

Animal Healthy Research Institute,  
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## **INCIDENCE OF INTERNAL PARASITES OF DESERT GOATS IN NEW VALLEY, EGYPT**

(With 5 Tables and 4 Figures)

By

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**معدل انتشار الطفيليات الداخلية فى الماعز الصحراوية  
فى الوادى الجديد - مصر**

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استهدفت الدراسة حساب معدل انتشار الإصابة بالطفيليات الداخلية للماعز فى الوادى الجديد وعلاقتها ببعض العوامل البيئية والبيولوجية المحيطة، حيث تم إجراء الفحص الطفيلي لعدد 515 حيوان من أعمار مختلفة وكلا الجنسين من أماكن مختلفة فى الوادى الجديد ( 300 من الخارجة، 215 من الداخلة) خلال الفترة من مايو 2007 الى مايو 2008 وذلك بإجراء الفحص الكمي والكيفي للإصابة الطفيلية حيث شملت الدراسة عد البيض كدليل على معدل انتشار الإصابة. أوضحت النتائج أن 455 من الماعز كانت موجبة للإصابة الطفيلية (88.34%)، منهم 78.02% للوكسيديا، 55.16% لباقي الديدان المعوية (40.55% فى الصغار و 64.72% للكبار) كما أشارت الدراسة ان نسبة الإصابة بالديدان الاسطوانية 35.16% والديدان الشريطية 3.95% والديدان المفلطحة 16.03%. وبدراسة تأثير التغيرات الموسمية على نسبة الإصابة بالطفيليات المختلفة فقد سجل الشتاء اعلى نسبة اصابة بالوكسيديا (86.7%) بينما سجل فصلى الربيع والصيف اعلى نسبة إصابة بالديدان المعوية. أوضحت الدراسة أيضا أن ديدان الهيمونكس قد سجلت 3.33% فى الماعز أقل من سنة، 14.54% فى الماعز البالغة. مما سبق يتضح أهمية فحص الماعز للوقوف على نوعية ومدى إصابتها بالطفيليات بأنواعها والتي تسبب خسارة اقتصادية كبيرة ومن ثم يمكن وضع برامج للمكافحة وتقليل العدوى بعمل فحص دوري للماعز وتجربتها بصفة دورية بمضادات الديدان.

### **SUMMARY**

The study was carried out on 515 goats from different localities in New Valley governorate with different ages and sexes during the period from May 2007 to May 2008. The study aimed to monitor parasitic infection among these goats qualitatively and quantitatively. The results proved that 455 goats infected with different gastrointestinal parasites (88.34%) where *Eimeria* spp. was representing an incidence of 78.02% while the total infection rate of different helminthes was 55.16% (40.55% in kids

and 64.72 % in Adult). The infection rates were 35, 16% for Nematodes, 3.95% for Cestods, 16.03% for Trematods. The study declared that parasitic infection represents a major health impact on goats at New Valley with special reference to *Eimeria* spp. and *Hemonchus contortus* in both young and adults. The influence of seasonal variation proved higher coccidial infection at winter (86.7%), however higher intestinal helminths infection were found at spring and summer. It could be concluded that periodical parasitic examination of goats in New Valley should be attempted to recognize and manage parasitic infection.

**Key words:** Internal, parasite, goats, New Valley

## INTRODUCTION

Internal parasites of goats are considered one of the biggest problems where it can cause major health issues, which have a major effect on the animal performance and causes great economic losses not due to mortality but due to production loss (Waller, 2004). The proper management of the internal parasites is extremely important to effectively reduce the herd exposure to parasites.

One of the first things that producer should realize, that goats are naturally browsers in contrast to sheep and cattle which are grazers. Additionally goats have traditionally been raised in dry-arid climate in extensive production systems and they simply have not had opportunity to adapt to the warm-moist condition of a humid climate. All of these factors in addition to the fact that many of the parasites that affect goats thrive in warm, moist condition and live close to the ground (Waller, 2004). Gastrointestinal nematode infection can be treated by anthelmintic chemotherapy; however, treatment costs and drug resistance has elevated in all major parasite species (Ross 1997, Zajac and Gipson 2000 and Veale 2002). Compared to sheep, which develop a strong natural immunity around 12 months of age, goats acquire a lower level of immunity to gastrointestinal parasites. This explain why goats having greater populations of adult parasites with high egg output. In experimental *Teladorsagia (Ostertagia) circumcincta* infection (Macaldowie *et al.* 2003) found that goats carried higher worm burden than lambs and there were significant differences in the stages of development attained by the larval challenge established in the two species. *Mullerius capillaris* was reported to cause Verminous bronchitis among goats causing sever losses (Bruce *et al.*, 1986)

