventory of IK in healthcare practices of dairy animals. 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 preparation of inventory on indigenous healthcare practices of dairy animals. Attempts were made to probe the farmers’ rationality towards the IK. Thirty-one IK have been collected, classified and documented with rationality.

Keywords: Indigenous knowledge, Indigenous healthcare practices, Dairy animals

IPC Int. Cl.: A61K36/00, A01J

Dairy development policy has undergone dramatic changes though it still suffer from certain inconsistencies. One of the major lacunae is its relative failure to recognize the importance of the indigenous knowledge (IK) of dairy farmers, as a potent surface of powerful ingredients of a judiciously synthesized technology to be evolved as a viable solution to meet the problem of modernization of dairy farmers. Those involved in the development and dissemination of technology has a facile tendency to reject outright any IK. They do not perceive that even farmers can develop technologies on the basis of traditional knowledge, belief, customs, experience and a rest of trials and experimentation. The development of traditional or indigenous knowledge and the associated technology has a logic of its own as also some kind of rough and ready methodology that is not altogether without merit and further that there is much to be learn from the vast structure of such IK as offered by various cultures all over the world. IK are not primitive, left over from the past but on the contrary, are systems of finely tuned and adopted, both biologically and socially, to counter the process of what are often harsh and inimical environment and often represents hundreds, sometimes thousands of years of adaptive evolution in which vagaries of climate, the availability of land, water, the basic needs of people and their animals for food, shelter and health have been amalgamated in a system which has allowed society to exist and develop in the face of tremendous odds. It defined as a sum total of knowledge and practices based on acquired knowledge and experience of people in dealing with problems and typical situation in different walks of life. Research on IK and on farmers’ experimentation is still in its infancy. Given the complexities of issues, many aspects of this prove to be descriptive. It would therefore, take some time for it to attain quantitative vigor for certain patterns to emerge by way of concretizing the analytical issues. Keeping these in view, an attempt has been made to prepare an inventory of IK in healthcare practices of dairy animals; to appraise the rationality of IK; studies on indigenous knowledge in animal healthcare system are of recent origin. Yet, significant theoretical and empirical contributions have been made which are mostly in the form of micro level studies.

Methodology

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 preparation of inventory on indigenous healthcare practices of dairy animals. Attempts were made to probe the farmers’ rationality towards the IK. Thirty-one IK have been collected, classified and documented with rationality.
villages (4). Mayureswar I and Sainthia blocks were selected purposively from Birbhum district. Two villages were selected randomly from each stratum. Thus, the study covered four villages. Snow-ball sampling technique was adopted in the selected villages for collection and documentation of IK. The following characteristics of the respondents were taken into account: at least 25 yrs of dairy farming experience, i.e. usually senior and experienced dairy farmers; having good knowledge about the historical background and all other aspects of dairy production of the study area; suitability as instances of interaction of IK; tribal farmers having dairy as secondary source of income, and Go Baidyi or local healers dealing with ethnoveterinary practices. Participant observation, unstructured interaction and recording of oral case histories by tape-records were used for documentation of indigenous healthcare practices of dairy animals. For abstracting and appraisal of rationality of indigenous knowledge, the analysis by formal R&D system is essential. Such analysis was done in relation to some practices. Attempts were made to probe the farmers’ rationality towards the IK.

**Results and discussion**

Following thirty one IK have been collected, classified and documented with rationality

(i) Treatment of cough and cold with *vasak*

Methodology: Decoction of *vasak* leaves was given to animals suffering from cough and cold.

Rationale: *Vasak* (*Adhatoda zeylanica*) leaves contain an alkaloid vasicine, and an essential oil. It is used as expectorant. The expectorant activity is due to stimulation of bronchial glands.

Farmers’ perception: This will cure animal.

(ii) Treating animals with fig leaves against fever

Methodology: Animals were treated with fig leaves in adequate quantities twice a day.

Rationale: *Fig* (*Ficus carica* Linn.) leaves contain inverted sugar (51.4%), mucilages (0.8%), flavonoids, vitamins and enzymes. Fresh leaves contain 80.8% moisture, 1.3% protein, ether extract 0.2%, mineral matter 0.6%, carbohydrates 17.1%, calcium 0.06%, phosphorus 0.03%, iron 1.2 mg/100g, carotene 270 IU, vitamin A, nicotinic acid 0.6 mg/100gm, riboflavin 50 mg/gm and ascorbic acid 2 mg/100gm. Fig leaves owe their value chiefly to their mineral and sugar contents. Fig leaves act as mild laxative, diuretic and expectorant.

