



# Use of Dry Cow Therapy for Control of Mastitis in Dairy Animals

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## ABSTRACT

An on-farm study was conducted during different season at farmers field in Samastipur district of Bihar to assess the effect of dry cow therapy as an intervention for control of mastitis in dairy herd. Twenty one crossbred cows were selected at dry-off and distributed in three group with 7 animals each. The experimental treatment groups were T<sub>1</sub> (Control- No dry cow therapy), T<sub>2</sub>: dry cow therapy with *Spectramast D C* at last day of milking) and T<sub>3</sub> group: dry cow therapy with *Spectramast D C* along with application of *Intavita H* 5ml I/M. Daily milk yield was recorded for 30 days after 15 days of post-partum to find out the effect of dry cow therapy on milk production. The finding of the study showed that dry cow therapy in combination with *Intavita H* (T<sub>3</sub>) or alone dry cow therapy were effective protocol to control mastitis with reduced mastitis cases as compared to T<sub>1</sub> (control). However, dry cow therapy in combination with *Intavita H* (T<sub>3</sub>) was more effective against control of mastitis. The milk quantity and quality were also improved with treatment of dry cow therapy.

**Key Words:** Dry cow therapy, Dairy animals, Mastitis, Milk yield, Milk quality and Season.

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## INTRODUCTION

Livestock play an important role in the livelihood of small and marginal farmers. Among livestock, dairy cows are essential asset to the rural people those directly linked in agricultural farming for sustainable nutrition, income generation and compost. Mastitis is one of most common disease in dairy animals, characterized by inflammation of the parenchyma of mammary glands or udder, occurred due to multi-etiological agents usually from bacterial infection introduced either during milking process or from environmental contact. The degree of severity of symptoms ranges from mild to moderate to severe. The degree of illness and presence of their symptoms depends on many factors, such as the nutritional or immune status of cow, environmental factors such as cleanliness, humidity and ambient temperature. The most common symptoms of clinical mastitis are swollen, heat, hardness and redness of udder and further manifested as changes in milk colour, consistency, flavour and its composition.

Mastitis is a disease of global economic importance because of it adversely affects the animal health, milk quantity or quality and causes huge economic losses to dairy sector (Radostits, 2009 and Bagri *et al*, 2018). The economic losses are in terms of reduction in milk yield, discarding of milk, treatment cost and premature culling of animals. Bansal and Gupta (2009) reported an amount of Rs.7165.51 cores losses due to mastitis in India. Mastitis also negatively affects on milk composition (fat, SNF, lactose and protein etc.) and physio-chemical characteristics (pH) of milk, causes low keeping quality and unfit for human consumption (Sharif *et al*, 2009). The alterations in milk composition are attributed to changes in vascular permeability due to the inflammatory process and the damage of epithelial cells that are responsible for synthesis of milk components. The estimation of Ph of milk is an indicator of milk quality. The changes in electrolyte composition of milk decides Ph, which depends on udder health of animal ( Bortolami *et.al*.2015). Whereas, decreased

in percent of fat, SNF, protein and lactose of mastitis milk due to impaired synthesis and secretory activity of the udder epithelial cells (Bagri *et al*, 2018).

The various approaches have been implicated to combat the infectious pathogens causing the mastitis. Dry cow therapy is the most effective way to treat udder infection during drying off period. Dry period is the period between two successive lactations. Dry cow therapy is use of intramammary antimicrobial therapy at the end of lactation. It is one of the key points in mastitis control programme and has become a very effective and advantageous method for control of mastitis (Neelam *et al*, 2017) because of longer retention time of the antibiotic in the udder, safely use of higher dose of antibiotic and minimizes the risk of contaminating milk etc.. In addition, the economic losses due to discarding of milk are alleviated. Further Tiwari *et al* (2018) observed 12per cent increased in milk yield during 45 days post calving period in dry cow therapy treated cows group as compared to untreated (control) .

The occurrence of mastitis cases varies from season to season because of growth and multiplication of organism depends on specific temperature and humidity. Improper housing and ventilation with high temperature and humidity encourages multiplication of bacteria. Therefore, dairy animals are prone to mastitis in the rainy season as compared to rainy and winter season (Patil *et al*, 2005). Hence, a study was conducted to assess the effectiveness of dry cow therapy as an intervention tool for control of mastitis in dairy herd during different (winter and rainy) seasons and its effect on milk quality parameters.

## MATERIALS AND METHODS

The study was conducted during two seasons (rainy and winter) at farmers field of Samastipur, Bihar, located at 25° 51'46.68"N and 85° 46'51.70"E to study the effect of seasonal variation on incidence of mastitis. The ambient temperature and relative humidity during the period of study,2017-18 ( rainy and winter ) were in the ranges 24.2- 37.5°C and 65-91% and 11.9-25°C and 65-92%, respectively. Twenty one dry off crossbred cows were selected from villages and distributed in to three groups (T1, T2 and T3) with 7 animals each during both season. The experimental treatment were T<sub>1</sub> (Control- No dry cow therapy), T<sub>2</sub>, : dry cow therapy with *Spectramast DC* and T<sub>3</sub>, : dry cow therapy with *Spectramast DC* along with *Intavita H 5ml I.M.* at last day of milking was done. All the animals were dewormed before the start of the experiment and also at subsequent regular intervals and maintained under normal feeding and animal husbandry practices of farmers. Daily milk yield was recorded for the period of 30 days after 15 days of post-partum to know the effect of dry cow therapy on milk production.

For milk quality estimation collection of milk sample was done after 30 days of lactation. The milking was done after properly washing of udder and teats with potable water and dried with cloth. Teats were disinfected with 70% alcohol dipped swabs. The first 2-3 streams of milk from each teat were discarded, mid flow milk was collected in sterile milk bottle for further test. The pH of milk samples were estimated just after milking using by digital Ph meter dipped in milk and value were recorded.

