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Awareness and impact of area specific mineral mixture technology in field situation

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Majority of the feed and fodders given to livestock are deficit in major nutrients all over India (Sharma *et al.* 2008) causing reducing immunity, delayed onset on estrus, repeat breeding /infertility and other reproductive disorder (Underwood and Suttle 1999). The infertile dairy animal means a loss in milk production and no profitability from dairying (Sharma and Joshi 2004, Sharma *et al.* 2005). These disorders were due to deficiency or imbalance of various dietary essential minerals and were mostly area specific (Sharma *et al.* 2003). An area specific mineral mixture (ASMM) for Uttar Pradesh and Uttarakhand was developed by the IVRI and commercialized to 6 different commercial houses. ASMM increased milk yield and body weight of cattle and buffaloes. This formulation is cost effective, contains no toxic level of any constituent, can be made into various size of packing and easily transportable. The area specific mineral mixtures technology for the Uttar Pradesh (Patent no. F.1-33/2004-IPR/DEL dated 17-12-2004) and Uttrakhand states (Patent No. 1399-DEL dated 12-11-2003) were registered for patent and one has already received a patent (Patent No. 23467 dated 17.3.2009, Office of Comptroller General, Patents, Design and Trademarks, plot no. 32, Sector 14 Dwarika, New Delhi 110 075). The present study was conducted to assess the impact of ASMM in the field level among the farmers, veterinary officers and the feed dealers.

The present study was carried out during 2005 to 2008 in Uttar Pradesh and Uttarakhand states. The impact of the ASMM was assessed in three parts. Firstly awareness of the technology among livestock owners and its adoption among them was assessed. Secondly opinion of field veterinary officers was sought on impact of the technology, and thirdly opinion of feed dealers regarding sale of ASMM and its demand among livestock owners was assessed. Farmers (640), veterinary officers (140) and feed dealers (64) were selected randomly from UP and Uttarakhand for the study.

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The data were collected through personal interview method on various aspects related to ASMM technology awareness, adoption and its impact on livestock health and production.

Impact of ASMM as reported by Livestock owners

Awareness and adoption of ASMM by the farmers: Out of the total 640 farmers 52.65% were aware about the ASMM technology; and out of these who were aware about the ASMM, 73.6% were feeding the ASMM to their livestock. It was found that 34.13% of the livestock owners were feeding the ASMM to their livestock since 1 to 2 years, while 17% were feeding it for more than 2 years. Rest of the respondents were feeding it for 6 months (8.9%) or from 6 to 12 months (13. 35%). In general feeding of mineral mixtures in the field condition is very poor. In and around Haryana practically none of the farmers are supplementing mineral mixture and only 25% of the farmers are adding common salt to the diet of their animals. Milch animals are fed with reasonable quantity of concentrate feed ingredients like cotton seed, wheat grain, mustard cake, etc. alone and hence, these are not balanced concentrate mixture. Over all, balanced feeding is not being followed. Deficiencies of calcium, phosphorus, copper, zinc and manganese were found in majority of the animals. Iron content was more than the required level in northern districts of Haryana state (Sharma *et al.* 2003). Further, it is also reported that dairy animals of North East Zone of Bihar yielding 6 kg milk/day were deficient in calcium, phosphorus, magnesium, sulpher copper and zinc (Garg *et al.* 2009).

Increased milk production: Regular feeding of ASMM increased milk production of livestock. Field trials reported 25% increase in milk yield due to feeding of ASMM. Out of 248 farmers who were feeding ASMM to their livestock 56.45% reported increase in milk yield due to feeding of ASMM up to 0.5 to 1.0 litres/day. Further, 25.8% reported an increase of 1.0 to 1.5 litre in milk yield/day. Around 14.12% reported an increase of milk between 1.5 and 2.0 litre while 3.23% reported an increase of more than 2.0 litre milk/day due to feeding of ASMM to their milch stock.

