

спектральном графике свидетельствует о гетерогенности пыльцевых комочков. Антиоксидантная активность пчелиной обножки с *P. rhoeas* в водном и спиртовом растворах составляет $68,61 \pm 6,712\%$ и $55,80 \pm 1,492\%$ соответственно. Содержание фенольных соединений – $419,16 \pm 9,356$ мг TEAC / г; фенольных кислот – $2,40 \pm 0,052$ мг CAE / г; полифенолов – $16,47 \pm 0,339$ мг GAE / г; флавоноидов – $13,34 \pm 1,533$ мг QE / г.

Ключевые слова: пчелиная обножка, *Paraver rhoeas*, монофлорность, спектрометрия, антиоксиданты, фенольные соединения

UDC 632.2.09:618.4-036.3

CHEWING ACTIVITY OF COWS AND ACIDITY OF RUMEN CONTENTS

Yu. Yu. BANIAS, Post-graduate student of the Department of Dairy and Meat Production Technology
National University of Life and Environmental Sciences of Ukraine
E-mail: triolakt@icloud.com

Abstract. Studying the relationship between the size of the food particles and the acidity of the rumen contents, found that the size of the particle feed has an effect on the pH of the rumen. Analyzing the results, it should be noted that the level of acidity of the rumen content in cows with low chewing activity indicated a more acidic environment, pH ranged from 6.94 to 6.03. At the same time, animals with a higher level of chewing activity were characterized mainly by a neutral or slightly alkaline rumen contents with a pH of 6.91 to 7.75. As we see, cows, which are characterized by elevated chewing activity, were distinguished by higher values of pH of a rumen in comparison with animals, which had a lower duration of chewing. Ruminating activity of cows fed the same ration has been studied. Time of rumination was different that influenced rumen acidity (pH). Strong correlation ($r = 0,57; 0,53$) between rumination time and rumen pH has been discovered. It has been proved that 24-h monitoring of rumination can serve as effective instrument of control of microbial processes in the rumen.

Keywords: chewing monitoring, dairy cows, rumination, rumen contents, acidity

Introduction. Milk production under the conditions of industrial technologies and high level of concentration of livestock is possible only with the maximum use of the most advanced technological solutions and analysis of the basic parameters of the physiological processes of animals. One of the

© Banias Yu. Yu., 2018

* Науковий керівник – доктор с. – г. наук, професор В. І. Костенко

most modern electronic control systems of the herd is the system of collecting and analysis of data of chewing activity of cows on the basis of HR-Tag LD™ collar transponder-actometer-ruminograph. The system is developed for acoustic tracking of one of the most important parameters of the life of a ruminant animal - the chewing process (rumination), which is a direct reflection of the effectiveness of the rumen. Scientific researches have proved high accuracy and informative of this system

Analysis of recent research and publications. Ruminants almost do not chew the food while eating. The main treatment of feed passes in the rumen, until it would be in correct consistency. This is anable by the periodic diversion of food into the oral cavity and the careful chewing. During the day, cows are chewed up to 100 kg of rumen contents. At the same time, the bulk of the plant feed that comes to the rumen is processed by the microorganisms that populate it. An important factor is the constancy of the pH of the proventriculuses, because the change in acidity leads to the death of certain types of microorganisms. Therefore, it is important for ruminants that in those parts of the stomach where fermentation occurs (rumen, reticulum), pH should be slightly alkaline or neutral.

By isolating cellulase and other hydrolases, cellulosic microorganisms partially break down cellulose, hemicellulose, pectin and lignin, and the resulting carbohydrates and resulting carbohydrates are fermented. However, the splitting of vegetable fibers is significantly dependent on their grinding during chewing [1; 2].

Taking into account the above, it can be argued that control and diagnosis of digestive problems are a necessity. One of the methods of controlling and diagnosing these problems is to evaluate their chewing activity. According to studies [3; 4] the high activity of the rumination contributes to the improvement of the rumen environment and its functional state. The more intense synthesis of saliva, which is released during chewing the food, stabilizes the pH of the rumen, which prevents such typical diseases of high-yielding cows as subclinical scaphoid acidosis and laminitis.

