

Investigation On Parasites Causing Diarrhoea In Young Lambs At Alexandria Governorate

Karema, M.El Bakery

Parasitology Dept., Animal Health Research Institute Alexandria Branch

Abstract

This study was conducted to investigate the prevalence of parasitic agents in 264 diarrhoeic lambs suffered from diarrhea collected from 12 different herds in Alexandria governorate. The parasitological examination revealed that the lambs were infected with one or more of parasitic agents. The infection by Protozoa were 6 types of *Eimeria* sp. Their incidence in lambs were recorded as *Eimeria parva* (18.5%), *Eimeria ovinoidalis* (15.1%), *Eimeria ovina* (12.8%), *Eimeria marsica* (10.9%), *Eimeria bakuensis* (5.6%), *Eimeria faurei* (4.5%), *Cryptosporidium* sp were detected in 13.6%. It was concluded that protozoan parasites infections were widespread in diarrhoeic lambs and must be given anti- protozoal drugs and rehydrans drugs. Moneizia eggs were found at an incidence of 7.4% and nematode eggs were recorded in this study at an incidence of 6.4%. Also in the present work recorded *Trichostrongylus* larvae depending up on the faecal culture with an infection rate of 23%

Key words: *Eimeria marsica*, *Eimeria parva*, *Eimeria ovinoidalis*, anti- protozoal drugs.

Introduction

Diarrhoea in lambs is a complex multi-factorial disease involving the animal, environment, nutrition and infectious agents (bacterial, viral, and parasitic). Despite improvements in management practices prevention and treatment strategies, diarrhea is still the most common and costly disease affecting neonatal small ruminants. Coccidiosis and cryptosporidiosis are protozoal parasitic diseases that are common causes of diarrhea in lambs (Ozer *et al.*, 1990). *Cryptosporidium* sp. known as one of the factor causing intestinal disorder in lambs, calves, goatlings and colts. They classically infect the intestinal tract and rarely the respiratory tract of animals birds and people. *C. parvum* and *C. muris* are significant species, causing disease in mammals (Anusz., 1994 and Bajer *et al.*, 2002). The disease is characterized clinically by profuse, watery, sometimes mucous, blood-stained diarrhea, dehydration, emaciation, anorexia, tenesmus and abdominal pain. However, *Cryptosporidium* are not host specific, hence, cross-infection can occur within and between animal species and humans. Humans and animals can be infected with this parasite through the contaminated environment. The main

sources of the disease are the asymptomatic carriers of the oocysts (Bajer *et al.*, 2002 and Olson *et al.*, 1997).

In lambs, coccidiosis caused by parasites of the genus *Eimeria* has a high economic impact, particularly in housed flocks. Clinical eimeriosis occurs only if the host is subjected to heavy infection or if its resistance was lowered. All age groups are susceptible to infection, but disease outbreaks are usually restricted to younger animals (Soulsby, 1986). Depending on the rearing conditions, lambs were mostly affected by clinical eimeriosis around six weeks of age, or when the animals were moved to feedlots (Forey., 1990). *Eimeria* lives within its host without significant pathogenicity. This balance is upset by stress factors such as other illnesses, sharp climatic changes, food changes or weaning. The parasite can multiply and cause severe illness. For successful treatment and economical control of diarrhea in lambs, a detailed knowledge about the species causing diarrhea and time course of infection in a flock is essential issue to plan effective programme for eradication. The effects of nematode infection can be influenced by the nutritional status of the host (Norton *et al.*,

1974).

The present study aimed to identify and estimate the percentage of infection of parasites causing diarrhea in young lambs in some herds in Alexandria Governorate.

