IDENTIFICATION OF *TAENIA SAGINATA* WORMS IN BEEF AT TRADITIONAL MARKET (THURSDAY-FRIDAY) BONE BOLANGO DISTRICT

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ABSTRACT

Cattle are animals that are raised by many people compared to other livestock. Cows can produce various benefits such as as as a source of milk, as a working animal in rice fields, and meat producers and for the fulfillment of food needs, especially animal protein, beef in addition to having high nutritional value beef is also a medium for the growth of diseases, one of which is *Taeniasis* caused by the worm parasite *Taenia saginata*. The purpose of this study was to identify *Taenia saginata* tapeworm in beef sold at the Traditional Market (Thursday-Friday) of Bone Bolango Regency. The type of research used is a qualitative approach with observational sample collection techniques. The type of data used is primary data in the form of research results and secondary data in the form of data from literature, parasite atlases, and previous penelit I data. This study uses descriptive data analysis techniques, namely describing the morphological characteristics of *the Taenia saginata* worm based on microscopic observations. The results obtained during this study were that out of 10 beef samples that were used as the object of study, *Taenia saginata* worms were found positive in 4 samples while 6 other samples were found positive for *Oesophagustomum* sp and *Cooperia sp* worms.

Keywords: Beef, Taenia saginata,Tapeworm,Parasites,Observation

INTRODUCTION

Cattle are animals that are raised by many people compared to other livestock. Cows can produce various benefits such as as as a source of milk, as a working animal in rice fields, and a meat producer as well as for the fulfillment of food needs, especially animal protein [2].

Beef is one of the most meaningful foodstuffs in adequate nutritional needs of the people and also as an economic commodity that has very strategic value. Based on the results of the 2017 main ingredient consumption survey, the need or consumption of beef reached approximately 704.9 thousand tons or around 2.70 kilogra m per capita per year. Per capita beef consumption per year in Indonesia is still very low with a prevalence of 10% reported in Malaysia and 34.6% in Zambia [20].

In addition to having a high nutritional value, ju ga beef isa medium of growth of penyakit, one of which is *Taeniasis* caused by the parasite *Taenia saginata.* Menurut Data Dharmawan In2018, itwas found almost all over the world. These zoonotic parasites have a distinctive epidemiological pattern, using an estimated case of approximately 50-77 million worldwide. Taenia *saginata* worm means tapeworm with a very long size, which is 4-8 meters, sometimes up to 15 meters. the economic impact caused by the stinger isdetrimental to various parties [8].

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Indonesia is one of the largest tropical regions whose population is infected with *Taeniasis* caused by the *Taenia saginata worm. The intestinal Cestode* infection is found in several provinces in Indonesia with endemic status, namely North Sumatra, in North Sumatra about 65% of beef infected with Taenia saginata, and in Papua about 58% of infected beef, Bali around 53% infected beef, Sulawesi about 25% infected beef, *Taenia saginata* also found in East Nusa Tenggara around 17% infected beef, Lampung 11% infected beef, West Kalimantan 27% infected beef and East Java 16% beef infected with Taenia saginata, seeing the prevalence of *Taenia saginata* in Indonesia is quite increasing [4].

Kasus Taenia saginata for the prevalence of *Taeniasis* was reported In Gorontalo Province, especially Gorontalo City as many as 54 individuals were found positive for the incidence of *Taenia saginata* worm infection. Beef infected with Taenia saginata in Bone Bolango Regency, especially in North Bulango Market, was found to be positive for Taenia saginata worm infection in beef, while 12% were found positive for Taenia saginata worm infection in Bone Bolango Regency Wednesday market, 32% were found to be positive for *Taenia saginata* worm infection in Butu market [3].

The relationship between beef and *Taenia saginata* is the onset of *Taeniasis*, which results from eating raw or undercooked beef. Cattle will be infected When the air, feed, or grass is infected by *Taenia saginata* eggs, then the eggs will grow into cysts in various organs and muscles (daging) that will cause *Taeniasis disease.* when metacestodes multiply into adult worms in the human body.

Taeniasis is a type of *zoonotic* disease in Indonesia. *Zoonosis* is a disease that can be transmitted by humans or other animals.

Zoonotic Hookers entering Indonesia are *rabies, anthrax, avian influenza, salmonellosis, brucellosis, Taeniasis* is a type of *cestode* infection similar to *infectious zoonoses* [6].