Studying the relationship between the size of the food particles and the acidity of the rumen contents, found [9] that the size of the particle feed has an effect on the pH of the rumen. So, chewing activity is the most reliable sign of a healthy cow.

The analysis of available sources of scientific literature showed that in the given problem the questions of connection and interaction of the duration of chewing activity of cows with the parameters of the acidity of the supported rumen contents. Constant monitoring of pH will effectively influence digestion processes in the rumen feed.

The purpose of the research is to scientifically substantiate the dependence of the acidity of the rumen contents on the duration of the chewing activity of the cow and, thus, to control the nature of the activity of microorganisms in the proventriculus.

Methods. The research was carried out at the dairy complex of the "Podilsky gospodar - 2004" LLC "Svarog" Corporation on cows of Ukrainian black-

and-white milk breed. For research, healthy cows with a health index (according to the Milcon program) at least 88 were selected. The registration of functional parameters was performed by the electronic MilCon HM™ system with an identification unit based on neck collar transponders that combine identification, activity and chewing activity (rumination) of animals and automatic transfer of accumulated data to a computer using infra-red technologies.

Investigation of the acidity level (pH) of the supported rumen is performed on 3 cows with elevated (over 230 min.) and 3 cows with a decreased (up to 201 min.) chewing activity during the last 12 hours. Samples were taken and checked for a period of no more than 5 minutes to determine the pH of the rumen containing using a special probe. Measurement of the acidity level was carried out by a certified device pH-150MA.

Results. Analyzing the results, it should be noted that the level of acidity of the rumen content in cows with low chewing activity indicated a more acidic environment, pH ranged from 6.94 to 6.03 (Tab. 1). At the same time, animals with a higher level of chewing activity were characterized mainly by a neutral or slightly alkaline rumen contents with a pH of 6.91 to 7.75. As we see, cows, which are characterized by elevated chewing activity, were distinguished by higher values of pH of a rumen in comparison with animals, which had a lower duration of chewing (Fig. 1).

1. Indicators of chewing activity and acidity of the rumen contents of cows

Cow number	Duration of the chewing process for the last 12 hours, min.	pH rumen contents	Duration of the chewing process for the last 24 hours, min.
Cows with lower chewing activity			
20136	201	6,9	402
20321	105	6,94	314
20275	157	6,03	410
<i>M ± m</i>	154,3 ± 27,74	6,6 ± 0,3	375,3 ± 30,75
Cows with higher chewing activity			
20168	241	7,75	589
8879	232	7,15	566
80	300	6,91	532
<i>M ± m</i>	257,7 ± 21,33	7,3 ± 0,27	562,3 ± 16,56

The trend line of pH confirms that in general there is a positive relationship between chewing activity and pH. The existence of such dependence is quite logical and linked with the buffer properties of saliva, with the fact that in the process of chewing of feed more saliva comes to rumen chewing activity and pH. The existence of such dependence is quite logical and linked with the buffer properties of saliva, with the fact that in the process of chewing of feed more saliva comes to rumen.

