

PREVALENCE OF ECTOPARASITES IN CATTLE IN THE PAYAKUMBUH LIVESTOCK MARKET

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ABSTRACT

This study aims to determine the prevalence of ectoparasites infestation in cattle at the Payakumbuh Livestock Market. This research was conducted in August 2022. A total of 158 cows were randomly selected to be examined for ectoparasites at the Payakumbuh Livestock Market. Examination of ectoparasites using the permanent mounting method without staining. This study used a descriptive non-experimental design to obtain data on the incidence of ectoparasitic infestation in cattle at the Payakumbuh Livestock Market. the 158 cows examined, 85 of them were positive for ectoparasites on the outside of the body with a prevalence of 53.8%. Type of ectoparasites in the form of ticks *Dermacentor sp.* (50.63%) and *Boophilus sp.* (13.92%). Ectoparasites were found to be highest in cattle aged >8 years, the prevalence reached 100% compared to the young cattle group of 56.36%. The highest prevalence of ectoparasites in cattle at the Payakumbuh Livestock Market is the type of *Dermacentor sp.* which is a class of hard ticks (Ixodidae) which can interfere with the health of livestock. It is recommended that livestock take preventive measures so that the level of ectoparasitic infestation can be significantly reduced.

Key words: Cattle; Ectoparasites; Livestock Market; Payakumbuh

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INTRODUCTION.

Cattle are large ruminant livestock that have the potential to produce meat, milk, bones and skin which have high economic value (Ritonga, 2018). Cows produce around 50% of the world's meat needs, 95% of milk needs and 85% of skin (Prasetya, 2012). Raising cows cannot be separated from various kinds of obstacles and obstacles, including the presence of ectoparasites. Economic losses arising from ectoparasitic infestations are emaciation, decreased endurance, and slow growth which will reduce meat production, body weight and selling value of livestock (Manggi, 2014).

According to their predilection, parasites can be classified into two groups, one of which is ectoparasites. Ectoparasites are parasites outside the host's body that obtain food from the host on the surface of the skin by sucking blood and body fluids (Fthenakis and Papadopoulus, 2018). Ectoparasite infestation can have direct or indirect impacts. Indirect impacts, animals can experience hair loss, pruritus, alopecia and skin irritation, while direct impacts animals experience anemia, stunted growth and can even cause sudden death (Yadav, 2017).

Ectoparasites that infest cattle are mites, fleas, ticks and flies. The flea group is *Haematopinuseurysternus*, *Haematopinustuberculatus*, *Damaliniabovis*. The tick group is often found *Boophilusmicroplus*, *Haemaphysialis*, *Rhipicephalussanguineus*, *Amblyoma americium*. The mite group was found *Sarcoptescabiei*, *Psoroptessp*, *Chorioptes*, *Oribatid mite*, and *Demodexbovis*. In the fly group found *Simuliumsp*, *Cullicoides*, *Stomoxyscalcitrans*, *Haematobiaexigua*, *Muscadomestica*, *Chrysomiabezziana*, *Hippoboscasp*, *Tabanussp*, *Chrysopsjavana*, *Haematopota truncate* (Hadi, 2013).

The City of Payakumbuh has a livestock market which is the center for livestock trade for Limapuluh Kota Regency, Payakumbuh City and other areas such as Tanah Datar Regency, Agam Regency and Padang Panjang City (Sujatmiko et al, 2020). Generally, there are

three types of livestock that are traded at the livestock market, namely cows, buffaloes and goats (Madarisa, et al, 2012). The livestock market can be used as an indicator of the prevalence of disease in an area because of its function as a place where livestock from various regions gather to be traded.

RESEARCH METHODS

The sample used was 158 cows taken randomly from the Payakumbuh Livestock Market. The materials used in this study were 70% alcohol, 10% KOH, xylol, alcohol (30%, 50%, 70%, 96%), aquades, and Canada balsam. The tools used in this study were specimen pots, magnifying glass, tweezers, scalpels, hair combs, gloves, masks, tissues, water bath, petridic dishes, object glass, cover glass, stereo microscope, optilab, pipette, needle and cloth.