In accordance with the results of his research that cattle farmers in Indonesia still lack attention to parasitic diseases. Cattle farmers still use the semi-incentive method by not paying attention to cattle to forage on their own (shepherd's way) and some are not even in the cage(traditional way). Cara cattle rearing using both methods that will be able to trigger a large outgrowth to cacing can make developments [6].

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The lack of information related to the large incidence of Taenia saginata worm infection is due to the infrequent research on the relationship of infection from tapeworms. this is because the government pays little attention to the existing programs in its area, The lack or absence of research on this case does not mean that there is no infection [23].

Due to the high percentage of endoparasite worms found in beef from the description above, researchers are interested in conducting a study entitled "Identification of tapeworms (*Taenia saginata*) in beef in Traditional Markets (Thursday-Friday) Bone Bolango Regency

Cattle are important animals for Indonesian farmers who have high economic value. Cows produce many benefits for human life includingmeat, milk, bones. Beef is one of the food needs that has high enough nutrition to be consumed. The level of meat consumption in Indonesia is still relatively low until a few years ago. The increase in population, changes in consumption patterns, and people's tastes have caused meat consumption to increase nationally since 2005. To produce quality beef, namely through the development of cattle, it needs support from various aspects, especially in sufficient animal feed, the surrounding environment and a good climate. This is because cattle are susceptible to being infected by *the Taeniasis* parasite, *Taenia saginata* [7].

Beef is one of the growth media of all microorganisms, one of which is parasites. parasites will breed in beef so that it will cause health problems in humans who consume meat that has been contaminated with parasites, as for examples of beef that is not suitable for consumption are: Sick animals especially those suffering from inflammations of an acute nature in the internal organs that will produce meat smelling like rancid butter, Animals in medicine mainly with antibiotic treatment will produce meat that smells of drugs, Abnormal meat color does not always harm health, however, it will reduce the appetite of consumers, Abnormal meat consistency characterized by a low degree of

meat chewiness (if pressed with fingers it will feel soft) may indicateunhealthy meat [26].

Basically, helminth parasitic disease is a disease that is economically detrimental. Because cows affected by this disease will experience inhibition of weight gain, worms absorb some of the food substances that are supposed to be for needs and growth, damage the tissues of vital organs of cattle, cause cows to consume less appetite for food, danger of transmission in humans [15].

Worms are animals that usually have a long tube-like body, and have no outer limbs such as hands or feet, and no eyes. Worms can also provide benefits, besides that worms can also parasitize. Parasitic worm infection is one of the most common parts of the disease that spreads and infects many humans and animals around the world, Parasites can be divided into two groups, namely: endoparasites and ectoparasites where endoparasites can be transmitted through food, that is, through poorly clean food that is easily infected with parasites[18].

Endoparasites refer to parasites that live inside their host. Most endoparasites are intestinal i.e., they live inside the intestine of the host. *Nematodes* such as roundworms, hookworms, and whipworms are intestinal endoparasites. *Worm-like trematodes* and tapeworm-like cestodes are endoparasites that live in the intestines of the host. Tapeworms belong to the subclass Cestoda, the class *Cestoidea*, the phylum *Platyhelminthes.* Adult worms occupy the intestinal tract of vertebrates and their larvae live in the tissues of vertebrates and invertebrates. The elongated body shape of an adult worm resembles a ribbon, usually dorsoventral flattened, has no digestibility or vascular ducts and is usually divided into segments called proglottids which when mature contain male and female reproductive apparatus [15].

Taenia saginata is a parasitic worm in the human small intestine, the difference with *Taenia solium* lies only in the sucker and the host is a cow. Meanwhile, *Taenia solium* has a sucking device with a hook on its scolex and its host is a pig. *Taenia* saginata causes *Taeniasis saginata* or tapeworm infection. The spread of these worms is cosmopolitan throughout the world especially in areas where residents enjoy eating raw or undercooked beef [13].

Adult worms measure 3-5 meters long, but some tails are once found that are 25 meters long. A round-shaped scolex equipped withn 4 suction vanities that protrude but have no rotelum or hook. Gravile proglotins have a uterus that branches 15-30 pieces (approximately 13 branches) on one side. The lateral genital openings are located alternately right left irregularly. The eggs measure 35 microns in diameter, the walls are relatively thick and brownish in color. The redier striped embryofor surrounds the hexakans embryo. Inside the uterus the egg is surrounded by a layer of membrane on the outside with two fine filaments at its poles that soon vanish after removing the proglotid. The larvae of *Taenia saginata* are called cysticerkus bovis, found in beef [13].

