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## **CONCURRENT INFECTION WITH INTERNAL PARASITES AND SKIN SCALY LESIONS IN FRIESIAN CALVES AND EFFICACY OF TREATMENT**

(With 10 Tables)

By

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**توافق الإصابة بالديدان الداخلية والأمراض الجلدية ذات القشور  
في العجول الفريزيان وكفاءة العلاج**

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أجريت هذه الدراسة على 600 عجل فريزيان تتراوح أعمارهم من 6-18 شهر بمزارع على طريق مصر - إسكندرية الصحراوى. تم فحص هذه الحالات للتعرف على وجود الديدان الداخلية والجرب والقراع عن طريق أخذ عينات براز وكحات جلدية من المناطق الإصابية بالجلد لإجراء الفحوصات الطفيلية اللازمة ، وكذلك الكشف عن وجود القراع. وقد أظهرت النتائج إصابة في إصابة 190 عجل بالديدان المعوية بمعدل انتشار 31.7 % ، وكانت الطفيليات شائعة الإصابة هي تراكوسترنجليس بنسبة 32.1 % هيمونكس 27.9 % استرتاجيا بمعدل 23.2 % ونيماتوديرس 18.8 % وأيضاً كانت الإصابة بالديدان الكبدية بمعدل 98 عمل بنسبة 16.3 % وديدان البارامفستيوم بمعدل 50 عجل بنسبة 8.3 % وديدان المونيزيا بمعدل 10 عجول بنسبة 1.7 % من إجمالي العدد المصاب. بينما أظهرت النتائج الكحات الجلدية إصابة 88 عجل بالجرب بنسبة 14.6 % و 121 عجل بالقراع بنسبة 20.2 من إجمالي العدد المصاب. وكذلك أظهرت النتائج أن معدل الإصابة المختلطة بالديدان المعدية والجرب معاً 65 عجل مصاب بنسبة 34.2 % ، وكذلك الإصابة المختلطة بالديدان المعوية والقراع معاً 83 عجل مصاباً بنسبة 43.6 % . وكذلك أظهرت النتائج أن الإصابة المختلطة بين الديدان الكبدية والجرب معاً بمعدل 60 عجل بنسبة 61 % والإصابة بالديدان الكبدية والقراع معاً 80 عجل بنسبة 82% بينما نسبة الإصابة بالجرب في العجول الغير مصابة بالديدان الكبدية هي 28 عجل بنسبة 5.6 % ، وكذلك نسبة الإصابة بالقراع في الحيوانات الغير مصابة بالديدان الكبدية هي 41 عجل بنسبة 8.2 % مما يؤكد توافق الإصابة بين الديدان المعوية والكبدية معاً وبين الإصابة بالجرب والقراع وارتباط العلاقة بينهم حيث أن الديدان المعوية والكبدية تعمل كعامل مساعد قوي للإصابة بالجرب والقراع وظهورهما. تم علاج العجول المصابة بالجرب بالعلاجات الآتية : 1- أيفوماك بمعدل 1 سم / 50 كجم . 2- منج سايد 3- مرهم كبريت 10 وكلهم أظهروا كفاءة بنسبة 100%. تم علاج الحيوانات المصابة بالقراع بديكلورفين وصبغة اليود وحمض الخليك وكلها كانت مفيدة ومؤثرة في

تحسن الحالات بنسبة 87.5% و95% و100% على التوالي. تم علاج العجول المصابة بالديدان المعوية والكبدية والديدان الشرطية بالبندازول وليفاميزول والأيفوماك وترايكلابندازول وأيفوماك إف ، وكلها أظهرت نتائج مؤثرة وينسب مختلفة حسب نوع الدواء المستخدم.

