ANALYSIS OF THE MEAN BURDENS OF ADULT *Dictyocaulus viviparus* AND *trichuris discolor* IN MALE CALVES, HOLSTEIN-FRIESIAN AND HOLSTEIN-FRIESIAN X GUZERA[1].

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SINOPSE.- Honer M.R., Braga R.M. & Rodrigues M.L. 1981. [**Análise da carga média de adultos de Dictyocaulus viviparus e Trichuris discolor, em bezerros machos Holandês vermelho-branco e mestiços HVB x Guzerá.**] Analysis of the mean burdens of adult *Dictyocaulus viviparus* and *Trichuris discolor* in male calves, Holstein-Friesian and Holstein-Friesian x Guzera. *Pesquisa Veterinária Brasileira 1(4): 133-135.* Área de Parasitologia, Univ. Fed. Rural do Rio de Janeiro, Km 47, Seropédica, RJ 23460, Brazil.

Analisando a carga média de *Dictyocaulus viviparus* e *Trichuris discolor* em sessenta bezerros machos traçadores de diferentes graus de sangue Holandês vermelho-branco x Guzerá, verificou-se que HVB apresentou cargas médias baixas para *D. viviparus* e altas para *T. discolor*. Não se encontrou diferenças significativas entre os tipos 5/8 e 7/8. F_1 (1/2 HVB x 1/2 Guzerá) e B_1 (3/4 HVB) demonstraram maior e menor susceptibilidade às duas espécies de helmintos respectivamente.

TERMOS DE INDEXAÇÃO: *Dictyocaulus viviparus, Trichuris discolor,* carga média, bovinos, graus de sangue.

ABSTRACT.- An analysis of the mean burdens of adult *Dictyocaulus viviparus* and *Trichuris discolor* with relation to genetic breeding types Holstein-Friesian (HVB) x Guzera, using sixty male calves, demonstrated significantly lower mean burdens of *D. viviparus* in the pure-bred HVB, who also had the highest mean burdens of *T. discolor*. No significant difference was seen between the types 5/8 and 7/8. The F_1 generation (1/2 HVB x 1/2 Guzera) is apparently susceptible to both species of helminths, the B_1 (3/4 HVB) less so.

INDEX TERMS: *Dictyocaulus viviparus, Trichuris discolor,* mean burdens, bovines, breeding types.

INTRODUCTION

Male calves derived from the breeding programme of the National Centre for Research on Dairy Cattle (EMBRAPA-CNPGL), Sta. Mônica Research Station, Rio de Janeiro, are being studied in an attempt to ascertain differences in endo- and ecto-parasite burdens as related to different breeding types. The present paper is the first of a series analysing helminth burdens encountered in the breeding types Red and White Holstein-Friesian (HVB), 1/2 HVB x 1/2 Guzera (F_1), 7/8 HVB, 3/4 HVB (B_1), 5/8 HVB and 1/4 HVB.

The helminth burdens considered here are of *Dictyocaulus viviparus* and *Trichuris discolor*, both present at low levels in the area of study. High level infections with other species have also been analysed (Paloschi, pers. communication) using similar statistical techniques. Madalena et al. (1979), in a previous experiment at the same Experimental Station, but using Black and White Holstein-Friesian x Gir, noted the superior performance of the F_1 cross and the intermediate position of the B_1, but suggested that full performance was being braked by, amongst other factors, various species of parasites. The present cooperative studies are designed to investigate this aspect.

MATERIALS AND METHODS

Sixty male calves belonging to the various breeding types were slaughtered during 1980. The experimental protocol envisaged one animal of each type at each slaughter date, but this was not completely realised. After weaning, the calves were treated with a broad-spectrum anthelmintic and turned out on infected pasture during thirty days, acting as tracers for each month. They were slaughtered and processed following the procedures described by Reinecke (1967). The lungs were opened completely and all helminths collected; immature forms were obtained by the variant of the Baermann technique described by Reinecke (1967), so that total counts were available. The large intestine was opened, washed and a 1/20 aliquot taken of the suspended contents. Helminths were fixed in alcohol-formalin-acetic acid (AFA), cleared and identified in lactophenol.

