

Parasitological Study on Cows During Lactation in Western Santa Catarina, Brazil

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ABSTRACT

Background: The milk production chain is an important component of the agribusiness in Western Santa Catarina, Brazil. However, this activity is facing problems regarding health of the herd that are often difficult to control because they can be caused by different etiologic agents such as viruses, bacteria, fungi and parasites. The damage caused by endoparasites may occur directly and indirectly, reflecting on weight gain, milk production, expenses with antiparasitic drugs, and mortality of untreated animals. To minimize these losses, all properties should implement a strategic program to monitor the herd. As a result, the objective of this study was to monitor dairy cattle properties from the West of Santa Catarina, by collecting information about the herd and parasitological stool examinations.

Materials, Methods & Results: This study was conducted on farms from 12 cities of the Western region of Santa Catarina state during the months of November and December of 2010 and January and February of 2011 (summer). The study included 23 properties that have part of their farm income from dairy cattle activity; these animals had not been treated with anti-parasitic for at least 30 days. To assist research, a questionnaire was given to the farmers. For parasitological examination, fecal material was collected from at least 20% of the herd up to 100%, that is, was standardized the analysis of 8-10 samples per property for the McMaster technique using saturated salt solution to determine the degree of infection (EPG: eggs per gram of faeces). The total number of cows present in the properties was 648 animals, and of these 569 was lactating. All properties fed their animals with cultivated pasture and ration, whose amount ranged between 1 to 8 kg ration/day according to the productivity. In the interview, it was found that 100% of properties used anti-helminthic treatment. Of these, 70% of all treatments were performed usually with six months of interval and 75% conducted anti-parasite rotations. Stool examination showed that only five farms had animals positive for gastrointestinal parasites the of Trichostrongylidae family (degree of infection between 100-300 EPG). Therefore, from 215 samples processed only 11 were positive for helminth eggs, which correspond to 5.16%.

Discussion: Cattle raised on natural pastures and raised in Brazil are exposed to infection by larvae of gastrointestinal nematodes. The occurrence and distribution of endoparasites present regional and seasonal variations. Young animals are generally more susceptible to helminths, however, adult animals may be involved in situations such as post-partum, in association with other diseases, high exposure to the agent and stress conditions, like during the lactation period during the summer. Milk production has gained importance in rural properties of West Santa Catarina and in recent years has modernized and invested in technology and genetics. Based on the data it is possible to conclude that the occurrence of gastrointestinal parasites in dairy cows, in the summer, is low. This fact can be attributed to efficient parasite control achieved by owners; by adult animals with good immunity and probably low exposure to parasites in the environment due the excellent parasite control with drugs, held by owners.

Keywords: dairy cattle, lactation, diagnosis, helminths, parasite control, treatment.

INTRODUCTION

The milk production chain is an important component of the agribusiness in the West of Santa Catarina State, Brazil. From this activity, the state has reached an important contribution to gross domestic product (GDP) of the State of Santa Catarina, where the dairy agribusiness still plays an extremely important social function for the state, represented by the establishment of thousands of families in the countryside and the generation of numerous direct and indirect jobs.

Animal health problems are generally difficult to control because they can be caused by different etiologic agents such as viruses, bacteria, fungi and parasites [1,7]. Helminthiasis, popularly known as worms, is among the diseases that most affect cattle productivity in many regions of the world. In the 70's, it was estimated that each year about 10 million heads of cattle and buffaloes died by direct or indirect consequences of the presence of helminths [1]. Today, it is believed that the number of cattle that die from parasites have reduced, due to strategic programs and new drugs on the market, although it increased considerably the diagnosis of helminth resistance to treatment.

The damage caused by endoparasites may occur directly and indirectly, reflecting on weight gain, milk production, costs with anti-parasitics, and mortality [7]. To minimize these losses, we must implement a strategic program to monitor the herd. As a result, the objective of this study was to monitor several dairy cattle properties of the West of Santa Catarina, by collecting information about the herd and parasitological stool examinations.

MATERIALS AND METHODS

This study was conducted in rural properties in the west region of Santa Catarina state, which covered the municipalities of Campo Erê, Caxambú do Sul, Chapecó, Coronel Freitas, Dionísio Cerqueira, Guatambú, Nova Erechim, Nova Itaberaba, Quilombo, São José do Cedro, Seara, and Saudades during the months of November and December of 2010 and January and February of 2011 (summer). The study included 23 properties that have part of their income from dairy cattle. These animals had not been treated with anti-parasitic for at least 30 days. We applied a questionnaire to owners with the following questions: a) number of cows on the property; b) number of cows

in lactation period; c) animal race; d) type of feeding; e) milk production per cow; f) use of anti-parasitic drugs; g) interval between deworming; h) performed rotation of antihelmintics. Other animals from different age groups described as heifers, bulls and calves were not documented.

For the parasitological examination faeces were collected from at least 20% of the herd to 100%, ie, the analysis was standardized using 8-10 samples per property by McMaster technique using saturated salt solution. The degree of infection (eggs per gram of faeces (EPG)) was classified as mild (1-300 EPG), moderate (301-600 EPG) and high (> 601 EPG).

RESULTS

The total number of cows present in the properties was 648, and of these 569 was in period of lactation. Of these animals, 67% were Holstein, 14% of the Jersey breed and 19% were crossbred cows. On 12 properties, over 80% of the herd was Holstein, and milk production average was 18.5 liters/cow/day. In three properties, over 80% of the cows were Jersey, which held a yield of 16.6 liters/cow/day. Five properties evaluated had more than 80% of the herd composed by crossbred cattle, with a productivity of 11.6 liters/cow/day. In three properties, it was found that the number of animals did not differ between races, ie was on average 50% Holstein and 50% of the jersey breed. All properties fed the animals with pasture and ration, with amounts between 1 to 8 kg ration/day. Only seven properties used to feed their animals according to their individual productivity. The majority used to feed the same amounts of ration to all animals, not considering their yield.

