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Dairy husbandry information needs of farmers in different agro-climatic zones of Uttar Pradesh

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ABSTRACT

The present study was undertaken to examine the information needs of farmers using mKisan services with respect to different dairy husbandry practices. Results of weighted mean score revealed that farmers have higher information need about feeding and watering practices (2.20) followed by marketing of farm produce (2.19), breeding practices (2.18), health care practices (2.12), management practices (2.11) and fodder production and grass land management (2.10) with their information deficiency level of 73.3, 73.0, 72.7, 70.7, 70.3 and 69.9%, respectively. Major needs were related to recommended feeding practices of dairy cattle (2.38) and area specific mineral mixture (2.30). Information about procurement agencies in area (2.15) and day-to-day price variation of different farm produce (2.11) were also found of great concern in marketing of farm produce. Farmers have higher information need about estrus detection and time of insemination (2.30), selection of dairy cattle (2.21) and heifer management (2.18) in the domain of breeding. In health care practices, information about preventive measure against diseases (2.23) and vaccination schedule (2.17) was much needed. In management practices, information need for calf management (2.20) and clean milk production (2.19) was found to be highest. In fodder production and grass land management domain, information need about locally suitable fodder varieties (2.16) and management for fodder availability round the year (2.14) were at highest priority. Information need over different aspect of dairy husbandry practices had significant variation across the different agro-climatic zones of Uttar Pradesh. North Eastern Zone and Bundelkhand Zone were found the highest information deficient zones in Uttar Pradesh.

Key words: Agro-climatic zones of Uttar Pradesh, Dairy husbandry, Information needs, mKisan advisory services

Uttar Pradesh is the most populous state and about 74.8% rural house hold depends on agricultural activities for their livelihood (NSSO 2014). It has a large livestock population, representing 10.2% of the cattle and 28.1% buffalo population in the country (GoI 2012a). Uttar Pradesh produced 24.19 million tonnes of milk during 2013–14 occupying first rank in milk production in the country. But in term of milk productivity/animal, Uttar Pradesh stood far behind the other states (BAH & FS 2015). Estimates indicated that 60% of farmers do not access any source of agricultural information and very small fraction of households (<6%) obtain information about dairy husbandry practices, resulting in huge adoption gap for recommended practices (NSSO 2005).

Importance of feeding and watering practices can be understood with the fact that it accounts for 70% of the total cost of milk production and about 10% increase in net daily income/animal can be achieved by applying the concept of balanced feeding (FAO 2012). Marketing of farm produce is another important aspect related to sustainability and viability of smallholders' livestock farms. Researchers have revealed that milk marketing through dairy cooperatives greatly failed in providing remunerative prices to dairy farmers (Rajendran and Mohanty 2004). Planning Commission (GoI 2012b) also perceived that reform in dairy cooperatives was necessary to make them more competitive. Several factors were identified responsible for poor performance of dairy cooperative like human resource, financial, policy related and administrative constraints (Biradar 2009, Rathod *et al.* 2012). Elimination of these factors with deliberate reform in dairy cooperative, can assure marketing interest of dairy farmers.

Government of India started mKisan services in the year 2013 to provide a unified platform to all the agencies involved in agricultural information generation, information delivery, farmers and buyers to interact with each other. Among the 5671.55 million messages sent till November 2017, only 5.49% (311.50 million) messages were related to animal husbandry. Likewise, about 16.4% farmers have been registered under this service in Uttar Pradesh (mKisan 2017).

Keeping in view the importance of this national level advisory service, it is essential to know what is the information need/deficiency among the farmers with respect

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Table 1. Mean Score and percent deficiency of information needs for dairy husbandry practices among the farmers of Uttar Pradesh