RESULTS

The adult burdens of *Dictyocaulus viviparus* and *Trichuris discolor*, together with their rankings, are presented in Table 1. Chi-squared analysis of the mean burdens between breeding types for both species of helminths are presented in Tables 2 and 3.

The choice of chi-square was dictated by the finding that although approaching a normal distribution, the burdens followed fundamentally a Poisson distribution, as can be seen by inspecting the means and standard deviation, especially for *T. discolor*.

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Table 1. *Mean parasite burdens and their ranking per breeding type Holstein-Friesian (HVB) x Guzera*

Helminth burden	HVB	7/8	B_1 3/4	5/8	F_1 1/2	1/4
Dictyocaulus viviparus						
Mean	6.60	11.33	8.25	7.62	12.5	11.13
Standard deviation	±11.07	±20.24	±10.51	±12.01	±17.57	±16.06
Trichuris discolor						
Mean	45.0	17.67	10.0	14.0	19.08	18.38
Standard deviation	± 6.31	±15.90	±11.87	±21.95	±20.39	±15.77
Ranking low-high[(a)]						
D. viviparus	1	5	3	2	6	4
T. discolor	6	3	1	2	5	4
Σ ranking	7	8	4	4	11	8

(a) Mean parasite burdens ranked from the lowest to the highest values.

Table 2. *Chi-square analysis of mean burdens,* Dictyocaulus viviparus *between breeding types*

HVB	7/8	3/4	5/8	1/2	1/4	
–	$0.005 < P < 0.01$	Not significant	$P \sim 0.01$	$P > 0.001$	$0.05 < P < 0.10$	HVB
	–	$0.005 < P < 0.01$	$0.75 < P < 0.90$	$P > 0.001$	$0.25 < P < 0.5$	7/8
		–	$P \sim 0.01$	$P > 0.001$	$0.05 < P < 0.10$	3/4
			–	$P > 0.001$	$0.85 < P < 0.50$	5/8
				–	$P > 0.001$	1/2
					–	1/4

Table 3. *Chi-aquare analysis of mean burdens,* Trichuris discolor *between breeding types*

HVB	7/8	3/4	5/8	1/2	1/4	
–	$P > 0.001$	$0.75 < P < 0.90$	$P > 0.001$	$P > 0,001$	$P > 0.001$	HVB
	–	$0.025 < P < 0.05$	Not significant	$0.25 < P < 0.50$	n.s.	7/8
		–	$P \sim 0.025$	$P > 0.001$	$0.25 < P < 0.50$	3/4
			–	$0.75 < P < 0.90$	n.s.	5/8
				–	$0.105 < P < 0.25$	1/2
					–	1/4

DISCUSSION

The analysis of the mean burdens of these two species of helminths are presented first in the series, due partly to their localisation in the host (*D. viviparus* – lungs; *T. discolor* – large intestine) which should eliminate any interaction between them, and partly because as low-level infections in this area, it was felt that the results could provide a rigid test for future analyses. It is clear from Tables 2 and 3 that the levels of the burdens for the two species of helminths are very similar in most of the breeding types, but the pure-bred HVB shows the lowest burdens of *D. viviparus* and the highest of *T. discolor*. The F_1 generation (1/2 HVB x 1/2 Guzera) is apparently susceptible to both species and the B_1 less so. The major differences between the breeding types with respect to *D. viviparus* (Table 2) is that the F_1 has significantly higher ($P > 0.001$) burdens than all other breeding types. Table 3 shows that significantly higher burdens of *T. discolor* ($P > 0.001$) were present in the HVB pure-breds than in other types, with exception of the B_1. The breeding types 5/8 versus 7/8 show no significant differences for any parasite species studied to date.

A least squares linear regression analysis between the mean burdens of adult *D. viviparus* and *T. discolor* shows a weak negative correlation ($r = -0.4$).

Madalena et al. (1979) noted that, in any breeding programme for production improvement, account must be taken of various external factors which may hamper the realisation of the potential of the animals. If it can be shown that there exist significant differences in helminth burdens in cross-bred and pure-bred cattle in this country, it may be necessary to develop a strategy to evaluate the relative risk factor for the major species of parasites, in the various breeding types. *D. viviparus*, although less common than *T. discolor*, is much more important in terms of its pathogenicity and potential interference with performance. Subsequent studies in this continuing programme will hopefully provide guidelines for such evaluations.

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