

# Detection of Giardiasis in apparently healthy cattle by using direct ELISA technique

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## Abstract

The study was conducted to detect the Giardiasis in apparently healthy cattle by using direct ELISA technique. 85 fecal samples were collected and preserved in formalin saline 10% until testing. 76.4% (65 out of 85) of samples were revealed positive result of infection, and highest rate was recorded among young and males. The study revealed that there is highly distribution of Giardiasis among the apparently healthy cattle, and the calves and males are more infective.

**Key words:** *Giardia lamblia*, direct ELISA, cattle, fecal sample.

## الكشف عن داء الجيارديا في الإبقار المعافاة ظاهريا باستخدام تقنية الممتز المناعي المرتبط بالأنزيم

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## الخلاصة

أجريت هذه الدراسة لتشخيص داء الجيارديا في الإبقار السليمة ظاهريا (المعافاة) باستخدام طريقة الممتز المناعي المرتبط بالأنزيم المباشر. تم جمع 85 عينة براز من الإبقار السليمة ظاهريا وحفظت بالفورمالين سلاين 10% لحين الفحص. 76.4% (65 من 85) من النماذج المفحوصة أعطت نتيجة ايجابية للإصابة وكانت النسبة الاعلى للإصابة في الحيوانات الصغيرة والذكور. أظهرت الدراسة ان هناك انتشار واسع لداء الجيارديا في الإبقار السليمة ظاهريا. الكلمات المفتاحية: جيارديا لامبليا , الاليزا المباشرة ، المواشي ، عينات البراز

## Introduction

Giardiasis is one of important worldwide distribution and it is traditionally considered an epidemic and zoonosis disease between human and animals (farms animals, dogs, cats, birds and rodents) affects all age groups (1). The parasite *Giardia lamblia* is an flagellated binucleated parasite protozoa from Mastigophora class habitat in duodenum down to the upper part of the ileum in man and wide variety of vertebrates, it is a main cause of traveler's diarrhea infection where manifested with symptoms include abdominal cramps nausea flatulence and acute or chronic diarrhea (2), and it is has two life phases trophozoite and cyst, *Giardia* infection can occur through ingestion of dormant cysts in contaminated water, food, or by the fecal-oral route

(through poor hygiene practices). The *Giardia* cyst can survive for weeks to months in warm water (3). The trophozoite attaches to the epithelium by a ventral adhesive disc, and reproduces via binary fission (4,5). The aim of study was to detect the Giardiasis in apparently healthy cattle as a risk factor to transport the infection.

## Materials and methods

Eighty five (85) fecal samples were collected from cattle (21 males and 64 females of different age groups where they had no signs of Giardiasis. These samples were preserved in 10 ml of formal saline 10% until used. *Giardia* 2<sup>nd</sup> generation Kit (Diagnostic Automation, INC, Cat. No. 8304-3) was used to detect the infection

according to the manufacturer's instructions. Briefly, 50 µl of fecal sample was added to each well with dilution buffer and incubated for 60 minutes at room temperature (15-25°C), washed, 2 drops of enzyme conjugate were added to each well, incubated 30 minutes, 2 drops of chromogen were added to each well, incubate 10 minutes, then 2 drops of stop solution were added to each well. The result was read at 450/620 ~ 650nm by ELISA reader.

## Results

The results were showed that the rate of infection among apparently healthy cattle were 76.4% (65 out of 85), regarding to the ages, the current study was referred to that most infections of Giardiasis were seen among young animals where it recorded 85.71% of infection in calves of age group ( $\geq 1$  year) with a significant differences ( $p \leq 0.05$ ) (Table 1). In other hand a significant difference ( $p \leq 0.05$ ) between males and females was recorded in the current study, where high prevalence rate (80.65%) was recorded in male (Table 2).

**Table (1): Prevalence of Giardiasis according to age groups using direct ELISA test.**

Age	No. of examined sample	No. of positive	Percentage (%)
< 6 m.	25	16	64% a
6 m.-1 y.	11	7	63.63% a
$\geq 1$ y.	49	42	85.71% b
Total	85	65	76.4%

Similar letters refers to the non-significant differences while different letters refers to significant differences at ( $p < 0.05$ ). m = month, y = year.

**Table (2): Prevalence of Giardiasis according to the sex using direct ELISA test.**

sex	No. of examined sample	No. of positive	Percentage (%)
male	21	17	80.65% a
female	64	48	65% b
Total	85	65	76.47%

Similar letters refers to the non-significant differences while different letters refers to significant differences at ( $p < 0.05$ ).

## Discussion

The prevalence rate of Giardiasis in cattle according to direct ELISA technique was (76.4%), which appeared highest than other previous studies (6),(7) and (8) when they referred to that the rate of Giardiasis infection by using ELISA test were 10.8%, 9.3% and 13.3% respectively. The increasing of the infection rate in the current study may be attributed to availability of suitable environmental condition to the parasite, reduction of animal health care in addition to the direct contact of the animal because more of them are rearing in close or semi closed cowsheds (9). Regarding to the ages, the current study was referred to that most infections of Giardiasis were seen among young animals where it recorded 85.71% of infection in calves of age group ( $\geq 1$  year) with a significant differences ( $p \leq 0.05$ ). This results is consistent with results that recorded by (10) who reported to that infection was highest among four to five week old calves and remained high among older calves up to 10 weeks, also line with (11) in Alava (northern Spain) who recorded that infection rate of Giardiasis in calves higher than adults, while (12) reported that 45.4% of Giardiasis were in calves aged between 2-16 weeks, but (8) in Bangladesh reported rate (13.3%) in calves. This may be due to the susceptibility of calves to infection when they exposure to the *Giardia* cysts which excreted from chronic infected mothers due to the decrease in the level of acquired immunity. (13) Noted that the excretion of *Giardia* cysts in cattle in the last period of pregnancy be in small quantities and then increase to 38.25cyst/gm. of feces at birth, and then increase in first week after birthing, that's lead to increase infection in young calves. On the other hand, there are significant difference ( $p \leq 0.05$ ) between male and female was recorded in the current study, which recorded the high prevalence rate (80.65%) in male. This result line with (8) in Bangladesh, who reported male calves (14.3%) have slightly higher prevalence than female calves (12.5%).

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