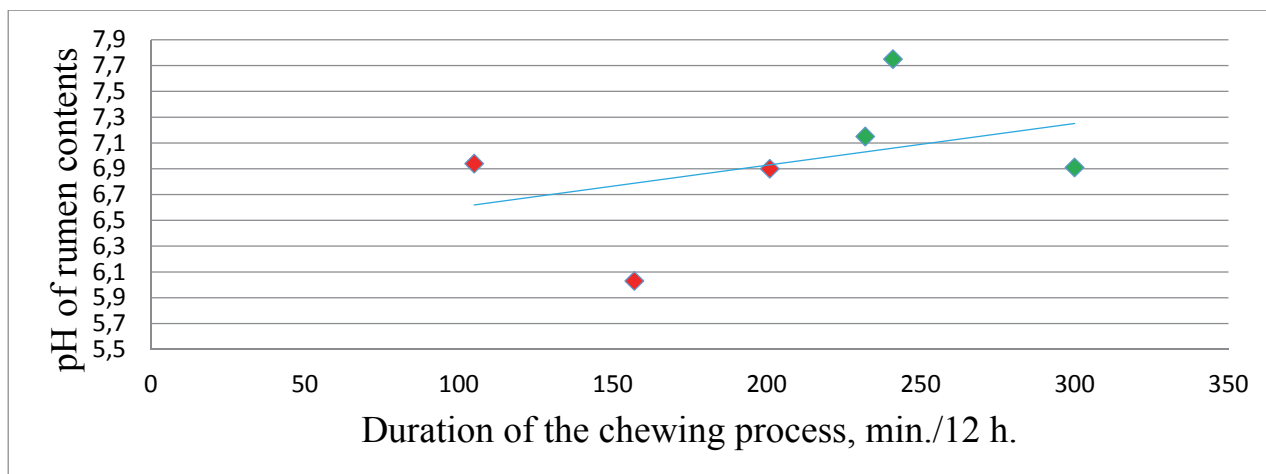


Fig. 1. pH of rumen contents depending on the duration of chewing activity of cows

Calculation of the correlation coefficients between the studied indices confirmed the dependence of the acidity of the rumen contents from the chewing activity of cows (tab. 2).

2. The level of dependence between the acidity of the rumen contents and the duration of the chewing process in cows.

Indicator	Average duration of chewing process in the last day, min / per 2 hours.	Duration of the chewing process for the last 12 hours.	Duration of the chewing process in the previous day, min.	Average expectations over the last 24 hours, kg
pH of rumen contents	0,53	0,4	0,57	- 0,55

Thus, the acidity of the rumen contents had a strong level of correlative ($r = 0,57$) depending on the level of chewing activity of the cows for the previous day before the measurement of the day. This, in our opinion, is explained by the fact that the rumen environment depends more on the amount of saliva that is produced just now, but on the amount of saliva that was produced earlier and which provided the optimum environment for the activity of the microflora. It should also be noted strong enough ($r = 0,53$) correlation between the pH of the contents of the rumen and the chewing activity of the cows for the current day. The study also established the presence of a strong reverse ($r = -0,55$) correlation between the pH of the contents of the rumen and the milk yield, which coincides with the results obtained by Geishauser T. et. al. [5].

Discussion.

1. Monitoring the chewing process is an effective tool for controlling microbiological processes in the cattle rumen.

2. A correlation between the length of the chewing process and the pH of the rumen contents is strong ($r = 0,57 \dots 0,53$).

Further research should focus on the specification of indicators of the duration of the chewing process, the pH of the contents of the rumen and their relationship with the nature of metabolic processes.

References:

1. Osoblyvosti perevartuvannia roslynnoi yizhi u roslynoidnykh tvaryn [Features of digestion of plant food in herbivorous animals]. (2010). Available at: http://pti.kiev.ua_posiv_2011.pdf.
2. Kostenko, V. I. (2011). Orhanizatsiia hodivli [Features of digestion in ruminants] Internet magazine "Agrarian business", 13. Available at: <http://agro-business.com.ua/agro/suchasne-tvarynnytstvo/item/8077-orhanizatsiia-hodivli.html>
3. Kostenko, V. I. (2015). Khvoroby obminu rehovyn u koriv [Prophylaxis of cow's diseases]. Internet publication of Agrobusiness Ukraine magazine. Available at: <http://agrobiznes.org.ua/node/27>.
4. Bar, D. A. (2011). DVM, SCR Chief Scientist Calving Disease Prevention. SCR's products and reports, 4.
5. Geishauser, T., Linhart, N., Neidl, A., Reimann, A. (2012). Factors associated with ruminal pH at herd level. J Dairy Sci, 95(8), 1556-1567.

