

Prevalence and Scabies Severity Rate on a Goat at Mempawah Hilir, Mempawah District West Kalimantan Province

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Abstract

This research aims to determine the prevalence and severity rate of scabies on goats in Sub-District of Mempawah Hilir, Mempawah, West Kalimantan. The goat livestock used were not determined by age, sex, and breed. The number of goats researched was 100 goats. Scabies prevalence measurement was to divide the number of scabies goats by total goats, then multiplied by 100% and measurement of the severity rate of scabies goats with scoring with grades 1-3 (low), 4-6 (moderate), and 7-9 (heavy). The results obtained scabies prevalence rate of 38% with 38 positive samples from a population of 100 goats and the percentage of severity was 42%, moderate 24%, and 34% severe. This is due to weather factors in the area and the type of cage as well as inadequate maintenance management, thus making many cases of scabies attack goats.

Keywords: prevalence, severity, goats, scabies, Mempawah Hilir, skin disease.

Introduction

Goats are one of the small ruminants that are often affected by scabies. Scabies is a skin disease caused by *Sarcoptes scabiei* (*S. scabiei*) in animals that can cause dermatitis or cause infection in animals that causes damage to the affected skin and causes anxiety in animal sufferers (Iskandar, 2000). Scabies is even zoonotic or can attack humans and is associated with the immune system (Lastuti *et al.*, 2018). According to Orisa *et al.*, (2014) stress is one of the factors that can cause goats to be susceptible to disease, the stress factor is due to the density of the population in livestock that are placed in one cage, decreased feed quality and unhygienic dirty cages, if left unchecked the impact from stress can slowly kill farm animals. Goats that are never bathed, brushed, and their cages are never sanitized and cleaned can facilitate transmission between cattle infected with scabies to healthy livestock (Andoko and Warsito, 2013).

Transmission of *S. scabiei* can occur if there is direct contact with larvae, nymphs, and fertile female mites either from the skin surface directly or from objects infected with *S. scabiei* (Sasmita *et al.*, 2005). Morphologically, the most sensitive part of scabies attack is the ear,

because the layer of the earlobe is a relatively thin skin and not much covered with hair so that *S. scabiei* mites easily live and breed (Eleser *et al.*, 2005).

According to a report from the Department of Agriculture, Food Security and Fisheries of Mempawah District, scabies cases in Mempawah reached 246 cases from March 2017 to May 2020 and reached the highest case in 2020 with 114 cases, 2017 was 76 cases, 2018 reached 31 cases, and in 2019, there were only 25 cases of scabies. The Department of Agriculture, Food Security and Fisheries of Mempawah District explained that the population of goats in Mempawah Hilir Sub-District in December 2019 had reached 1435 heads.

This study was conducted to determine the prevalence of scabies and the level of the severity of scabies in goats in Mempawah Hilir Sub-District, Mempawah District. The results of this study are used as data as information to determine the right method of prevention and treatment control in cases of scabies.

Materials and Methods

This research is an observational study with laboratory exploration followed by SPSS



analysis with tree regression method. The variables observed in this study were goats with no specified age, sex, and breed of goat. Sampling was carried out in the Mempawah Hilir Sub-District, Mempawah District which included 3 Villages, namely Terusan Village, Tengah Village, Tanjung and 5 Villages, namely Pasir Village, Sengkubang Village, Malikian Village, Penibung Village, and Kuala Secapah Village. Sample examination was carried out at the Parasitology Laboratory of the Faculty of Veterinary Medicine, Universitas Airlangga. Severity rate is a measure of the severity of scabies in goats which can be seen from clinical symptoms, namely crusting and alopecia in several body regions.

Research Procedure

Sampling was randomly divided into 5 villages. The positive goats were scraped using a sterile scalpel, the scabs on the goat skin were scraped until they bleed, then the scrapping samples were put into a petri dish containing 0.9% sodium chloride for microscopic examination. The results of scrapings that have been clarified with 10% KOH solution, then placed on an object glass, then covered with a cover glass and examined under a microscope on 40 to 100 magnifications. The results were declared positive if the morphology of the *S. scabiei* was found and the results were declared negative if the *S. scabiei* was not found (Soulsby, 1986).

Research Materials and Tools

This study uses materials and tools, including: 0.9% sodium chloride, 70% alcohol, and iodine tincture, gloves, cotton, petri dishes, scalpel, pipette or disposable syringe, object glass, cover glass, and a microscope.

Data Analysis

according to Davis et al, (2013), there is no standard way to describe the severity of a scabies crust or scab. However, a clinical rating scale has been developed using a scale to determine the severity of the infestation according to the grade grade 1, 2, or 3 indicating mild, moderate or severe severity based on the distribution and extent of crusting, crusting thickness, history of disease occurrence, and skin condition. In this study, the severity was assessed based on the division of the body region by taking into account the clinical symptoms such as alopecia and crusting. The distribution of grades/levels and scores is as shown in Table 1.