Farmers’ perception: This will cure animal.

(iii) Indigenous treatment of fever by raw turmeric and molasses

Methodology: Paste of raw turmeric and molasses was given to animals 2-3 times a day.

Rationale: *Turmeric* (*Curcuma domestica*) possesses caffeic acid, curcumin, limonene, eugenol and turmerin. All these compounds are antimitagentic in property. Inhibition of carcinogenesis is imparted by limonene. Limonene is anti-influenza A and B viruses α-pinene in turmeric is anti-influenza A and B viruses. Molasses increases the water intake capacity.

Farmers’ perception: This mixture helps to lower the temperature due to cooling effect of turmeric.

(iv) Treating diarrhoea with bamboo leaves.

Methodology: Animals were given bamboo leaves in adequate quantities twice a day.

Rationale: Bamboo leaves contain 15.09% crude protein, 23.15% crude fibre, 1.43 ether extract, ash 18.35%, phosphorus 170.0 mg/100gm, calcium 1,550.0 mg/100 gm. It is antidiuretic.

Farmers’ perception: It helps to solidify dung.

(v) Treating diarrhoea with *bel* (*Aegle marmelos*)

Methodology: Animals were given bamboo leaves in adequate quantities twice a day.

Rationale: The unripe or half ripe *bel* fruit is regarded as astringent, digestive and stomachic. It helps to remove constipation, which hinders the healing of ulcerated surfaces of intestines.

Farmers’ perception: It helps to solidity dung.

(vi) Feeding of rice husk with banana against diarrhoea.

Methodology: Farmers practiced feeding of rice husk with banana thrice a day to control diarrhoea. It is followed for 2-3 days.

Rationale: Banana (raw or ripe) has been reported to contain high amount of 5 hydoxytryptamine, ranging from 0.36 to 8.40 mcg of dry tissue as base, the content being highest in raw banana and nor-epinethrine. Serotonin, (5-hydroxytryptamine) inhibits gastric secretion and stimulates smooth muscle in the
Nor-epinephrine acts as a mediation of autonomic function as a vasoconstrictor agent. The efficacy of banana in diarrhoea is attributed to these active principles.

Farmers’ perception: It helps to solidity dung.

Methodology: Animals were fed with whey in case of diarrhoea.

Rationale: Whey is a by-product obtained during the course of production of chhana. Chhana contains whey-water 93.6%, fat 0.5%, protein 0.4%, lactose 5.1%, ash 0.1%, lactic acid 0.2%, and milk solid 6-7%. It is a good source of vitamin A & D. It is diuretic and having antibacterial property.

Farmers’ perception: It supplies mineral to animals and animal used to gain strength.

(viii) Feeding of tamarind leaves and mustard seeds to control bleeding dysentery.

Methodology: Animals were fed with tamarind leaves and sarsoon (Brassica sp) seeds with some water for consecutive three days in the morning in empty stomach to control bleeding dysentery.

Rationale: Tamarind (Tamarindus indica) contains malic acid, which acts as mild laxative besides this acid; presence of a fair amount of fibre contributes towards laxative. This acid acts as diuretic. Geranial and geraniol in tamarind inhibit several photogenic fungi and bacteria. Tamarind pulp contains methylsalicylate, which acts like salicylate exerting antipyretic, anti-inflammatory and analgesic effects. It is astringent. Ferulic acid and coffee acid present in mustard are anti-mutagenic; while coumaric acid is antipyretic.

Farmers’ perception: It helps to solidity dung.

(ix) Treating animal with white sandal to control bleeding dysentery.

Methodology: Paste of white sandal placed on banana leaf is given to animal.

Rationale: White sandal wood (Santalum album) contains triterpenes and tetratripterterpenoids (limonoids and protolimonoido of the gedunin group): nimbin, nimbidin, nimboline, nimbysterol, nimbolide, salamin, azadirone along with polyphenolic compounds, tannins, various acids and sulphur. Neem leaves extract is reported to be effective on helmithiasis, having antibacterial property. Nimbin and nimbidin are reported to possess anti-inflammatory property. Nimbidin acts as analgesic and antipyretic, anticholinergic, antihistaminic and antinicotinic.

Farmers’ perception: It acts as anti septic to the wounds in hooves.

(x) Treating animals with turmeric against bloat.

Methodology: Raw turmeric paste mixed with molasses was fed twice a day to animal.