## SUMMARY

Six hundred Friezian calves of 6-18 months age were stocked in different private farms at Alexandria desert road Egypt were clinically examined, fecal samples and skin scraping were collected for detection of internal parasites, ring worm and mange infestation. Fecal examination revealed that the prevalence rate of gastrointestinal nematode in examined animals was (31.7%). The most prevalent nematodes recovered by larval cultural were *Trichotronglus* spp. (32.1%), *Haemonchus* spp. (27.9%), *Oestertagia* spp. (23.2%), and *Nematodirus* (16.8%). While the infestation rate of *Fasciola* spp, *paramphistomum* and *moneizia* were 16.3 % , 8.3 % and 107 % respectively. Examination of skin scraping revealed that the prevalence rate of mange was (14.7%). The mycological culture revealed isolate of *Trichophyton* spp. (20.2%). Mixed infestation of gastrointestinal nematodes and skin lesion due to infestation by mange and infection by ringworm were 34.2% and 43.6 % respectively. Mixed infestation of *Fasciola* spp. and skin lesion which occur due to infestation by mange and by ringworm was 61 % and 82 % respectively. The efficacy of drugs as Ivomec F, Mangedice and Sulpher ointment 10 % treated mange was 100% while the efficacy of drugs in calves infected by ring worm were Dichlorphen 1.5 % . Tincture iodine 3% and glacial acitic acid 3% was 87.5 % , 95 % and 100 % respectively. The efficacy of drugs used for selected calves wormer in this study were, Abendazole in parasitic gostrointestinal, *Fascioala* and *Moneizia* infestation was 96%, 83.3 % and 100 % respectively, while levamisol and Ivomec have 100% efficacy in treatment of parasitic gostrointestinal. The treatment of *Fasciola* by triclabendazole and Ivomec F was 90 % and 85 % respectively.

**Key words:** calves, skin lesions, parasitism, ringworm

## INTRODUCTION

Parasitic infestations causes an economical losses among cattle. *Fasciola gigantica* is considered as the most important one and it seriously affects animals health in Egypt. Economical losses are huge due to drop in meat and milk production arised from feeding of young flukes on hepatic cells, anemia and emaciation produced by the daily

loss of about 50 ml blood per fluke which was reported by (Abd El-Gawad *et al.*, 1989).

Mange is a common cause economic losses include weight losses, decrease milk production and increased susceptibility to other diseases (Urquhart *et al.*, 1988).

Outbreaks of mange usually occur in housed cattle, as sarcoptic mange is highly contagious and spread by close contact. Infestation in cattle starts usually on the sparsely haired part of the body such as the head and neck or sacral region (Kettle, 1984).

Under certain conditions, mange can spread all over the body of cattle. Mild infestations showed scaly skin with little hair loss, but in severe cases, the skin becomes thickened and wrinkled (hyperkeratosis) and there is a marked loss of hair. The altered skin functions and the intense priorities in cattle may result in considerable economic losses (Kutzer, 2000).

Ringworm is the most commonly seen in calves, particularly in the region around the eyes, although generalized skin lesions on the body can develop. Lesions are usually discrete, scaly patches of hair loss with a grey crust formation. Some thickly crusted with pus. Ring worm is more common as a herd health problem in winter months and also in tropical climate due to high humidity (Younes 2002).

The aim of the present work is to spotlight on:

- 1 - The relationship between the infestation by internal parasites and scaly skin lesions (mange and ring worm).
- 2 - The efficacy of the treatment.

## **MATERIALS and METHODS**

### **Animals:**

A total 600 Friesian calves of 6-18 months age belonging to a private farm at Alexandria desert road Egypt were used in this study.

### **Samples and methods**

#### **A - Faecal samples:**

Faecal samples of 600 Friesian calves were collected from the rectum and examined microscopically using concentration flotation and concentration sedimentation techniques, the faecal culture and larval differentiation carried out according to (Georgi 1980).

#### **B - Skin scraping:**

Samples were collected from the periphery of lesions, taking no more than 10% of the total area of the lesion at any sampling time, scrapings were made using a sharp flat scalpel from an area

approximately 3x3 cm. A part of each sample was placed in a few drops of Potassium Hydroxide 20% solution on a slide covered with a cover slid and examined microscopically after 30 minute without its dryness for the presence of fungal elements (Emmons *et al.*, 1977).

The second-third part of skin scraping was inoculated into the surface of Sabouroud's Dextrose Agar media to which Chlormphenicol (250 mg/L) and Actidione (500mg/L) were added. The inoculated tubes incubated at 25-30°C for 2 weeks. The growing organisms were examined for cultural characteristics and spore morphology was studied by slide culture method according to Freg *et al.* (1979).

