

Assessment of a method for the detection and the scoring of digital dermatitis in dairy cows during milking



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Introduction

Digital dermatitis (DD) is a contagious multifactorial disease which causes lameness, that is increasingly reported in France. It's detection is currently based on the visual inspection of the feet during trimming. This method is labour-consuming and not adapted for frequent evaluations of the DD status of the cows at herd level. Evaluations by visual inspection in the milking parlour have been tested but were not fully satisfying [1-3].

OBJECTIVE: to assess the epidemiological value of a method for detection and scoring of DD in dairy cows, that can be used during milking with basic tools.

This method consist in inspecting the hind feet, previously washed with a water hose, with a powerful headlamp and a swivelling mirror, in the milking parlour.

Design of the trial

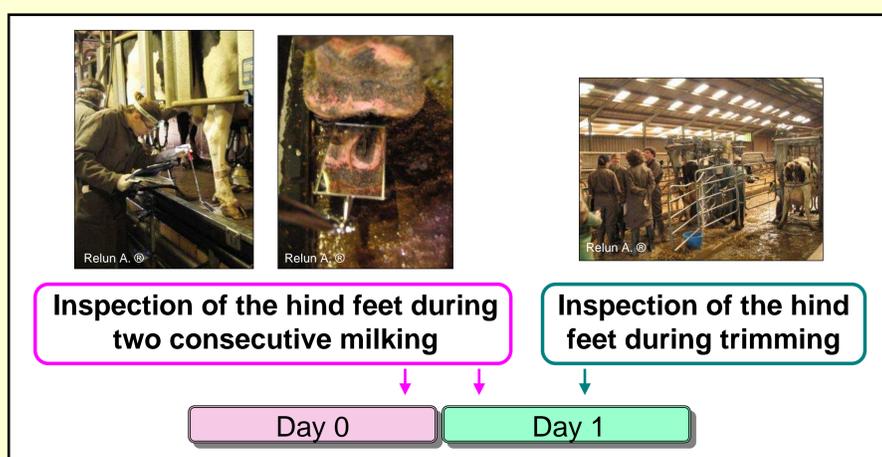


Figure 1. Protocol for the assessment of the method

During **spring of 2009**, the hind feet of 242 Prim' Holstein cows from **4 farms** with different milking parlours, were concomitantly inspected by **5 trained observers** during two consecutive milkings. This inspection was followed by an inspection in the trimming chute.

Scoring of digital dermatitis lesions

Each hind foot was inspected and lesions were recorded using the **scoring system** first described by Döpfer et al. (1997) [4] and validated during the last International Symposium on Lameness (2008) [5], with five stages, as illustrated below.

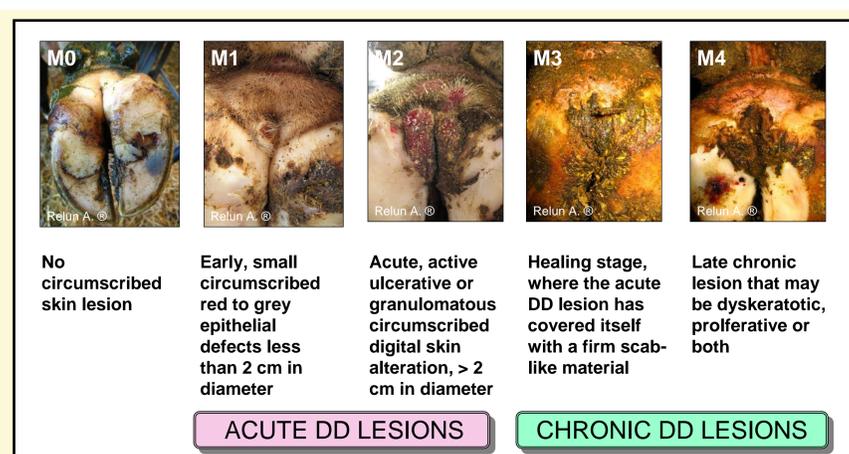


Figure 2. Description of the different stages of digital dermatitis

Criteria to assess the method

Sensitivity and **specificity** (absence *versus* presence) were calculated by comparing the scorings attributed during the first milking with those attributed during trimming ("Gold-Standard").

Intra-observer reliability was assessed by comparing the scorings at the two consecutive milkings for each observer (weight-kappa).

Inter-observer reliability was evaluated by comparing the scorings of the 5 observers during the first milking (weight-kappa).

Description of the DD lesions

18.8 % [8.0 – 29.3%] of feet had an acute lesion [M1, M2] and **22.2 % [5.7 – 61%]** a chronic lesion [M3, M4], depending on farms.

Most of the lesions were located **between the heels** (73.5% of the acute lesions). Some acute lesions were located in more hidden parts : 2% in front of the feet, 16.7% under the feet, mostly **on an interdigital hyperplasia** (13.3%).

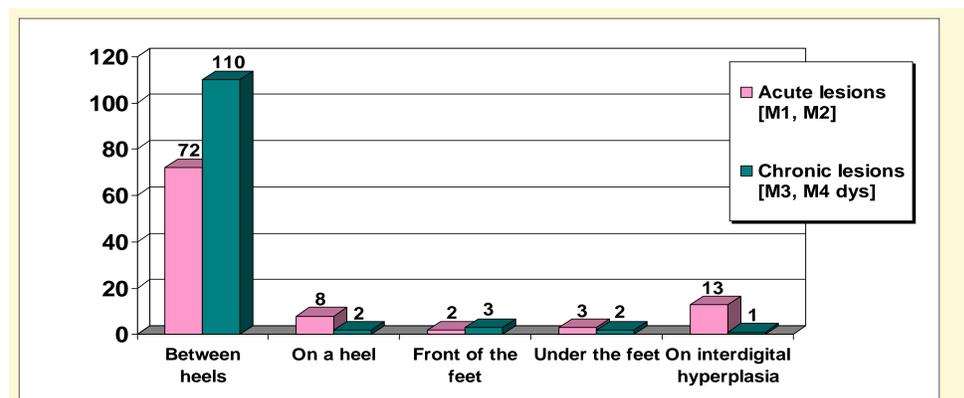


Figure 3. Localisation of the acute [M1, M2] and chronic lesions [M3, M4] of digital dermatitis observed in the trimming chute

Performance of the method

This method has a **good sensitivity** (0.90 [0.77 – 0.95]) and an **average to good specificity** (0.79 [0.65 – 0.92]) to discriminate between presence and absence of a DD lesion, depending on the farms where were done the observations.

The method has a **high intra-**($K_w = 0.62$ [0.51 – 0.65]) **and inter-**($K_w = 0.63$ [0.56 – 0.67]) **observer reliability**, when the lesions are merged into **3 classes** (absence: M0 / acute lesion: M1-M2 / chronic lesion: M3-M4). The worst results correspond to a farm where the feet remained dirty. This reinforce the need of a good cleaning of the feet before inspection.

Inspection of the hind feet of dairy cows during milking with a powerful headlamp and a swivelling mirror is a reliable cost and time friendly method for:

- the detection and scoring of digital dermatitis for research purposes,
- a farmer day-to-day hoof health monitoring.

As the sole can't be inspected, this method can not replace an inspection of the feet in a chute for a lameness diagnostic.

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