

Effect of hoof care products on hoof hardness



M.B. Gentilini¹, M. Lopez-Benavides², T.C. Hemling², L.R. Molina³, V.M.de Paula³

Introduction

- Claw hardness may influence the likelihood that a cow will suffer from claw lesions due to its influence on rate of horn wear and erosion.
- Anecdotally, some hoof bath products are indicated as positively or negatively impacting hoof hardness, but little supporting data exists.
- The objective of the study was to assess hoof hardness comparing 2 different hoof care products under field conditions.

Material and Methods

- A 45 day trial was conducted in an open free stall commercial dairy farm in Minas Gerais, Brazil, with 105 animals in a split hoofbath design.
- Left hooves walked through 5 % (vol/vol) Formalin and right hooves through 4Hooves™ (DeLaval) at a 1% (vol/vol) dilution, once a day, three times a week.
- Three evaluations were performed in a standing hoof trimming chute: at the beginning of the experiment 30 days, and 45 days after.
- Hoof hardness was assessed using a durometer (Shore D DP-400, Instrutherm) and triplicate measurements of each hoof area were taken by pressing the instrument against 3 designated areas of the claw (Figure 1).
- Average temperature during the experiment was 24,2°C and sum of precipitation was 152.7mm in November and 140.4mm in December.
- Data were analyzed using ANOVA for repeated measures using individual hooves as the experimental unit (MedCalc Software v.12.4.0).

Results

- Results indicated no treatment differences in the hardness of claws occurred.
- Hoof hardness changed in the same direction, regardless of treatment during the trial period (P<0.001) (Table 1).
- In both treatments, a significant decrease in hoof hardness could be seen from day 0 to day 30 (P<0.001) that also coincided with rainy episodes and higher humidity.
- Because of the open free stall design, it is hypothesized that hooves were exposed to increased environmental humidity. This may have increased absorption of water by the hoof that consequently reducing the structural integrity and reduced hardness of the hooves.

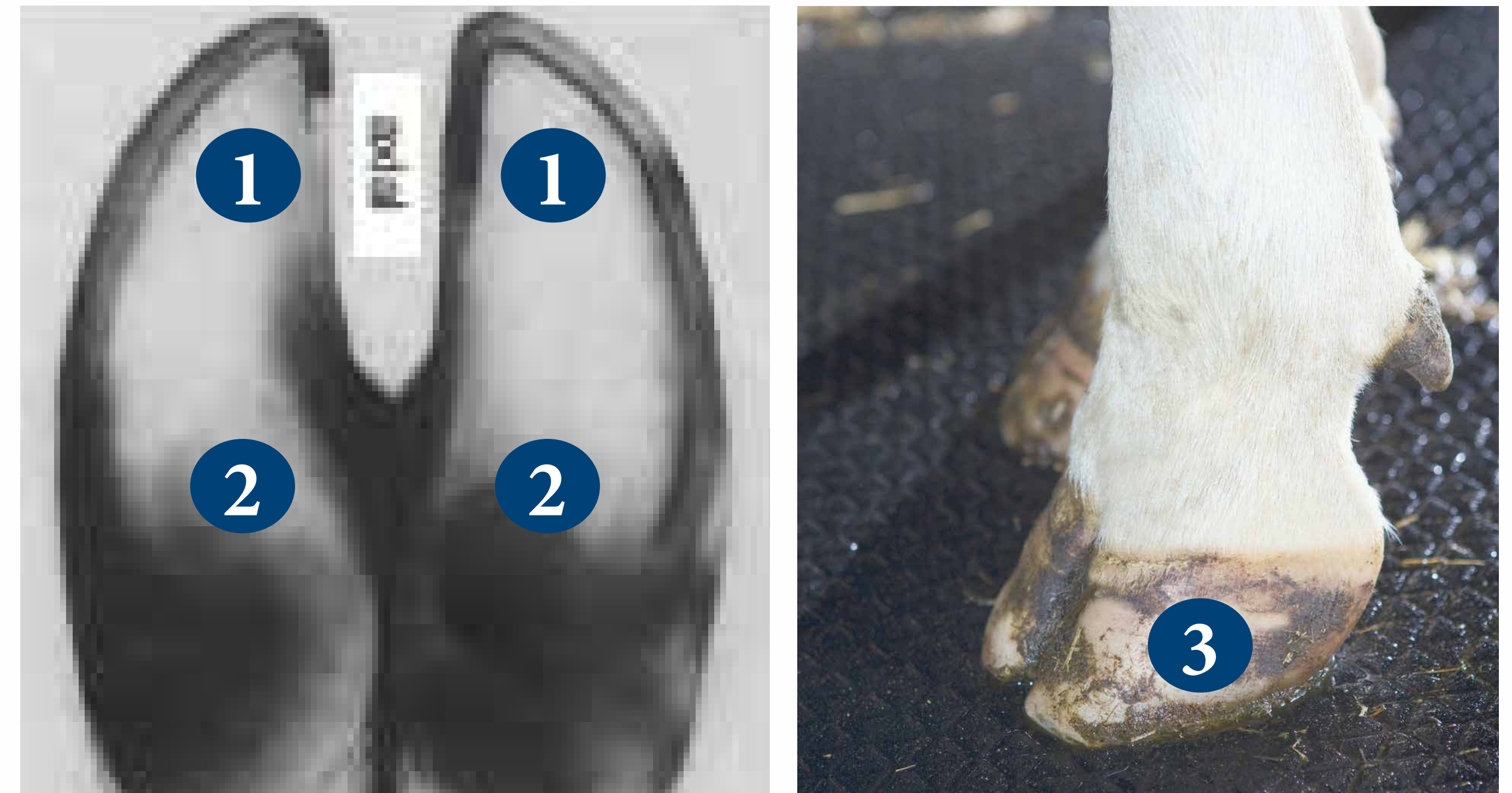


Figure 1. Hardness measuring points. Point 1: the tip of the toe at sole midway between white line and claw edge. Point 2: midpoint at the apex of the sole. Point 3: abaxial wall

Table 1. Mean values (D units*) of hoof hardness (\pm StDv) of hooves soaked in 4Hooves™ or Formalin during the trial period

Treatment	Day 0	Day 30	Day 45
4Hooves™ (1%)	44.2 +/- 0.3 ^a	41.6 +/- 0.4 ^b	44.1 +/- 0.4 ^a
Formalin (5%)	44.0 +/- 0.3 ^a	41.5 +/- 0.47 ^b	45.2 +/- 0.4 ^a

*Means within a row or column with different superscripts differ (P<0.001). * D scale: range 0 - 100, higher values indicates harder material.

Conclusions

- No difference on hoof hardness when using either 4Hooves™ or Formalin was observed.
- It is likely that hoof hardness is more influenced by environment condition rather than the hoof bath product.
- The study raises questions on the current anecdotal impressions of the impact of copper sulfate, formalin and other hoofbath products on hoof hardness.

⁽¹⁾ DeLaval Ltda, Estácio de Sá, 560, Jd. Sta. Genebra, Campinas SP, Brazil ⁽²⁾ DeLaval Inc., 11100 N Congress Ave, Kansas City MO, 64153, USA ⁽³⁾ University of Minas Gerais, UFMG, Av. Antônio Carlos, 6627, Belo Horizonte MG, Brazil

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