Dairy husbandry practices	Mean score (Information deficiency)
Breeding practices	2.18 (72.7)
Estrus detection and time of insemination	2.30 (77.1)
Artificial insemination services	2.16 (71.9)
Breeding policy for the area	2.14 (71.2)
Heifer management	2.18 (72.7)
Selection of bulls for natural service	2.15 (71.6)
Selection of dairy cattle	2.21 (73.6)
Feeding and watering practices	2.20 (73.3)
Regular availability of clean and potable water	2.15 (71.8)
Area specific mineral mixture	2.30 (76.6)
Formulation of balanced ration	2.25 (74.9)
Recommended feeding practices of dairy cattle	2.38 (79.3)
Recommended feeding practices for young stock	2.22 (73.9)
Colostrum feeding of newly born calf	2.21 (73.6)
Nutrient enrichment of dry fodder	2.12 (70.7)
Alternative ways of concentrate preparation at home	2.09 (69.8)
Management practices	2.11 (70.3)
Clean milk production	2.19 (72.9)
Clean and sanitary management	2.18 (72.6)
Housing management	2.14 (71.4)
New technology for livestock production	2.11 (70.3)
Calf management	2.20 (73.5)
Proper disposal of farm waste	1.96 (65.2)
Record keeping practices	2.02 (67.4)
Health care practices	2.12 (70.7)
Vaccination schedule	2.17 (72.2)
Management for fodder availability	2.14 (71.4)
Symptoms of different prevalent diseases	2.09 (69.8)
Control measures for diseases	2.03 (67.7)
De-worming practices	1.94 (64.6)
Preventive measure against diseases	2.23 (74.3)
Ecto and endo-parasitic control measure	2.14 (71.4)
Fodder production and grass land management	2.10 (69.9)
Locally suitable fodder varieties round the year	2.16 (72.0)
Fodder preservation practices	2.09 (69.8)
Fodder alternative in lean seasons	1.98 (65.9)
Marketing farm produce	2.19 (73.0)
Procurement agencies in area	2.15 (71.7)
Day to day price variation of different farm produce	2.11 (70.3)
Area specific demand and supply status of different farm produce	2.09 (69.8)

Figure in parenthesis represent percent information deficiency.

to various dairy husbandry practices.

MATERIALS AND METHODS

The present study was conducted in 5 agro-climatic zones of Uttar Pradesh. Out of the 9 agro-climatic zones in Uttar Pradesh 5 zones in term of their overall food grain productivity (highest and lowest productive zone with 3 other zones at equidistance place) were selected. One district was selected randomly from each agro climatic zone, viz. Meerut in Western Plain Zone, Bareilly in Mid-Western plain Zone, Allahabad in Central plain Zone, Gonda in North Eastern plain Zone, and Hamirpur in Bundelkhand Zone. From each district, a total of 45 farmers (registered for the mKisan services since last two years and cultivating wheat besides rearing at least 2 cattle or buffalo, completed at least 1lactation) were selected, randomly. Thus, the total sample size for the study was 225.

Information need is the information required by the farmers with regard to various dairy husbandry practices. Information need assessment was done at 2 levels. Primarily with exhaustive review of literature and discussion with expert, items for information need for dairy husbandry were identified. These items were categorised in different domains and their respective components. Prioritization of these domains was done by calculating weighted mean score. Component practices were prioritized on the basis of their mean score, obtained by primary response of farmers for their degree of need for different component of dairy husbandry on 3 point continuum as 'Less needed' (score of 1), 'needed' (Score of 2) and 'Most needed' (Score of 3). Zone wise preference of farmers' information need among the different dairy husbandry domains was calculated by the weighted mean of scores of different component practices as follows:

$$WMS = \frac{W_1X_1 + W_2X_2 + \ldots W_nX_n}{W_1 + W_2 + \ldots W_n}$$

WMS, weighted mean score; W, weight of given practice; X, score of given component practice for n^{th} farmer; n, No. of respondents.

Percent deficiency of information need was calculated as

$$\text{Percent deficiency} = \frac{\text{Score obtained}}{\text{Maximum score}} \times 100$$

Analysis of mean difference for different information needs among the farmers of different zones was done by applying one way ANOVA and Tukey HSD post hoc analysis.

RESULTS AND DISCUSSION

Six dairy husbandry practices were considered for information needs assessment. The result of pooled mean score are presented in Table 1, which revealed that among these practices feeding and watering practices (2.20) have highest overall information need with 73.3% of information deficiency, followed by marketing farm produce (2.19), breeding practices (2.18), health care practices (2.12), management practices (2.11) and fodder production and grass land management (2.10) with 73.0, 72.7, 70.8, 70.3 and 69.9% of overall information deficiency among the farmers, respectively.

Feeding and watering practices: Results revealed that among the different feeding and watering practices, recommended feeding practices for dairy cattle was found as highest (79.3%) information deficient component followed by area specific mineral mixture (76.6%), formulation of balanced ration (74.9%) and other feeding management practices (Table 1). Information need priorities of these practices were also ascertained with their overall mean score. It was also found that information needs for recommended feeding practices for young stock and nutrient enrichment of dry fodder have shown significant variation across the farmers of different zones. Similar findings were reported by Singh *et al.* (2013b), Singh and Gupta (2015), who reported that farmers were in medium to low knowledge level for this practice. As per FAO (2012) feeding is an important factor which can increase farm income by 50–60% through improvement of livestock productivity, improved milk production (10–15%) and decreasing cost of milk production (FAO 2012). Birthal and Jha (2005) also reported that poor feeding practices leads to loss of ₹142,351 million, which was highest among all the other dairy practices.