The research design used was a descriptive non-experimental design. Descriptive research to obtain data on the incidence of ectoparasite infestation in cattle at the Payakumbuh Livestock Market (Murtidjo, 1994). Samples were taken randomly without considering certain criteria and did not see clinical symptoms. In this study, the sample used was 158 cows from the Payakumbuh Livestock Market. Ectoparasite samples were collected during the day using tweezers or combing using a hair comb sequentially starting from the head, neck, back, stomach or abdomen, inner thighs and legs. The collected samples were put into a bottle containing 70% alcohol and labeled with the species of cow, body parts, age of the cow, sex. The collected samples were observed and identified at the Animal Disease and Health Laboratory of the Payakumbuh State Agricultural Polytechnic. For the manufacture of preparations using the permanent mounting method without staining (Hastutiek et al., 2015). Collected ectoparasites were clarified by immersing them in 10% KOH solution for 30 minutes. Then, the ectoparasites were placed on an object glass and observed using a microscope. These preparations were

observed and photographed with a digital camera. Furthermore, dry preservation was carried out, namely by storing the ectoparasites specimens in a dry state in a glass preparation. The cleared ectoparasites were then sterilized using a spirit lamp. The clear sample is placed on the object glass. Then dripped with Hoyer's solution and covered with a cover glass. After that the object is put into the oven with a temperature of 400C until it is completely dry and the edges of the cover slip are given nail polish. Identification is done by giving identity to the specimen according to the taxonomic order, then grouping is determined based on order, family and genus. Species that have been photographed and observed under a microscope are then identified to determine their type (Irsya et al., 2017).

The data obtained will be analyzed using the prevalence formula to obtain the prevalence rate of ectoparasites in cattle at Table 1. The level of ectoparasites infestation at the Payakumbuh Livestock Market by type of ectoparasites

Type of ectoparasiter	Positive (%)
<i>Dermacentor</i> sp	80 (50,63)
<i>Boophilus</i> sp	22 (13,92)

The results showed that the ectoparasites found in cattle at the Payakumbuh Livestock Market were *Dermacentor* sp, and *Boophilus* sp. which is a genus of the Ixodidae family or a group of hard fleas, but no other types of ectoparasites were found such as flies, mosquitoes, mites and fleas because the cows sold at the Payakumbuh livestock market routinely spray ectoparasites. This is also supported by Syahroni's research which reported that more than 61.0% of cattle in Indonesia were infested with various types of hard ticks. In local Aceh cattle at BPTU-HPT Indrapuri, 500 Acehnese cattle were also found to be

the Payakumbuh Livestock Market. Cattle that are positive on examination are calculated using the prevalence formula as follows (Murtidjo, 1994):

$$P = \left(\frac{na}{nr} \right) \times 100 \dots (1)$$

P = Prevalence
NA = Number of Infected Animals
NR = Number of Animals at Risk) x 100%.

RESULTS AND DISSCUSION. Ectoparasite Infestation Rates Based on the Type of Ectoparasites

The results showed that out of 158 bulls and cows at the Payakumbuh Livestock Market, it was found that 85 cattle were positive for ectoparasites on the outside of the cow's body with a prevalence of 53.8%. The types of ectoparasites that infest cows at the Payakumbuh Livestock Market can be seen in table 1.

infested with Ixodidae ticks, with an overall prevalence of 47.6%. (Leliana, 2015).

Based on the abundance of species, the most dominant tick is *Dermacentor* sp. (50.63%). This shows that this genus is the most widely distributed in cattle in the Payakumbuh Livestock Market. This is because the cattle at the Payakumbuh Livestock Market come from various areas in West Sumatra which have a tropical climate and have a large area of pasture which is very suitable for the development of parasites such as ticks. Subroto (2006) states that tropical areas that have high humidity and sunlight that is unable to penetrate trees are factors that support the development of larvae, including ticks.



