In 1982, Dr. Paul Greenough, of the University of Saskatchewan’s Western College of Veterinary Medicine, published the ‘Hoof Atlas’, an illustrated guide to claw lesions in cattle. Since that time, new claw lesions have been discovered and our knowledge and understanding about the causes, treatment and prevention of different claw lesions have expanded dramatically.

Accurately identifying specific lesions is critical for treatment and prevention plans. In the past, it was common for several different types of claw lesions (white line, sole ulcer or sole hemorrhage) to generically be identified as laminitis. In order to accurately identify the cause of the lesion and determine the proper corrective action plan, it is critical to be more specific and consistent.

To assist in the accurate and consistent identification of lesions, a poster was developed through the combined effort of Zinpro Corporation, and the International Lameness Committee, a collaboration of researchers, veterinarians, academics and hoof trimming professionals from around the world. Key components of that poster are reproduced on the following pages.

### Establishing Processes to Reduce Lameness

By recording lesions and where they occur, producers can implement a more targeted treatment plan and track over time which lesions are most prevalent in their cattle.

- Properly identify and record the observed lesions; the proper treatment for the different lesions and the proper corrective action plan for decreasing prevalence can vary.
- Record the zone where lesions occur to help determine the root cause.

### Non-Infectious Lesion Risk Factors

- Lack of claw trimming, infrequent claw trimming or improper claw trimming;
- More than three hours per day spent standing in the holding area, stall area and/or excessive time locked in headlocks;
- Poorly designed stalls creating discomfort;
- Insufficient lying time;
- Limited access to feed due to overstocking or insufficient feed bunk space;
- Flooring conducive to excess horn wear;
- Nutritional factors, such as feeding excessive amounts of fermentable carbohydrates, lack of effective fibre, TMR sorting, inconsistent feeding times and inadequate trace mineral status;
- Post-calving metabolic disorders such as milk fever and ketosis;
- Heat stress, resulting in lower rumen pH and cows spending more time standing;
- Abrupt transition (nutrition and environment) from dry to lactation period.

### Infectious Lesion Risk Factors

- Wet conditions;
- Poor foot hygiene;
- Presence of infected animals in the herd;
- Poor footbath management.

### Lesions By Zone

<table>
<thead>
<tr>
<th>Zone</th>
<th>Lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Interdigital Hyperplasia</td>
</tr>
<tr>
<td></td>
<td>Interdigital Dermatitis</td>
</tr>
<tr>
<td>1</td>
<td>White Line Lesion</td>
</tr>
<tr>
<td></td>
<td>Toe Ulcer</td>
</tr>
<tr>
<td>2</td>
<td>White Line Lesion</td>
</tr>
<tr>
<td>3</td>
<td>White Line Lesion</td>
</tr>
<tr>
<td>4</td>
<td>Sole Ulcer</td>
</tr>
<tr>
<td></td>
<td>Sole Hemorrhage</td>
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<tr>
<td></td>
<td>Thin Sole</td>
</tr>
<tr>
<td>5</td>
<td>Sole Hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Thin Sole</td>
</tr>
<tr>
<td>6</td>
<td>Sole Hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Heel Erosion</td>
</tr>
<tr>
<td>7</td>
<td>Corkscrew Claw</td>
</tr>
<tr>
<td></td>
<td>Vertical Fissure</td>
</tr>
<tr>
<td></td>
<td>Horizontal Fissure</td>
</tr>
<tr>
<td>8</td>
<td>Vertical Fissure</td>
</tr>
<tr>
<td></td>
<td>Horizontal Fissure</td>
</tr>
<tr>
<td></td>
<td>Digital Dermatitis</td>
</tr>
<tr>
<td></td>
<td>Foot Rot</td>
</tr>
<tr>
<td>9</td>
<td>Digital Dermatitis</td>
</tr>
<tr>
<td></td>
<td>Interdigital Dermatitis</td>
</tr>
<tr>
<td>10</td>
<td>Axial Fissure</td>
</tr>
<tr>
<td>11</td>
<td>Axial Fissure</td>
</tr>
<tr>
<td>12</td>
<td>Axial Fissure</td>
</tr>
</tbody>
</table>
Non-Infectious Lesions

