

# Prevalence of Ringworm in Dairy Cows at Baturraden Indonesia

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**Abstract.** Ringworm is one of the forms of zoonotic dermatitis caused by dermatophyte fungus that can be suffered by dairy cows. The disease usually does not cause death; however, it can decrease the productivity of dairy cows. This study aimed to determine the prevalence of dermatitis in dairy cows at BBPTUHPT Baturraden, Indonesia. This retrospective study was based on medical record data from January–October 2021. Cows were diagnosed with ringworm if they show any clinical symptoms of grayish-white lesions or dark round-shaped patches with crusts, scales, hyperkeratosis, and alopecia of various sizes. The data obtained were analyzed descriptively. The results showed that cases of ringworm in January–October 2021, had occurred in 114 out of the 1,099 dairy cows. Ringworm occurred throughout the year, and the 3 months with the most cases are March (36 cases), February (18 cases), and September (15 cases). To conclude, ringworm occurred in dairy cows at BBPTUHPT Baturraden, Indonesia from January to October 2021 with a prevalence of 10.4%.

**Keywords:** Baturraden, dairy cow, ringworm

## 1 Introduction

Ringworm is a zoonotic skin infection of the crusty tissue caused by dermatophytes. The three genera of dermatophytes fungi are *Microsporum*, *Trichophyton*, and *Epidermophyton* [1]. The disease is spread all over the world and is considered a worldwide public health problem [2]. Dermatophytosis can be suffered by various livestock that causes high economic losses, especially in cattle ranches, due to skin damage and causing decreased milk and meat production. In addition to that, this disease also has the potential to transmit the infection to humans [3-4].

Dermatophyte is a fungus that invades cows' skin and hair, causing the onset of round-shaped grayish-white lesions accompanied by crusts, scales, hyperkeratosis, and alopecia of various sizes. These lesions generally occur on the face, neck, chest, legs, and body [5]. On a series of lesions that arise among them are alopecia and/or grayish-white lesions, crusty, and prominent. These lesions generally take place on the head, neck, dewlap, and chest areas. *Trichophyton* sp and *Microsporum* sp are the fungi most commonly isolated from cows [6]. Dermatophyte infection can occur from mild to severe as a result of fungal metabolic reactions, the infecting strain or species virulence, anatomical location of the infection, and local

environmental factors [7]. Lesions caused by dermatophytes do not cause death but can cause other diseases to enter infected animals [8]. Ringworm can heal on its own, but it is highly recommended to conduct therapy due to its easily spreadable nature and zoonotic nature [9]. The treatment of cows that experience ringworm will increase costs for farmers, but if sold, the selling price will decrease from normal conditions.

This research was carried out at Balai Besar Pembibitan Ternak Unggul dan Hijauan Pakan Ternak Baturraden (BBPTUHPT) Baturraden because it is located in one farm location with high humidity and rainfall conditions. It is one of the Technical Implementation Units in the Directorate General of Livestock and Animal Health which plays a role in operationalizing the technical policies of the central government, with its main activities being, to carry out breeding of dairy cows and dairy goats as well as the production and distribution of seeds/forage seeds of animal feed. The incidences of skin diseases on cattle farms are often found, however, the diagnosis of ringworm has never been reported. This study aims to determine the prevalence of dermatitis in dairy cows at BBPTUHPT Baturraden, Indonesia from January to October 2021. The information obtained is expected to be useful for breeders, veterinarians, and farmworkers to prevent and control this disease.

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## 2 Materials and Methods

This retrospective study was based on medical record data from January–October 2021 at BBPTUHPT Baturraden, Banyumas, Central Java, Indonesia. A total of 1,099 dairy cows kept in BBPTUHPT were examined clinically and were diagnosed with ringworm if they showed any clinical symptoms of grayish-white lesions or dark round-shaped patches accompanied by the presence of crusts, scales, hyperkeratosis, and alopecia of various sizes. The data obtained were analyzed descriptively.