Figure 1. Ectoparasites in Cattle. *Dermacentor sp.* (a) and *Boophilus sp.* (b)

Based on the picture, it can be seen the differences in the morphology of the two genera of ticks. On *Dermacentor sp.* The body consists of the cephalothorax and the abdomen has four pairs of legs, each consisting of six segments, the capitulum consists of the base of the capitulum and the mouth, the mouth consists of the hypostoma, chelicera and pedipalps. The male scutum tick covers the entire dorsal surface, the female only anteriorly (Dryden et al, 2008). *Boophilus sp.* has an ornament

on the scutum and does not have a festoon. The base of the capituli is hexagonal in shape. This tick has a short hypostoma, the lateral part of the scutum there are eyes, and on the first pair of legs there is a gap. Male ticks have adanal and accessory plates. This genus consists of 5 species (Harwood and James 1979).

Ectoparasite Infestation Rates Based on Gender.

Ectoparasite infestation rates by sex can be seen in table 2.

Table 2. The level of ectoparasitic infestation in cattle at the Payakumbuh Livestock Market by sex.

Sex	Positive (%)	Negative (%)	Number of cattle
Female	63 (55,26)	51 (44,74)	114
Male	22 (50,00)	22 (50,00)	44
			158

Based on table 1, the highest level of ectoparasitic infestation was found in female cattle (55.26%) and male cattle, 50% of the total cattle examined. A study by Rustam et al (2018) showed that the prevalence of *Boophilus sp.* tick infestation in female bali cattle was higher than male bali cattle with a prevalence rate of 8.1% in female cattle and 6.9% in male cattle but not significantly different ($p > 0.05$) this is because bulls and cows are placed in the same place so that the transfer of ticks from infested livestock to healthy livestock is very easy. Konore's research (2019) also reported that the livestock most infested with ticks were female cattle with an average of 4.38 ticks/cow, while bulls had 3.33 ticks/cow in terms of the number of tick infestations per cow.

There is a very close relationship between sex, age, maintenance method and environment for tick infestation in cattle. High levels of prolactin and the hormone progesterone make female livestock more susceptible to parasite infestations. Female cows experience more stress than bulls. The processes of pregnancy, childbirth and lactation cause increased stress on livestock. These stress factors cause hormonal changes and hormonal imbalances (Kaur et al., 2015).

Ectoparasite infestation rates by age group.

The percentage of ectoparasitic infestation levels in cattle at the Payakumbuh Livestock Market based on the age of the cattle can be seen in table 3.

Table 3. The level of ectoparasitic infestation in cattle at the Payakumbuh Livestock Market based on the age of the cattle.

age	Number of cattle	Positive (%)	Negative (%)
≤ 1 year old	55	31 (56,36)	24 (43,64)
> 1 to ≤ 2 year old	41	21 (51,22)	20 (48,78)
> 2 to ≤ 3 year old	42	20 (47,61)	22 (52,39)
> 3 to. ≤ 4 year old	9	8 (88,89)	1 (11,11)
> 4 to ≤ 5 year old	4	2 (50,00)	2 (50,00)
> 5 to. ≤ 6 year old	3	1 (33,33)	2 (66,67)
> 6 to ≤ 7 year old	2	1 (50,00)	1 (50,00)
> 7 to ≤ 8 year old	0	0 (0,00)	0 (0,00)
> 8 to ≤ 9 year old	1	1 (100)	0 (0,00)
≥ 10 year old	1	1 (100)	0 (0,00)
Cumulative 0-2 year old	96	52 (54,17)	44 (45,83)
Cumulative > 2 year old	62	34 (54,83)	28 (45,16)

Old cattle aged > 8 years have the highest prevalence (100%) when compared to young cattle < 2 years and mature cattle (> 2-8 years). Similar to the research conducted by Rony et al. (2010) which showed that old cattle with an age range of > 8 years had the highest prevalence rate of tick infestation. This study also shows that young cattle are also susceptible to tick infestation ≤ 1 year old with a prevalence of 56.36%. This is also supported by research by Kaur et al. (2015) for young cattle < 1 year, the prevalence of tick infestation was Table 4. The level of ectoparasitic infestation in cattle at the Payakumbuh Livestock Market by type of livestock.

breed	Number of cattle	Positive (%)	Negative (%)
Bali	2	2 (100)	0 (0,00)
Brahman	2	1 (50,00)	1 (50,00)
Angus	2	0 (0,00)	2 (100)
Madura	2	2 (100)	0 (0,00)
Limousin	20	10 (50,00)	10 (50,00)
Pesisir	15	12 (80,00)	3 (20,00)
PO (Peranakan Ongole)	6	3 (50,00)	3 (50,00)
Simmental	109	55 (50,45)	54 (49,55)