Material and Methods

A- Clinical Examination

A total of 264 lambs from 12 herds selected at Alexandria and Behera governorates. Clinical examination of lambs revealed mild to moderate degree of illness in the form of anorexia; depression; diarrhea with watery and greenish-yellow feces, emaciation, dehydration and recumbency. Some owners tried to treat their flocks with medication of antibiotics (enrofloxacin and spectinomycin) or other drugs (rehydran) but diarrhea did not stop

B- Parasitological Examination

A fecal samples were taken from the rectum using a disposable plastic bag and disposable plastic containers with a lid. Fresh fecal samples collected from lambs with diarrhoea were stored at room temperature in a solution of potassium dichromate (2.5%) for sporulation **Pellerdy (1974)**, **Adam et al., (1979)** All fecal sample were identified (date of sampling, origin, age, and identification number were

recorded for each animal

The samples were subjected to :

1- Microscopical Examination: Each faecal sample was examined microscopically by both direct smear and flotation technique methods according to **Solusby, (1986)** Eimeria species were identified according to **(Olson et al., 1997; McAllister, 2005 and Singh et al., 2006)**. Depending on size, shape, colour of oocysts and structure of sporocysts after sporulation.

2- Acid fast staining for detection of Cryptosporidium spp. using modified Ziehl Nelson technique was carried out according to **Causapé et al. (2002)**.

3- Faecal culture was performed for larval identification as mentioned by **(Echert, 1960)** and the lugol solution was added before the microscopical examination as stated by **(Georgi and Georgi., 1990)**. The recovered larvae was identified according to **(Soulsby, 1982)**.

Results

Clinical examination of lambs revealed mild to moderate degree of illness in form of anorexia; depression; diarrhea with watery and greenish-yellow feces emaciation, dehydration and recumbency.

Table (1). infection rate of parasites from faecal samples of lambs(264)

Parasite	Number of infected lambs	Infection rate
Eimeria spp	179	74.2
Cryptosporidium sp	36	13.63
Cestodes eggs Moneizia	19	7.4
Nematodes eggs	17	6.4
Total	251	95.07

Table (2). Type and percentage of infection rate of Eimeria spp from faecal samples of lambs

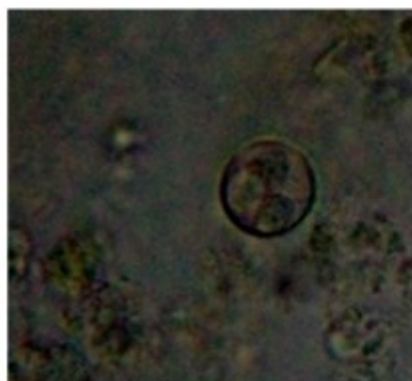
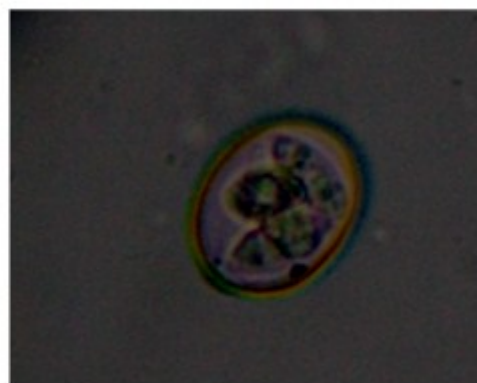
Eimeria species	Infection rate %
Eimeria parva.	(49/264)18.5%,
Eimeria ovinoidalis	(40/264)15.1%
Eimeria ovina	(34/264)12.8%,
Eimeria marsica	(29/264)10.9%
Eimeria bakuensis	(15 /264)5.6%
Eimeria faurei	(12/264)4.5%

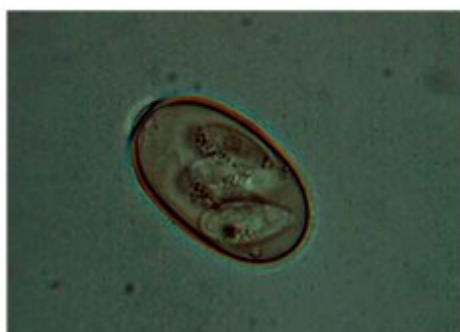
Table (3). Morphological Characteristics of sporulated *Eimeria* oocysts species in lambs.