At the interview, it was observed that 100% of properties used anthelmintic treatment routinely. Of these, 70% of the treatments they performed at intervals of six months (the others were at shorter intervals of time) and 75% used the rotation of anti-parasitic drugs. In addition, only 21.7% of all farms performed examination of EPG, eventually, before performing the parasitic treatment.

The stool examination showed that only five properties had positive animals for gastrointestinal parasites of the family Trichostrongylidae. Our results show that only 30% of all examined herds or less had between 100 and 300 EPG (Figure 1). Therefore, the 215 samples processed, only 11 were positive for helminth eggs, which corresponds to 5.16% of lactating cows.

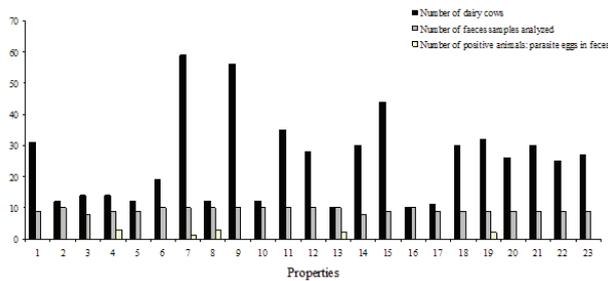


Figure 1. Results of parasitological analysis of 215 samples for parasites of the family Trichostrongylidae in 23 rural properties of districts of West Santa Catarina. Samples analyzed between November 2010 and February 2011

DISCUSSION

Cattle raised on natural and cultivated pastures in Brazil are exposed to infection by larvae of gastrointestinal and lung nematodes, particularly the genus *Cooperia*, *Haemonchus*, *Ostertagia*, *Strongyloides*, *Trichostrongylus*, *Oesophagostomum* and *Dictyocaulus* [2,3]. The occurrence and distribution of endoparasites is influenced by regional and seasonal variations, depending on various factors such as rainfall patterns, ecosystem, management, type and age of the animals [2]. Young animals are generally more susceptible to helminths, however, adult animals may be involved in situations such as post-partum, in association with other diseases, high exposure to the agent and stress conditions, for example, on the lactation period during the summer. Despite the low susceptibility of adult animals to gastrointestinal helminths, parasite control for ecto and endoparasites is necessary, such as those carried on the properties subject of this study.

Milk production has gained importance in rural properties in Western Santa Catarina and in recent years has been modernizing and investing in technology and genetics. As we can see, the vast majority of properties have chosen to breed animals with dairy fitness, which reflects a higher productivity compared to crossbred cows. The rotational grazing used by the properties can also be defined as a method of control of gastrointestinal parasites. This happens in cases where the parasite life cycle is interrupted, reducing the rate of reinfection and the number of immature stages of the parasite in the environment [4]. However, the contribution of improved nutrition achieved with rotational grazing tends to be more beneficial in terms of the efficiency of the immune response of adult bovine the parasites.

In this study it was found that all the properties were routinely using antiparasitic drugs. In a study of

young and adult animals in the city of Pindamonhangaba, Vale do Paraíba, São Paulo State was found that 47.5% of farmers were using preventive anthelmintic, 45% did the curative use (sick animals) and 7.5% used in order to increase the performance of the herd [5]. Another important data obtained by the investigator was that farmers admitted that treatment was not done in animals older than one year of age, specifically to control nematodes [5], different from our study, which found that cows received antiparasitic treatment at intervals not exceeding six months. In our study, only 21.7% of producers performed EPG before treatment. This value was still higher than that observed in another study (5.7%) [5]. The same author also found that only 6.4% of the producers sought veterinarian advice regarding anthelmintic treatment before treating their animals.

Rotating anti-parasitic may be a good tool to control parasites in adult animals, but needs to be done correctly. This practice, when executed properly, helps reducing the occurrence of parasitic resistance. However, if the rotation of drugs is done incorrectly (sub-dose, use in very short intervals, among other factors) may aggravate the process of resistance. In Brazil there are several reports of resistance to gastrointestinal helminths in cattle to compounds such as benzimidazoles, levamisole and ivermectin [6,8,9], due to the misuse of anti-helminthics.

The prevalence of infected adult animals in this study was low (5.16%), and well below other studies conducted in the states of Rio de Janeiro and São Paulo in 1981 (72.7%) [3] and São Paulo in 2011 (34.3%) [5]. The big difference between our study and research conducted in 1981 [3] may be related to the period in which both studies were conducted. In the 80's the number of drugs on the market was limited; the properties had no program of strategic control of parasites and mainly, had no interest in the prophylactic treatment. The highest prevalence of positive animals found in São Paulo/2011 may be related to the absence and/or lower application of anti-parasitic drugs [5], which was done regularly in the properties analyzed in this study. Moreover, the recent study conducted in São Paulo [5] included young cattle, which tend to have higher rates of infection with gastrointestinal nematodes and higher EPG when compared to adults. Another important fact found in our investigation was that the degree of infection was mild, and therefore treatment was not recommended due to the low economic impact of this type of infection.

CONCLUSION

Based on our results it is possible to conclude that the occurrence of gastrointestinal parasites in dairy cows in western Santa Catarina, during summer, is low. This is in agreement with the fact that adult cattle often have good immunity against gastrointestinal nematodes and low counts of EPG in stool (except in peripartum cows). Moreover, there is no evidence of failure in the effectiveness of parasite control performed by the owners.

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