The life cycle *of adult Taenia saginata* lives in the human small intestine. Proglotid

gravid escapes from the circuit (strobila), moves out through the colon and rectum, is squeezed in the opening and can migrate to the perineum, to the legs or folds of the thigh. Sometimes proglotid gravid ruptures in the intestines, out of which eggs (approximately 100,000 grains per proglotid) can be found infeces (feces). When gravid proglotides or eggs that are at home are eaten by cows eating hexakans embryos hatch in the intestine, penetrate the intestinal wall, follow the blood circulation and are carried to the muscles of the cow. That's where it will develop into cysticercus within 8 weeks. Cysticercus bovis measuring 10 × 5 mm can be found on the tongue, diaphragm, heart, legs, ponk and other organs in cows. The larvae of this stay in cows for about a year, then they whitewash. If poorly cooked beef containing cysticercus is eaten by humans, it will freely attack the small intestine mucosa and grow into adulthood within 8-10 weeks. Only humans as definitive hosts whereas only cows as intermediate haspes. The duration of life of adult worms is more than 25 years [13].

Adult worms rarely cause noticeable symptoms, a possible complaint is pain in the epigastrium. diarrhea, unreal taste in the stomach. Proglotides can move actively, sometimes they can be found in underwear or bedding and this can cause disturbances such as confusion, disgust and others. The probability of *cysticercosis* is very small and the prognosis of *Taeniasis* is good [12].

Cysticercosis disease in animals can be suppressed by treating defenitive landladies suffering from *Taeniasis.* To prevent *Taeniasis* in humans, it can be done by avoiding eating undercooked meat, both pork and beef. Contaminated meat must first be cooked to temperatures above 56°C. In addition, freezing meat first can reducethe risk of disease transmission [12].

Prevention of *Taeniasis saginata* is to be able to cook beef until it is fully cooked Beefwill have *cysticercosis*. Eliminating the source of infection by treating and preventing soil contamination with human feces performs cooling of beef [12].

Feeding of farm animals needs to be considered. Forage from grass planted or growing wild around fields, or fields, is what makes cattle at high risk of infection by infective larvae so that the larvae can enter the body of cows or other farm animals. Lack of feed causes livestock malnutrition so that cows will be more sensitive to parasitic worm infections [19].

The type of farming is the main factor that farm animals can become infected with parasitic worms. If the cattle are kept in individual cage types, the cattle are better supervised, fights between livestock can be avoided and disease transmission. Meanwhile, livestock that are raised in groups have a higher risk of contracting diseases, especially parasitic diseases [19].

Hygiene and sanitation measures are efforts to maintain the cleanliness of the cage such as clean and dry floors, good drainage around the cage building, regular liming of the cage walls, perfect arrangement of cage ventilation and efforts that are able to fortify from the attack of various types of disease

infections. The beef cattle shed is equipped with a drain in the form of a small sewer that extends at the back of the cow's position. How to clean the manure usually pours towards the scattered cow dung so, the manure flows directly into a reservoir. The stall should be cleaned daily and the cows should be bathed daily or at least once a week. The cleaning of the stall and continued with the cow bath aims to maintain the cleanliness of the stall and maintain the health of the cow so that the cow is not easily infected by diseases [33].

Treatment, which is an effort to give medicine to sick livestock until the livestock becomes cured and produces. Drug administration should be adjusted to the instructions on the label or veterinary prescription so that nothing negative happens. For treatment in cows that have been infected can be done with broad-spectrum deworming drugs such as *levamisol, piperazine, albendazole, and panacur.* The first treatment is carried out 3 weeks after the arrival of the rainy season, then repeated with an interval of 6 weeks until the onset of the dry season. *Valbazen* can also be given medicine mixed with drinking water. Administration of this drug is carried out once every 4-5 times a month. In case of trematode infection, recommended drugs such as clorsulon [14].

Thinking, that is, the act or effort of separating livestock that is no longer productive. This business is one of the handling of unproductive livestock from livestock that are still productive [14].

Extermination is the health care of livestock, especially cattle in a population that experiences a very dangerous and contagious disease by being killed and then burned or buried so that the disease does not spread to other livestock [14].