Result and Discussion

The prevalence rate of scabies in goats in Mempawah Hilir Sub-District, Mempawah District was 38% with 38 positive samples from a total population of 100 goats. Goats experience clinical symptoms of scabies in the form of crusts on the facial region which includes the mouth, nose, eyes and ears, as well as alopecia and crusts are also found in the leg region which includes the forelegs and hind legs. The results of the clinical examination can be seen in Figure 1.

Table 1. Scabies Severity Scoring (Davis et al, 2013)

Body region	Clinical symptoms	Score
1. Facial region (mouth, nose, eyes and ears)	1.1 There is mild alopecia (0-1 cm)	1
	1.2 There is severe alopecia (>1 cm)	2
	1.3 There is treatment (crust)	3
2. Foot region (front and hind legs)	2.1 There is mild alopecia (0-1 cm)	1
	2.2 There is severe alopecia (>1 cm)	2
	2.3 There is treatment (crust)	3
3. Body region (in areas other than face and feet)	3.1 There is mild alopecia (0-1 cm)	1
	3.2 There is severe alopecia (>1 cm)	2
	3.3 There is treatment (crust)	3



Figure 1. Clinical examination of scabies goats, including the face and extremities.

Microscopic examination of goat skin scraping shows the presence of *S. scabiei* which grows and breeds on the surface of goat skin, resulting in scabies which can be seen in Figure 2. The results of goat skin scraping which has clinical symptoms of scabies in various stages of development of *S. scabiei* seen in Figure 3.

The results of the assessment of the severity of scabies crusts based on the division of the goat's body region with crusts and alopecia, 38 samples of goats obtained positive results. The percentage of severity is classified as mild 45% with clinical symptoms only found alopecia and crusting in the facial region which includes the mouth, nose, eyes, and ears. The percentage of moderate severity is 21%, with clinical symptoms of alopecia and crusting in the facial region and accompanied by the goat's leg region as well as the front or hind legs. As for the severity group, it is classified as severe because there is alopecia and crusting in the facial region, leg region, and body region with a percentage of 34%. The severity of scabies in this study is shown in Figure 4.

Clinical symptoms with mild severity in the form of crusting and alopecia in the facial region which includes the area of the mouth, eyes, nose, and ears. Goats with moderate severity have clinical symptoms, namely alopecia and crusting in the face and body regions of goats experiencing alopecia. In addition, there is also a severe severity level that has clinical symptoms of crusting and

alopecia on the face, legs (forefoot and hind legs), and on the body area of the goat's body.

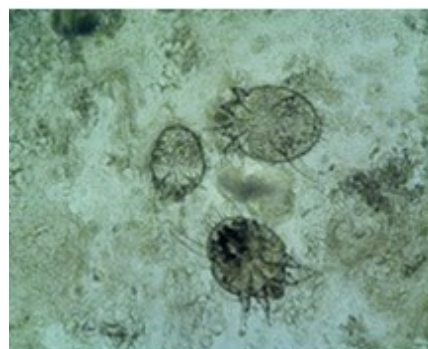


Figure 2. *Sarcoptes scabiei* was seen on the results of native skin scrapings under a microscope with a magnification of 100x.

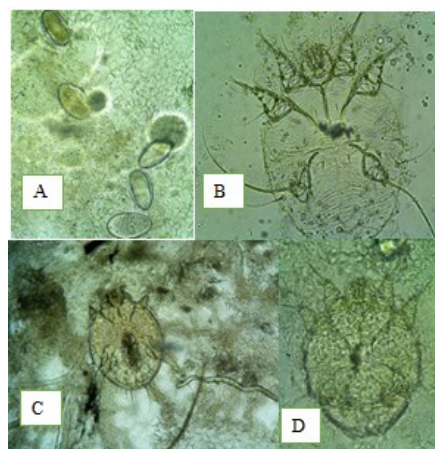


Figure 3. The results of skin scrapings showed that *S. scabiei* was in the developmental stage (a) eggs; (b) larvae; (c) nymphs; (d) adult.



Figure 4. The severity rate of goat scabies is (a) mild, (b) moderate, (c) severe: 1) the facial region has crusting, 2) the leg region has crusting, alopecia, and hypersensitivity, 3) the extremity region has alopecia and crusting.

The spread of scabies lesions in goats, seen from Figure 5 has the most spread around the ears. The places of spread of the highest number of lesions were consecutively on the front legs, eyes, hind legs, nose, dorsal body legs, mouth, and finally the lesions with the fewest lesions were on the ventral body of the goat.

