

Adoption of Scientific Dairy Practices by Cross Bred Cow Rearer in Jodhpur District

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Abstract

Dairying is an important enterprise for employment for the farmers in urban and rural areas of Rajasthan. With the growing pressure of human population, dairying has to be developed in a scientific manner so that the maximum potential of milch animals can be harness. Dairying in India has been considered to play a crucial role in Indian economy. The level of adoption of dairy innovation by farming community has been far from satisfactory though it has direct bearing on dairy farm production. The study was conducted in Jodhpur district with the objective to identify the level of adoption of major recommended scientific dairy practices by crossbred (CB) cattle rearers. The study was conducted on those farmers only which were work as dairy entrepreneur and already have taken training from Krishi Vigyan Kendra or other training institute of state Govt. /NGO. The selected respondents were interviewed personally with the help of a well-structured and pre-tested interview schedule in order to get relevant information. In the study it was found that the practices adopted by the farmers were Artificial Insemination(87.5 %), feeding of mineral mixture (95.83 %), deworming (95.83 %), feeding of chaffed fodder (82.5 %), disbudding/dehorning (81.66 %), vaccination and colostrum feeding (100%), drying of animals for 60-90 days (75.83 %), ecto-parasite control (74.16 %), feeding of balance ration (71.66%) and selling of milk through middle man (76.66 %).The average adoption index of different aspect of scientific dairy farming practices of breeding, feeding, health care, management and marketing were 36.16, 56.01,64.44, 45.24 and 34.71 percent respectively which indicates good knowledge level of dairy farmers in Jodhpur district.

Keywords: Adoption, Crossbred, Dairy Farmers, Jodhpur, Scientific Practice

Introduction

Livestock is essential to economic, nutritional and social wellbeing of farmers and it is one of the fastest growing agricultural subsectors in developing countries. The contribution of livestock sector to the national economy in terms of GDP at current prices is 3.9 percent during 2014-15 (CSO, 2015). India is one of the countries which has modernized its dairying and has achieved higher production through the introduction of scientific technologies into dairy farming system (Khayalia *et al.*, 2015). Low production of milk mainly due to lack or low level of adoption of improved animal husbandry practices by dairy farmers. Numbers of improved technologies have been developed in previous years in the field of dairy sector; however, these have not been successful in changing the socio-economic condition of farmers at desired level. Moreover, it is recognized that if progress has to be achieved in dairying, farmers need to be continuously updated in knowledge, adoption of new technologies and other personal, social and economic characteristics (Surkar *et al.*, 2014). Majority of farmers in Jodhpur district depend on dairy for main/supplementary income and employment. Though crossbred cattle rearing was taken up by the farmers due to factor like high yield but still milk productivity is low i.e., 6.941 kg/day statistics, SDAH, Govt. of Rajasthan, 2010-2011).

Materials and Methods

The present study was conducted in Jodhpur district of Rajasthan as it has the second highest number of cross bred cattle population (31387) in the state. The average milk production is 6.94 litre per cross bred cow per day (SDAH, Rajasthan, 2010-2011). The KVK Jodhpur organized various training programmes on different aspects of agricultural science. In this study we included only those dairy farmers which were participated in training programme on scientific dairy farming and then started dairy farming as entrepreneur. Dairy farmers were then contacted individually, informed the purpose of survey and requested to react as per the questionnaire. The selected respondents were interviewed personally with the help of a well-structured and pre-tested interview schedule in order to get relevant information. The schedule was developed on binary response format (yes / no) of a single statement and scored as 1 and 0. Total 120 respondents were interviewed personally. Then, the data collected were tabulated and analyzed using simple statistical tool to interpret the results. In dairying, milk production not only depends on the best breeds but also on efficient management through adoption of recommended scientific management practices. Hence, study was carried out on adoption of scientific animal husbandry practices in and around Jodhpur district of Rajasthan.

Results and Discussion

Adoption of different scientific dairy husbandry practices in the area of breeding, feeding, disease control & healthcare, management and marketing are presented in Table 1.

