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Research Article

Helminth Parasitic Infestations in Cattle and Buffaloes

Mod Raj Acharya[1], Anjay Kumar Mishra[2]

[1]Program Coordinator, School of Agriculture, Madan Bhandari Memorial Academy Nepal, Urlabari 3, Morang, Nepal.
[2]Associate Professor, School of Engineering, Madan Bhandari Memorial Academy Nepal, Urlabari 3, Morang, Nepal.

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Corresponding Author:
Mod Raj Acharya, Program Coordinator, School of Agriculture, Madan Bhandari Memorial Academy Nepal, Urlabari 3, Morang, Nepal.
E-mail Id:
acharyaveterinarian@gmail.com
Orcid Id:
https://orcid.org/0000-0003-2803-4918
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A B S T R A C T

The purpose of the research is to assess the Helminth parasitic infestations in the cattle and buffaloes with a case of vicinity of the institute especially in Agriculture Campus of Urlabari, Morang, Nepal. It is an empirical research conducted as diagnostic approach. Field visit of the community was done for the collection of fecal sample in cattle and buffaloes in order to find out the helminthic parasitic infestation. All 200 fecal samples were collected directly per-rectally and examined by sedimentation method in veterinary Diagnostic and Disease Investigation Laboratory and found 43% positive and 57% negative out of 200 fecal samples in cattle and buffaloes. Comparatively liver fluke infestation was found more dominant 36 positive cases out of 86 total positive cases.

Keywords: Sedimentation Method, Fecal, Fluke Infestation, Magnesium, Zinc, Sulphate, Flotation

Introduction

Parasites inhabiting the digestive canal and biliary and urinary systems produce eggs, larvae or cysts that leave the body of the host by way of the feces or urine. Occasionally even adult helminth parasites may be seen in feces, especially when the host has enteritis. Parasitic-worm eggs or larvae from the respiratory tract are usually coughed into the pharynx and swallowed and they too appear in feces. Helminth parasites are grouped into three categories: to find out the helminth parasitic infestations in the vicinity of the institute especially in cattle and buffaloes Cestodes (tape worms), trematodes (flukes) and nematodes (round-worms). The drugs used against these parasites are, therefore, called anticestodal, antitrematodal and antinematodal drugs. The drugs that are used to destroy and eliminate helminth parasitic worms are called anthelmintics. Helminthic infestations represent the most common parasitic diseases of man and animals. When the animals get infested by the helminth parasites, animals show the signs and symptoms of emaciation, loss of appetite, reduced in milk yield in lactating animals, anemia, and foul smelling of feces, coughing and sometimes diarrhea or enteritis may also be seen. In such condition, feces must be collected and examined for the detection of parasitic ova or larva. The broad objective of this study will be; to find out the helminth parasitic infestations in the vicinity of the institute especially in cattle and buffaloes.

Examination of Feces

Collection of Fecal Sample and its Storage

Equipments:

- Fecal box
- Wooden spatula

Procedure

According to Margaret (1994), the sample should be fresh. It should be free from any mud, dirt or other foreign materials. If the sample is to be collected from the soil, only the middle portion should be taken. The sample should be picked up with wooden spatula which may be discarded after use.

In large animals, the hand is passed into the rectum after washing it with soap and water and a 10 gm amount is collected. In dogs and cats, the material should be collected by introducing rubbery index finger in the rectum. The fecal sample should be collected in the wax cardboard cups fitted with lids or any other suitable container like ice cream cups but the use of absorbent material like newspaper should not be used.

Storage of Samples

If the material is to be examined after some time of collection, then it should be stored in a refrigerator. The material, except where lungworms are suspected, can be preserved in 10% formalin.

Examination of Fecal Samples

Fecal examination is the process of observing and identifying the parasiticova or larva in feces by means of our naked eyes (Gross examination) or with the aid of microscope (Microscopic examination).

Equipments

Microscope, tooth pick or match stick, glass slide, cover slip, beaker, centrifuge, floatation solution, centrifuge tube, funnel, test tubes and gauze etc.