**WHITE LINE LESION (W)**
Also called: White Line Separation, White Line Disease
Zones Affected: 1, 2, 3
Common signs:
- In mild cases, a void occurs in the junction between the sole and the wall
- In severe cases, abscesses form, generally at the heel-sole-wall juncture (zone 3)

**SOLE ULCER (U)**
Also called: Pododermatitis Circumscripta, Rusterholz Disease
Zone Affected: 4
Common signs:
- Raw sore (horn erosive defect) occurring at sole-heel junction on inner side of outside hind claw
- Often occurs in both outside hind claws (when present)

**SOLE HEMORRHAGE (H)**
Also called: Sole Bruising
Zones Affected: 4, 5, 6
Common signs:
- Slight to significant red (or blue) coloration of the sole
- Not to be confused with natural black pigmentation of claw horn

**VERTICAL FISSURE (V)**
Also called: Sandcrack, Fissura Ungulae Longitudinalis
Zones Affected: 7, 8
Common signs:
- Vertical split in front or side of claw
- Occurs primarily on outside front claws
- Often the most painful cause of lameness

**AXIAL FISSURE (X)**
Also called: Axial Wall Fissure
Zones Affected: 11, 12
Common signs:
- Deep groove on interior surface of claw wall parallel to front claw surface
- Bleeding may indicate lesion presence
- Mild to severe lameness

**INTERDIGITAL HYPERPLASIA (K)**
Also called: Corn, Interdigital Fibroma, Interdigital Growth
Zone Affected: 0
Common signs:
- Rapid growth of skin and/or tissue between the digits, forming a firm mass
- Secondary infection likely with severe (large) lesion
TOE ULCER (T)
Also called: Toe Necrosis, Apicalis Necrotica
Zone Affected: 1
Common signs:
• Black mark, blood stain and/or rupture in white line or sole at the toe
• Caused by rotation of pedal bone within the claw pressing down on the sole or thin soles

CORKSCREW CLAW (C)
Zone Affected: 7
Common signs:
• Rapid irregular growth of the claw with rotation
• Sole displaced inward and rear
• Causes difficulty walking

HORIZONTAL FISSURE OR HARDSHIP GROOVE (G)
Also called: Horizontal Wall Fissure, Fissura Ungulae Transversalis
Zone Affected: 7, 8
Common signs:
• Claw wall parallel to the hairline cracks and eventually breaks off
• Caused by nutritional or metabolic stress

THIN SOLE (Z)
Zones Affected: 4, 5
Common signs:
• Sole is thin and flexible when pressure is applied
• Caused by insufficient length of toe, excessive wear or over trimming
• Minimum claw length of 3 inches (7.5 cm) does not apply to heifers or animals that weigh less than 900 lb (400 kg)
Infectious Lesions

DIGITAL DERMATITIS (D)
Also called: Hairy Heel Warts, Mortellaro Disease
Zones Affected: 9, 10
Common signs:
• Raw, bright-red or black circular growth above the heel bulbs, with edges forming a white opaque ring or hard, thin, hairy, wart-like growths or sores
• Affected cattle are reluctant to walk or are lame

HEEL EROSION (E)
Zones Affected: 6
Common signs:
• Severe erosion of heel in irregular pit-like depressions or “v” shaped grooves causing lameness
• Instability of the claw due to lost or damaged horn resulting in uneven weight bearing
• Heel becomes sore as erosion progresses

INTERDIGITAL DERMATITIS (I)
Also called: Stable Foot Rot, Scald
Zones Affected: 0, 10
Common signs:
• Discharge and destruction of skin between the claws
• Bulb horn clefts leading to contusion of the corium and ulceration

FOOT ROT, FOUL OR PHLEGMON (F)
Also called: Interdigital Phlegmon, Interdigital Necrobacillosis
Zone Affected: 9
Common signs:
• Swelling of the entire foot (equally) including the dew claws
• Separation of digits, infection produces a noticeable foul odor
• Animals will likely have a fever

Claw Zones

Abaxial (outside) view
Axial (inside) view