Table 1: Adoption of scientific dairy husbandry practices in and around Jodhpur district of Rajasthan (n=120)

Scientific Dairy Husbandry Practices		No. of adopters (Percentage)	Rank
Feeding Practices	Concentrate Feed as per production of milk/state of animal	68 (56.66)	V
	Roughage /dry fodder feed as per body weight	45 (37.50)	VII
	Green fodder ratio maintains	25 (20.83)	IX
	Chaffed fodder use	99 (82.50)	II
	Feeding of mineral mixture/Brick/MNFB/salt	115 (95.83)	I
	Concentrate feeding of dry/ pregnant cow	70 (58.33)	IV
	Feeding of energy rich product to post-partum cow	62 (51.66)	VI
	Feeding of balance ration	86 (71.66)	III
	Extra feeding to high yielders (more than 20 liters/ day)	35 (29.16)	VIII
	Overall mean	56.01	
Breeding Practices	AI/ Natural services by superior male	105 (87.5)	I
	Pregnancy diagnosis (3 months later A.I.)	70 (58.33)	II

	Maintain the record of pregnancy or Date of calving	30 (25.00)	III
	Try to use superior straw from private	10 (8.33)	IV
	Use of Sex detriment semen	2 (1.66)	V
	Overall mean	36.16	
Health care practices	Vaccination against FMD, HS, BQ	120 (100)	I
	Ticks/ endo-parasite control	89 (74.16)	III
	Production disease control (Mastitis, milk fever, ketosis, downer cow syndrome etc.)	65 (54.16)	IV
	Reproductive problem control (anoestrus, repeat breeding)	50 (41.66)	V
	Quarantine/Isolation of animal	25 (20.83)	VI
	Deworming	115 (95.83)	II
	Overall mean	64.44	
Managemental practices	Scientific housing (Pakha, E-W model)	55 (45.83)	V
	Records maintain	5 (4.16)	VII
	Debudding/Dehorning	98 (81.66)	II
	Cleaning of cattle shed	10 (8.33)	VII
	Cooling (fan, cooler, fogger etc.)	64 (53.33)	
	Colostrum feeding to new born calves	120 (100)	I
	Machine milking	5 (4.16)	VII
	Major precaution of new born calves (viz. Naval cord, resp., suckling)	70 (58.33)	IV
	Hygienic condition maintains pre and post milking (teat dipping, washing of udder etc.)	25 (20.83)	VI
	Drying of pregnant animal (2-3 months before calving)	91 (75.83)	III
	Overall mean	45.24	
Marketing practices	Selling of milk self as brand	28 (23.33)	II
	Sell through middle man	92 (76.66)	I
	Value added product viz. panner, Dahi, Cheese, Rashgula etc.	5 (4.16)	III
	Overall mean	34.71	

Feeding Management Practices

Scientific feeding schedule that provides a high plane of nutrition ensures better milk production for better economic returns. 56.66 % of the farmers were followed concentrate feeding to the animals as per milk production. The study revealed that 95.83% respondents were fed mineral mixture/ MNFB/ common salt to their animals in study area. Only 20.83 percent of the respondents were aware about ratio of green and dry fodder feeding to their animals whereas 51.66 percent farmers fed energy rich product to their animals' post-partum for control of production diseases. Farmer perceived that extra care of feeding is necessary to those animals which give more than 20 liters of milk per day. It was revealed that balanced feeding of ration is adopted by 71.66 percent of farmer. Rathore and Kumar (2017) observed that only 20 percent of co-operative society member adopted the balance feeding of cow. It was noticed that feeding of concentrate feed to the pregnant animal was adopted by 58.33 percent farmers. Farmers felt that balanced feeding is necessary for prevention of production diseases, more milk production, timely estrus and reproduction. It was observed that 82.50 and 71.66 percent dairy farmer' adopted feeding of chaffed fodder and balance concentrate feed respectively to their animals. Only 37.50 percent farmers were fed dry fodder to their animals as per requirement. Letha (2013) reported that the adoption of green fodder feeding was to some extent and concentrate feeding was fully adopted in her area. Mohi and Bhatti (2006) reported lack of knowledge of balance feeding was main constraints. Singh and Chauhan (2006) found poor resource for raising fodder crops, high cost of concentrate, poor availability of fodder seeds were main constraints in Tonk and Jhunjhunu district of Rajasthan. Tailor *et. al.* (2012) reported that in Udaipur district of Rajasthan major problem were non-availability of green fodder throughout the year and inadequate knowledge about scientific feeding of dairy animals faced by tribal farmers. Rathore and Tanwar (2013) reported high cost of fodder and concentrate, inadequate irrigation and small land holding for green fodder production were main constraints in feeding management practices in Jhunjhunu