## **MATERIALS and METHODS**

### **Animals (Table 1):**

The study was carried out on 515 goats (different ages and sexes) of native breed from various regions of New-valley Governorates (300 goats from El-Kharga and 215 from El-Dakhla). In order to properly manage a herd, it is important to be able to recognize the signs of parasitism. Diagnosis is usually done by observing the clinical signs and performing a fecal egg count test.

#### **A- Observing the clinical signs:**

Diseased goats were usually isolated from the herd and do not eat normally. Daily visual inspection is usually sufficient to monitor for parasitic infection.

B- Other diagnostic methods such as a fecal egg counts must also be routinely done since the biggest impact of internal parasites occur in the sub clinical level (not easily detected by visual observation) (Waller and Thransborg, 2004).

### **Sampling:**

Fecal samples were collected directly from the rectum or immediately after defecation, then kept in clean plastic sac, labeled with the required data concerning age, sex, date of collection and any apparent clinical signs, then sent to the diagnostic laboratory.

### **Gross examination of samples:**

Fecal samples were grossly examined for color, consistency, presence of mucous, blood, indigested feed and parasites (intact parasite, and / or larvae or gravid segments of *Cestodes* (Charles 1998).

### **Parasitological examination:**

Fecal samples were examined by using floatation technique in saturated NaCl solution for detection of Nematode and *Cestode* eggs (Burger and stoy, 1968) and sedimentation technique for detection of *Trematode* eggs (Charles 1998). Egg count was done by using McMaster counting slide (Seivwright *et al.*, 2004 and Pereckienè *et al.*, 2007)

### **Fecal culture:**

In order to assess species of gastrointestinal nematodes, samples of feces from individual animals were cultured for third stage larval development (Christie and Jackson, 1982). After 7 days of incubation larvae from cultures were harvested and identified to genera or species using light microscope. Baerman's technique was used for detection of

lung worm infection. Identification of the collected eggs and larvae was done according to Dunn, (1978) and Soulsby (1982).

## RESULTS

In the present study 515 goats with variable ages, sexes and seasons were selected from different localities in New Valley Governorate during the period of one year, Table (1).

### A- Observed clinical signs:

Some of the observable clinical signs of heavy internal parasite infection are anemia, bottle-jaw and wasting away or poor weight gain, anemia results from blood sucking parasites is clearly observed in scleral and oral mucus membranes.

### B- Parasitological findings (Tables 2-5 and Fig. 1-4):

As many as 88.34% of examined goats were infected with at least one genus/species of parasite. In this study *Eimeria* infection was the most prevalent parasitic infection (78.02%) where its rate in young < 1 year was 75% and 80% in adults. *Helminthes* infection was detected in 55.6% of totally examined goats with infection rates of 40.55 and 64.72 % in young and adult respectively (Table 2).

*Strongyloid* like eggs were the most predominant nematodes observed in the examined fecal samples (25.93%) but in fecal culture the most predominant worms were *Hemonchus* spp., *Chabertia* spp., *Trichostrongylus* spp., *Ostertagia* spp. and *Oesphogastomum* spp. Their infection rate was 10.10, 5.93, 5.49, 4.6, 3.07% respectively (Table 5). *Fasciola* eggs (Trematode) were detected only in adult goats in ratio of 12.74% and Cestodes infection were detected in 3.95% of examined goats (Table 3). Rate of infection was higher in female (94.52%) than in males (79.02%) as in Table 6.

Concerning to the seasonal variation, the incidence of *Eimeria* was the most prevalent parasitic infection all over the year, where it was ranged from (86.72%) in winter to (68.96%) in spring, but *Nematode* increase gradually at autumn and reach to the high level of infection in winter and spring but low level of infection indicated in summer (Table 4).

