

## A CLINICAL OUTBREAK OF DERMATOPHILOSIS IN DAIRY CATTLE IN BELGIUM

*Een klinische uitbraak van dermatophilosis bij melkkoeien in België*

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### ABSTRACT

This case report describes a clinical outbreak of dermatophilosis among dairy cattle in Belgium. Seven out of the ten animals were affected, exhibiting papules especially on the back and lumbar area. The two most severely affected animals were treated with the cephalosporin antibiotic ceftiofur, the other five remained untreated. In all animals, a full recovery was noted after one month.

### SAMENVATTING

In deze casuïstiek wordt een klinische uitbraak van dermatophilosis beschreven bij melkkoeien in België. Zeven van de tien dieren waren aangetast, waarbij papula's aanwezig waren vooral op de rug en de lenden. De twee meest aangetaste dieren werden behandeld met ceftiofur, de andere dieren werden niet behandeld. Alle dieren waren volledig hersteld na één maand.

### INTRODUCTION

*Dermatophilus congolensis* is a Gram-positive, facultatively anaerobic actinomycete bacterium which causes an acute, subacute or chronic skin disease known as dermatophilosis. The condition has been described in a wide range of animal hosts, including both terrestrial and aquatic animals such as seals and reptiles (Zaria, 1993). In Belgium, the bacterium is isolated on a regular basis from sero-purulent skin infections in horses (Dom *et al.*, 1995). Isolation of *D. congolensis* from cattle in Belgium has only been reported once, however, the agent having been retrieved from a dairy cow, which was the only clinically affected animal in the herd (Hannes *et al.*, 1991). This disease in cattle is much more prevalent in the humid, tropical and subtropical regions (Zaria, 1993), where it constitutes a significant problem in the livestock industry.

The organism is believed to exist as a skin commensal or saprophyte which is not able to cause an infection until the skin is damaged. The bacterium invades the cutaneous abrasions and initiates an inflammatory re-

action characterized by the formation of a thick crust. The disease represents essentially an exudative dermatitis with extensive scab formation. The crusts adhere firmly to the affected skin and are further held in place by hair fibers. Removal of the crusts reveals a moist hyperemic area. Heavy dandruff of the hair coat is common (Horner, 1986). Infection is frequently seen along the back of cattle from the withers to the rump and extends to the midlateral aspect. Few affected cattle have pruritus, and during dry weather most recover without treatment. Many epizootiological factors have been implicated in the cause, spread and resolution of the disease. Among these are rainfall, humidity (moisture), ectoparasites (ticks, flies, biting flies), wounds and abrasions (Horner, 1986). Concurrent bacterial, viral or fungal disease and malnutrition have also been implicated as triggering agents (Vestweber and Kennedy, 1992).

The present article reports a clinical outbreak of dermatophilosis among dairy cattle in Belgium, where various animals in the herd were clinically affected.

**CASE HISTORY**

A piebald Holstein dairy cow was referred as representative of a problem of dermatitis to a private veterinary practitioner in mid-August, 2001. The animal was part of a herd comprising thirty beef and ten dairy cattle. The condition had affected seven (out of the ten) dairy cattle, while the beef cattle remained unaffected. The affected animals were between three and seven years of age. The animals were on pasture day and night, except for milking. The prevailing weather conditions were relatively warm and dry.

Upon clinical examination of the referred animal, a dermatitis was noted which presented as numerous papules extending over almost the entire body, especially the back and side, as well as the perineal region and hind limbs (Figure 1). Another animal was likewise affected, while in five other animals similar papules were present, though they were markedly fewer in number. On closer examination, each papule appeared as an area of matted hair which could be detached together with a moist crust, eliciting a pain reaction in the ani-

mal and leaving a raw, denuded, exudative lesion. The detached hairs and crust resembled a camel-hair paint brush (Figure 2). The temperature, milk production and appetite of the animals were normal. Hair and crusts were submitted for bacterial culture.