district of Rajasthan. In our study, it was observed that feeding of mineral mixture helps in increasing milk production and timely estrus. Farmers perceived that feeding of energy rich product (polysaccharide preparation) help in prevention of negative energy and ultimately control of production diseases. Farmers are aware about balanced feeding of concentrate; it is due to training before or during dairying business. Constrains in feeding practices were minimum because high level of adoption of feeding practice.

Breeding Management Practices

It was noticed that Artificial Insemination (A.I.) /Natural services are adopted by 87.5 percent farmers with superior germplasm of the animals and it was observed that pregnancy diagnosis after A.I. was adopted by 58.33 percent farmers. Similar findings were reported by Modi and Patel (2010) and Tewari *et al.* (2016) that almost all farmers practiced A.I. for breeding their crossbred cows in rural areas of north Gujarat. It was also observed that the practice of inseminating cow after 12 to 15 hours of onset of estrus in our study. Ranjit Kumar *et al.* (2015) reported that 74.40 percent of dairy farmers adopted this practice as per the advice given by veterinary doctor, whereas, Tanwar *et al.* (2012) reported that majority farmers did not present their animals for pregnancy diagnosis after A.I. The majority of farmers were having more than 20 crossbred and there was association among the farmers for advancement of A.I. and advancement of other scientific dairy practices. Gandhi and Singh (2006) reported that importance of A.I. network under field condition is the need of the day to disseminate superior germ plasma from exotic bulls besides improving the conception rate from A.I. Whereas, few number (25 %) of farmers followed the recording of date of parturition/ calving of the animals. The data observed that only 1.66 percent farmer used the sex sorted semen for breeding. Large numbers of respondents are not taking the services of A.I. from private Agencies for their animals. High rate (87.5 %) of adoption of artificial insemination by dairy farmer due to better awareness and future planning of heifer rearing. Farmers used bull for natural services to those cows which were not conceived successively 3 times through A.I. and found better results by natural services.

Heath Care Practices Management

It was noticed that nearly (95.83 %) of farmers adopted deworming of adult cattle in study area. Similar findings are observed by Prajapati *et al.* (2015), Sabapara *et al.* (2015), Singh *et al.* (2016) and Tewari *et al.* (2016). High adoption of deworming was due to free medicine scheme run by state govt. and awareness of farmers. Most of the farmers were dewormed their animals in 3-6 months of interval. They felt that after deworming animal's digestibility will be improved and animal give more milk.

It was found that cent percent farmers practiced vaccination of dairy animals against infectious diseases like F.M.D., H.S. and B.Q. as per schedule. Similar findings were also observed by Shyam Singh *et al.* (2015), Prajapati *et al.* (2015), Sabapara *et al.* (2015) and Tewari *et al.* (2016). Cent percent of vaccination in dairy animals may be due to FMD CP programme of central govt.

It was revealed that 20.83 percent dairy farmers practice disolation of sick animals from healthy animals. Similar findings were also observed in the study of Shyam singh *et al.* (2015), Ranjit Kumar *et al.* (2015) and Singh *et al.* (2016). It was observed that cent percent farmers practiced of treatment of sick animals by qualified veterinarian in crossbred cattle. Similar findings were observed in studies of Rupendra Kumar *et al.* (2014) and Mali *et al.* (2014) that treatment of sick animals from veterinary doctors, deworming and cent percent vaccination against F.M.D. adopted.

It was noticed that 41.66 % farmers adopted the practice oftreatment of animals for anoestrus and repeat breeding. Ranjit Kumar *et al.* (2015) reported that 86.70 percent of dairy farmers adopted practice of treatment of repeat breeders by suggestion of veterinarian to make their animal conceive. Sunil Kumar *et al.* (2011) reported that only 5 percent of farmers got treatment of their animals for anoestrus and repeat breeding problem in mid hill area of Uttarakhand. The adoption of treatment of anoestrus& repeat breeding in dairy cows in present study area might be due to existence of veterinary facilities and awareness of reproductive diseases. Farmers felt that, if animal is delay in conception, the per month loss approximately Rs. 2000/- to 4000/- as per milk production.

