Arq. Bras. Med. Vet. Zootec., v.65, n.5, p.1570-1572, 2013

Communication

[*Comunicação*]

Impacto econômico de *Rhipicephalus* (Boophilus) *microplus*: estimativa de redução de produção de leite

[*Economic impact of* Rhipicephalus (*Boophilus*) microplus: *estimate of decreased milk production on a dairy farm*]

D.S. *Rodrigues*[1], R.C. *Leite*[2]

[1]Empresa de Pesquisa Agropecuária de Minas Gerais – Epamig – Belo Horizonte, MG
[2]Escola de Veterinária –Universidade Federal de Minas Gerais – EV/UFMG – Belo Horizonte, MG

The cattle tick importance is highly related to the economic impact that it imposes to the regions where it occurs. In the United States, this perception led to the first governmental eradication program that began in 1906 (Graham and Hourrigan, 1977). At that time, direct and indirect losses of about US$ 63,250,000.00 were estimated, most of it due to the decreased milk and beef production and the mortality caused by bovine babesiosis (Mohler, 1906). After the ticks were eradicated, the resultant savings were estimated to exceed US$1 billion per year. A cost-benefit analysis demonstrated a US$ 98.00 return for every US$1.00 spent on control program (Bram and Gray, 1979).

In Brazil, the cattle tick economic impact was estimated by using the information obtained from an epidemiological survey from 3,117 of the 4,114 existing counties at the time, in addition to the available literature and the information requested to the various government and private sectors involved. The losses were at US$ 968 million dollars per year. The milk production decrement was the largest contributor parameter corresponding to the amount of 40%. Among the states, Minas Gerais was the most affected since it was responsible for 21% of the total (Horn, 1983; Horn and Arteche, 1985). Actually, the losses are estimated to more than US$ 3.90 billion dollars (Grisi *et al*., 2013).

As the milk production is one of the most important components of the total losses value, the objective of this study was to estimate the reduction of milk production as a result of *R.* (B.) *microplus* parasitism on a dairy farm. For that, the data obtained on an experiment about spray techniques of acaricides applied during the period of May 14, 2010 to May 18, 2011 at a government property located at the central region of Minas Gerais state were used. The data are based on tick counts conducted in a 3/4 Holstein x Zebu herd of 74 cows managed under intensive pasture system. The stocking rates ranged from one to 45 AU ha^{-1} day^{-1} according to the carrying capacity. The animals were kept on pasture from November to May and in feedlot paddocks during the rest of the year.

All animals received nine acaricidal strategic treatments at 14 days intervals from May to September, while from November to March only 30% of the herd received six prophylactic treatments with 30 days intervals. In the last case, those that presented the highest tick burden before being ranked by the individual average of three counts were chosen (Wilkinson, 1962). According to the results of the engorged female immersion tests, the used active was an association between high-cis-cypermethrin 06 %, diluted to 0.01 %, and chlorpyrifos 50%, diluted to 0.083 %.

The tick counts were conducted at seven up to 14 days intervals on the right side of each cow individually contained within squeeze chute and only female above 4.0mm length were considered according to Villares (1941). The final value was obtained by multiplying the observed value by two, according to Wharton *et*

Recebido em 23 de junho de 2013
Aceito em 13 de setembro de 2013
E-mail: dsrodrigues@epamig.br

al. (1970). Wharton and Utech (1970) demonstrated that counts at 48 hours intervals are independent and allow measuring the number of engorged females that drop off the hosts.

On 30 counts evenly distributed over the period of one year, 156,328 ticks were observed. The average and standard deviation were 71.67±123.64 ticks per animal, respectively. A total of 182 counts at 48 hours intervals would be required to know the total number of females that engorged during the period, as same as six times more than that was performed. It was decided, therefore, to multiply the observed value by six, obtaining the value of 937,968 ticks. The index in which each engorged female would be responsible for 8.90mL of milk reduction (Jonsson *et al*., 1998) was multiplied by 750,374 ticks that dropped off from only lactating cows, on average of 80% of the flock. A total loss of 6,678 liters was estimated. During one year, as the total output was 245,449 liters, the losses represented 2.7% reduction on an average of 90.24 liters per cow.