Approximately the last-third of each skin scraping was moserated in 10% potassium hydroxide in a hot water (not boiled) until clearing of the skin tissues, cooling them, centrifuged and examined microscopically for detection of mites (Barth and Visse 1985).

#### **Treatment:**

Treatment were carried out by using different drugs for internal parasites [Albendazole 10 % 3ml/45 K.g B.W Orally, Levacide 10 % (levamisol Hcl 10 %), 10ml/100 K.g B.W S/C, Ivomec 1 ml /50 K.,g B.W subcut . Tricla-bendazole (Fasinex) 10 ml /100 K.g B.W. orally.

Efficacy of drugs in mange is carried by using Ivomec 1ml 50 K.,g B.W s/c twice injection with week interval, mangicide applied locally daily for 5 days and sulpher ointment 10 % applied locally daily for 5 days.

Different drugs are used in treatment of ring worm (Di-chlorophan 1.5%, spray for 2 weeks, tincture iodine 3% applied for 3 weeks and glacial acetic acid 3 % locally for 10 days, all animals were treated orally by potassium iodide 2 mg / k.g B.w for 10 days, AD<sub>3</sub>E (10 m/calves) i.m, twice injection.

## **RESULTS**

Some calves were suffering from diarrhea, rough coat, loss of weight, emaciation and unthriftness. Skin affection appeared on some cases in addition to the previous signs. There were itching manifested by biting and rubbing of the infested skin; the skin of the effected area was thickened with some fissures as well as denuded crusts; the hair was broken and extirpated.

Results of the parasitological examination of fecal samples revealed that gastrointestinal nematodes Fasciola, Paramphystomum and Moneizia were 31.7 %, 16.3 %, 8.3 % and 1.7 % respectively. While the results of fecal culture for larval differentiation revealed the infestation

of these calves with *Trichostrongylus* spp., *Heamonchus* spp., *Oestartagia* spp. and *Nematodiurus* spp (Table 2).

Skin scraping examination recorded 88 calves were infested with mange (14.1 %) and 121 calves infected with ring worm (20.2 %) (Table 3).

The percentage of infestation with mange and ring worm in PGI infested calves was high 34.2 % and 43.6 % respectively in which 65 managed calves and 83 infected ring worm calves out of 190 infested with parasitic gastrointestinal one, while it was low 5.6% and 9.3 % respectively (23 managed calves and 38 infected ring worm out of 410 PGI free calves) (Tables 4, 5).

The percentage of infestation with mange and infected ring worm in fasciolated calves was high 61% and 82 % respectively in which 60 managed calves and 80 infected ring worm calves out of 98 fasciolated calves. While it was low 5.6 % and 8.2 % respectively where 28 manged calves and 41 infected ring worm in out 502. *Fasciola* free calves (Tables 6, 7).

**Treatment:**

Ivomec, magnified and sulpher ointment 10% are used in treatment of manged calves and show 100 % cure rate (Table 8). Treatment of ring worm by different drugs dichlorophen 1.5 %, tincture iodine 3% and glacial acetic acid show 87.5 %, 95 % and 100 % curity respectively (Table 9).

Efficacy of drugs in selected calves wormer show that Albendazol were 96 % of PGI 88.3 % of *Fasciola* and 100 % in moniezia levamisol and Ivomec show 100% in both drug in parasitic gastrointestinal. Triclabendazole and Ivomec F cure 90 % and 85 % respectively from fasciolated calves.

**Table 1:** Results of parasitological examination of fecal samples.

Total No. of examined animals	Fasciola spp.		Paramphystomum		Moneizia		Parastic G.I		Mixed infestation Fasciola and P.G.I		Mixed infestation Paramphystomum and P.G.I	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
600	98	16.3	50	8.3	10	1.7	190	31.7	53	8.8	35	5.8

**Table 2:** Results of larval differentiation of fecal culture.

No. of infested calves	Trichostrongylus		Heamonchus spp.		Oestrtagia spp.		Nematodirus spp.	
	No.	%	No.	%	No.	%	No.	%
190	61	32.1	53	27.9	44	23.2	32	18.8

