

## Subacute Ruminal Acidosis (SARA) in Different Groups of Age and Lactation in Cows for Milk Production



### Veterinary Medicine

**Keywords:** SARA condition, ruminal pH, nasoesophageal probe, the period of lactation, age.

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### Abstract

In the period January 2010 - January 2013, in four cattle farms were studied experimentally the vulnerability relations of cows from the (SARA condition) in age and in different periods of lactation. The presence of SARA condition in cow was based on the evaluation of the rumen pH content. For a period of 3 years, were studied 137 cows of different ages and in different periods of lactation. In the first month of lactation (on days 3-30's) resulted affected by SARA condition, 8 heads or of 17:02% heads of control. In the second month of lactation (on days 31-60 th) resulted affected seven heads or 15.9% and in the third month of lactation (on days 61-90 th) resulted affected 5 heads or 10.8% of heads of control. Vulnerability of cows by SARA condition increases by 0.0% in first lactation, in 11.1% in the second lactation cows, in 23.5% in the third lactation cows and culminates in the fourth lactation cows with 31.5%. In cows with more lactations observed decrease in the level of vulnerability to both the culmination of six lactation cows (21.4%) and in cows older than seven lactation (11.7%). Vulnerability indicator of cows by SARA condition tends to decrease with advancing lactation days. Averages values were statistically proven for vulnerability by age group ( $P > 0.005$ ;  $T_d = - 1,742$ ). Between the level of vulnerability of the SARA condition in cows and their age were correlative relation to the average strength of character and negative ( $r = - 0.313$ ).

### Introduction

Subacute rumen acidosis (below, SARA condition) is the most common disorder in well-managed farms cows for milk production, Enemark (2008). This syndrome is basically the deviation from the norm of fermentation processes and digestion of food in the ruminal environment. SARA condition comes as a result of feeding the animals with high levels of concentrates, Oetzel (2003) and characterized by daily episodes of reducing the pH of rumen content values between 5.5 and 5.0, Krause and Oetzel (2008). Functional disorder of fermentation process cause reducing pH of rumen content associated with motor function of rumen, from 3 to 5 hours a day, Kleen (2003). This condition manifests not clinically significant. Most often affected by SARA condition are the early lactation cows and middle-aged. The authors' data on the extent of vulnerability of cows by SARA condition is different, but most agree that cows in the first month after calving and lactation cows of 3-5, are most vulnerable to be affected Ceroni V et.al. (2005). In previous studies in cattle farms in the country is estimated incidence of SARA situation, Ceroni V. et.al (2011). Our study aims to identify the period of lactation and age at risk of being affected by the SARA condition and finding of relations between the age and vulnerability of the lactation period.

## Material and methods

The study was conducted in the period January 2010 - January 2013 in 4 cows farms for milk production with intensive breeding regime. In each farm were randomly selected 12 cows in different ages, in every season of the year, in different periods of lactation, and with no clinical signs of disease and in good body condition. Animals were treated with the same dietary and average yields were 5000 - 8000 liters of milk per year. In animals selected, samples were taken from the rumen content through ruminocentesis and nasoesophageal probe, 3-6 hours after consumption of mixed food in different periods of lactation, for three consecutive years. pH of the liquid from rumen contents was measured with portable pH- meter, immediately after sampling. Based on the results of pH rumen content, animals in the study were divided into three groups. Group A (healthy animals), the pH value of the rumen content 5.8 - 6.2, Group B (animals at risk), ruminal pH value of 5.6 -5.8 and Group C (animals with SARA), with most of the ruminal pH less than 5.6. The results obtained were grouped according to age and the period of lactation animals and were processed statistically. In conclusion relations between factors were identified in the study and drafted a factorial regression equations.

## The results obtained

Data processing for the degree of vulnerability of the SARA condition in cows showed increased level of presence of SARA in the first period of lactation (days 3-30 th). In this period 47 cows were checked and found to be affected by SARA condition 8 heads or 17:02 % control heads. In the second month of lactation (days 31-60's) were searched results on the four farms, 44 heads and proved to be affected by SARA 7 head or 15.9% of them. In the third month of lactation (days 61 - 90th) was searched and a total of 46 cows affected by SARA resulted 5 heads or 10.8% of control heads, Table 1.

