

INDIGENOUS FEEDING PRACTICES FOR BETTER REPRODUCTIVE PERFORMANCE IN BUFFALOES IN HIMACHAL PRADESH, INDIA

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ABSTRACT

Sound health and regular calving in milch animals is a prerequisite for successful and profitable dairy farming. In hilly areas due to tough terrain farmers are often unable to take their animal to nearby veterinary institution on time and the livestock is often affected by several reproductive disorders. To overcome these disorders and ensure better reproductive performance in buffaloes a number of indigenous feeding practices are prevalent among the dairy farmers. In the present manuscript these traditional feeding practices has been documented in agroclimatic zone I and II of Himachal Pradesh, India by using participatory rural appraisal technique. These practices are divided into three categories *viz.* those intended to improve conception rate, those which help the animals to successfully carry the pregnancy and those which are followed around calving time. The documented practices were scientifically validated by consulting practicing veterinarians, experts on animal nutrition, livestock production management and veterinary gynecology and obstetrics in the region as well as by consulting available relevant

literature. It was concluded that majority of these practices bear some scientific rationale while some needs to be corrected and some require further investigation.

Keywords: *Bubalus bubalis*, buffaloes, feeding practices, reproduction, Himachal Pradesh

INTRODUCTION

Sound health and regular calving in milch animals is a prerequisite for successful and profitable dairy farming. It is suggested that an adult cattle and buffalo must calve at every 12 and 15 months interval, respectively. Any reproductive disorder like repeat breeding, early embryonic mortality, inability to carry the pregnancy full term, prolapse, dystocia and retained placenta etc has long term effect on the overall productivity of animal as well as the economy of dairy farming. In Himachal Pradesh like any other hilly state, due to difficult terrain farmers are unable to take their livestock to nearby veterinary institutions on time, there is shortage of trained manpower and

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medicines at veterinary institutions and purchasing power of small and marginal farmers is low as a result the animal husbandry/ dairy sector is plagued by several constraints.

To overcome such complications a number of cost effective traditional feeding practices are being followed by certain dairy farmers of the state since time immemorial. These practices are being transferred through word of mouth from generation to generation. It becomes imperative to document such practices to understand their scientific rationale and to increase awareness among the young generation for the traditional system and to revive and restore confidence among the practicing farmers themselves. Location specific farmer practices must be documented and validated for wider replication (Biradar, 2007). The scope of lab generated feed technologies tends to remain limited under smallholder dairying scenario in India, hence such documentation and validation becomes more necessary. Feed technologies and interventions tend to be fairly context specific and work only in a particular situation (Duncan *et al.*, 2015). In the present manuscript an attempt has been made to document the traditional feeding practices followed for improving reproductive performance in buffaloes and their scientific rationale if any.

MATERIALS AND METHODS

Himachal Pradesh falls between 30.22' to 33.12' north latitude and between 75.47' to 79.40. east longitude. The state has been divided into four agroclimatic zones based on altitude and prevailing agro climatic conditions. Out of these four zones, only zone I and II, which included districts Una, Hamirpur, Bilaspur and parts of Kangra and Mandi were selected for the present study based

on large buffalo population and considerable milk production.

Data was collected by participatory rural appraisal technique (Mukherjee, 1994) for getting the information on traditional feeding practices followed for improved reproductive performance in buffalo. The responses were obtained by conducting focused group discussions with key informants i.e. dairy farmers about different feeding practices followed for improved conception, during pregnancy and during peri parturient period.

The documented practices were scientifically validated by consulting practicing veterinarians, experts on animal nutrition, livestock production management and veterinary gynecology and obstetrics in the region as well as by consulting available relevant literature (Nagnur *et al.*, 2006; Sharma *et al.*, 2014).

RESULTS AND DISCUSSION

The details of the findings, farmer's perception and scientific rationale are divided into three categories *viz* those followed after A.I. or natural service, during pregnancy and those followed during peri parturient period and are presented in Table 1, 2 and 3 respectively.

CONCLUSION

An effort has been made to document indigenous feeding practices for better reproductive performance in buffaloes in Himachal Pradesh, India. Majority of these practices are low in cost and have scientific rationale but certain practices like not feeding concentrate feed to pregnant dry animals and not allowing the calf to suckle

Table 1. Indigenous feeding practices followed after A.I. or natural service.