**Table 3:** Results of examination of skin scraping.

Total No. of examined animals	No. of animals infested with mite		No. of animals infected with ringworm	
	No	%	No	%
600	88	14.6	121	20.2

**Table 4:** Results of manged calves from PGI infested and PGI free calves.

Total No. of ex. Calves	No. of PGI infested Calves	No. of manged calves recovered from PGI infested Calves	Positive %	No. of PGI free calves	No. of manged calves recovered from PGI free calves	Positive %
600	190	65	34.2 %	410	23	5.6 %

**Table 5:** Results of ringworm infected calves recovered from PGI infested and PGI free calves.

Total No. of ex. Calves	No. of PGI infested Calves	No. of ringworm infected calves recovered from PGI infested Calves	Positive %	No. of PGI free calves	No. of ringworm infected calves recovered from PGI free calves	Positive %
600	190	83	43.6	410	38	9.3 %

**Table 6:** Results of manged calves recovered from fasciolated and fasciola free calves.

Total No. Of ex. Calves	No. of fasciola infested Calves	No. of manged calves recovered from fasciola infested Calves	Positive %	No. of fasciola free calves	No. of manged calves recovered from fasciola free calves	Positive %
600	98	60	61 %	502	28	5.6 %

**Table 7:** Results of ringworm infected calves recovered from fasciola and fasciola free calves

Total No. Of ex. Calves	No. of fasciola infested Calves	No. of ringworm infected calves recovered from fasciola infested Calves	Positive %	No. of fasciola free calves	No. of ringworm infected calves recovered fasciola from free calves	Positive %
600	98	80	82 %	502	41	8.2 %

**Table 8:** Results of efficacy of mangedical drugs.

Total infested No. (88)		Drug administration	Cure rate	
Groups			No.	%
G1	30	Ivomec (Twice injection with week interval)	30	100
G2	30	Mangcide ( Benzyl benzoate, Sulpher, Salicylic acid, Phenol and Tar) applied locally daily for 5 days.	30	100
G3	28	Sulpher ointment 10 % applied locally daily for 5 days	28	100

**Table 9:** Results of efficacy of fungicidal drugs.

Total infected calves (120)		Drug administration	Cure rate	
			No.	%
G1	40	Dichlorophen 1.5% for two weeks	35	87.5
G2	40	Tincture iodine 3% for three weeks	38	95
G3	40	3 % Glacial acetic acid for 10 days	40	100

**Table 10:** Efficacy of drugs in selected calves wormers.

Generic drug name	PGI			Fasciola			Moneizia		
	Total 190			Total 98			Total 10		
	No. of treated	Cure	%	No. of treated	Cure	%	No. of treated	Cure	%
Albendazole	50	48	96	48	40	83.3	10	10	100
Levamisol	50	50	100	-	-	-	-	-	-
Ivomec	90	90	100	-	-	-	-	-	-
Triclabendazole	-	-	-	20	18	90	-	-	-
Ivomec F	-	-	-	20	17	85	-	-	-

## DISCUSSION

Gastrointestinal nematodes and liver fluke infestation are the major contributors to reduced productivity and can lower the production of meat and milk (Radostits *et al.*, 2000). Mange is one of the most destructive parasitic diseases not only on the skin, but also to general condition of the affected animals (Hourrigan 1979). Ring worm is more common as a herd health problem in winter months, spontaneous recovery is common in cattle, but valuable animals are commonly treated to limit progression of the disease to other members (Emmons *et al.*, 1977).

This investigation revealed the prevalence of gastrointestinal nematodes infestation in naturally infested calves (Table 1) 190 calves (31.7 %) were infested with gastrointestinal nematodes, 98 calves (16.3 %) infested with fasciola spp., 50 calves (8.3 %) infested with paramphistomum and 10 calves (1.7 %) infested with Moneizia these results agree with Morsy *et al.* (2005), who recorded fasciola infestation rate among calves (20 %) but disagree with El-Shazly *et al.* (2002) who reported it 9.73 %.