Estimated reductions of up to 50% of milk production on dairy farms were related in the available literature. For sure, extreme tick loads could more than break down lactations, but lead hosts to death, as well as low parasite burdens apparently do not produce significant effect (Horn, 1983). There are only few studies in which the method allows satisfactory controlled conditions. Jonsson *et al*. (1998) and Norval *et al*. (1997), who carried out the most recent ones, observed very close values of 8.90 and 9.00mL of milk reduction per engorged female. However those researches were performed during a relatively short period of up to 15 weeks. The long-term tick feeding effects on productive and reproductive activity may be also related to causes that justify the higher rates observed in the other reports. There are no studies on the subject carried out under the Brazilian conditions.

Keywords: *Rhipicephalus* (Boophilus) *microplus*, losses, dairy cattle, Minas Gerais

RESUMO

A redução da produção de leite em bovinos é um dos aspectos majoritários na composição total do valor de impacto econômico provocado por R. *(B.)* microplus. *Portanto, o objetivo deste estudo foi estimar a perda decorrente da carga parasitária, observada em uma propriedade produtora de leite na região central de Minas Gerais. Para tal, foram consideradas 30 contagens de carrapatos, distribuídas de maneira uniforme durante o período de um ano, em um rebanho bovino com 74 vacas de composição racial 3/4 Holandês x Zebu, mantidas sob sistema de produção intensivo em pastoreio. A partir dos dados observados, foi possível estimar que 937.968 teleóginas completaram o repasto sanguíneo e foram responsáveis pela redução de 6.678 litros de leite durante o período avaliado. Esse valor corresponde a uma redução de 2,7% da produção, média de 90,24 litros por vaca em lactação.*

Palavras-chave: Rhipicephalus *(Boophilus)* microplus, *prejuízos, bovino, Minas Gerais*

ACKNOWLEDGEMENTS

MAPA; CNPq; FAPEMIG; INCT em Informação Genético-Sanitária.

REFERENCES

BRAM, R.A.; GRAY, J.H. Eradication – an alternative to tick and tick borne disease control. *World Anim. Rev.*, v.30, p.30-35, 1979.

GRAHAM, O.H.; HOURRIGAN, J.L. Eradication programs for the arthropod parasites of livestock. *J. Med. Entomol*., v.13, p.629-658, 1977.

GRISI, L.; LEITE, R.C.; MARTINS, J.R. *et al. Impacto econômico das parasitoses em bovinos no Brasil*. Campo Grande, 13 de abril de 2013. Palestra proferida na Conferência Nacional para Atualização das Perdas Econômicas pelas Parasitoses, EMBRAPA/CNPGC.

HORN, S.C. *Prováveis prejuízos causados pelos carrapatos no Brasil.* 2.ed. Brasília: Ministério da Agricultura, 1983. 79p.

HORN, S.C.; ARTECHE, C.C.P. *Carrapato, Berne e Bicheira no Brasil, 1983*. Rio de Janeiro: PANAFTOSA, 1985. 153p.

JONSSON, N.N.; MAYER, D.G.; MATSCHOSS, A.L. *et al.* Production effects of cattle tick (*Boophilus microplus*) infestation of high yielding dairy cows. *Vet. Parasitol.*, v.78, p.65-77, 1998.

MOHLER, J.R. Texas or tick fever and its prevention. *Farm. Bulletin of United States Depart. of Agricul.*, v.238, p.1-44, 1906.

NORVAL, R.A.I.; SUTHERST, R.W.; GIBSON, J.D. *et al.* The effects of the brown ear-tick *Rhipicephalus appendiculatus*, on milk production in dairy cattle. *Med. Vet. Entomol.*, v.11, p.155-158, 1997.

VILLARES, J.B. Climatologia Zootécnica. III. Contribuição ao estudo da resistência e susceptibilidade genética dos bovinos ao *Boophilus microplus*. *Bol. Indústria Anim.*, v.4, p.60-86, 1941.

WHARTON, R.H.; UTECH, K.B.W. The relation between engorgement and dropping of *Boophilus microplus* (Casnestrini) (Ixodidae) to the assessment of the tick numbers on cattle. *J. Australian Entomol. Soc.*, v.9, p.171-182, 1970.

WHARTON, R.H.; ROULSTON, W.J.; UTECH, K.B.W.; KERR, J.D. Assessment of the efficiency of acaricides and their mode of application against the cattle tick *Boophilus microplus*. *Austr. J. Agricultural Res.*, v.21, p.985-1006, 1970.

WILKINSON, P.R. Selection of cattle for tick resistance and the effect of of herds of different susceptibility on *Boophilus* populations. *Australian J. Agricultural Research*, v.13, p.974-983, 1962.