It was observed that 54.16 % dairy farmers adopted to control measures for production diseases. Farmers felt that production diseases (Mastitis, milk fever, ketosis, downer cow syndrome etc.) were highly dangerous in terms of economic losses and health of the animals. Once animal suffered from these diseases may be permanently damage

the udder and died during treatment. So, all the control measures were adopted by the farmers like teat dipping for mastitis, Ca supplementation for prevention of milk fever, energy rich supplement for ketosis etc.

For the control of ticks, 74.16 percent farmers were adopted the practices of bathing and injection for tick control. In summer season, when ticks incidence remains high, farmers were used Malathion powder 3-4 inch below soil along with ash.

Managemental Practices

It was noticed that scientific housing to protect animals from adverse weather conditions was adopted by 45.83 percent of farmer's in study area. It was noticed that all the large no. of farmers adopted proper housing to protect animals from adverse weather conditions. Sabapara *et al.* (2015) reported that 58.33 percent respondent's adopted some kind of measures to protect the animals from extreme weather conditions. It was observed that cleaning /washing of shed regularly was adopted only by 8.33 percent of farmers. The low level of adoption this practice because it is labour and time-consuming practice and water availability was not certain in studies area. It was found that disinfectant and fumigation of shed and premises was not adopted by of farmers. Cooling of pukha shed by fogger was adopted by only at 2 farmers shed. Similar findings are observed in the reports of Rathore *et al.* (2010) and Minu Singh *et al.* (2015). In our study some of farmers use disinfectant (Bleaching powder, soda etc.) in outbreak of disease in our study area. Whereas, Minu Singh *et al.* (2015) and Singh *et al.* (2016) reported that nearly three fourth of respondent were not applying disinfectants in animal shed. It was observed economic benefit of cooling in lactating dairy cows. It helps in decreases the case of heat stress and increase milk production in summer season. It was revealed that practice of cooling devices like fan, tree around the shed and water sprinklers during summer season were adopted by 53 percent of farmers. Singh *et al.* (2016) reported that regarding the welfare practice in summer season, 50 percent of farmers sprinkled water on animal's body in Kathua district of Jammu and Kashmir. Tewari *et al.* (2016) reported that 89.38 percent farmers provided their animals shade from trees in Tarai region of Uttarakhand, India. Bhaga *et al.* (2003) also revealed that spray cooling increased the physiological comfort and milk yield high yielding during hot climate condition. Almost all the respondents practiced cleaning of housing / shed regularly by removal of dung and clean by Jadu (broom) in the study area. It was observed that cutting & sealing of navel cord in aseptic condition was adopted nearly 58.33 percent of farmers. In total, cent percent of respondents adopt the practice of colostrums feeding to new born calf within half an hour in the study area. Few of respondent practiced feeding of calf starter in the study area. The data revealed that drying of animals for 2-3 months was adopted by 75.83 percent. Tanwar and Kumar (2017) reported ignorance about drying off animals before 45-60 days of calving (66.67%) in milking practices by member of milking co-operative society in Jaipur district.

It was noticed that majority of farmers practiced hand method milking followed by machine milking (0.04%) only. Tewari *et al.* (2016) reported that only 7 percent of farmers adopted full hand milking method in Tarai region of Uttarakhand, India. Sukar *et al.* (2014) also reported that full hand milking technique was not adopted by any of the respondents in Wardha district of Maharashtra. The adoption of milking machine (4.16 %) was limited dairy farmers in study area. The main reasons were its cost and maintenance. Choudhary *et al.* (2001) revealed that the cost of milking per kg of milk by machine was higher (Rs. 0.40 in buffalo and Rs. 0.25 in cows). Bhosale (2006) reported that one out of two commercial dairy farm adapted machine milking.