It was observed that the infestation with Paramphistomum (8.3 %), this results agree with Haridy *et al.* (2006) who reported Paramphistomum infestation was 10%. The results of larval differentiation of fecal culture of nematodes were Trichostrongylus spp (32.1 %), Heamonchus spp (27 %), Oestertagia spp. (32.2%) and Nematodirus spp. (16.8 %) (Table 2). It was obvious that highest susceptibility of calves less than 1.5 years old to parasitic infestation especially PGI that could be explained by incomplete development of



immune system in young ages and with age progress the immune system can overcome these parasitic infestations and eliminates it from the animal body this agree with Salib (2007).

Results of skin scraping examination recorded in Table (3) reveled that 14.7 % and 20.2 % for mange and ring worm respectively. This result agrees with Gates and Wescott (2000) and Younes (2002).

The mixed infestation of gastrointestinal parasite mange and ring worm were 34.2 % and 43.6 % respectively (65 managed calves and 83 ring worm infected calves respectively out of 190 of parasitic gastrointestinal one) while it was low 5.6 % and 9.3 % respectively in parasitic gasterointestinal free calves (23 manged calves and 38 ring worm infected calves out of 410 one)

Although mixed infestation of fasciola, mange and ring worm were 61 % and 82 % respectively (60 managed calves and 80 ring worm infected calves respectively out of 98 fasciolated calves) while it was low 5.6 % and 8.2 % respectively in fasciola free calves (28 manged calves and 41 infected ring worm calves out of 502 of fasciola free calves).

From the obtained results it could be concluded that gastrointestinal and fasciola flukes may enhance susceptibility of calves to mange and ring worm and predispose to infestation.

Naturally occurring of parasitic diseases in farm animals are frequently caused by concurrent infections with two or more immunobiologically unrelated or remotely related species of parasites (Fakae and Chiejina 1993) while, (Christensen *et al.*, 1987) reported that heterologous parasite interaction in domestic animals may give rise to the prolonged survival and enhanced pathogenicity of one of the concomitant infections. Also Bruer and West (1993), Fritsche *et al.* (1993) reported that, gastrointestinal nematodes naturally infested with mange. They attributed these results to the nematodes infestation which induces desquamation and sloughing of the epithelium, villous atrophy and consequently decrease absorption mineral and other food nutrients and inappetance.morever, At farm level the factors must be considered in approaching the mange outbreak such as source of infestation, helminth parasite status and general health status (O'Brien 1999).

The efficacy of the treatment was assessed based on healing of the skin lesions and absence of mites on the skin. Table (8) showd that total of 88 calves naturally infected with mange were divided into 3 groups which were group 1 treated with Ivomec F 2 injections subcutaneously at week intervals, and group 2 treated with Mangecide

applied locally daily for 5 days and group 3 treated with a sulphur ointment 10 % topically applied once daily for a week. Skin scrapings were examined at weekly intervals to determine the efficacy of the treatments. It was shown that the total number of treatments to cure mange was 100% in all three groups. Ivomec F provides numerous advantages when used in the form of injection. meanwhile local treatments to be effective the drug must cover the entire integument which may cause side effects such as burning sensation and irritative dermatitis (Buffect and Dupin 2003). So Ivomec is the most easily effective applied treatment against mange. This result agrees with results obtained by Bridi *et al.* (2001) and Patal *et al.* (2003).

In Table (9) a total of 120 calves infected with ring worm were divided into 3 groups which were treated with dichlorophen 1.5% for two weeks, tincture iodine 3% for three weeks and glacial acetic acid for 10 days. Skin scrapings were examined at weekly intervals to determine the efficacy of the treatment. It was shown that, the efficacy of treatments was 87.5%, 95% and 100% for Dichlorophen, Tincture iodine and Glacial acetic acid respectively. This result agrees with Younes (2002).

Table (10) shows efficacy of drugs in selected cattle wormers where Albendazole effect 96%, 94.7% and 100% on PGI, *Fasciola* and *Moneizia* respectively. Levamisol and Ivomec effect 100% on PGI. These results agree with Gates and Wescott (2000).

Triclabendazole effected on 90% of liver fluke our results supported by Yehia *et al.* (2006).

Ivomec F effected on 85% of liver flukes agreed by Eisa and Esmail (2003).

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