Eimeria Species	Size(μm)	Shape	Color Oocyst	Oocyst Polar Cap	Shape of sporocyst
<i>Eimeria.parva.</i>	10-22 x 10-19	Spherical to sub spherical	colorless	absent	broad to ovoidal
<i>Eimeria ovinoidalis</i>	17-28 x 12-23	Oval to ellip-soid	colorless	absent	elongate to ovoidal
<i>Eimeria. ovina</i>	10-12x10-18	Elongated	Colorless	present	Spindle
<i>Eimeria.marsica</i>	15-22 x 11-14	Ellipsoidal	Colorless	present	elongate to ellipsoidal
<i>Eimeria bakuensis</i>	23-36 x 15-24	Elongated	yellowish	present	elongate to ellipsoidal
<i>Eimeria faurei</i>)	25-37 x 19-27	Oval to pyri-form	Pale yel-lowish	absent	ovoidal

Table (4). Some morphological characters of the recovered nematode larvae in lambs.

Species	Total length of larva (μ)	Length, end of larva to end of sheath (μ)	Other differential features
<i>Trichostrongylus</i>	650-900	20-40	Short straight larva, conical tail sheath. Tubercles on tail of larva. .

**Fig(1)***E.parva* x100**Fig (2)** *E.ovinoidalis* x100**Fig(3)** *E.ovina* x100**Fig(4)***E.marsica*x100



Fig(5) *E.bakuensis* x100



Fig(6) *E.faueri* x100

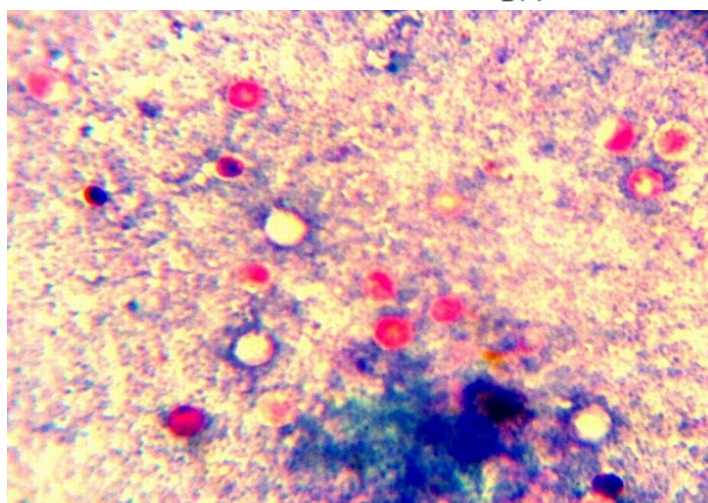


Fig. (7). Fecal smear obtained deeply stained red bodies against green background with modified Ziehl–Neelsen staining showing *Cryptosporidium* sp. s (Arrows). X1000