Rationale: Cineol, camphor and linalool present in volatile oil have shown antispasmodic activity. Molasses increase the water intake capacity of animals.

Farmers’ perception: It helps to remove the gas from the stomach.

(xi) Treating animal with Anthocephalus against bloat.

Methodology: Animals were fed with the leaves of Anthocephalus sp with molasses twice a day to control bloat.

Rationale: Anthocephalus leaves contain dry matter 30.0%, crude protein 21.3%, hemicellulose 13.8%, lignin 8.3%, cellulose 11.7%, calcium 2.72%, phosphorus 0.25% and silica 0.5%. The methanolic extract of the leaves contains cadambine, cadambine, isocadamine, 3α-dihydrocadambine, 3α-isodihydrocadambine, 3β-dihydrocadambine and 3β-isodihydrocadambine. The leaves also yield hentriacontanol and β-sitosterol. It is said to be nutritious and astringent. Molasses used to increase the palatability of feed.

Farmers’ perception: It helps to remove the gas from the stomach.

Methodology: Neem leaves were boiled in water, after cooling the green water was used to wash the infected hooves.

Rationale: Neem (Azadirachta indica) leaves contain triterpenes and tetranortriterpenoids (limonoids and protolimonoido of the gedunin group): nimbin, nimbidin, nimboline, nimbysterol, nimbolide, salalin, azadirone along with polyphenolic compounds, tannins, various acids and sulphur. Neem leaves extract is reported to be effective on helmithiasis, having antibacterial property. Nimbin and nimbidin are reported to possess anti-inflammatory property. Nimbidin acts as analgesic and antipyretic, anticholinergic, antihistaminic and antinicotinic.

Farmers’ perception: It acts as antiseptic to the wounds in hooves.

Methodology: Animals were allowed to walk into mud, so that a thick layer of mud was formed and covered the wounds of feet.
Rationale: Mud layer helps to protect the wound from the flies, mosquitoes or other insects can not act on the wounds.

Farmers’ perception: Farmers expressed the same opinion.

(xiv) Treating animals with tarpin oil and camphor for FMD

Methodology: After washing the wounds in feet or mouth with luke warm water, drying of infected portion was done, then mixture of tarpin oil and camphor was applied to the infected feet.

Rationale: Tarpin oil acts as insect repellent. Camphor is applied externally to the skin acts as rubefacient, counter-irritant and local anodyne. It is a mild antiseptic.

Farmers’ perception: It is antiseptic.

(xv) Treating open wound with lime, garlic and turmeric.

Methodology: Paste of garlic, turmeric and lime was applied on open wound after that it was covered with akand leaves.

Rationale: Ascorbic acid or vitamin C present in garlic (Allium sativum) imparts analgesic, anti-inflammatory, antihepatoxic, antioxidant, and chromosome stabilization activities. Linoleic acid present in garlic exerts immunomodulation; while quercetin is anti-platelet forming compound. Curcumin present in turmeric (Curcuma domestica) is an ideal therapeutic agent in the cases of suspected staphylococcal infections and is also having anti-inflammatory action. Akand (Calotropis procera Linn.) leaves possess anti-fungal and anti-bacterial properties. The dried or withered leaves are found to be non-toxic to ruminants and it exerts a stimulant and tonic effect.

Farmers’ perception: This mixture exerts cooling effect.

(xvi) Application of warm coconut oil containing garlic extract to open wound.

Methodology: Luke warm coconut oil heated with garlic was applied on open wound.

Rationale: Ascorbic acid present in garlic imparts analgesic, anti-inflammatory, antihepatoxic, antioxidant and chromosome stabilization properties. L. ascorbic acid present in garlic is antimutagenic and acts as desmutagen. Linoteic acid present in garlic exerts immunomodulation. Coconut oil acts as a medium.

Farmers’ perception: It is used to get relief from pain resulting from open wound.

(xvii) Application of tobacco leaf extract to open wound of shoulder.

Methodology: Wound in shoulder is washed with luke warm water, then after drying, tobacco leaf extract was applied for 3-4 days.

Rationale: Leaves of tobacco (Nicotiana tabacum L.) are thermogenic, sedative, anodyne, antiinflammatory, antihelminthic, carminative, laxative, mental stimulant and toxic.

Farmers’ perception: it helps to cure local infection.

(xviii) Treatment of fracture by square stalked–vine (Hadjoda)

Methodology: Paste of Hadjoda was applied in bone fractures and the area was covered with bamboo leaves for 6 weeks.