Methods of Fecal Examination

There are two methods of fecal examination

- Gross/macroscopic examination
- Microscopic examination

Gross/ Macroscopic Examination

The fecal samples are examined for the following information.

- Consistency and form of the feces: hard, normal, loose
- Color and composition
- Presence of adult parasites
- Presence of segments of parasites
- Presence of blood
- Presence of mucus

Microscopic Examination

Itis divided into two methods

- Qualitative examination
- Quantitative examination

Qualitative Examination

Direct Smear Method

- Take a clean slide and place one drop of distilled water in the centre.
- Place a small amount of fecal sample on the drop of water.
- Mix uniformly with the help of either a smooth glass rod or teeth pick or match stick.
- Place a cover slip over it.
- Examine under the low power of microscope and ensure that whole of the mass has been examined.

Note: If no egg is present, the sample should not be declared as negative. The floatation method should be followed for confirmation.

Sedimentation Method

Sedimentation is used to isolate eggs of flukes and some other tape worms and nematodes whose eggs do not float readily in common floatation solutions.

- About 5-10g of fecal sample is taken in a clean mortar.
- About 30-40ml of water is added to it and triturates it properly with the help of pestle.
- It is filtrated with the help of sleeve and is kept in a glass.
- It is allowed for 20-30 minutes for sedimentation.
- Supernatant fluid is discarded from glass.
- 1-2 drops sediment is taken on clean slide and make a smear.
- It is examined under low power microscope.
- If desired, add 1 drop of 0.1% Methylene blue.

Floatation Method

This technique is used on the principle of floating the parasitic eggs to gravity. Following solutions are used for floatation technique:

- Saturated sugar solution (Sheather's solution)
- Saturated sodium nitrate solution
- Saturated sodium chloride solution
- Magnesium sulphate (41%)
- Zinc sulphate (33%)

Sugar Floatation

Centrifugal Floatation

- Take a small amount of feces (1 to 2 grams) in a glass beaker.
- Mix it well by stirring with a small amount of water to make a watery suspension with the help of glass rod or wooden spatula.
- This watery suspension of feces is poured into a second container through the funnel on which a gauze piece has been put.

Note: The material left on the gauze piece is examined for tape worm segments and other foreign materials and then discarded. The funnel is cleaned.

- Pour this sleeved sample into a centrifuge to its 1/3 capacity.
- Add it to Sheather's sugar solution up to the brim (Upper end) of the tube.

- Mix the contents by inverting the tube 4-5 times by putting the thumb on the top of the tube.
- Centrifuge it for 4-5 minutes at about 15,000 rpm.
- Take out the tube from the centrifuge and place it in the test tube stand. Care should be taken not to disturb the tube.
- Transfer some amount from the tube with the help of a glass rod.
- Cover it with cover slip and examine under the lower power of microscope. High power can be used wherever necessary.

Similarly, Simple Floatation was also done**.**

B. Simple Floatation

- Take small quantity of fecal sample in a glass beaker and mix it well with the sugar solution with the help of a glass rod.
- Strain the mixture through a funnel fitted with gauze piece into a test tube to its top. The solution should not fall down from the tube.
- Allow the test tube to stand in vertical position for half an hour.
- Now either take some material by putting the plunger straight on the top and removing it quickly or by putting a slide over it.
- Examine it under the low power microscope.

Sodium Nitrate Floatation

Centrifugal Floatation

This method is satisfactory; however, the sample should be examined as early as possible as the solution has tendency for crystallization. Saturated aqueous solution of sodium nitrate should be prepared.

- Place near about 1-2 grams of sample in wax cup and mix it well with a saturated solution of sodium nitrate. The ratio of feces and the saturated solution is nearly 1:5.
- Transfer it to the centrifuge tube to approximately 1/4th inch below the top.
- Proceed as for sugar centrifugal floatation.

Sodium Chloride Floatation

The technique is same as for sodium nitrate floatation. The feces are mixed directly with salt solution and examined as for other floatation techniques.

