

# Increase of Bovine Fascioliasis in Puerto Rico as Determined by Slaughterhouse Surveys<sup>1</sup>

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## ABSTRACT

Surveys conducted at all the existing slaughterhouses in Puerto Rico during the period of 1973-76 showed that the prevalence of *Fasciola hepatica* in cattle steadily increased from 23.83% in 1973 to 31.76% in 1976. This increase was found to be even more dramatic when compared to the 1948-49 survey, where only 7.55% of the bovine livers were found to be infected. For the period of 1973-76, 1.76 million pounds of bovine livers were condemned. This represents a direct loss of over 1.584 million dollars for the Puerto Rican cattlemen in condemned livers alone, and multiple indirect losses for the local economy.

## INTRODUCTION

The first large scale survey of fascioliasis in cattle in Puerto Rico was documented by Rivera Anaya and Martínez de Jesús in 1948-49 (5). They surveyed the 38 slaughterhouses in Puerto Rico and found that the prevalence of this bovine disease was 7.55%. In 1973 Chiriboga et al. (1), in a limited survey of 9 slaughterhouses, observed an increase in this infection. Since that time we are unaware of any published report on the status of *Fasciola hepatica* throughout the Island. In this study we report a survey of all of the slaughterhouses in Puerto Rico with respect to prevalence of *F. hepatica* in cattle. In addition, we discuss some of the economic impact of this infection in the Island. A brief report on these results has been published by Frame and Bendezú (4).

## MATERIALS AND METHODS

With the cooperation of the Department of Agriculture, data were obtained regarding the number of cattle slaughtered per month at all the existing licensed abattoirs in Puerto Rico during 1973-76. Of the animals slaughtered, the number infected with *F. hepatica*, as determined by condemned livers, was obtained. In addition, 76 condemned livers from infected cows were weighed for an approximation of the amount of edible food lost due to the infection.

## RESULTS AND DISCUSSIONS

Table 1 summarizes the number of cattle slaughtered at each of the operating abattoirs in Puerto Rico during 1973-76, together with the

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TABLE 1.—*Prevalence of Fasciola hepatica in Puerto Rico as determined by livers condemned at the slaughterhouses. Data obtained in 1973–76 is compared with that of 1948–49*

Slaughterhouse	1948–49			1973			1974			1975			1976		
	Animals		% infected	Animals		% infected	Animals		% infected	Animals		% infected	Animals		% infected
	Sacrificed	Infected		Sacrificed	Infected		Sacrificed	Infected		Sacrificed	Infected		Sacrificed	Infected	
Aguadilla	1,638	226	13.8	2,174	428	19.69	3,534	764	21.65	3,643	737	20.23	1,733	543	31.33
Aibonito	596	27	4.53	1,461	388	26.56	1,587	334	21.05	616	176	28.57	957	348	36.36
Arecibo	2,583	273	10.50	12,108	2,248	18.16	9,542	2,198	23.00	8,846	2,482	28.05	7,066	2,592	26.86
Cabo Rojo	—	—	—	—	—	—	3,332	559	16.78	4,339	735	16.94	3,779	801	21.20
Caguas	4,248	73	1.70	26,085	6,172	23.70	21,016	6,515	31.00	—	—	—	—	—	—
Carolina	—	—	—	9,218	3,015	32.71	7,530	2,274	30.20	5,419	2,290	42.25	7,412	3,508	47.46
Corozal	585	20	3.40	9,176	2,561	27.90	6,458	1,982	30.70	6,095	2,398	39.34	2,886	1,483	51.38
Humacao	2,504	143	5.71	4,483	998	22.26	6,324	1,316	20.81	5,524	998	18.07	6,184	1,317	21.30
Juana Diaz	—	—	—	4,520	646	14.29	1,429	182	12.74	2,072	397	19.16	4,481	867	19.35
Lares	578	70	12.11	—	—	—	—	—	—	—	—	—	1,293	542	41.92
Manati	251	145	57.70	5,568	1,571	28.21	6,115	1,353	22.10	3,420	1,409	41.20	3,578	1,571	43.80
Mayagüez	6,914	745	10.77	—	—	—	3,821	684	17.90	6,331	1,003	15.84	7,721	1,402	18.16
Naguabo	688	37	5.30	8,039	2,718	33.81	6,363	2,159	33.91	5,511	1,931	35.03	5,155	2,246	43.51
Ponce	7,338	133	1.81	2,748	593	21.57	4,728	799	16.89	4,092	718	17.54	2,907	543	18.68
Quebradillas	—	—	—	1,375	235	17.09	1,482	279	18.83	1,670	422	25.27	953	208	21.83
San Germán	1,349	161	11.93	—	—	—	—	—	—	1,740	426	24.48	2,152	541	25.14
San Juan	2,638	356	13.50	13,517	3,446	25.50	5,323	1,379	25.91	8,966	1,947	32.87	13,853	4,493	32.24
San Sebastián	—	—	—	1,489	519	34.85	1,319	514	38.96	1,206	439	36.40	1,087	454	41.77
Utuado	1,387	204	14.70	4,850	233	4.80	7,441	284	3.80	1,191	380	31.90	775	283	36.52
Yauco	—	—	—	2,745	408	14.86	1,505	232	15.41	907	203	22.38	1,779	317	17.82
Others <sup>2</sup>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTALS	46,565 <sup>3</sup>	3,515	7.55	109,556	26,179	23.90	98,849	23,808	24.09	71,588	20,091	28.06	75,751	24,059	31.76