Cestode eggs

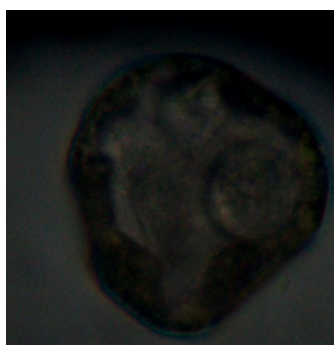


Fig.(8) less triangle to pyramidal
X400
Monezia egg showing embryo

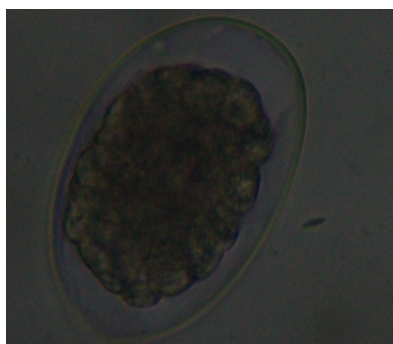


Fig.(9)wide slightly flattened poles
X400



Fig. (10) Thick shell with smooth surface,
X400



a



b

Fig (11) (a) anterior end x500
(b) posterior end x500

Larva of trichstrongyles

Discussion

Eimeria sp and *cryptosporidium* sp. were commonly identified intestinal parasitic pathogens in both diarrhoeic and non-diarrhoeic ruminants (Olson *et al.*, 1997, De Graaf *et al.*, 1999, O'Handley *et al.*, 1999, Ulutas., 2004 and Singh *et al.*, 2006).

Eimeria sp. oocysts were identified in 179 (74.2. %) lambs. This infection in lambs was relatively common, with that obtained by (Gultter *et al.*, 1990, Causapé *et al.*, 2002, Kaya, 2004 and Jorg *et al.*, 2005). These protozoan were considered to be important in small ruminants in the etiology of diarrhoea in confined ruminants was established, especially when accompanied by dietary changes or situations of stress (Forey, 1990). The infection by protozoa were 6 types of *Eimeria* sp, with their incidence in lambs were recorded as ***Eimeria Parva*** (18.5%), *Eimeria ovinoidalis* (15.1%), *Eimeria. ovina* (12.8%), *Eimeria.Marsica* (10.9%), *Eimeria bakuensis* (5.6%), *Eimeria faurei*(4.5%). These results in aggrement with O'Handley *et al.*, (1999), Erman (2000) and Ulutas (2004). On The other hand, Thompson (2000); Wade (2000) and Causapé *et al.* (2002) reported that infection rates of *Eimeria* sp. were higher in non-diarrhoeic than in diarrhoeic lambs. Our finding was higher than that recorded by Castro *et al.* (2007).

The overall infection rate of *Cryptosporidium* sp. in lambs in our study was 13.63%. These results were similar with those reported by Noordeen *et al.*, (2001), Ulutas (2004) and Castro *et al.* (2007). While it was higher than those reported by Ozer (1990), Matos (1993), Xiao (1993), Erman (2000), Ulutas (2004) and Alonso (2005).

The results of this study showed that protozoal infections are widespread in diarrhoeic lambs. So that further studies are necessary to apply effective therapy to protect lambs against the harmful effect of such protozoan parasites. . as *Eimeria ovinoidalis* *E. parva* and *E. bakuensis* have been associated with the disease in lambs, and they are considered to be the most pathogenic *Eimeria* species for sheep. these results

in aggrement with (Rommel, 2000) . The prevalence of *Moneizia* in this study was at an incidence of 7.4% The results agreed with previous studies (Cantorary *et al.*, 1993; Kaur *et al.*, 1995; Moazeni., 2004 and Saleh., *et al* 2008).

The present work recorded *Trichostrongylus* larvae depending up on the faecal culture with an infection rate of 23% this results were Similar to which obtained by Selim (1988) and disagreed with that of Fakae (1990) who found the prevalence of *Trichostrongylus* species among goats in eastern Nigeria was 63.8%, this might be attributed to the nature of pasture and difference in the environmental condition nematode eggs were recorded in this study at an incidence of 6.4% .The parasitological examination revealed that 264 lambs examined were infected with one or more of parasitic protozoan agents. The results of this study confirmed the fact that, protozoal infections were widespread in diarrhoeic lambs , So, *Eimeria*,and *Cryptosporidium* species should be considered as major agents in the aetiology of diarrhoea in lambs. These results agreed with that recorded by (Forey, 1990) and advice the owner to give fluid therapy (rehydrans) and anti protozoal drugs.