ЖУВАЛЬНА АКТИВНІСТЬ КОРИВ І КИСЛОТНІСТЬ ВМІСТУ РУБЦЯ

Баняс Ю. Ю.

Анотація. Вивчаючи залежність між розміром часток корму та кислотністю вмісту рубця встановили, що розміри часток корму мають вплив на pH рубця. Аналізуючи отримані результати, слід відзначити, що рівень кислотності вмісту рубця корів з низьким рівнем жувальної активності характеризувався більш кислим середовищем і показник pH коливався від 6,94 до 6,03. У той же час, тварини з вищим рівнем жувальної активності вирізнялися переважно нейтральним або дещо залуженим середовищем вмісту рубця з рівнем pH від 6,91 до 7,75. Як бачимо, корови, які характеризувалися підвищеною жувальною активністю, вирізнялися вищими значеннями pH вмісту рубця у порівнянні з тваринами, які мали меншу тривалість жуйки. Рівень жувальної активності корів за однакового складу раціону був різним, що позначилося на кислотності (pH) вмісту рубця. Установлено достатньо сильний ($r = 0,57...0,53$) кореляційний зв'язок між тривалістю жування та pH вмістом рубця. Доведено, що цілодобовий моніторинг жувальної активності може бути ефективним інструментом контролю перебігу мікробіологічних процесів у рубці.

Ключові слова: моніторинг жувальної активності, корови, румінація, вміст рубця, кислотність

ЖЕВАТЕЛЬНАЯ АКТИВНОСТЬ КОРОВ И КИСЛОТНОСТЬ СОДЕРЖИМОГО РУБЦА

Баняс Ю. Ю.

Аннотация. Изучая зависимость между размером частиц корма и кислотностью содержимого рубца, определили, что размеры частиц корма влияют на pH рубца. Анализируя полученные результаты, следует отметить, что уровень кислотности содержимого рубца коров с низким уровнем жевательной активности характеризовался более кислой средой и показатель pH колебался от 6,94 до 6,03. В то же время, животные с высоким уровнем жевательной активности отличались преимущественно нейтральной или несколько щелочной средой содержимого рубца с уровнем pH от 6,91 до 7,75. Как видим, коровы, которые характеризовались повышенной жевательной активностью, отличались высокими значениями pH содержимого рубца по сравнению с животными, которые имели меньшую продолжительность жевания. Уровень жевательной активности коров при одинаковом составе рациона был разным, что сказалось на кислотности (pH) содержимого рубца. Установлена достаточно сильная ($r = 0,57...0,53$) корреляционная связь между продолжительностью жевания и pH содержимого рубца. Доказано, что круглосуточный мониторинг жевательной активности может быть эффективным инструментом контроля течения микробиологических процессов в рубце.

Ключевые слова: мониторинг жевательной активности, коровы, руминация, содержимое рубца, кислотность

УДК 638.32:631.521

БІОХІМІЧНИЙ СКЛАД ПЕРГИ ЗА РІЗНИХ СПОСОБІВ ОТРИМАННЯ

В. БРОВАРСЬКИЙ, доктор сільськогосподарських наук, професор кафедри конярства та бджільництва¹

Національний університет біоресурсів і природокористування України

Я. БРІНДЗА, doc. Ing., CSc.²

С. ВЕЛІЧКО, аспірант^{*1}

¹ **Національний університет біоресурсів і природокористування України**

² **Словацький аграрний університет, м. Нітра**

E-mail: vbrovarskiy@ukr.net, brindza.jan@gmail.com, svelichko.bee@rambler.ru

Анотація. Досліджено біохімічний склад перги, одержаної від бджолиних сімей з використанням загальноприйнятого способу та розробленої промислової технології. Встановлено, що інвертазна активність у зразках перги становить 420,0 – 425,2 мг глюкози на 10

© Броварський В., Бріндза Я., Велічко С., 2018

* Науковий керівник – доктор с. – г. наук, професор В. Броварський