For bacteriological examination, the crusts and hairs were crushed in a mortar and inoculated onto Columbia agar with 5% sheep blood (blood agar) (Difco, Detroit Michigan, USA). Incubation occurred at 37°C under 5% CO<sub>2</sub>. After one day, a virtually pure culture of pinpoint greyish-white colonies surrounded by a fairly broad zone of complete hemolysis was evident. After two days, the colonies were approximately one millimeter, rough, granular and pitting the medium. A Gram's stain exhibited the typical morphology of *D. congolensis*, i.e. the presence of coccoid cells arranged longitudinally in a chain consisting of a single or two parallel rows of these Gram-positive coccoid cells.

The two most severely affected animals were treated with ceftiofur for five consecutive days; the remaining five animals remained untreated. After three



**Fig. 1.(a and b).** Dermatitis in a dairy cow due to *Dermatophilus congolensis*. Note the numerous papules covering the entire body surface, especially the back and side of the animal, as well as the perineal region and hind limbs.



**Fig. 2.** The detached hairs and crust resemble a camel-hair paint brush.

weeks, an almost full recovery was noted both in the treated and the non-treated animals. The papules and crusts had disappeared, leaving only soft pink-greyish scars on which hair regrowth was clearly noted.

## DISCUSSION

Dermatophilosis has a world-wide distribution, though the disease is reported most frequently in relatively low-altitude areas with tropical or subtropical climates with high ambient temperatures and torrential rain patterns. The epizootiology of *Dermatophilus* infection has generated much controversy, but generally it is believed that high ambient temperature, rainfall, humidity, ectoparasites, intercurrent diseases, malnutrition and stress play an important role in the course, spread and resolution of the disease (Stewart, 1977; Zaria, 1993). The effect of the climate, more specifically rainfall, is regarded as one of the most prominent epizootiological features of bovine dermatophilosis. Indeed, humidity weakens the skin barrier, influences the maturation and motility of the infective zoospores and increases the prevalence and activity of the arthropod vectors. In this case, however, the weather was indeed warm, yet dry. The question why this outbreak of dermatophilosis occurred under these dry weather conditions remains to be answered. The same phenomenon was noted on the occasion of the first isolation of *D. congolensis* from cattle in Belgium, which occurred in equally dry weather conditions (Hannes *et al.*, 1991). What was even more peculiar in this case is the fact that the healing process took place during the month of September (2001), which was exceptionally humid. The farmer claimed that the crusts were washed off by the often heavy rainfall, accelerating the healing process. One research group also found that the lesions could heal better under humid conditions (Macadam, 1961). Nevertheless, it has to be stated that the latter finding is in conflict with numerous other studies claiming an obvious triggering effect of humidity on the development of dermatophilosis and consequently an increased incidence of dermatophilosis in the rainy season (Zaria, 1993).

In contrast to the previously reported case of bovine dermatophilosis in Belgium (Hannes *et al.*, 1991), where only one individual was affected, in this case, seven out of the ten dairy cows showed skin lesions. As stated in the introduction, *D. congolensis* is believed to exist as a skin commensal. The outbreak may then be explained in terms of all the dairy cattle being subjected to the same (unknown) predisposing fac-

tors, which triggered the outbreak of the disease in the majority of animals. Why three out of the ten dairy cows remained unaffected - and, even more, why all the beef cows were spared - remains unknown. It has been suggested by a number of researchers that some animals may have a hereditary predisposition to a *Dermatophilus* infection and that this is a breed rather than an individual characteristic. There are indeed indications that the degree of resistance varies from breed to breed, ranging from extreme susceptibility to complete immunity under normal conditions (Zaria, 1993). The two most severely affected animals were treated successfully with ceftiofur. The other animals remained untreated and healed spontaneously. Spontaneous healing is known to occur in relatively mild cases (Zaria, 1993).

In the absence of parasites, fungi and other bacteria, the findings of the present investigation strongly point towards *D. congolensis* as the only pathogen involved in this outbreak of dermatitis. Differential diagnosis is recommended to exclude fungal infection caused by dermatophytes, infestation with skin parasites such as *Demodex* and *Psoroptes* species, parakeratosis, photosensitization, *Staphylococcus hyicus* infection and pox viruses (Vestweber and Kennedy, 1992). The diagnosis of dermatophilosis may be primarily based on the clinical signs, but a definitive diagnosis needs to be based on bacteriological examination.

## LITERATURE

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