The sedimentation method uses a solution with a lower specific gravity of parasitic organisms, so that the parasites can subside, Prepare tools and materials, Take 3-4 drops of fecal / meat concentrate, put it in a test tube and add *NaC*l 0.9% to 2 or 3 tubes, then covered with a cotton swab, Centrifuge at a speed of 2000 rpm for 10 minutes Formed 2 layers, namely clear layers and precipitate, disposed of clear parts by means of rapidly pouring test tubes and the precipitate is checked, Making the preparation by taking 1 drop of the material and added *0.9% NaCl*, homogenized and covered with a glass cover, Checked under a microscope with a magnification of 10x and 40x [17].

METHODS

This research uses a qualitative approach. because this study identified whether there was a tapeworm (*Taenia saginata*) in beef sold at the Traditional Market (Thursday-Friday) of Bone Bolango Regency. The type of research used in this study is descriptive research. Descriptive research is a type of research whose purpose is to get a complete picture of an object under study. This study was to determine whether there was a tapeworm infection (*Taenia saginata*) found in beef sold at the Traditional market (Thursday-Friday) of Bone Bolango Regency.

The types of data used in this study are primary and secondary data, the primary data

in this study are the results of the examination of *Taenia saginata* worms on beef at the Microbiology Laboratory of Bina Mandiri University Gorontalo while secondary data were obtained from literature, atlas parasit, and data of previous researchers.

The data obtained were analyzed descriptively, namely describing the morphological characteristics of the Taenia saginata worm based on mycrysoscopic observations then continued with identification activities to identify by matching the characteristics of the *Taenia saginata* worm obtained from the observation results by referring to the identification book.

As important as the position of data in research is important, ensuring the correctness of data is also a job that should not be ignored by a researcher. Good and correct data will determine the results of a good and correct study. Conversely, erroneous data (doubtful of its veracity) will reduce the degree of trustworthiness of a research result. There are 4 (four) criteria for the validity of data in a study, namely; degrees of *credibility*, *transferability*, *dependability* and *confirmability*. The following describes some of the techniques used in this study to check the validity of the data

Examination of the validity of data through triangulation techniques in this study the author conducted by comparing data obtained from several sources through semi-structured interviews (source triangulation); comparing data from participatory observations, semi-structured interviews and documentation (triangulation techniques/methods); comparing several theories that are directly related to the research problem (triangulation theory).

The three triangulation techniques researchers carried out to check and re-ascertain the validity of the data that had been collected, namely by conducting direct interviews with beef sellers at the Bone Bolango Regency Thursday Friday market and comparing the results of the interviews with the results obtained when conducting identification in the laboratory.

The adequacy of references in this study was carried out by collecting as many data sources as possible through several sources (human sources); literature books, scientific papers and research reports (sources of materials) related to research problems. With the adequacy of this reference, the researcher can explain the resulting data. The more sufficient references collected into research data, the research results can be believed to be correct and guaranteed validity. With the adequacy of references, a researcher can explain well the data generated from the research he conducts, with which the research results can be believed to be correct and guaranteed the validity of the data.

Through this technique, researchers report the results of their research in detail, carefully and meticulously in order to be able to describe well and correctly the context of the research carried out. The description of the research context that the researcher describes in detail is expected to be able to build *transferability* between the researcher (in the context of the sender of the message in the

form of a research report) and the reader (the context of the recipient of the message).

RESEARCH RESULTS

Table 1. Results of microscopic observations of Thursday and Friday Market samples

No	Sample Code	Research Results				Types of worms
		Thursday Market		Friday Market		
		Positive	Negative	Positive	Negative	
1	Sample 1	√				*Taenia saginata*
2	Sample 2	√				*Taenia saginata*
3	Sample 3	√				*Oesophagustomum sp*
4	Sample 4	√				*Cooperia sp*.
5	Sample 5	√				*Oesophagustomum sp*
6	Sample 6			√		*Cooperia sp*.
7	Sample 7			√		*Cooperia sp*.
8	Sample 8			√		*Oesophagustomum sp*
9	Sample 9			√		*Taenia saginata*
10	Sample 10			√		*Taenia saginata*

Sumber: Data Primer, 2022.

Based on microscopic results carried out from 10 samples, the results of 4 samples identified by *Taenia saginata* worm s were in samples (1,2,9 and 10) while the other 6 samples identified other worms, namely *Oesophagustomum* sp and *Cooperia sp*. worms.

