Subacute Rumen Acidosis (SARA) in Cows With Intensive Breeding in Different Periods of the Year

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Kewords: SARA condition, ruminal pH, pH- meter, nasoesophagale probe, season.

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Abstract

In the period January 2010 - January 2013, in four cattle farms were studied experimentally vulnerability relations of cows from subacute rumen acidosis (SARA condition) in different seasons of the year. Assessment of the presence of SARA condition in cow was based on the evaluation of rumen pH content. In 137 cows studied in different seasons of the year, for a period of 3 years was found various state presence of SARA. More affected animals were found in summer. In this season resulted positive for SARA condition 11 of 37 controlled heads of cattle or 29.7%. Levels and increased vulnerability was found in the spring and winter, respectively, in the spring 4 by 33 heads of cattle controlled, or 12.1% in winter and three heads, or 9.3% of cows controlled resulted affected by SARA condition. In the autumn season had the lowest level of vulnerability of the situation SARA cows. In these seasons were found affected two heads or 5.7% of cows controlled. The largest group of risk animals to be affected by SARA condition belonged to autumn. Among the incidence of the SARA condition in cows and the seasons were found correlative relation and negative character (r = - 629).

Introduction

Subacute rumen acidosis (SARA), is recognized as a disorder of the processes of fermentation and digestion of food in the rumen. This syndrome is found in particular in well-managed farms of cows for milk production, Enemark (2008). SARA condition is the most common disorders in ruminants and deviation from the norm underlying processes in the environment of ruminal fermentation. SARA condition is characterized by episodes of lowering daily pH of rumen content in values between 5.5 and 5.0, Krause and Oetzel (2006). This disorder is a result of feeding the animals with high levels of concentrate, Oetzel (2003). SARA condition can also be defined as a decrease of pH in the content of rumen in nophysiological levels after receiving concentrated foods and not to favor environmental adaptation in terms of ruminal microflora and mucous membranes. This condition is not associated with obvious clinical signs. Clinical phenomena of fall of body weight, reduced milk production, the indicators of reproductive disorders, increased incidence of laminitis syndrome manifested by lameness, etc.. take time to identify, Ceroni V. et.al. (2005). The controll of the SARA condition can be accomplished by evaluating the pH of ruminal content, assessment of hematobiochemical and hematological profile and most significant clinical signs that warn or guide for the presence of SARA in dairy farms, Ceroni V.et.al. (2011). In previous studies, is evaluated the incidence of SARA condition in cattle farms in our country, Ceroni V.et.al. (2011). Our study aims to identify the presence of the relation between environmental factors and vulnerability of cows for milk production by SARA condition.

Material and methods

The study was conducted in the period January 2010 - January 2013 in 4 cows farms for milk production with intensive breeding system. In each farm were randomly selected 12 cows in each season of the year, at different periods of lactation, without clinical signs of disease and in good body condition. Animals were treated with the same diet and average yields were 5000 - 8000 liters per year. In animals selected were taken samples from the rumen content through ruminocentesis and nasoesophagal probe, 3-6 hours after consumption of mixed food, in the 4 seasons of the year for 3 consecutive years. pH of the liquid contents from rumen was measured with portable pH-meter, immediately after sampling. Based on the results of rumen pH content, animals in the study were divided into three groups. Group A (healthy animals, the value of pH content 5.8-6.2), Group B (animals at risk, the value of ruminal pH 5.6-5.8) and Group C, with ruminal pH less than 5.6, or animals with SARA). The results obtained were processed statistically and were defined the attachments between factors in the study.

Results

Data processing for the degree of vulnerability of cows by SARA condition in different seasons of the year showed that the increased level of presence had summer. In this season resulted positive for SARA condition 11 of the 37 heads of cows or controlled 29.7% of them. The increased level of vulnerability in cows by SARA condition was found in the spring and winter. Spring resulted in 4 cows affected by the 33 heads of controlled, or 12.1% of them. In winter resulted affected by SARA condition 3 heads by 32 controlled or 9.3% of cows. The autumn season had the lowest level of vulnerability of cows by SARA condition. In these times, were found two heads affected of the 35 controlled, or 5.7% of cows, Table 1, Figure 1.