Similarly, Magnesium Sulphate Floatation and Zinc Sulphate Floatation were done.

Quantitative Concentration Method

It is done to obtain more accurate information about severity of infection.

There are several techniques of counting the nematode eggs per gram of feces.

Mcmaster Techniques

- Weigh 2 grams of feces in a beaker
- Add 28 ml of water and mix well
- Place 1 ml of mixture in a test tube and add 1 ml of Sheather's sugar solution and mix.
- While still keeping the mixture in motion, withdraw some of it with a pipette and place gently in a McMaster counting chamber. Making sure that the marked area in the cell is filled.
- Let the preparation stand for a few minutes to allow the eggs to come to the top
- Place the cell on the microscope and count the eggs in marked area.
- Multiply the count with 200 to get the number of eggs per gram of feces.

Stoll's Method

Weigh 3 grams of feces are placed in a tube of 45 ml capacity. Fill up the mark with deci-normal caustic soda solution or water. Close the tube with a rubber stopper and shake to make a homogeneous suspension. 0.15 ml of the mixed suspension of filtrate is taken on a slide and the whole area is examined under the low power microscope.

EPG (Egg Per Gram of feces) = Number of eggs counted x 100

Methodology

According to Chakrabarti (2014); Akhtar (1994); Veterinary Clinician Guide (Third Edition, 1988); Acharya (1996), field visit was done to collect the fecal samples and collected per-rectally and put in polythene bag. We put level for identification in each samples like name of the farmer, animal species, breed, sex and age and returned to the veterinary laboratory of the institute and proceeded examination of samples one by one with the aid of electronic binocular compound microscope. The method involved in examination of samples was sedimentation. We have taken 10g of fecal sample in a clean mortar and added 40 ml of water to it and triturated it properly with the aid of pestle. The samples were filtrated with the help of sleeve and poured in a glass beaker and allowed for 30 minutes for effective sedimentation. After 30 minutes, the supernatant fluid of samples was discarded from the glass. We have taken 2 drops of sediment on the clean slide and made a smear and put one drop of Methylene blue solution on the smeared slide for clear visualization. Thereafter examinations of fecal samples were carried out.

Result and Discussion

Data Analysis

Table I

Animal species	R/W +ve	L/F +ve	P/P +ve	T/W +ve	Total +ve	Total -ve	Total Tested Samples	% +ve	% -ve	Remarks
Cattle	29	32	13	7	81	108	189	42.9	`57.1	
% +ve	15.3	16.9	6.9	3.7	42.9	57.1	-	-	-	
Buffalo	-	4	-	1	5	6	11	45.5	54.5	
% +ve	-	36.4	-	9.09	45.45	54.5				
Total	29	36	13	8	86	114	200	43	57	
% +ve in both animals	14.5	18	6.5	4	43	57				

Interpretation of Result

On the basis of above mentioned table, we have found 43% positive and 57% negative out of 200 fecal samples in case of cattle and buffaloes, whereas in case of cattle, 42.9% positive out of 189 samples and 57.1% negative. In case of buffaloes, we have found 45.5% positive out of 11 samples and 54.5% negative. Highest infestations have found in liver fluke that was 18%.

Conclusion and Recommendation

Helminth parasitic infestation is problem to cattle and buffaloes with domination of liver fluke.

We have mentioned the following recommendations.

- We have suggested to those farmers having the positive test of helminth parasitic infestation for drenching with suitable and effective anthelmintics like Nilzan (oxyclozanade and levamisole) to their animals promptly.
- Periodic drenching with suitable anthelmintics to the animals (in every 4 months of interval) is recommended.
- It is recommended for fecal examination in each and every month of interval.
- Nutritional status should be corrected as per requirement and provision of plenty of nutritious fodder crops to their animals.
- Do not provide too moist fodder crops (due to chance of liver fluke infestation) and not to graze the animals in swampy areas due to the high incidence of snail in such areas.

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