Rationale: Hadjoda (Cissus quadrangularis L.) stem contain 2-tetracyclic triterpenoids and 2- teriodal principles. The anabolic steroidal principles showed a marked influence in the rate of fracture-healing by influencing early regeneration of all connective tissues involved in the healing and quicker mineralization of the callus. The total alcoholic extract of the plant, on potential administration neutralizes the anti-anabolic effect of the cortisone in healing of the fracture.

Farmers’ perception: Hadjoda stem helps in calcification of bones.

(xix) Treating wound of udder with neem.

Methodology: Neem leaves boiled in water for some time, after cooling, the water was used to wash the affected part of udder, and then it was dried with a clean cloth.

Rationale: Neem (Azadirachta indica) leaves contains triterpenes and tetrarttriter penoids (limonoids and protolimonoido of the gedunin group) nimbi, nimbidin nimbinine, nimbrosterol, nimbolide, salanin, azadirone along with polyphenoic compounds, tannins, various acids and sulphur. Neem leaves extract is found to be effective on helmithiasis, having antibacterial property. Nimbin and nimbidin are found to possess antiinflammatory property. Nimbidin acts as analgesic and antipyretic, anticholinergic, antihistaminic and antinicotinic.

Farmers’ perception: It acts as antiseptic to the wounds of udder.

(xx) Application of ghee/butter in case of cracking of udder.

Methodology: In case of cracking in udder, farmers usually apply ghee/butter in udder before milking.
Rationale: Ghee/butter massage used to soften the skin and it helps in easy milking.
Farmers’ perception: Farmers have the same view.

(xxi) Treating animal with kalmisak for snakebite.
Methodology: In case of snakebite, first tying was done just above the affected area, then second and third tying were done 10-15 cm interval. The animal was fed with Kalmsak. The length of kalmsak was equal to the length of body of the animal.
Rationale: Kalmsak (Ipomoea aquatica Linn.) is emetic in case of poisoning due to snakebite. It is having purgative properties. Leaves are said to be cooling.
Farmers’ Perception: It is anti-venom.

(xxii) Control of intestinal parasites by pineapples leaves.
Methodology: Pineapple leaves extract was fed to animals for few days.
Rationale: Pineapple leaves are antagonistic to the internal environment, by this treatment, the faces become loose and the parasites are expelled.
Farmers’ perception: It helps to expel parasites from intestine.

(xxiii) Feeding sugarcane to the animals suffering from jaundice
Methodology: Sugarcane was cut into small pieces and it was given to animals suffering from jaundice for few days.
Rationale: Sugarcane (Saccharum officinarum) when chewed, mixed with saliva is considered a nourishing tonic. It is diuretic. It is used as disinfectant of urinary tract.
Farmers’ perception: It helps in proper functioning of liver.

(xxiv) Treatment with doorva in case of bleeding from any injury.
Methodology: In case of bleeding from any injury, paste of doorva was applied.
Rationale: Doorva (Cynodon dactylon Linn.) contains six phenolic phytooxins- ferulic, syringic, P-coumaric, vanillic, P-hydroxybenzoic and O-hydroxyphenyl acetic acids. Leaves contain tricin, flavor C-glycosides and a flavonoids sulphate. It exhibits anticoagulant, wound healing, astringent, and anti-fungal activities. Plant paste helps in immediate stoppage of blood if applied on wound or injuries.
Farmers’ perception: It helps to stop bleeding from any injury.

(xxv) Treatments with marigold leaves in case of bleeding from any injury.
Methodology: Paste of marigold leaves are applied in the affected part.
Rationale: Paste of marigold (Tagetes erecta Linn.) leaves is emmenagogue, vermifuge, diuretic and carminative.
Farmers’ perception: It helps to stop bleeding from any injury.

(xxvi) Feeding of arjun bark and black pepper to check loose motion.
Methodology: Paste of arjun bark and black pepper is fed to animal to check loose motion.
Rationale: The bark of arjun contains β-sistosterol, ellagic acid and arjunic acid. The bark is acrid, and credited with styptic, tonic, febrifugal and antisepsic properties.
Farmers’ perception: It solidifies the dung.

(xxvii) Feeding of wheat flour, mustard oil and molasses in case of constipation.
Methodology: A mixture with wheat flour, mustard oil/ghee and molasses prepared by farmers is given to animals suffering from constipation.
Rationale: This mixture is laxative in action.
Farmers’ perception: Farmers had same opinion.