DISCUSSION

This study used a sample of 10 samples. Sample examination is carried out by the sample sedimentation method which is tested using the inner beef in cows after sampling, the sample is put into plastic then the sample below to the laboratory for examination.

The first step taken by the researchers was to cut the meat of the inner part into small parts, then the meat was mashed using a pestle lumpang, after being mashed the sample was put into a test tube and a 0.9% NaCl solution was added to easily identify the worms in the sample, after being put into a test tube and a 0.9% NaCl solution was added then in a centrifudge at a speed of 2000 rpm for ±10 minutes. after that take one drop then placed on the object glass and closed using a *glass cover*. then the sample is placed under a microscope using weak magnification (10×) and strong magnification (40×).

Worm Identification Results

The results of the identification of Taenia saginata worms in the inner beef were found to be 4 samples identified as *Taenia saginata* worms from 10 samples studied. While 6 samples identified worms but not *Taenia saginata*, but other types of worms namely *Oesophagostumum* and *Cooperia sp*.

Taenia saginata was found in the sample (1,2,9,10) using a magnification of 40x the worm has the characteristics that there is a round *scolex*, elongated flattened shape with a length of ±8 mm, and there are *Proglotides* (Body segments).

This is in line with the research carried out, namely the description of *Taenia saginata* in beef shows that the existence of tapeworms in humans has been known for a long time. The association of adult tapeworms with *metacestodes* in cattle has been shown to successfully infect *gravid proglotides* in beef [9].

Based on the results of previously conducted researchon beef, it was found that the presence of *Taenia saginata* worms which have characteristics, namely a segmented body, having a scolex (head), Proglotid (Body segment) [1]. Research in several regions shows the prevalence of Taenia saginata in North Sumatra is around 65%, Papua 58%, Bali 53%, Sulawesi around 25% beef infected with *Cestoda* class worms, which often infect livestock, especially cattle, *namely Taenia saginata.* This worm is a *Cestode* that can infect the host through food, for example through grass or drinking water containing parasite eggs and this worm can also cause *Taeniasis* disease if accidentally consumed by humans.

The disease caused by Taenia saginata is Taeniasis, Taeniasis is a parasitic infection that is commonly found throughout the world *Taeniasis* is a parasitic disease in the form of tapeworms belonging to the genus *Taenia* which can be transmitted from human animals or from humans to animals. *Taeniasis* in humanscaused by the species Taenia saginata also known as the pitasapi worm, The disease can affect humans and, often found in people who have the habit of consuming raw or undercooked meat and can contain *Taenia saginata* in humans [2].

In the sample (3,5,8) obtained Oesophagustomum worms using 40x magnification, the worms have the characteristics of being elongated flattened, and those with heads, and there are capsule cores have a size of ± 10 mm, this is in line with previous studies that the average size of adult *Oesophagustomum* worms is 13.8 – 19.8 mm [21]. Infection by the worm *Oesophagustomum sp*. characterized by the presence of *nodule* or nodules Clinical symptoms due to infection with this worm the animal becomes thin, feces are black, soft mixed with mucus. In chronic circumstances, cows show diarrhea with blackish stools, decreased appetite, thinness, *hypoalbuminemia* anemia and *hypoproteinemia* [26].

Then in samples (4,6,7) researchers found *the Cooperia sp*. worm. using a magnification of 40x the worm has the characteristics of an elongated flat shape marked by the presence of a body enlargement in the vulvar area (Fluff) and there are fine feathers on the edges, having a size of ±13 mm.

Cooperia sp. is the dominant endoparasite infecting cows this worm is brownish in color. The length of the male worm is 5-9 mm with a spiculum with a length of 240-300 mm. The female worm is 6-8 mm with marked enlargement of the body in the area of the vulva. In cows after examination, the cow is infected with *Cooperia sp*. Single helminth infection *Cooperia sp.*, found in cattle (cattle, sheep, buffaloes). This is due to the age of cows that are still fairly young so that they are easily infected with *Cooperia sp eggs.* Symptoms of infection in cattle include diarrhea, weakness, anemia, dehydration, and weight loss [4].

CONCLUSION

Based on this study, it was concluded that the results of the identification of Taenia saginata worms in beef sold at the Traditional Market (Thursday-Friday) of Bone Bolango Regency found 4 positive samples of Taenia saginata worms, while 6 other samples were identified as positive for *Oesophagustomum* and *Cooperia sp*. worms.

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