**Table1. Effect of dry cow therapy on crossbred cows during rainy season.**

Group	Total milk yield (lt.)	Clinical Mastitis Symptoms	Av. milk yield/ day/Animal	Input cost (Rs.)	Gross return (Rs.)	Net Return (Rs.)	Additional Income (Rs.)
T1	2110	03(42.85%)	10.05	37832	75960	38128	-
T2	2545	01(14.23%)	12.12	47732	91620	43888	5760
T3	2610	00(0%)	12.43	48947	93960	45013	6885

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California mastitis test (CMT) was done at 30 days of lactation for identification of mastitis. For California mastitis test: the milk from 4 teats were drawn into the four chambers on CMT paddle separately. California Mastitis Test (CMT): 2ml of mastitis test reagent mixed with 2mL of milk sample collected in each chamber of paddle and mixed thoroughly by clockwise, anticlockwise, forward and backward movements and results were read within 30sec.

### RESULTS AND DISCUSSION

The effect of dry cow therapy on milk production and incidence of mastitis during different seasons revealed that no cows of T3 group showed mastitis symptom after application of dry cow therapy in combination with *Intavita H*, however 14.23 and 42.85 per cent cows of T2 and T1 group (control), respectively expressed mastitis within 45 days of post-partum in rainy season (Table 1). Singh *et al* (2018) conducted similar type of study and reported that use of post teat dip technology enhanced the milk production significantly and helped in prevention of the sub clinical mastitis to a great extent. Therefore, farmers must be advised to use this low cost technology at their dairy farms in order to increase their margin of profit and also to improve public health. Berry and Hillerton (2002) described that dry cow antibiotic treatment in all four quarters of animal at the end of their lactation had reduced the number of mastitis pathogens already existed and prevented new mastitis pathogens in the dry period and also

after calving, so dry cow therapy practically is very effective tool in the control of mastitis in dairy animals. Similar finding were observed by Tiwari *et al* (2018) who further reported an increase in milk production in dry cow therapy treated group as compared to untreated group (control). The milk yield from cows of T3 and T2 were increased as compared to T1 (control). The lesser milk yield from cows of T1 was largely due to damage of mammary parenchyma of mammary gland because of mastitis (Zhao and Lacasse, 2008). Moreover, animals suffering from mastitis decreased appetite, leads to low feed intake, which have a negative impact on milk production.

The occurrence of mastitis symptoms in animals of T1 group were higher in rainy (42.85%) as compared to winter season(28.57%), which might be due to faster growth and multiplication of mastitis causing organism in hot and humid climate (rainy season)(Joshi and Gokale, 2006). The impact of dry cow therapy along with application of *Intavita H* on animals of T3 groups showed fully effective against mastitis in both season, might be due to synergistic effect of DCT in combination with *Intavita H*. As *Intavita H* contains vitamin A, D and biotin, which might play role in keratinization of skin and prevent for teat canal skin lesion. However, application of only dry cow therapy on animals of T2 groups were also effective during both season but little lesser in rainy season. In present study an additional income of Rs. 5000-9000 were obtained by farmers as compared to control because of higher milk production.

**Table 2. Effect of dry cow therapy on crossbred cows during winter season.**

Group	Total milk yield (lt.)	Clinical Mastitis Symptoms	Av. milk yield/day/Animal after DCT	Input cost (Rs.)	Gross return (Rs.)	Net Return (Rs.)	Additional Income (Rs.)
T1	2058	02(28.57%)	9.8	36900	74088	37188	-
T2	2562	00(0%)	12.2	48037	92232	44195	7007
T3	2667	00(0%)	12.7	49969	95832	45863	8675

**Table 3. Effect of dry cow therapy on Milk quality in crossbred cows.**

Group	Rainy season			Winter Season		
	pH	Fat%	SNF%	pH	Fat%	SNF%
T1	6.72	3.43	8.01	6.68	3.54	8.12
T2	6.58	3.66	8.52	6.61	3.76	8.70
T3	6.60	3.78	8.60	6.57	3.92	8.72

( N= 10 , All average of 10 days milk sample)

The average pH of T1 and T3 milk were 6.72 and 6.60 in rainy and 6.82 and 6.57 in winter, respectively (Table 3). pH value of control group (T1) milk was increased as compared to treatment groups (T2 and T3) due to increased permeability of mammary glands tissue and movement of bicarbonate ions into milk ( Bortolami *et al*, 2015). Whereas, the percent of fat and SNF of T1 (control) milk were reduced as compared to T3 groups and average values were 3.43 Vs 3.78 and 8.01 Vs 8.60 during rainy and 3.54 Vs 3.92 and 8.12 Vs 8.72, respectively. The decreased in percent of fat and SNF were in agreement with Jagadeesh *et al*, (2016), Singh *et al*, (2018) and Bagri *et al* (2018) might be due to impaired synthesis and secretory activity of udder epithelial cells. Moreover, reduction in SNF per cent as a result of drop in lactose and protein percent which are major components of SNF ( Rao, 1990).

### CONCLUSION

Optimum production and maximum daily yield of milk can only be achieved if mastitis is prevented at herd level by adopting guidelines of mastitis control program. On the basis of results found in the present study it is concluded that dry cow therapy in combination with application of *Intavita H* are effective intervention tool to control mastitis and improvement of milk quantity as well as quality production. Dry cow therapy was significantly effective in the prevention of clinical and sub-clinical mastitis in dairy animals as well as against the control of pathogens. Hence, a large no of front line demonstration should be encouraged by KVK scientist to adopt dry cow therapy to

reduces losses due clinical and sub-clinical mastitis and avoid health issues in human beings due to consumption of contaminated milk.

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