## 3 Results and Discussions

The results of this study showed that as many as 114 out of the 1,099 dairy cows (10.4%) were diagnosed with ringworm based on symptoms of round alopecia in white, gray, or blackish brown (hyperpigmentation) accompanied by the presence of hyperkeratosis, scales, and crusts (Fig 1). The results of this study are lower than Shams-ghahfarokhi [4], which reported the prevalence of ringworm in Holstein cows in Iran is by 72.6%. The high incidence of ringworm in cows is likely due to high humidity. According to Scott et al. [10], dermatophyte fungi will grow easily in tropical climates with high humidity.



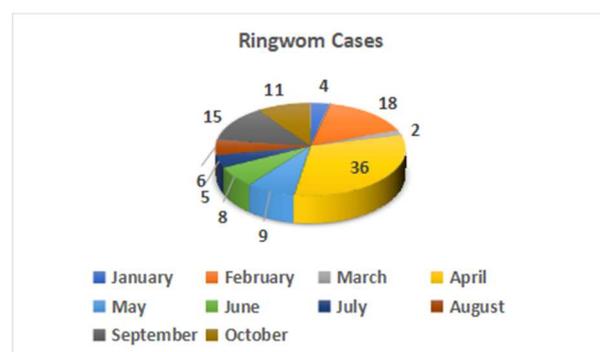
**Fig. 1.** Clinical symptoms of a dairy cow diagnosed with ringworm (personal documents)

Cases of ringworm in BBPTUHPT Baturraden were recorded occurring from January to October 2021, and the 3 months with the most cases are March (36 cases), February (18 cases), and September (15 cases) (Table 1; Fig 2). The results were lower than the study of ringworm in Brahman cattle in the Jaipur-India area by 34.21% [5], in Holstein cattle in Iran by 72.6% [4,7], and in Arabian cattle in Jordan by 30.6% [11]. This shows that the ringworm cases can be found in all of breed and there is not influence by breed. The presence of ringworm occurring throughout these months is thought to be caused by high humidity at the sampling site as BBPTUHPT farms have high rain intensity of 4,000 to 9,000 millimetres/year. The range of environmental temperatures is between 22 to 31 °C with

an average of 25.26 °C and air humidity between 68 to 100% with an average of 93.16% [12]. This is in line with the statement made by Scott et al. [10] which is high dermatophytosis incidences occur in areas with high humidity. On the other hand, in this study, the lowest ringworm occurs in March 2021, which is 1.8%, although this month's rainfall is quite high, 300–400 mm [13]. However, the total cases from February to April 2021, was quite high, namely 56 of 114 (49%). The rainfall in February was 300–400 and April was 200–300 mm. In January to October 2021, Baturraden has humidity of 81–86%. Therefore, it is necessary to determine the incidence of ringworm for a period of time related to rainfall and humidity.

**Table 1.** Ringworm cases of dairy cows in BBPTUHPT Baturraden from January to October 2021.

Months	Cases	%
January	4	3.5
February	18	15.8
March	2	1.8
April	36	31.6
May	9	7.9
June	8	7
July	5	4.4
August	6	5.3
September	15	13.2
October	11	9.6
Total	114	100



**Fig. 2.** Pie chart of ringworm cases in dairy cows at Baturraden from January–October 2021

The diagnosis of ringworm in this study was based on clinical symptoms, especially round-shaped grayish-white lesions accompanied by the presence of crusts, scales, hyperkeratosis, and alopecia of various sizes. These lesions generally occur on the face, neck, chest, legs, and body [5]. The presence of round-shaped lesions can be used for tentative diagnosis. Further laboratory examinations need to be done to determine the specific conditioning agent so that the diagnosis and therapy can be more precise. According to Vermout et al. [1], the causative agent of ringworm in cows is derived from three genus dermatophyte fungi namely *Microsporum*, *Trichophyton*, and *Epidermophyton*. [The diagnosis and therapy of cattle ringworm in BBPTUHPT Baturraden were based on clinical signs only, and the treatment was carried out using povidone iodine.](#) Therefore, for the basis of diagnosis and therapy related to ringworm in BBPTUHPT Baturraden to be more precise, laboratory examinations are needed.

## 4 Conclusion

It was concluded that ringworm in BBPTUHPT Baturraden occurred throughout the months of January-October 2021 with a prevalence of 10.4%.

## Acknowledgment

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