**Table 1:** The goats selected for the study.

Items	No.	Sex	Age	Season
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Localities			M	F	<1 Y	> 1 Y	Win	Spr.	Sum	Aut
El-Kharga	El-Monera	59	34	25	30	29	15	14	15	15
	El-Thawra	47	20	27	17	30	11	11	13	12
	Boulak	56	16	40	16	40	14	14	14	14
	El-Rawad	60	20	40	18	42	15	15	15	15
	Darb-El arbin	78	20	58	36	42	19	20	20	19
	Total	300	110	190	117	183	74	74	77	75
El-Dakla	El-Hendaw	56	20	36	20	36	14	14	14	14
	El-Rashda	48	10	38	26	22	12	12	12	12
	El-Maashra	41	8	33	19	22	10	10	10	11
	West-El Mowhoub	70	20	50	28	42	17	17	18	18
	Total	215	58	157	93	122	53	53	54	55

**Table 2:** Prevalence of parasitic infection in examined goats in New – Valley Governorate.

Item	No.	Infected animals		Single coccidian		Single helminth		Mixed infection		Total coccidia		Total helminth	
		N.	%	N.	%	N.	%	N.	%	N.	%	N.	%
< 1 Year	210	180	85.7	107	59.44	45	25	28	15.55	135	75	73	40.55
> 1 Year	305	275	90.6	97	35.27	55	20	123	44.72	220	80	178	64.72
Total	515	455	88.4	204	44.83	100	21.97	151	33.18	355	78.62	251	55.16

**Table 3:** Prevalence of parasitic infection with relationship of age in examined goats.

Items	Young < 1year N (180)		Adult N (275)		Total N (455)	
	N.	%	N.	%	N.	%
Nematodes:						
• <i>Toxocara Vitulorum</i>	5	2.77	-----	-----	5	1.09
• <i>MuelleriusCapillaris</i>	2	1.11	18	6.54	20	4.93
• <i>Trichuris ovis</i>	8	4.44	9	3.27	17	3.73
• <i>Strongyloids like eggs</i>	48	26.66	70	25.4	118	25.9
Cestode.						
<i>Monezia.spp.</i>	5	2.77%	13	4.72	18	3.95
Trematode.						
• <i>Fasciola spp.</i>	-	-----	58	21.09	58	12.74
• <i>Paramphistomum spp.</i>	5	2.77%	10	3.63	15	3.29
Protozoa.						
<i>Eimera. spp.</i>	135	75%	220	72.13%	355	78.02

**Table 4:** Seasonal variation with different parasite in examined goats.

Parasitic Species	Summer N (113)	Autumn N (113)	Winter N (113)	Spring N (116)
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	N	%	N	%	N	%	N	%
Nematodes:								
• <i>Toxocara.vitillorum</i>	-	---	1	0.9		2.65		0.9
• <i>Muellerius capillaries.</i>		2.6	3	2.6	3	6.2	1	4.3
• <i>Trichurs. ovis</i>	3	5	2	5		7.07		4.3
• <i>Strongylidea like eggs</i>	-	---		1.7	7	-	5	-
1. <i>H. contortus.</i>		-	1	6		17.6		9.5
2. <i>Ostertagia.spp.</i>	-	4.4	0	-	8	9	5	6.9
3. <i>Chabertia.</i>		2	6	8.8		5.3	-	7.8
4. <i>Oesphogastomum</i>	5	0.9	5	4	2	11.5	1	4.3
		----	5	5.3	0	4.42	1	
	1	-		4.4	6			
	-			2	1		8	
		1.8		4.4	3			
	2			2	5		9	
					--		2	
Cestodes: <i>Moniezia.spp.</i>	3	2.7	4	3.5	2	1.8	9	7.8
Trematode:								
• <i>Fasciola. spp.</i>	1	15.	1	14.	2	17.6	1	12.
• <i>Paramphistomum.spp.</i>	8	9	6	2	0	9	5	9
	-	---				1.8	1	9.5
			5	4.4	2		1	
					--			
Protozoa: <i>Eimeria.spp.</i>	8	72.	9	84.	9	86.7	8	68.
	2	6	5	1	8		0	9