Indigenous practice	Farmer perception	Scientific rationale
After artificial insemination (A.I.) or natural service of the animals farmers offer mustard oil (250 ml) to animal.	This practice improves conception rate in the buffaloes.	Negative energy balance in animals sometime leads to non ovulatory estrus. So supplementation of oil in diet may surmount the negative energy balance in animal resulting in timely ovulation and fertilization (Wathes <i>et al.</i> 2007).
<i>Peda</i> of Barley flour with Coriander/ Gond katira (<i>Tragacanth</i> gum)/ Camphor or Banana leaves are fed after A.I. or natural service.	Improves conception rate.	Barley is a good galactogogue and may also contribute to improved conception.
Fermented wheat flour (locally known as <i>Seera</i>) is dissolved in water and drenched after A.I. or natural service.	Improves conception rate.	Being a good source of energy it may help in overcoming negative energy balance but needs further investigation.
Concentrate feed especially oil cakes are not offered for about a month post A.I. or natural service.	It is believed that protein rich concentrate feeding interferes with conception.	Feeding excess cakes sometime reduces the uterine pH making it unfavorable for spermatozoa viability and thereby fertilization and conception (Elrod <i>et al.</i> 1993).
Avoid feeding foliage from trees like Mullberry <i>Morus alba</i> (locally known as Toot/Cheemu), Baans <i>Bamboosa aurandinalis</i> (local name <i>Magar; Faaglu</i>) after A.I. or natural service.	The leaves from these trees have rough/ scaly surface and are referred to have <i>Garm taasir</i> and interfere with conception.	May be high in phyto estrogen and crude protein content which interfere with fertilization or implantation of zygote/ embryo. Leaves of some bamboo cultivars have rough/ scale surface and are also high in alkaloid content which may lead to miscarriage (Singh, 1962).
Prefer feeding foliage of Kachnaar (<i>Bahunia verigata</i>) and Baans <i>Dendrocalamus hookeri</i> (local name Benjhi)	Their leaves are soft, easy to digest and often referred to have cooling effect.	The foliage may have low crude protein or phyto estrogenic content and in turn favorable for fertilization or implantation of zygote.

Table 1. Indigenous feeding practices followed after A.I. or natural service. (Continue)

Indigenous practice	Farmer perception	Scientific rationale
<p>About 5-7 days post A.I. or natural service if animals release a thick vulvar discharge (<i>locally known as Gull</i>), the animal is considered to have conceived.</p>	<p>Indicator of conception.</p>	<p>The discharge may be from prolonged estrus or may be elicited by secondary wave of follicular growth. Or else when the animal has conceived there is formation of cervical seal and during this process some of the mucus may get expelled in the form of thick mucus but it need further investigation.</p>
<p>Heifers which have shed their one or more deciduous teeth do not conceive till appearance of new teeth</p>	<p>Much attention is not paid for their mating or A.I. till permanent teeth appears.</p>	<p>When the deciduous central incisor fall, the age of buffalo heifer is only about 2 years. At this age some heifers may attain puberty and display signs of estrus but are not sexually mature to sustain pregnancy for full term. So to let the animal attain sufficient body weight, growth and sexual maturity farmers may not mate/cross their animals. But it has no rationale with conception.</p>

Table 2. Indigenous feeding practices followed during pregnancy.

Indigenous practice	Farmer perception	Scientific rationale
While offering foliage from <i>Grewia Optiva</i> (local name <i>Biul</i>) farmers keep a vigil that animal must not consume branches or the bark over the branches.	During first trimester of pregnancy farmer believe that consumption of bark or twigs of <i>Grewia optiva</i> by buffaloes may lead to repeat breeding.	This practice requires further detailed investigation.
Feeding of foliage from trees like Peepal (<i>Ficus religiosa</i>) is prohibited as farmers believe that it may lead to miscarriage.	People believe that feeding Peepal leaves to pregnant animals leads to miscarriage.	The author himself has observed at Model Murrah Demonstration Unit of Krishi Vigyan Kendra Hamirpur that feeding Peepal foliage to pregnant buffaloes lead to apparent vulvar discharge and if presented to breeding bull, the bull mount and serve such buffaloes even if they are pregnant. It might be due to high phytoestrogenic content in peepal leaves but it needs further investigation.
Salt licks are avoided	An excess licking of salt often lead to thick mucoid discharge from vulva.	Salt is required for normal physiology in pregnant as well as non pregnant animals. But excess licking of such licks may result in Salt toxicity and negative impact on health and reproduction. But how this impact is more pronounced in pregnant animals need further investigation.
Avoid feeding Elephant grass (<i>Pennisetum purpureum</i>) and Baggar ghas (<i>Culaliopsis binata</i>)	It results in early drying-off thereby prolonging the dry period and increases the incidence of prolapse in pregnant animals.	These grasses are known to be high in oxalate content, which irreversibly bind the dietary calcium into a non absorbable form leading to calcium deficiency in pregnant animal. Calcium deficiency is often associated with low milk yield and increased incidence of prepartum prolapse.
Avoid feeding concentrate to dry animals	It is believed that if concentrate are fed to dry animals, nutrients would nourish only calf and increase its body size. This may ultimately lead to difficult calving and other complications	The size and body weight of calf is mainly determined by its genetic makeup. If the pregnant animal and hence the fetus do not get sufficient nourishment through feed, several reproductive complications and reduced milk yield post calving may arise. Hence this practice is required to be corrected by various extension approaches.

