Cryptosporidium spp. PREVALENCE IN LAMBS AND EWES FROM THE NORTHERN REGION IN THE STATE OF MEXICO

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Introduction

The genus *Cryptosporidium* has been recognized as a significant enteropathogen of humans and livestock. Cryptosporidial infection of livestock may have an important economic impact to farmers because of high morbidity an sometimes mortality rates among farm animals (Casemore *et al.,* 1997). *Cryptosporidium* oocysts excreted with faeces from infected farm animals can be a source of human infection having great influence on public health (Lee *et al.,* 2001). There is few information regarding the occurrence of cryptosporidiosis in sheep (Casemore *et al.,* 1997), mainly in small flocks. The infection in these animals is common and in some cases the infection often causes death in diarrhoeic lambs (Tzipori *et al.,* 1981; Kaminjolo *et al.,* 1993; Olson *et al.,* 1997).
The State of Mexico is an important non-technified (rustic) sheep production zone in which the existence of gastrointestinal and respiratory syndromes are known as well as high morbidity and mortality regarding these problems.

The aim of the study was to determine the prevalence of *Cryptosporidium* in sheep (lambs and ewes) in the Northern region in the State of Mexico.

Material and Methods.

20 flocks from the Northern region in the State of Mexico (Jiquipilco and San Felipe del Progreso) were chosen at random. 502 faeces samples were taken directly from the anus by using a plastic bag to identify *Cryptosporidium spp*. They were properly identified and were taken in a refrigerated box (4ºC) to the laboratory until processed. Smears were stained by using the modified Zeihl-Neelsen technique. A positive control was run in each smear to compare the samples (Henriksen and Pohlenz, 1981). Smears were observed under the light microscope by using immersion oil objective (100X). All the processes were performed under proper biosafety conditions at the laboratory facilities. Faeces were taken
The comparison of the groups by production stage and size flock was perfomed by using the independent group proportion hypothesis test ($p<0.05$). The punctual prevalence was compared with a hypothetical proportion according to published reports (Fátima *et al.,* 1995). The statistical software Stata version 5.0 (1999) was used.

Results.

Table 1 shows the sample distribution according to the number of exposed population and production stage.

TABLE 1.- SAMPLE DISTRIBUTION PER PRODUCTION STAGE.

EXPOSED POPULATION		NUMBER OF SAMPLES PER PRODUCTION STAGE (%)	
LAMBS	EWES	LAMBS	EWES
522	927	214 (40.1)	288 (31.1)

In table 2, prevalence distribution of the sampled population is shown, according to the flock size and age group.

TABLE 2- *Cryptosporidium spp.* PREVALENCE BY FLOCK SIZE, GROUP AND PRODUCTION STAGE.

			PREVALENCE		
Flock size (heads)	SAMPLED ANIMALS	Positive Samples	GROUP	LAMBS	EWES
	502	129	25.7^{x}	20.09^{A}	29.86^{B}
≤ 100	307	91	29.64^{a}	29.85^{A}	29.58^{A}
> 101	195	38	19.48^{b}	15.64^{A}	31.25^{B}

We found a higher prevalence in lambs than in ewes ($p>0.05$) in flocks with less than 100 animals. In the ones in which there were more than 101 animals, ewes had a higher prevalence than lambs ($p<0.05$).

Discussion

Our results demonstrate that there is a high prevalence of *Cryptosporidium spp*. in the region in comparison to other studies. Majewska *et al.* (2000) in Poland found a 10.1% prevalence in sheep; Valenzuela *et al* (1991) in Chile found a 7.7% prevalence in lambs; Gorman *et al.* (1990) in central Chile found a 6.4% prevalence in sheep; Santos da Silva *et al.* (1990) found in Brasil 10% prevalence in lambs; Villacorta *et al.* (1991) found in Spain (Galicia) a 1.45% prevalence in lambs;Olson *et al.* (1997) found in Canada a 23% prevalence in sheep; Ozer *et al.* (1990) found in Turkey a 12% prevalence in diarrhoeic lambs with less than one month of age; Minas *et al.* (1993) in Greece (Larissa) found a 4.6% prevalence in diarrhoeic lambs; Kaminjolo *et al.* (1993) found in Trinidad and Tobago a 20% prevalence in diarrhoeic and non-diarrhoeic lambs; Abou Eisha (1994) in Egypt (Ismailia Governorate) found a 24% prevalence in lambs and a 2.4% prevalence in ewes; Nagy (1995) found in Hungary a 22.6% prevalence in diarrhoeic lambs aging 1 to 5 weeks old; Kambarage *et al.* (1996) found in Tanzania (Morogoro region) no animals infected with the parasite; Nouri and Karami (1991) found in Iran a 17.2% prevalence in sheep. In contrast, Muñoz *et al.* (1996) in Spain found a 45% prevalence in lambs, Causapé *et al* (2002). found 59% prevalence in Spain too and Fatimah *et al.* (1995) found in Malaysia a 36% prevalence in diarrhoeic and non-diarroheic lambs. According to Ortega Mora (1999) ewes can represent a risk factor for lambs because of an increase in the secretion of oocysts during

the perinatal period. In our study, ewes presented a higher prevalence than lambs, which may be related to the phenomena described by Ortega Mora (1999).

Conclusion

We conclude that there is a high prevalence in sheep mainly in flocks with a high number of animals.

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