Marketing farm produce: Marketing of farm produce is one of the important factors, which decide the success of any farm enterprise. Information about this practice has found second highest (2.19) prioritised information needed among the farming community with information deficiency level of 73.00%. Among the different components in marketing farm produce, information about procurement agencies in area (2.15) with information deficiency level of 71.7% was found highest prioritised component, followed by information about day to day price variation of different farm produce (2.11) and information for area specific demand and supply status of different farm produce (2.09) with respective information deficiency level of 70.3 and 69.8%, respectively (Table1). Higher information need about marketing of farm produce can be understood with fact that it is an important factor which decides sustainability and viability of livestock farm. In recent years many private players were engaged in providing procurement facility to farmers but their efforts are sporadic and there are apprehensions about the capability of smallholder producers to participate in market-oriented production systems owing to strict food safety and quality standards that the small-scale farmers have to comply with (Birthal 2007). Dairy cooperatives still have the responsibility of most of dairy farmers due to their wide coverage. However, these cooperatives are facing various challenges and issue of their efficient functioning and need long term support (Chander and Sulaiman 2014). Poor capacity of dairy cooperatives can be understood with fact that only four states, viz. Gujarat, Maharashtra, Karnataka and Tamil Nadu, contribute over two-thirds of milk procurement by cooperatives, while their share in total milk production is 24% (Birthal and Taneja 2006). Existence of unorganized dairy sector, poor awareness among the farmers and poor marketing infrastructure in Uttar Pradesh were also reported by Poonia *et al.* (2014) as major marketing issue of dairy farmers. In absence of proper marketing facilities farmers have to distress sale their milk to local milk vendor and remain devoid of large fraction of profit. The information needs for marketing were found to be equally high in all the five agro-climatic zones of Uttar Pradesh.

Breeding practices: Information about estrus detection and time of insemination was highest needed (2.30) to the farmers followed by selection of dairy cattle (2.21), heifer management (2.18), artificial insemination services (2.16), selection of bulls for natural service (2.15) and breeding policy for the area (2.14) with their overall information deficiency ranged between71.2 to 77.1% (Table 1).Information needs of farmers about breeding policy for the area and heifer management have found a significant variation across the different zones. Optimum time for Artificial Insemination is based on time of ovulation i.e. estrus detection alone contributes considerably not only to reproductive status of the herd but also to success of an effective breeding program (Rao et al. 2013). So information deficiency about estrus detection and time of insemination is an important problem of breeding practices. Selection of dairy cattle and heifer management has long term impact over the performance of livestock farm. Poor awareness about breeding practices leads loss of Rs 60030 million, which is second highest after feeding losses, as reported by Birthal and Jha, (2005). They further reported that economic losses through lack of progeny bulls, long intercalving period and failure of artificial insemination were Rs. 14769, 14084 and 8715 million, respectively.

Health care practices: Results revealed that information needs of farmers were highest for preventive measure against diseases (2.23) followed by vaccination schedule (2.17), ecto and endo-parasitic control measure (2.14), symptoms of different prevalent diseases (2.09), control measures for diseases (2.03) and de-worming practices (1.94) with their overall information deficiency ranged between 64.6 to 74.3% (Table 1). Information need about control measures for diseases, preventive measure against diseases and ecto- and endo-parasitic control measure have found significant variation across the different zones. The value of annual economic losses due to FMD was reported to be ₹ 140,00 crore (Singh *et al.* 2013a), while losses of ₹ 5,255 and 8,895 crore were estimated due to hemorrhagic septicaemia and PPR respectively. (Singh *et al.* 2014). Birthal and Jha (2005) also suggested about need to focus more on prevention and control of mastitis, FMD, brucellosis, theilerosis and ticks.

Management practices: Information needs of farmers for management practices were assessed by considering 7 management aspects of dairy husbandry and results revealed that the overall information needs for calf management was the highest (2.20) among the farmers, followed by clean milk production (2.19), clean and sanitary management (2.18), housing management (2.14) and other aspects of management practices (Table 1) with their information deficiency level ranging between 65.2 and 73.5%. Tiwari

et al. (2007) also reported poor management of calves reared by dairy farmers which leads to a great damage in terms of loss of good quality germplasm. Likewise Lingathurai *et al.* (2009) observed poor hygiene and sanitation measure at livestock farm as a major issue in age of competitive domestic and global market as it increases pathogenic bacteria load. It is not only major threat to public health but also deteriorate keeping quality of milk (Lingathurai and Vellathurai 2010, Salman and Hamad 2011). Information needs of farmers shows significant variation for clean milk production and record keeping component of management practices across the different zones.