Table 2. Indigenous feeding practices followed during pregnancy. (Continue)

Indigenous practice	Farmer perception	Scientific rationale
<p>About 1 month prior to expected date of calving farmers start offering boiled mixture of broken wheat and cotton seed meal</p>	<p>It improves the body condition of pregnant animals and also milk yield after calving.</p>	<p>Feeding improves body condition of pregnant animals and milk yield post calving. Additionally Cotton seed meal contains toxin named Gossypol which has luteolytic action and feeding unheated meal may cause premature calving (Sandhu and Brar, 2000). Similarly if wheat grain is fed without soaking, large fraction of it remains undigested and gets excreted in faeces.</p>

Table 3. Indigenous feeding practices followed during peri parturient period.

Indigenous practice	Farmer perception	Scientific rationale
Immediately after calving about 250 ml of Ghee plus Jaggery is offered to the animal	It provides strength to exhausted animals.	It may act as laxative and instant source of energy as most of the animals after calving enters into a state of negative energy balance so supplying energy rich source may help the animal to recoup.
Two and half shoots/leaves of sugarcane is fed	It helps in early expulsion of placenta	It has ecobolic effect i.e. stimulate detachment of placenta from uterine nodes and promote uterine motility.
Animals are not milked and even the newborn calf is not allowed to suckle until the placenta is expelled by animal.	Farmer believe animal is unhygienic till placenta remain hanging from its vulva and the colostrum if milked will also become unhygienic and unsafe for calf.	This is a misconception and scientific studies has confirmed that colostrums as first feed must be given to calf within two hrs of birth to have maximum absorption of immunoglobulins. Moreover, suckling by calf and milking releases oxytocin hormone which promotes early expulsion of placenta. So this practice needs to be corrected by improving their awareness level.
Green fodder either grass or tree foliage is not offered to freshly calved animals upto about 10 days	Farmer believe that green fodder increases lochial discharge and time required for conversion of udder secretions from colostrum into milk is also prolonged.	Excess green fodder feeding may lead to diarrhea/loose feaces but it needs investigation.
Only dry fodder is fed to freshly calved animals	It is better digested	Dry fodder improves gastro intestinal tract motility.

till placental membranes are expelled need to be corrected through improved awareness. Similarly feeding fermented wheat flour (*Seera*) for improved conception and avoiding ingestion of bark and branches of *Grewia Optiva* by pregnant animals need further investigation.

REFERENCES

- Biradar, N., C.R. Ramesh and P.S. Pathak. 2007. Traditional livestock feeding practices in northern Karnataka. *Indian J. Tradit. Know.*, **6**(3): 459-462.
- Duncan, A., N. Teufel, T. Ravichandran, S. Hendrickx and P.G. Ballantyne. 2015. *Innovation Platforms to Improve Smallholder Dairying at Scale: Experiences from the MilkIT Project in India and Tanzania*. International Livestock Research Institute Project Report, Nairobi, Kenya.
- Elrod, C.C., M. Van Amburgh and W.R. Butler. 1993. Alterations of pH in response to increased dietary protein in cattle are unique to the uterus. *J. Anim. Sci.*, **71**(3): 702-706.
- Mukherjee, N. 1994. *Participatory Rural Appraisal Methodology and Applications*, Concept Publications, New Delhi, India. 162p.
- Nagnur, S., G. Channal and N. Channamma. 2006. Traditional dairy herd management practices during pregnancy and calving. *Indian J. Traditi. Know.*, **5**(2): 243-244.
- Sandhu, H.S. and R.S. Brar. 2000. Environmental pollutants, p. 246-261. In Sandhu, H.S. and R.S. Brar *Textbook of Veterinary Toxicology*. Kalyani Publishers, Ludhiana, India.
- Sharma, P.K., R. Thakur, Gulshan, Deepika and D. Kumar. 2014. Important medicinal and aromatic plants and their traditional use in district Hamirpur - A sub himalayan tropical region of Himachal Pradesh. *Journal of Krishi Vigyan*, **2**(2): 88-91.
- Singh, G.S. 1962. Some aspects of feeds and fodders poisonous to livestock. *Indian Dairyman*, **14-15**: 287-291.
- Wathes, D.C., M. Fenwick, Z. Cheng, N. Bourne, S. Llewellyn, D.G. Morris, D. Kenny, J. Murphy and R. Fitzpatrick. 2007. Influence of negative energy balance on cyclicity and fertility in the high producing dairy cow. *Theriogenology*, **68**(1): 232-241.