(xxviii) Treating eye infection by little gourd (Coccinia indica).
Methodology: Little gourd leaf juice is applied in each eyes of animal twice a day for 3-4 days continuously.
Rationale: The leaves of little gourd are having cooling and astringent effect.
Farmers’ perception: It helps to keep the eyes cool and free from infection.

(xxix) Treatment with tea liquor in case of blood in urine.
Methodology: Tea liquor after cooling was given to animals.
Rationale: The main constituents in tea are caffeine polyphenols, essential oil, and the purin base alkaloid. Tea is a stimulating drink; it relieves muscular and mental fatigue. The stimulating action is attributed due to the purine base alkaloid, caffeine (1,3,7- trimethylxanthine). Caffeine has a diuretic effect on the kidneys and stimulates gastric secretion. Hence it is thought to aid digestion. Tea shows antiinflammatory activity. The constituents responsible for the antiinflammatory and capillary strengthening properties of tea are the flavanols, (-)–epicatechin and (-)–epicatechin gallate.
Farmers’ perception: It helps in curing kidney infection.

Methodology: Farmers used to feed the animals with young seedlings of date palm (Phoenix dactylifera) to prevent abortion.

Rationale: Date palm contains reducing sugars, chlorogenic acid, caffeic acid and aspirin. It has mild estrogenic effect.

Farmers’ perception: It helps to maintain pregnancy.

Methodology: Farmers used to measure cuscuta by their hand. Cuscuta 3.5 times length of hand was fed to animals to prevent abortion.

Rationale: Cuscuta sp contains flavonoids, hydroxycinnamic acid, cuscutin, cuscutalin, leeta-sitosterol, buteolin, lergenin and kaempferol. It is purgative and febrifuge and useful for urinary incontinence, premature senility.

Farmers’ perception: It helps to maintain pregnancy.

Conclusion

Many indigenous veterinary beliefs and practices persist, given that the benefits of centralized, high-tech driven and top-down approaches to animal healthcare have reached only a minority of the world’s stock raisers and farmers. Till now, as little as 15-20% of the livestock population in developing countries has enjoyed some regular and affordable access to modern veterinary medicine. High-tech healthcare is beyond the reach of the dairy farmers, who cannot afford them in view of their high cost thereof coupled with their own economic constraints and other problems like side effects associated with the conventional animal healthcare system. Dairy farmers believe that this kind of traditional way of treating animal diseases by employing the knowledge passed on orally from generation to generation provides a permanent and safe cure for this commonly occurring diseases.

A systematic approach to protect and honour IK needs a series of logical steps, which are as follows: considering IK as the mainstream form of therapy suitable for the majority of the poorer section of society, especially in the developing countries. While orthodox modern therapy, which is out of reach for most of the people should be considered as the ‘alternative’; 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. Healers should be encouraged read/write or to have assistants who read, write and even keep records for them; IK for animal healthcare system may be toxic to the body, if not properly analyzed. Concerted effort is needed to modify the traditional practice so, that it can be used safely; users of traditional medicines should be educated on dosage of herbal preparations; publications of magazines on ethno-veterinary therapies in local language may be helpful to the users; 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.; 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: losing monopoly. If they are assured of compensation, they will surely open up and give out more information that will be useful.

References

9. Das P, Inventory of indigenous technical knowledge in agriculture, Mission mode project on collection,
documentation and validation of Indigenous Technical
10 Singh RP (Ratan), Punam K, Qaiyum S & Srivastava RM,
Sustainable technology generation some: ITK of tribal
11 Saha A, Indigenous Knowledge of Dairy Farming in
Birbhum district of West Bengal, India: An Exploratory
Study, Unpublished PhD Thesis, (Institute of Agriculture,
Visva Bharati, Sriniketan, West Bengal), 2006.
12 Jorgenson DL, 1989 Participant observation, The
methodology for Human Studies, (Sega Publication,
London).
13 Rajasekaran B, A framework for incorporating indigenous
knowledge system into agricultural research, extension and
NGOs for sustainable agricultural change, No 21,
Technologies and Social Change Programme, (Iowa State
University, Ames Iowa 50011, USA), 1993.
14 Parasar B, Indigenous agricultural knowledge of tribals in
Eastern Ghat highland zone of Orissa, PhD Thesis, (BHU,
15 Pal PK, Indigenous knowledge base of agro-technology- A
study in a lateritic area of West Bengal, PhD Thesis,
(Institute of Agriculture, Visva Bharati, Sriniketan, West
Bengal), 1998.