**Table 5:** Prevalence of helminthes detected by fecal culture in examined goats.

Parasitic species	Young N (180)		Adult N (275)		Total		Characteristic of infective larvae
	N.	%	N.	%	N.	%	
<i>Trichostrongylus spp.</i>	5	2.77	20	7.27	25	5.49	Short straight larva with small tubercle, conical tail sheath
<i>Oesphogastomum spp.</i>	4	2.22	10	3.63	14	3.07	Simple pointed long tail
<i>Chabertia spp.</i>	7	3.88	20	7.27	27	5.93	The larva has 32 rectangular intestinal cells
<i>Hemonchus spp..</i>	6	3.33	40	14.54	46	10.10	Head bullet-shaped and has pointed tail
<i>Ostertagia spp.</i>	-	-	21	7.63	21	4.6	Conical, finger like tail

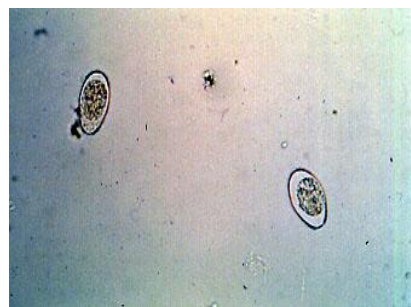
**Table 6:** Prevalence of parasitic infection in relation to sex of examined goats.

Animals	Sex	No. of examined goats	Positive cases	
			No.	%
Goats	Females	310	293	94.52%
	Males	205	162	79.02%
	Total	515	455	88.34%

## FIGURES



**Fig. 1:** *Moniezia* spp. eggs



**Fig. 2:** *Eimeria ovis*



**Fig. 3 :** *Fasciola* spp. egg



**Fig. 4:** *Muellerius capillaris* larva

## DISCUSSION

The results of the present study supports the opinion that goats acquire a lower level of immunity to gastrointestinal parasites than other ruminant. The infection with *Eimeria* spp. (Coccidia) result in serious clinical signs of fluid diarrhea which may or may not contain mucus or blood, dehydration, weakness, loss of appetite and death while some goats may instead be constipated and suddenly die without diarrhea.

Coccidian parasites were detected in 90.3% at Saudi Arabia (Alyousif *et al.*, 1992) and 94.65% of examined goats in Egypt (Otify, 1984). *Eimeria* oocyst are widely present in feces of both normal and diseased goats in a reported range of 38% to 100% of all goats (Smith and Sherman, 1994). One of the most prevalent infection of

*Trichostrongyloid nematodes* was *Hemonchus Contortus* (blood sucking worm) and *Muellerius capillaries* which is associated with marked tissue damage and pronounced cellular reaction. These results agreed with Berrag *et al.* (1997).

Bottle-jaw in gastrointestinal parasite infection is caused by hypoalbuminemia that results from either decreased feed intake, lack of appetite and increase the demands of proteins (Ashraf and Nepote 1990 and Min *et al.*, 2005). The absence of *Fasciola* infection in young goats agree with the same result of (El-Sherif and Abo-EL- Hadid, 2005 and Mohsen and Ibrahim., 2008). Concerning the relationship between the sexes of examined goats and the infection rate, females were highly infected than males and this may be attributed to the fact that females are exposed to more stress like, pregnancy, lactation and parturition. These results agreed with those of Abd el- Wahed (1987).

Concerning the seasonal dynamics of parasitic helminthes infection, the study revealed that the incidence of nematode increase gradually at autumn and reach to the peak in winter and spring, but low level of infection observed in summer. This pattern may be attributed to the spring rise phenomena but the infective stage of most *Strongyloid* worm not resist the hot dry season. This phenomena mentioned by Herd (1971) as the end of winter and beginning of spring is considered as the peak of reproduction and maturation of their inhibited larvae takes place in spring season which known as spring rise.

## REFERENCES

- Abd El-Wahed, M.M. (1987):* Morphological studies on gastrointestinal nematode infesting buffaloes in Kalubia and Sharkia Governorate. M. V. Sc. Thesis, Cairo University.
- Alyousif, M.S.; Kasim, A.A. and Shawa, Y.R. (1992):* Coccidiosis in domestic goats (*Cabrahiricus*) in Saudi Arabia. *Inter. J. Parasitology*, 22 (6) 807-811.
- Ashraf, M. and Nepote, K.H. (1990):* Prevalence of gastrointestinal nematodes, coccidian and lung worms in Maryland dairy goats. *Small Ruminant Research*, 3, 291-298.
- Berrag, B.; Rhalem, A.; Sahibi, H.; Dorchies, P. and Cabaret, J. (1997):* Bronchoalveolar cellular responses of goats Following infections with *Muellerius Capillaris* (Protostrongylidae Nematode). *Veterinary immunology and immunopathology*, 58, 77-88.



