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## Displaced Abomasums on a Dairy Farm in Iran

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**Abstract:** Abomasal disorders are one of the most important problems in large scale dairy herds, especially in high producing cows. Prevalence of abomasal disorders was studied in a dairy farm with 1400 milking cows. Eighty eight out of 2299 parturient cows (5.59%) affected with different abomasal disorders. LDA recorded as the most prevalent condition (95.45 %) and right anatomical disorders of the abomasum recorded as 4.55% of the cases. Total prevalence of abomasal disorders in heifers (3.59%) did not show any difference with cows (5.1%). Prevalence of the disease in low producing cows is less than moderate and high producing and in >6 parturition was less than other parturitions; however the highest prevalence recorded in third parturition. Recorded cases were increased in autumn that was significantly higher than spring and summer in heifers but no significant difference recorded in cows.

**Key words:** Abomasal disorder, dairy farms, Iran

### INTRODUCTION

Since the first report of displacement of the abomasums (DA) in a cow in 1950 (Begg, 1950), this disorder in dairy cattle nowadays has become more common. The DA is characterized by the abomasums filled with gas floating in the dorsal part of the abdomen. This state can result in anorexia and signs of colic, accompanied by a drop in milk yield, discomfort of the cow and, in some cases, death. After non surgical correction of the position of the abomasums the production can be disappointing, which may result in culling of the cow. The total estimated economic loss of a case of this disorder is between 250-450 US dollar (Geishauser *et al.*, 2000). Displacement of the abomasum is a common and economically important problem of dairy cattle in early lactation. In addition to the direct costs of treatment, affected cows produce less milk at least in the short term (Detilleux *et al.*, 1997) and have a higher culling rate (Geishauser *et al.*, 1998b; Grohn and Rajala-Schultz, 2000). Treated cows that remain in the herd produce 350 kg less milk the following month than cows without a displaced abomasums (Dawson *et al.*, 1992). The median incidence of LDA was 1.7% in 22 studies published between 1982 and 1995 (Kelton *et al.*, 1998). Considering published reports from data from the US and Canada, it appears that the incidence of LDA is increasing in the last decade, from between 1 and 2% lactational incidence

risk to 5 to 7%. Risk factors for left displaced abomasum (LDA) have been reviewed (Shaver, 1997), but significant gaps remain in understanding its pathogenesis. Numerous studies have identified twins, dystocia, milk fever, retained placenta, metritis and ketosis as risk factors for LDA (Grohn and Rajala-Schultz, 2000). Herd level risk factors related to nutrition and feeding management in the transition period have also been identified (Cameron *et al.*, 1998). The incidence of DA varied, depending on the country, from 0-7% per year (Cameron *et al.*, 1998; Kelton *et al.*, 1998). There is however a large variation at the herd level within a country (Van Dorp *et al.*, 1998; Wolf *et al.*, 2001). Some herds seldom have a case of DA, while in other farms the incidence can be 20% (Dawson *et al.*, 1992; Kane, 1983). When the herd-incidence is high, DA can result in considerable economic loss. Eighty to 90% of all abomasal displacements are left-sided (Geishauser *et al.*, 1998a; Holtenius *et al.*, 1998).

### MATERIALS AND METHODS

Displaced Abomasum was studied in a large dairy herd located in central Iran in 18 month from March 2003-September 2004. Fourteen hundred cattle were milked in the above mentioned farm with average milk production of 9743 liters/305 days (31.9 kg/day) in first calvers and 10717 liters/305 days (35.1/day) in others.

All cows housed in free stall barns and get their ratio as TMR (Total Mixed Ratio). Data out of 2299 parturient cows were recorded as LDA (Left Displacement of Abomasum) and RDA (Right Disorders of Abomasum including distention, torsion and volvulus of abomasum). Time to parturition, parity, average 305 milk production in the last recorded period, season of the disease and age were recorded and analyzed for report.

Regular clinical findings like history, anorexia, sudden milk decrease or milk drop from average of the herd, diarrhea, dehydration and metallic sounds in left or right flank were main criteria for diagnosis. All diagnosed cattle referred to surgery and additional correction were done in the data in case of any misdiagnosis.

All cows under study were divided into three groups in according to milk production in the last recorded production, as in High Producer (HP) milk production was more than 10000 liters/305 days, in Moderate Producer (MP) milk production were between 7000-10000 liters/305 days and in low producer (LP) milk production was less than 7000 liters/305 days. Difference of the prevalence of the condition analyzed by Chi-Square test between groups,  $p < 0.05$  recorded as significance level.