Fodder production and grass land management: Results revealed that fodder production and grass land management were found least (2.10) prioritised by the farmers. However, among the different component of this practice, locally suitable fodder varieties were found as the highest information deficient component (72.0%) with mean score 2.16 followed by management for fodder availability round the year (71.4%), fodder preservation practices (69.8%) and fodder alternative in lean seasons (65.9%) with their mean score 2.14, 2.09 and 1.98 respectively (Table 1). Region specific and high yielding fodder variety can fulfil the gap between availability and requirement of feed and fodder. Making availability of feed and fodder round the year is a real crux for dairy husbandry. Birthal and Jha (2005) also argued that feed scarcity is the most important constraint, and accounts for nearly half of the total economic losses in dairy production. Farmers should be made aware about high yielding fodder varieties and various fodder preservation methods to fight with problems of feed and fodder scarcity. Significant difference was recorded for information need about locally suitable fodder varieties across the farmers of different zones.

Information needs among the farmers of different agro-climatic zones: Information needs about recommended feeding practices for young stock were significantly high among the farmers of North Eastern Zone (2.42) and Bundelkhand Zone (2.52) in comparison to Mid- Western Zone (2.02) and Western Zone (1.98). Information needs about nutrient enrichment of dry fodder was also significantly higher among the farmers of North Eastern Zone (2.33) and Bundelkhand Zone (2.32) as compared to farmers of Mid- Western Zone (1.96) and Western Zone (1.87). Information need of farmers for breeding policy was significantly high in North Eastern Zone (2.20) and Bundelkhand Zone (2.40) in comparison to Western Zone (1.79). Similarly among the health care practices, significantly high information need of farmers was reported with regard to control measures for diseases in the North Eastern Zone (2.22) and Central Plain Zone (2.27) in comparison to Western Zone (1.58). Significantly high information need about preventive measures against diseases was reported among the farmers of North Eastern Zone (2.46) and Bundelkhand Zone (2.48) to Mid- Western Zone (2.04) and Western Zone (1.98), while for ecto- and endo-parasitic control measure it was high in the farmers of North Eastern Zone (2.33), Bundelkhand Zone (2.38) and Central Plain Zone (2.24) in comparison to farmers of Mid- western Zone (1.76). Information need for clean milk production was significantly higher in North Eastern Zone (2.53), Bundelkhand Zone (2.42) and Central Plain Zone (2.47) as compared to Mid- Western Zone (1.82) and Western Zone (1.69). Results also revealed that significantly higher information need was found for locally suitable fodder varieties in the farmers of North Eastern Zone (2.38) in comparison to Mid- Western Zone (1.96).

Higher information need among the farmers of North Eastern Zone and Bundelkhand Zone in comparison to Mid-Western Zone and Western Zone for the different dairy husbandry aspects can be understood with the fact that most of the districts of North-Eastern region and Bundelkhand region are considered in backward region of Uttar Pradesh (BRGF, 2014). These are low agricultural productive region in comparison to western region of the state (GOUP 2010). Prasad (2013) also reported that dairy farmers of Varanasi district of eastern Uttar Pradesh were found deficient in knowledge about improved dairy farming practices. Yadav *et al.* (2016) also asserted that the farmers of this region were not following scientific breeding and calf rearing management practices owing to lack of knowledge and awareness. Low knowledge of dairy farmers of eastern Uttar Pradesh as compared to western Uttar Pradesh about dairy farming was also reported by Kumar *et al.* (2017). Singh (2014) also identified lack of knowledge about various management practices and information perceived by dairy farmers in Bundelkhand to cope up with drought condition.

Farmers of different agro-climatic zones of Uttar Pradesh have varied information needs about different aspects of dairy husbandry. Although information need about feeding and watering, marketing of farm produce and breeding practices have high need among all the zones but variation was seen in information need priority for the different aspect of dairy husbandry among the farmers of different zones. So, there is immense requirement to provide advisory services about different aspect of dairy husbandry as per information needs of farmers. Especially Bundelkhand Zone and North Eastern Zone were identified as high information deficient region and therefore, more deliberate effort for fulfilling the dairy husbandry related information need of farmers of these zones should be utmost priority of the developmental organization.

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