References

- Alonso-Fresán- M.U., García-Álvarez A., Salazar-García F., Vázquez-Chagoyán J.C., Pescador-Salas N. and Saltijeral-Oaxaca J.(2005). Prevalence of *Cryptosporidium* sp. in asymptomatic sheep in family flocks from México State. J Vet Med B, 52, 482–483.
- Adam, K.M.; Paul, J. and Zaman, V. (1979). Medical and Veterinary Protozoology. Revised Edition Churchill Livingstone. Edinburgh and London.
- Anonymous (1991). Basic laboratory methods in medical parasitology. WHO, Geneva, 18.
- Anusz, K. (1994). Kryptosporidydioza cieląt [Cryptosporidiosis in calves]. Życie Wa-

- ter. 8: 306–309.
- Bajer A., Bednarska M Pawelczyk A., Behnke J.M., Gilbert F.S. and Sinski E. (2002).** Prevalence and abundance of *Cryptosporidium parvum* and *Giardia* sp. in wild rural rodents from the Mazury Lake District region of Poland. *Parasitology*, 125, 21-34.
- Bowman D.D. Georgi's (1999).** *Parasitology for Veterinarians*. W.B.Saunders Co., New York.
- Castro-Hermida J.A., González-Warleta M. and Mezo M. (2007).** Natural infection by *Cryptosporidium parvum* and *Giardia duodenalis* in sheep and goats in Galicia (NW Spain). *Small Rumin Res*, 72, 96–100.
- Causapé A.C., Quílez J., Sánchez-Acedo C., del Cacho E. and López-Bernad F (2002).** Prevalence and analysis of potential risk factors for *Cryptosporidium parvum* infection in lambs in Zaragoza (Northeastern Spain). *Vet Parasitol*, 104, 287–298.
- Cantorary, R.; Guclu, F. and Aydenizoz, M. (1993).** Prevalence of Anoplocephalidae species in sheep slaughtered at an abattoir in Kon-ya]. *Veteriner Fakultesi Dergisi*, 9: 53-57.
- De Graaf D.C., Vanopdenbosch E., Ortega-Mora L.M., Abbassi H. and Peeters J.E. (1999).** A review of the importance of cryptosporidiosis in farm animals. *Int J Parasitol*, 29, 1269–1287.
- Diaz V., Campos M., Lozano J., Manas I., Gonzalez J(1996).** Aspects of animal giardiosis in Granada province (Southern Spain). *Vet Parasitol*, 64, 171–176.
- Echert, J. (1960).** The diagnosis of gastrointestinal strongylosis in the sheep by differentiation of the free living third stage larvae. *Zentralblatt für Vet. Med.*, 94, 612-629.
- El-Naas,A;Al-Kubisy,R. and Rashed,A. (2004).** Prevalence Of *Eimeria* Species In Libyan Sheep Egyptian Veterinary Medical Association Vol 64 No 6
- Erman, N., Beyazıt, A. and Oz, I. (2000).** Prevalence of cryptosporidiosis in lambs and kids in Izmir province. *Bornova Vet Kont Araş Enst Md Derg*, 25, 33-38.
- Fakae, B. (1990).** The epidemiology of helminthosis in small ruminants under the traditional husbandry system in eastern Nigeria. *Vet. Res. Commun*, 14 (5).381-391.
- Forey, W.J. (1990).** Coccidiosis and cryptosporidiosis in sheep and goats. *Vet Clin North Am Food Anim Pract.*, 6, 655–670.
- Georgi, J. and Geogri (1990).** *Parasitology for veterinarians* 5th ed.
- Gultter S., Dumanli N., Ozer E., Erdogmus Z. and Koroglu E. (1990).** Studies on the prevalence of *Eimeria* species in lambs and kids in Elazığ province. *Doğa-Tr J Vet Animal Sci*, 14, 295-300.
- Jorg Reeg K., Gauly M., Bauer C., Mertens C., Erhardt G. and Zahner H. (2005).** Coccidial infections in housed lambs: oocyst excretion, antibody levels and genetic influences on the infection. *Vet Parasitol*, 127, 209–219.
- Joyner, L.P.; Norton, C.C.; Davies, S.F.M. and Watkins, C.C. (1966).** The species of coccidian occurring in cattle and sheep in the south west of England *Parasitol.*, 56 531-541.
- Kaur, A.; Bali, H.S. and Duggal, C.L. (1995).** Seasonal variation of anoplocephaline cestodes infection in sheep of Punjab. *Indian J. An-im. Sci.*, 56: 30-40.
- Kaya, G. (2004).** Prevalence of *Eimeria* species in lambs in Antakya province. *Turk J Vet Anim Sci* 28, 687-692.
- Knox, M. R., J. W. Steel, C. A. Anderson, and L.L. Muir, ed. (2003).** *Nutrition-parasite interactions in sheep*. Aust.