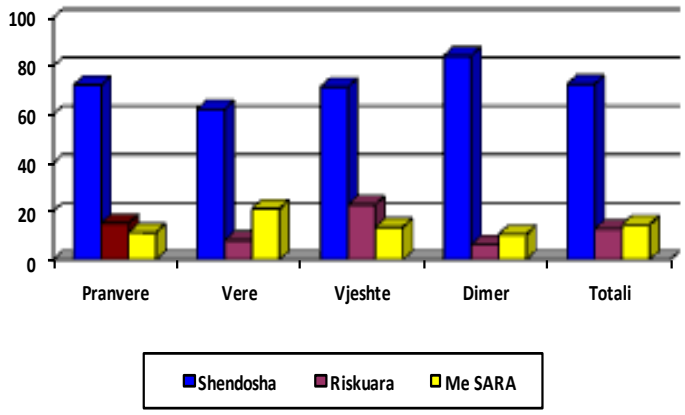
Table 1. The level of vulnerability of cows in the farms studied by SARA condition in different seasons of the year.

Sesons	Controlled in total	From this					
		Healthy		Risk		SARA	
		Heads	%	Heads	%	Heads	%
Spring	33	24	72.7	5	15.1	**4**	**12.1**
Summer	37	23	62.1	3	8.1	**11**	**29.7**
Autumn	35	25	71.4	8	22.8	**2**	**5.7**
Winter	32	27	84.3	2	6.2	**3**	**9.3**
Total	**137**	**99**	**72.7**	**18**	**12.8**	**20**	**14.5**

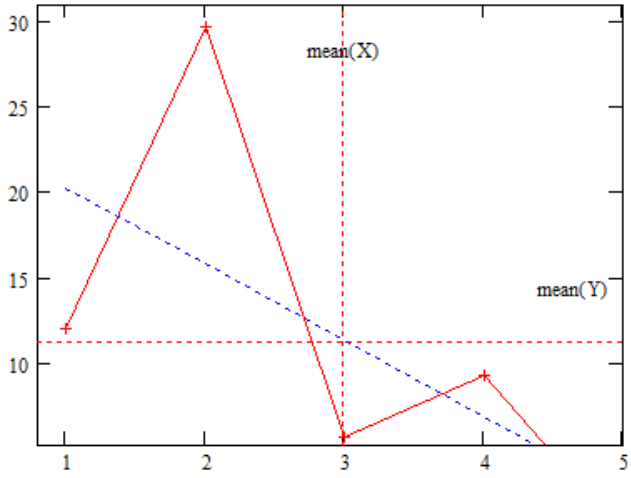
The data of our study for the degree of vulnerability of cows by SARA condition in different seasons of the year are close with data published from other authors. Gianesella reports (2012), in a study conducted in cattle farms in Italy that in summer seson, cows had more vulnerability by SARA condition. The prevalence of SARA condition in summer in surveyed farms was highest

(48%), confirming the fact that this season match the top curve in the graph of the state density of SARA in dairy cows and that is the most critical period for SARA condition, Gianesella (2012).

Figure 1. The level of vulnerability of cows in the farms studied by SARA condition in different seasons of the year



The survey data were processed statistically (ANOVA method), the charts were developed and defined linear regression correlative attachments. As appears from the graph 2, the linear regression between SARA condition in dairy cows and seasonal and environmental factors are related dependency. In the results obtained random effects are not excluded, but our data evidenced by the tendency of addiction. Blue curve shows the relation just lowering the level of vulnerability of the SARA condition in cows over the summer season, in the fall and then winter. Among the incidence and sesons of year found strong links correlative negative character (r = -629), graph. 2.