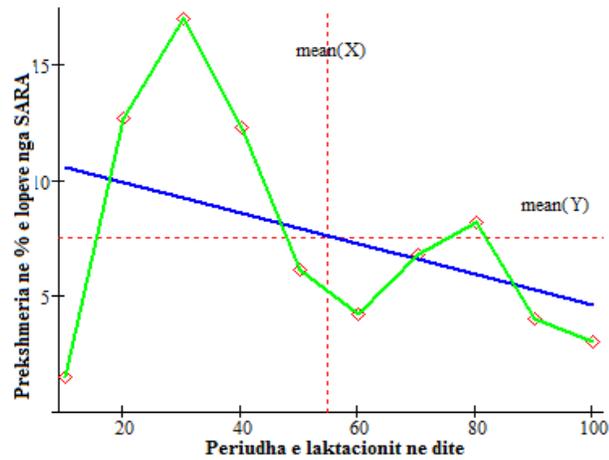
**Table 1.** Cows controlled at different stages of lactation and results in the incidence of SARA condition, according farms and in total.

Nr	Farm	Cows controlled by days of lactation, and their results								
		3 - 30 days			31 - 60 days			61 - 90 days		
		Contr	Pos	%	Contr	Pos	%	Contr	Pos	%
1	A	13	1	7.6	11	2	18.1	12	1	8.3
2	B	12	5	41.6	10	3	30.0	13	3	23.0
3	C	11	1	9.1	10	1	10.0	11	0	0.0
4	D	11	1	9.1	13	1	7.6	10	1	10.0
5	Amount	<b>47</b>	<b>8</b>	<b>17.02</b>	<b>44</b>	<b>7</b>	<b>15.9</b>	<b>46</b>	<b>5</b>	<b>10.8</b>

The survey data showed that the period of the first month of the start of lactation, or periods of days 3-30's is the most endangered time to be affected by SARA condition. In such conclusions reached and other researchers. Nocek (1997), higher frequency of touching the animal by SARA condition is the time of transition from the dry period in early lactation.

The survey data were processed statistically (ANOVA method), the charts were developed and defined linear regression correlative attachments. From figure 1, shows that the average incidence of SARA condition in all farms in the study, is higher at the beginning of lactation (green curve).

**Figure 1:** Dependency relations and the degree of vulnerability of SARA condition cows in lactation days.



Vulnerability indicator of cows by SARA condition tends to decrease with advancing lactation days. The chart also evidenced relation dynamics of dependency and vulnerability of SARA condition in cows from the lactation period. The green curve graph shows fluctuations in the value of highlighting vulnerability and highlights. In the period of 90-days of lactation has two climactic moments with vulnerable adults. The highest level of vulnerability of SARA condition in cows recorded on the third week of lactation (or on days 18-23). High level were on days 78-85 of lactation. If the linear regression graph (blue line), indicated that between SARA condition in dairy cows and lactation has the weak link correlative ( $r = - 0.195$ ) negative character. The data confirmed statistically ( $TD = 4.175, P > 0.005$ ). Grouping and processing of data also showed that with increasing age (based on the number of lactation) increases the risk of the presence of SARA condition in cows and that up to the fourth lactation cows. In cows with more advanced age than sixth lactation is clear tendency of decreasing density on the degree of vulnerability of animal by SARA condition, Table 2.

**Table 2.** The relationship between the number of lactation and frequency of the vulnerability of animals from SARA condition in all the surveyed farms.

Lactation	Heads checked in total	From this					
		Healthy animals		Risk animals		With SARA	
		Heads	%	Heads	%	Heads	%
First	15	13	86.6	2	13.3	-	0.0
Second	18	13	72.2	3	16.6	2	11.1
Third	17	12	70.5	1	5.8	4	23.5
Fourth	19	11	57.8	2	10.5	6	31.5
Fifth	21	15	71.4	4	19.1	2	9.5
Sixth	14	8	57.1	3	21.4	3	21.4
Seventh	16	14	87.5	1	6.2	1	6.2

More	17	13	76.4	2	11.7	2	11.7
<b>Amount</b>	<b>137</b>	<b>99</b>	<b>72.5</b>	<b>18</b>	<b>13.1</b>	<b>20</b>	<b>14.5</b>