It was found that farmers were not adopting practiced of washing of animal before milking. In total, 20.83 percent of respondents practiced clean udder pre and post milking in cross breed cattle in the study area. When setting standard for clean milk production, it is important that the standards reflect the local condition. High capital investments to improve hygiene may not be an economic necessity. The cost of clean milk production should not exceed the benefit of the farmers. For clean milk production in study area respondents were used simple technique like teat dipping with povidine iodine which is very effective. Sandip Kumar *et al.* (2014) reported that cleaning of animals before milking was not much in practice in Shahdol district of Madhya Pradesh. Whereas, Singh *et al.* (2014) reported that 62 percent of the respondents were cleaning their animals before milking in Jammu & Kashmir. It was observed that practice of proper cleaning of udder with water before milking was adopted by cent percent of crossbred cattle farmers. The findings are in line with findings of Bashir and Vinod Kumar (2013), Patel *et al.* (2014), Shyam Singh *et al.* (2014), Sabapara *et al.* (2015), Sabapara *et al.* (2016) and Singh *et al.* (2016). Sunil kumar and Mishra (2011) reported that none of the respondents wiped the udder and teats just after milking in Uttarakhand.

In total, only 4.16 percent of respondents practiced maintenance important records in the study area. Records of farm were not maintained by majority of CB cattle farmers. The farmers need to be enlightened about farm records for better dairy farming.

It was recorded that 81.66 percent dairy farmers adopted the disbudding practice. Farmers perceived that price of animal without horn is more about Rs. 5000/- per animal at the time of selling/buying. Some farmers were trained in disbudding; they were practiced in nearby area.

It was found that practices of strip cup test and dipping of teats in povidone iodine after milking were adopted by 20.83 percent dairy farmers in study area. The findings are in line with the findings of Patel *et al.* (2014), Sabapara *et al.* (2015) and Sabapara *et al.* (2016).

Marketing Management

The average marketing price is rupees thirty of cross bred cow milk. The annual dairy income of crossbred cattle farmers in the study are ranged between Rs. 30,500- 3, 15,000/-. More than half of the crossbred cow rearers were with low level of dairy income. This variation was due to no. of animals kept and adoption of scientific technologies. These findings are in accordance with Nirmal Kumar and Chandra Roy (2015). Sharma and Singh, 2020 that net margin of profit is Rs. 10.73 higher in crossbred/exotic cattle that of indigenous cattle and buffalo. This can be revealed that the crossbred/exotic cow rearing were very profitable in the region as in case of other part of the country reported by several authors (Nagrале *et al.*, 2007, Gauraha, 2007, Jaiswal and Singh, 2015, Sinha *et al.*, 2012, Malsawmdawngliana & Rahman, 2016, Chand *et al.*, 2017 and Joshi *et al.*, 2018).

Keeping in view of increasing importance of quality milk by consumers, farmers need to be encouraged to follow the clean milk production practices which ensures good price for the quality milk. Moreover, Crossbred cattle which are high yielding are much prone to mastitis and other metabolic diseases. Hence, farmers need to be educating about preventive practices than curative practices for quality milk production and to prevent economic losses.

Constraints Faced by the Dairy Owner

Dairy farmers were adopted scientific dairy practices for betterment of dairy but faced some of the constraints. Majority of the farmers expressed that the price they get for the sale of milk was low and high price of feed and fodder in summer season. Another major constraint was high incidence of mastitis and repeat breeding in dairy animals.

Conclusion

The study concluded that, in general, overall technology adoption rate is higher in comparison to other areas of country. Respondents have high level of adoption of scientific practices of feeding, breeding, management and health care. Adoption of improved dairy technologies is influenced by many factors. Among each respondent, level of education, awareness on available technologies and willingness of farmers to adopt technologies are major ones. Extension services should be strengthened and training of farmers on improved technology and technical support should be continuing. There is large gap in technologies adoption on advance breeding and marketing practices, which should be filled up by product selling under a brand. In dairying, milk production not only depends on the best breeds but also on efficient management through adoption of recommended scientific managemental practices. It was focused on the adoption behavior of crossbred cattle rearers towards recommended dairy managemental practices. Government should intervene with subsidy and other financial incentives to attract unemployed educated youth to replace the old people looking after dairy farming.

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Conflict of Interests

There is no conflict of interest.

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