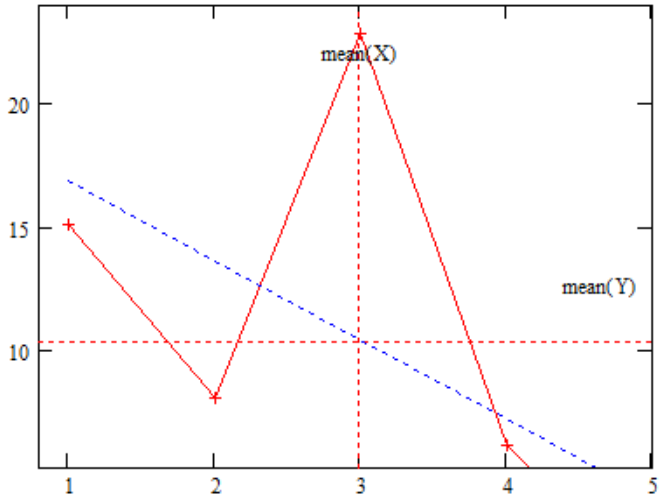


Graph 2.

Dependency relation between the level of vulnerability of cows bySARA conditions in different seasons of the year. **(r = - 629).**

The same tendency of links between environmental factors were found in the category of animals at risk to be affected by SARA condition, Table 1 and Chart 3. The largest group of animals at risk to be affected by SARA condition belonged to autumn. In this season 8 heads or 22.8% from 35

controlled were found in ruminal pH values within the boundaries of the group risked. In large number was group of animals at risk in the spring seson. Results showed that in this season 5 cows or 15.1% of controlled animals resulted in risk to be affected SARA condition. In seasons of summer and winter animals at risk groups were small in numbers 3 or (8.1%) and 2 or (6.2%). Relationship of dependency on the number of animals at risk to be affected by SARA condition with seasons of year, was also strong and negative character (r = - 579).



Graph 3. Dependency relation between the number of cows at risk to be affected by SARA condition in different seasons of the year. **(r = - 579).**

Discussion

In our opinion the increased level of vulnerability of cows by SARA condition in summer is related with increased environmental temperatures and reduce the amount of dry matter consumed by cows. In the summer, with increasing of environmental temperature recorded decrease of food consumption, especially of food forage because digestion of forages produces much more energy (body heat) than starch, Amaral Twehues Phillips (1996). This fact is essential in modifying of the behavior of cows being driven them preferential consumption of food concentrates. Depending on the breeding system (free or bound) and often insufficient space in front of the food, are not excluded "social" conflicts. Dominant animals consume more food concentrates developing the depth of the problem of rumen acidosis and dominated animals consume less food, they chew less and send therefore less saliva in the rumen, while also deepening the condition of rumen acidosis. In summer seson increase from high temperatures the frequency of respiratory, elimination of CO2 from the lungs and reduced rumination, Roche and Mazza (2008). All these factors potentially affect the reduction of appetite, reduced dry food intake, increased intake of concentrated food and increase the level of risk for developing the condition of SARA in summer seson. The results obtained allow to determine that seasonality is a potential risk factor for developing the condition of SARA in intensive breeding farms of dairy cows. While the increase in the number of animals at risk to be affected by SARA condition in the autumn season, perhaps beginning to affect the feeding of silage corn cob, an energy-rich food.

Conclusions

1. The summer period is the period with the highest number of cows (29.7% of controlled animals) suffering from SARA condition.
2. Autumn period has the largest number of animals at risk (22.8% of controlled animals) to be affected by the SARA condition.
3. In the degree of vulnerability of the animals from SARA condition affects period of year. Among these factors has strong ties dependency negative character (r = - 629).
4. Strong links negative character (r = - 570) is between the number of animals at risk to be affected by SARA condition in different seasons of the year.
5. In certain periods of the year should increase vigilance and further routine checks for the presence of SARA condition in dairy cows.

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