- J. Exp. Agric. (Special Issue) 43:1383–1488
- Levine, N.D. (1985).** Veterinary Protozoology 1st ed, Iowa state university Press. Ames. 413 pp
- Matos-Fernández M.J., Pereira-Bueno J., Ortega-Mora L.M., Pilar-Izquierdo M., Ferre I. and Rojo-Vázquez F.A (1993).** Prevalencia de la infección por *Cryptosporidium parvum* en corderos, cabritos y terneros en la provincia de León. Acta Parasitol Port, 1, 211.
- McAllister T.A., Olson M.E., Fletch A., Wetzstein M. and Entz T. (2005).** Prevalence of *Giardia* and *Cryptosporidium* in beef cows in southern Ontario and in beef calves in southern British Columbia. Can Vet J, 46, 47–55.
- Moazeni, M. and Nili, M. (2004).** Mixed infection with intestinal tapeworms in sheep. Trop. Biomed., 21: 23-26.
- Noordeen F., Faizal A.C., Rajapakse R.P., Horadagoda N.U. and Arulkanthan A. (2001).** Excretion of *Cryptosporidium* oocysts by goats in relation to age and season in the dry zone of Sri Lanka. Vet Parasitol, 99, 79–85.
- Norton, C.C.; Joyne L.P.; and Cachpol, J. (1974).** *Eimeria weybridgei* sp. nov. and *Eimeria ovina* from domestic sheep. Parasitol., 69:87-95.
- O’Handley, R.M., Cockwill, C., McAllister T.A., Jelinski M.D., Morck D.W. and Olson M.E. (1999).** Duration of naturally acquired giardiasis and cryptosporidiosis in dairy calves and their association with diarrhea. J Am Vet Med Assoc, 214, 391–396.
- Olson M.E., Guselle N.J., O’Handley R.M., Swift M.L., McAllister T.A., Jelinski, M.D. and Morck, D.W. (1997).** *Giardia* and *Cryptosporidium* in dairy calves in British Columbia. Can Vet J, 38, 703–706.
- Ortega-Mora, L.M.; Requejo-Fernandez, J.A.; Pilar-Izquierdo, M. and Pereira-Bueno, J (1999).** Role of adult sheep in transmission of infection by *Cryptosporidium parvum* to lambs: confirmation of periparturient rise. Int. J. Parasit., 29:1261–1268
- Ozer E., Erdogmus S.Z. and Koroglu E. (1990).** Studies on the prevalence of *Cryptosporidium* in calves and lambs in Elazığ province. Turk J Vet Anim Sci, 14, 439-445.
- Pellerdy, L.P. (1974).** Coccidia and coccidiosis. Akad. Kiado. Budapest.
- Rommel, M. (2000).** Protozoa eninfektionen der Wiederkäuer (Rind, Schaf, Ziege), Eimeriose (Coccidiose). In : Rommel, M., Eckert, J., Kutzer, E., Körtig, W., Schnieder, T. (Eds), Veterinärmedizinische Parasitologie: fünfte. Paul Parey, Berlin, pp. 133-149.
- Saleh, A.A. (2008).** prevalence of cestode parasites in sheep slaughtered in Riyadh city, Saudi Arabia. J. Egypt. Soc. Parasitol., 38 (1): 273 – 280
- Singh B.B., Sharma R., Kumar H., Banga H.S., Aulakh R.S., Gill J.P.S. and Sharma J.K. (2006).** Prevalence of *Cryptosporidium parvum* infection in Punjab (India) and its association with diarrhea in neonatal dairy calves. Vet Parasitol, 140, 162–165.
- Selim (1988).** some studies on parasitic disease of zoo animals. Ph.D. Thesis, Fac. Vet. Med. Zagazig University.
- Soulsby, E.J. (1982).** Helminthes, Arthropods and Protozoa of domesticated animals. Bailliere Tindall Ltd, 7th ed., British Library, London
- Solusby, .E.J.L. (1986)** Helminths, Arthropods and Protozoa of domesticated animals, 7th ed. Bailliere Tindall, London, 807 pp.
- Taylor, M.A. and Catchpole, J. (1994).**