The highest ectoparasitic infestation was found in Bali cattle with a prevalence rate of 100% from 2 cows examined, this number is not sufficient to represent the prevalence rate of ectoparasites in cattle. Research by Patodo et al. (2018) the prevalence of ectoparasites in Bali cattle was only 7.7% of the 300 cattle examined. The Payakumbuh Livestock Market mainly markets Simmental cattle, and the number of samples for other types of cattle is still uneven so that the samples obtained based

recorded at 77.71%. Host age has a significant effect on infestations of ticks and other ectoparasites. The underdeveloped immune system in young cattle is also a contributing factor to the high rate of tick infestation in livestock (Mamun, et al., 2010).

Ectoparasite infestation rates by type of animal

The percentage of ectoparasitic infestation levels in cattle at the Payakumbuh Livestock Market by type (breed) of cattle can be seen in table 4.

on the type of cattle are not evenly distributed, therefore conclusions cannot be drawn on the level of ectoparasitic infestation based on the type of cattle.

Ectoparasite infestation rates based on predilection

Ectoparasites in livestock can be found on the head, neck, back, stomach, groin, legs and tail of livestock. The level of infestation based on predilection can be seen in the graph.

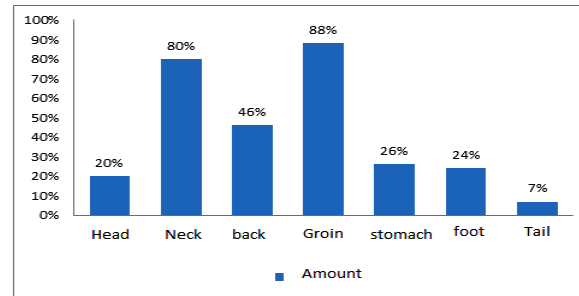


Figure 2. Ectoparasite infestation rates based on predilection

The research results obtained at the Payakumbuh City Livestock Market showed that ectoparasites were found in all parts of the cow's body, but the groin area was the part that had the most ectoparasites as much as 88% while the tail part was the part that was the least infested with ectoparasites as much as 7%. This study did not count the number of ectoparasites that infested body parts. Ticks are a type of ectoparasites found in cattle at the Payakumbuh Livestock Market. Research by Konore et al (2019) showed that the highest tick infestation was in the groin with an average of 5.63 ticks/cows in Pinabetengan Village, Tampaso District, Minahasa Regency and there were no tick infestations on the head. The research by Patodo et al (2018) also showed that the inner thigh is the most preferred part of ticks in cattle in Tolok Village, Tampaso District, Minahasa Regency with an average of 6.70 ticks/cow and 1.11 ticks/cow on the legs. The high infestation of ticks on the inner thighs is because this part is a moist part and the shelter for ectoparasites from their hosts. Ticks have moisture, chemical and mechanical receptors. The ability of chemical receptors causes ticks to be able to detect blood chemistry which is a food source for ticks so they are able to find the

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right place to infest, while the mechanical function is in the form of the tick's ability to find shelter from outside disturbances (Hadi and Soviana, 2000). Fielden and Rechav (1994) also stated that ticks require a thin skin section and a protected area on the host to facilitate the process of sucking blood.

Few ectoparasites were found in the tail because this part is free and open for tick predators such as ants and the outside is visible so that breeders can easily clean the visible ectoparasites. Barnet (1968) states that the fire ant (*Pheidolemegachepala*) is a predator that can prevent the larvae from climbing onto the cow's body by eating them and interfere with the blood-sucking process by ticks in the cow's body.

CONCLUSION

Based on the results and discussion of the study, there are several things that can be concluded that the highest prevalence of ectoparasites in cattle at the Payakumbuh Livestock Market is the type of *Dermacentor sp.* which is a class of hard ticks (Ixodidae) which can interfere with the health of livestock. It is recommended that livestock take preventive measures so that the level of ectoparasitic infestation can be significantly reduced.

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