Body weight gain: Majority (86.89%) of the respondents

reported weight gain of animals after feeding of ASMM. It was found that concentrate supplementation @ 400g/ewe/day during late gestation enhanced production performance as well as birth weight of lambs (Chaturvedi *et al*. 2009) and in heifers (Sharma *et al.* 2004).

Constraints in use of ASMM: Majority (85.08%) of the respondents reported high cost of the ASMM in the market to be the major constraints in regular feeding of ASMM to their livestock. Further, regular availability of the ASMM in the shops was also reported to be major constraint by 23 27% of the livestock owners. Only 14.92% livestock owners reported facing no constraints in feeding ASMM to their livestock.

Impact of ASMM as reported by veterinary officers

Awareness about IVRI Area specific mineral mixture: Out of the total 140 veterinary officers, 116 veterinary officers i.e., 82.86% were aware about the ASMM technology. Further, out of 116 VO's who were aware about the ASMM, 54% were recommending it to the livestock owners since 1 to 2 years

Effect of ASMM in increasing milk production: Majority of the VO's reported that the ASMM is very effective in increasing milk production. Control experimental trials of ASMM in the field showed 20–30% increase in growth rate and milk production of cattle and buffaloes. The quantity of milk also improved with a concurrent increase in lactation length up to 300 days in comparison to 180 days to 240 days recorded in animals of the area, which did not receive optimum diets balanced with area specific mineral mixture. Thus, an increase of 60–120 days in lactation length was found to translate into higher economic returns in terms of approximately 90–300 kg. Besides, significant acceleration in growth rate was also observed wherein cow and buffalo heifers attained puberty at 18 to 24 months and 24 to 30 months age, as against approximately 30 to 36 months and 36 to 42 months, respectively. Singh (2007) found unbalanced animal feeding schedule in his study which caused malnutrition in animals that further caused short stature of animals and low milk production in Himalayan region.

Improvement reported by farmer after feeding the ASMM: Further report of VO's on ASSM feeding revealed — 100% VO's reported that farmers gave a positive feedback with regard to improvement in health status of animal; 83% VO's reported that farmers found improvement in general appearance and reduction in disease incidence; and 64.58% VO's reported that farmers had also noticed enhanced reproduction efficiency of animal.

Constraints faced in recommending ASMM: VO's reported following reasons as constraints in recommendation of technology — 87.06% VO's reported high cost of ASSM while 81.89% VO's reported non -availability of ASMM in nearby shops as a constraint. Rezvanfar (2007) reported that availability of input/ technologies and the knowledge about technologies has positive and highly significant relationship with adoption of technologies among farmers.

Impact of ASMM as reported by feed dealers

Results of the study revealed that around 84.37% dealers were aware about the ASMM. Among those who were aware about the ASMM 51% reported selling this product.

Duration of sale and demand of ASMM in field: The dealers who were selling this product, of them around 53% were selling the product for 13–18 months while 21.43% were selling it for more than 18 months. With regards to demand of ASMM among the livestock owners, majority dealers (71.42%) reported its high demand in the field, while 23% reported its moderate demand. Majority (71.43%) of the dealers reported no constraint in selling the product while a few (28.57%) reported its high cost to be a constraint in its sale.

The study revealed a positive impact of the ASMM in the field among the livestock owners. ASSM significantly increased milk production and body weight gain in livestock in field situation. VO's also reported a positive effect of ASMM in field conditions. The feed dealers also reported a high demand of ASMM in field situation. Thus it can be concluded that the area specific mineral mixture technology developed by IVRI has a positive impact in the field situation and its adoption rate can be increased by extension education programmes (Bardhan *et al.* 2007).

SUMMARY

The present study was conducted to assess the awareness and impact of the area specific mineral mixture (ASMM) technology developed by Indian Veterinary Research Institute in the field situation. The present technology was commercialized to 6 different commercial. Results revealed that technology had a significant effect on increasing milk production and body weight gain in livestock in field situation as reported by livestock owners. The veterinary officers (VO's) also reported, a positive effect of ASMM in field among the farmers. Majority of VO's were recommending this technology to livestock owners. The feed dealers also reported a high demand of ASMM in field situation.

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