- Bruce, M. McCraw and Paula, I. Menzies (1986): Treatment of Goats Infected with the Lungworm *Muellerius capillaries*. Can Vet. J.; 27(8): 287–290
- Burger, H.J. and Stoy, M. (1968): Parasitologische diagnostic (Teil 11) Elzählung und larven differenzierung. Therapogen praxidienst, 3, 1-22.
- Charles, M. (1998): Diagnostic veterinary parasitology, second Edition, page 245-254.
- Christie, M. and Jackson, F. (1982): Specific identification of strongyle egg in small samples of sheep feces. Research in Veterinary Science, 32, 113-117.
- Dunn, A.M. (1978): Veterinary Helminthology. 2<sup>nd</sup> Ed. Butter and Tanner lid, frome and Landon. Pp. 295-304.
- El sheriff, A.M. and Abo-El Hadid, S.M. (2005): Episoatological investigation about different internal parasitic affection among cattle calves in Beni-Suef Governorate. J. Egypt. Vet. Med. Ass., 65 (6) 261-274.
- Herd, R.P. (1971): The parasitic life cycle of *Chabertia ovina* in sheep. Internal J. Parasitology, 1, 189-199.
- Macaldowie, C.; Jackson, F.; Huntley, J.; Mackellar, A. and Jackson, E. (2003): A comparison of larval development and mucosal mast cell responses in worm-naïve goat yearlings, kids and lambs undergoing primary and secondary challenge with *Teladorsagia circumcincta*. Veterinary parasitology, 114, 1-13.
- Min, B.R.; Hart, S.P.; Miller, D.; Tomita, G.M.; Loetz, E. and Sahlu, (2005): The effect of grazing forage containing condensed Tannis on gastrointestinal parasite infection and milk composition in Angoro does. Veterinary Parasitology, 130, 105-113.
- Mohsen, I.A. and Ibrahim, A. (2008): Studies on some internal parasites of goats in Assiut Governorate especially which affecting liver. Assiut University. Bull. Environmental Research, 11: (1) 57-71.
- Otify, Y.Z. (1984): Studies on Coccidian parasites of goats. Ph. D. Fac. Vet. Med. Alex. University.
- Pereckienė, A.; Kaziūnaitė, V.; Vyšniauskas, A.; Petkevičius, S.; Malakauskas, A.; Šarkūnas, M. and Taylor, M.A. (2007): A comparison of modifications of the McMaster method for the enumeration of *Ascaris suum* eggs in pig faecal samples

Veterinary Parasitology Volume 149, Issues 1-2, Pages 111-116.

- Roos, M.H. (1997):* The role of drug in the control of parasitic nematode infections, must we do without parasitology, 114, 137-144.
- Seivwright, L.J.; Redpath<sup>a.1</sup>, S.M.; Mougeot, F.; Watt, L. and Hudson, P.J. (2004):* Faecal egg counts provide a reliable measure of *Trichostrongylus tenuis* intensities in free-living red grouse *Lagopus lagopus scoticus*. Journal of Helminthology, 78: 69-76  
Cambridge University Press doi:10.1079/JOH2003220  
Published online by Cambridge University Press 22 Feb 2007
- Smith, M.C. and Sherman, D.M. (1994):* Goat Medicine 1<sup>st</sup> Ed. Lea Febiger U.S.A. page 312-340.
- Soulsby, E.J.L. (1982):* Helminths, Arthropods and Protozoa of domestic animals 7<sup>th</sup> Ed. The English Language Book. Society and Baillier Tindall, London. Pp 795-803.
- Veale, P.I. (2002):* Resistance to macrocytic lactones in nematodes of goats. Australian Veterinary J., 80, 303-304.
- Waller, P.S. (2004):* Management and control of nematode parasites of small ruminants in the face of total anthelmintic failure. Tropical biomedicine, 21, 7-13.
- Waller, P.S. and Thramborg, S.M. (2004):* Nematode control in green ruminant production systems. Trends in Parasitology. 20 (10) 493-497.
- Zajac, A.M. and Gipson, T.A. (2000):* Multiple anthelmintic resistance in a goat herd. Veterinary Parasitology, 87, 163-172.