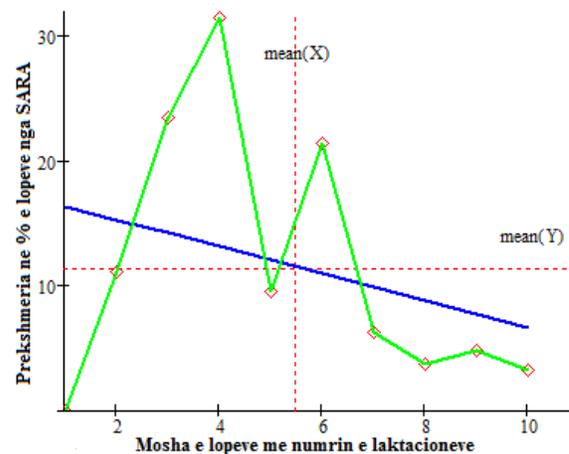
The data obtained indicate that the vulnerability of SARA condition in cows increased by 0.0% in the first lactation, to 11.1% in the second lactation, at 23.5% in the third lactation cows and culminates in the fourth lactation 31.5%. In later lactation cows observed decrease in the level of vulnerability with two culmination of six lactations cows (21.4%) and in cows older than seven lactations (11.7%).

The data of our study to increase with increasing age vulnerability of productive cows or by increasing the number of lactations are not in agree with Giancesella data (2012), which negates the impact of the number of lactation in the vulnerability of the animals by SARA condition.

Statistical processing of the data showed that the average values statistically confirmed ( $P > 0.005$ ;  $T_d = -1742$ ) and the level of vulnerability among cows by SARA condition and age related correlative of average strength of character and negative ( $r = -0.313$ ).

**Figure 2.** Relations of dependence between age (with lactation) and vulnerability of dairy cows by SARA condition.

Dynamics of change in the degree of vulnerability of cows by SARA condition depending on their age looks good on the chart (green curve) and the dependency relationships between these indicators reflect the blue curve of the linear graph. Indicators such dependence similar to the incidence of SARA condition in milk cows from aged were found on four farms in the study.



**Discussion**

Basically SARA condition represents a form of fermentative disorders in rumen of dairy cows, typical for the beginning of lactation but not only, which affects the welfare of animals in farm productivity and profitability, MORGANTE (2007). In our opinion the increased vulnerability of cows from SARA condition. Start of lactation is characterized by the rapid transition from feedstuff rich in fiber that are fermented with difficulty in meals with high energy content, or fiber easily fermentable. With the advancement of the lactation period reduced the risk of incidence of SARA condition because animals adapt to ration for milk production and cows vulnerability cases of SARA condition with advancing lactation, associated with the preparation of ration flaws, or flaws management in animal breeding. In reaching this conclusion the researchers have Garry FB (2002) and Nocek (1997), who explain the vulnerability of cows by SARA condition in mid and late lactation and is entirely managerial and has nothing to do with the process of adaptation.

The high level of animal vulnerability by SARA condition at the fourth lactation associated with high productivity. High milk production requires high levels of ration energy for body maintenance and production, therefore increase the amount of food consumed and in particular concentrates containing food.

Cows in this age choose so concentrated food preference and "ignore" food forager. In this age cows dominance begins to appear in the environment "social" and identify mutual problems. Dominant animals consume more concentrates food developing the depth of the problem of rumen acidosis and dominated animals consume less food, chew and less, send therefore less saliva in the rumen, and also develop and deepen the state ruminal acidosis.

## Conclusions

The first period of lactation (days 3-30) has been the period with the highest number of heads affected by the SARA condition (17:02%). The risk of vulnerability of dairy cows from the SARA conditions reduced with advancing lactation. Between SARA condition and vulnerability of the lactation period is related to poor correlation ( $r = - 0.195$ ) negative character. Between Sara condition and vulnerability of the lactation period were poor correlation ( $r = - 0.195$ ) and negative character. The highest level of vulnerability of cows by SARA condition were observed in the fourth lactation cows (31.5%). High percentage of state vulnerability of cows by SARA condition were evidenced in the third lactation cows and six. Between the indicators of vulnerability of age cows and SARA condition related correlation of average strength of character and negative ( $r = - 0.313$ ). In different periods of lactation and in different lactation cows t, especially in the fourth lactation, should increase vigilance and further routine checks for the presence of SARA condition.

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