## RESULTS

Total prevalence of DA recorded as 5.59% that was higher in the cows in third calving without any significant difference with the total prevalence of the disease and the lowest recorded in  $>6$  calving that was significantly lower from total prevalence of the disease ( $p < 0.05$ ) (Table 1). An increase in prevalence was recorded in autumn that was significantly higher than spring and summer in heifers but no significant difference recorded in cows ( $p < 0.05$ ) (Table 2). The highest prevalence recorded in MP (Table 3) although no significant difference detected between HP and MP, but a significant difference was recorded with LP cows (Table 3). Most of recorded abomasal disorders were LDA (95.45%) and right anatomical disorders of the abomasum include RTA, RVA and RDA recorded as 4.55% of the cases. Total prevalence of abomasal disorders in heifers recorded as

Table 1: Distribution of the DA in different parities\*

Statistical analysis	Percent	Prevalence DA/Parturition	Parity
NS	3.59	37/752	1
NS	7.26	22/303	2
NS	8.82	18/204	3
NS	7.57	15/198	4
NS	4.87	4/82	5
S	0.35	2/557	6 and $>6$
	5.59	88/1573	Total

\*: All data compared with the total of DA ( $p < 0.05$ )

Table 2: Seasonal distribution of DA in heifers and cows

Percent	Total (DA/Total parturition)	Percent	Cows* (DA/Total parturition)	Percent	Heifers* (DA/Total parturition)	Season
3.37	26/771	4.47	21/469**	1.65	5/302	Spring
3.24	24/740	4.01	20/498**	1.65	4/242	Summer
7.46	20/268	6.58	20/268**	8.91	9/101	Autumn
5.76	18/312	4.39	18/312**	8.41	9/107	Winter

\*: Significantly different between seasons ( $p < 0.05$ ).

\*\* : No significant difference from heifers ( $p < 0.05$ )

Table 3: Distribution of DA in different milk production groups and ages\*

Group	Recorded DA (Number)**	Milk production (Liter/ 305 day)	Age (Month)
HP	22	12033 $\pm$ 1473	55 $\pm$ 13
MP	25	8534 $\pm$ 939	53 $\pm$ 15
LP	13**	4875 $\pm$ 2430	55 $\pm$ 15

\*: All data analyzed by previous milk production record and data of heifers were excluded, \*\*: Significantly lower than moderate producers ( $p < 0.05$ )

3.59% that is less than the prevalence in cows (5.1%) but no significant change between cows and heifers was recorded ( $p < 0.05$ ).

## DISCUSSION

Displacement of the abomasums as a disease is described in ruminants, both males and female. With respect to the incidence of the DA one should conclude that DA is mainly a disorder associated with cattle, in particular Holstein-Friesian cows. The major risk period is the first month after calving, with an increasing risk with age (Van Widen and Kuiper, 2003). In current study the most prevalence were recorded in third parturition that is somehow equal to 5 years old and not significantly decrease in the fourth parturition but the rate of the DA is significantly lower in  $>6$  parturition that is somehow different from reported articles. Culling of susceptible cows in lower parturition, lower milk yield in higher parturition possible better food consumption of the cattle in higher ages maybe the reasons for this decline in prevalence of the DA in this farm. However some reports mentioned higher prevalence of the disease in the first lactation that can be a result of a poor social and nutritional adaptation of the newly lactating heifer (Jubb *et al.*, 1991). Different incidence rate of the abomasal disorders were reported in dairy farms that ranged from 0-7%. Estimates of mean yearly incidence rates for left displaced abomasums (LDA) in lactating dairy cows range from 1.4-5.8% (Correa *et al.*, 1990). Incidence rated for individual herds within these studies ranged from 0-21.7%. The average prevalence of the disease in current study has been recorded as 5.59 that related to the size of the herd relatively high prevalence in affected cows (Holtenius *et al.*, 1998). Shaver (1997) reported a mean incidence rate for LDA of % (0 to 21.7%) from a survey of 71 dairy herds with 5742 cows.

Incidence rates ranged from 1% (0 to 3%) in 34 low incidence (<3% LDA) herds to 8.7% (3.2% to 21.7%) in 37 high incidence (>3% LDA) herds. Jordan and Fourdraine reported a mean incidence rate for LDA of 3.3% (0 to 14%) from a survey of 61 high producing dairy herds (244 cows per herd) averaging 11,096 kg of milk per lactation (Shaver, 1997).

DA is associated with milk production, the higher the milk yield the larger the risk of development of DA (Fleischer *et al.*, 2001), but this relation is not always present. However in current study MP cows with average milk production of 9000 liter/305 days showed the highest prevalence that was not significantly different from HP cows that support some other previous reports (Rohrbach, 1999). However large amounts of volatile fatty acids in the rumen and abomasums and low blood calcium levels in high producing cows maybe responsible for higher prevalence in this group than low producers (Van Widen and Kuiper, 2003).

Higher prevalence of the disease in autumn and winter may be a result of declining quality of the stored roughage over winter, with poor intake of roughage as a result, besides there is evidence that season weather conditions influence the incidence of DA. Rainfall, low temperature and strong wind increase the incidence of DA when cows are at pasture, probably via a reduced intake of roughage (Van Widen and Kuiper, 2003), however reports of occurrence of DA in different seasons are not concise (Cameron *et al.*, 1998; Constable *et al.*, 1992).

Higher prevalence of LDA was previously reported (Geishauser *et al.*, 1998a; Holtenius *et al.*, 1998). In current study LDA was recorded about 19 times more than right ones. Since all data recorded from the cows that refereed to the surgery and regarding to an idea about low chance in curing the right abomasal disorders, maybe one of the reasons for this difference is lower referral for surgery and direct culling of the cows that were affected with the right disorders of the abomasums.

Focusing on the transition period of the postpartum dairy cows, by optimizing the ration in the dry period (prevent obese cows), facilitating the adaptation process of the lactating cows (socially and nutritionally by adding dry cow two weeks before the estimated calving date) and optimize postpartum feed intake (prevent concurrent diseases), the problem regarding displacement of the abomasums could be reduced to a minimum.

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