<sup>1</sup> Slaughterhouse closed.<sup>2</sup> Other slaughterhouses surveyed in 1948–49 not opened during our study not included.<sup>3</sup> Total taken from Rivera Anaya and Martínez de Jesús 1948–49 report (5).

number of animals infected. In addition, we report the results published by Rivera Anaya and Martinez de Jesús for the period 1948-49 (5) for comparison.

The prevalence of *F. hepatica* increased steadily, and of the 20 slaughterhouses surveyed, 16 showed an increase in infected cattle over previous years.

Although an accurate estimate of the economic losses to the cattle industry in Puerto Rico due to *F. hepatica* is not easy to make, it has been estimated that at least one million dollars is lost to the Puerto Rican economy annually (3).

Indirect losses due to reduction in milk and meat production are difficult to determine. Ross (6) calculated an 8% reduction in milk production per cow with a low grade infection; he also estimated that there was a similar reduction in weight. Direct losses due to liver condemnation, however, can be measured. De León, Ritchie, and Chiriboga (2) reported a direct loss of at least 600,000 dollars due to infested livers in the Island from January to June 1969. Table 2 summarizes the direct losses due to condemned livers for the period 1973-76. We weighed 76 infected livers and found them to have a mean weight of 18.7 lb. In November 1977 reliable meat dealers reported the wholesale price of fresh local beef liver at around \$0.90 per pound, and as much as \$1.29 at the retail level. These figures reveal a direct loss of \$1,584,000.00 to the cattle industry, due to condemned livers alone, for the period 1973-76 and a loss of over \$2,270,000.00 from the local economy at the retail level.

This increase in bovine fascioliasis in Puerto Rico, coupled with the decrease of cattle slaughtered, should be reason for concern.

#### RESUMEN

Encuestas realizadas en todos los mataderos en Puerto Rico durante el periodo de 1973-76 demostraron que la prevalencia de *Fasciola hepatica* en el ganado aumentó firmemente de 23.83 por ciento en 1973 a 31.76 en 1976. Este incremento fue aún más dramático al compararse con los resultados de la encuesta del periodo 1948-49, en la cual se informa que solamente el 7.55% de hígados vacunos estaban infectados. Para el periodo de 1973-76 sobre 1.76 millones de libras de hígados vacunos fueron desechadas. Esto representa

TABLE 2.—*Estimate of direct losses due to condemned livers infected with Fasciola hepatica for the period 1973-76*

Year	Total cattle sacrificed	Total cattle infected	Total livers condemned (18.7 mean weight)	Losses due to condemned livers at wholesale price of \$0.90
			<i>lb</i>	
1973	109,556	26,179	489,546.30	\$440,591.67
1974	98,849	23,808	445,209.60	400,688.64
1975	71,588	20,091	375,701.70	338,131.53
1976	75,751	24,059	449,903.30	404,912.97
Total	355,744	94,137	1,760,361.90	1,584,325.70

una pérdida directa de sobre 1.584 millones de dólares para los ganaderos puertorriqueños y múltiples pérdidas indirectas para la economía local.

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