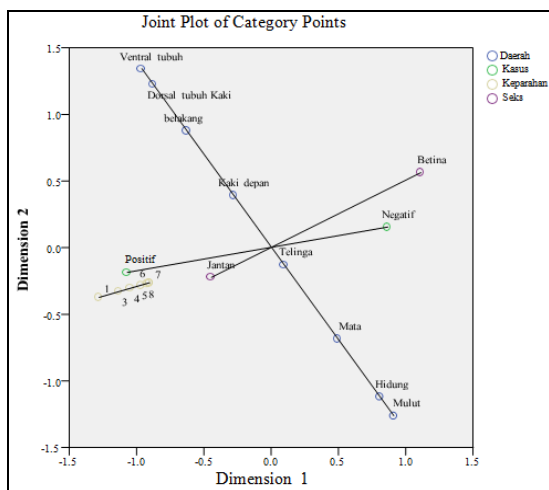


Figure 5. Diagram of the spread of scabies lesions in goats

The results showed that the prevalence rate of scabies in goats in Mempawah Hilir Sub-District, Mempawah District, West Kalimantan Province was 38% with 38 positive samples from a total of 100 samples taken randomly. In accordance Handoko (2001) macroscopic

examination is very necessary because clinical examination is the basic examination to diagnose the presence of *S. scabiei* in crusts and microscopic examination is carried out with a magnification of 40-100 times. Diagnosis through clinical symptoms of scabies needs to be done differential diagnosis. In some cases, the differential diagnosis of scabies resembles that of systemic lupus erythematosus, bullous pemphigoid, Langerhans cell histiocytosis, urticaria pigmentosa, and seborrheic dermatitis. Crusted scabies can also mimic psoriasis (Heukelbach and Feldmeier, 2006). Goats found clinical symptoms of alopecia, erythema, papules, scabies crust formation or hyperkeratosis and pruritus or itching in the hump, neck, forehead and head area. This symptom is a common clinical symptom in cases of scabies in goats (Kumar *et al.* 2014). Ahmad (2004) reported that *S. scabiei* can live at a temperature of 20–30°C with a humidity of 40–50%. Hartati (2001) also reported in his study that low ambient temperatures of 20–22°C, fairly high rainfall (1918 mm/year) and high humidity are good places for the growth of mites. This is supported by the weather conditions in Mempawah Hilir Sub-District, Mempawah District according to the Meteorology, Climatology and Geophysics Agency of West Kalimantan Province (2019), Mempawah Hilir Sub-District has an average air temperature of 21 °C and has an average rainfall of 338.5 mm and rainy days an average of 17 days per month. Poor sanitation and environment are also suspected to be the main factors in the transmission of this disease. This is in accordance with that reported by Marimuthu *et al.* (2015) that the transmission of mites that can be transmitted quickly is through direct contact between goats with one another. The severity level was classified as mild, amounting to 16 of 38 positives. The level of severity classified as moderate is 9 goats while the sample classified as severe severity is 13 goats. Alopecia and crusting characterize the clinical symptoms of scabies, according to Davis *et al.*, (2013) the scabies score is divided into 4 components, namely the distribution and area of crusts, crust thickness, history of disease occurrence, and skin conditions and the percentage of scabies crusts. The course of scabies according to Morsy *et al.*, (1989) is divided into 4 phases, namely the first phase, occurring 1-2 days after infestation. The first phase of the mite begins to penetrate the epidermis layer causing the skin surface to have

many small holes. The second phase, *S. scabiei* is under the keratin layer, the skin surface has been covered by a thick crust / scab. Hair loss occurs in the second phase and occurs after 4-7 weeks of infestation. The third phase the crusts begin to peel, so that on the surface of the skin it repeats itself which causes small holes in the epidermis layer. This last phase occurs 7-8 weeks after the infestation, it appears some mites leave the scars of the hole.

Conclusions

The prevalence rate of scabies in goats in Mempawah Hilir Sub-District, Mempawah District was 38%. The severity rate of scabies in goats in Mempawah Hilir Sub-District, Mempawah District was divided into 3, namely the severity level, namely mild, moderate, and severe. The percentage of mild severity was 45%, moderate severity was 21%, and severe severity was 34%. Regular counseling and assistance to farmers in order to further improve the management of goat rearing, so that they pay more attention to cage sanitation and management, as well as environmental cleanliness around the cage. The importance of the presence of veterinarians and paramedics to be placed in the area due to the lack of veterinarians and paramedics is also a factor in the high incidence of a disease, especially scabies in Mempawah Hilir Sub-District, Mempawah District, West Kalimantan Province.

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