- Coccidiosis of domestic ruminants. Appl Parasitol 35, 73–86).
- Taylor, M.A. (1995).** Diagnosis and control of coccidiosis in sheep. Practice, 17, 172–177.
- Thompson R.C. (2000).** Giardiasis as a re-emerging infectious disease and its zoonotic potential. Int J Parasitol, 30, 1259–1267.
- Thompson R.C.A., Olson M.E., Zhu G., Enomoto S., Abrahamsen S. and Hijawi. S. (2005).** Cryptosporidium and cryptosporidiosis. Adv Parasitol, 77–158.
- Ulutas, B. and Voyvoda, H. (2004).** Cryptosporidiosis in diarrhoeic lambs on a sheep farm. T Parazit Derg, 28, 15–17.
- Wade S.E., Mohammed H.O. and Schaaf S.L. (2000).** Prevalence of Giardia sp. Cryptosporidium parvum and Cryptosporidium muris (C. andersoni) in 109 dairy herds in five countries of southeastern New York. Vet Parasitol, 1–11.
- Xiao, L., Herd R.P. and Rings D.M (1993).** Diagnosis of Cryptosporidium on a sheep farm with neonatal diarrhea by immunofluorescence assays. Vet Parasitol, 47, 17–23.

فحص الطفيليات التي تسبب إسهال في الحملان الصغيرة في محافظة الإسكندرية كريمة محمد البكري

قسم الطفيليات- معهد تشخيص وبحوث صحة الحيوان (فرع الإسكندرية)

الملخص العربي

أجريت هذه الدراسة على عدد 264 من الحملان الصغيرة تم اختيارها من عدد 12 قطيع من محافظة الإسكندرية وقد كانت هذه الحملان تعاني من الإسهال الشديد وتم أخذ عينات براز من فتحة الشرج لفحصها في المعمل لمعرفة سبب الإسهال وكانت نتيجة الفحص الطفيلي لعينات البراز هي الإصابة بحويصلات الإيميريا وكريبتوسبورديم بالنسبة الآتية 74.2%، 13.6% على التوالي وقد تم عزل ستة أنواع مختلفة من الإيميريا وهي إيميريا بارفا 18.5% إيميريا أوفيدينالز 15.1% إيميريا أوفينا 12.8% إيميريا مارسكا 10.9% إيميريا باكويونسيس 5.6% وإيميريا فايورا 4.5% ونم عزل بعض أنواع من الديدان الشريطية والخيطة بنسبة 7.4% و 6.4% على التوالي، وتم تسجيل البرقات الأسطوانية الشعرية اعتمادا على استنابات البراز بمعدل إصابة 23% وتمت التوصيات بإعطاء المحاليل التعويضية لمعالجة الجفاف وإعطاء علاجات للبرتوزوا.