Injuries can negatively impact your cows’ productivity and longevity, and reduce dairy production efficiency. They can also reduce a cow’s motivation to eat and ability to show heat signs, as well as cause pain. Injuries are also a source of infection, and can jeopardize a cow’s welfare, resulting in increased treatment costs.

A project funded by a collaborative agreement on innovation in dairy production was carried out on 240 farms in Quebec, Ontario and Alberta. The organizations funding the collaborative effort included Agriculture and Agri-Food Canada (AAFC), Fonds de recherche du Québec - Nature et Technologies (FQRNT), Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec (MAPAQ), Novalait Inc., the Canadian Dairy Commission and Dairy Farmers of Canada (Dairy Research Cluster).

The researchers in the project developed methods for effectively assessing cows’ injuries. They sampled 100 tie-tall farms, 111 freestall farms and 30 farms with automated milking. The following is a breakdown of injuries and the methods used to treat them:

**Hock injuries**

Hock condition can be a major indicator of abrasion from stall flooring.

**Identifying injuries**

**Preventing hock, knee and neck conditions will ensure better cow comfort and greater profitability for the farm**

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**DESCRIPTION OF SCORING FOR HOCK INJURIES**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No swelling. No hair is missing, some hair loss or broken hair.</td>
</tr>
<tr>
<td>1</td>
<td>No swelling or minor swelling (&lt; 1 cm). Bald area on hock.</td>
</tr>
<tr>
<td>2</td>
<td>Medium swelling (1-2.5 cm) and/or lesion on bald area.</td>
</tr>
<tr>
<td>3</td>
<td>Major swelling (&gt; 2.5 cm). May have bald area/lesion.</td>
</tr>
</tbody>
</table>

**DESCRIPTION OF SCORING FOR KNEE INJURIES**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No swelling. No hair is missing, some hair loss or broken hair.</td>
</tr>
<tr>
<td>1</td>
<td>No swelling. Bald area.</td>
</tr>
<tr>
<td>2</td>
<td>Broken skin or scab and/or swelling (&lt; 2.5 cm). May have bald area.</td>
</tr>
<tr>
<td>3</td>
<td>Major swelling (≥ 2.5 cm). May have bald area/lesion.</td>
</tr>
</tbody>
</table>

Hock injury assessment protocols on farms: Use a flashlight if there is not enough light to see properly, and remove the bedding that is covering the area to be assessed. Record the results of the left and right hocks. Assess when cows are at the trough, and when they are eating in the stall.
Lesions usually result from prolonged exposure to an abrasive stall surface. Broken skin leads to infection risk, swelling, discomfort and can potentially result in lameness.

The percentage of cows per farm with hock injuries was 56.2 per cent for tiestalls, 47.4 per cent for freestalls and 36.8 per cent for farms with automated milking (see Figure 1).

The results show several producers are able to keep the hock injury rate of their cows near or below 20 per cent. The Code of Practice for the Care and Handling of Dairy Cattle recommends minimizing cows’ injuries.

Producers can reduce hock injury rates. The results also show the quantity and quality of bedding are key factors to avoid cow injury. For instance, producers should keep at least 2 centimetres of bedding over the entire surface of the stalls at all times. More bedding may need to be added under certain conditions, such as with mattresses. Cleaner, dryer bedding means fewer injuries. Stalls that use sand as bedding have fewer hock injuries compared with stalls that have mattresses without much bedding.

**Knee injuries**

A knee condition is a major indicator of flooring hardness and cow discomfort. Injuries usually result from prolonged exposure to the hard ground. This can cause swelling and broken skin, increasing infection risk causing discomfort, and potentially lameness. In addition, a poor stall configuration can increase the occurrence of knee injuries.

The percentage of cows per farm with knee injuries was 42.9 per cent for tiestalls, 30.1 per cent for freestalls and 32.8 per cent for farms with automated milking (see Figure 2).

Again, the results show several producers are keeping their cows’ knee injury rates near or below 20 per cent.

The study showed increasing the softness of the resting surface by adding a sufficient quantity of bedding over a mat or mattress, at least 2 cm over the entire surface of the stalls at all times, or a lot of bedding over a concrete base and over mattresses,
can help reduce knee injuries. Often in tiestalls, a rail that is too far back will cause knee injuries because the cows will kneel to eat. This puts increased pressure on cows’ knees.

**Neck injuries**

Neck condition is important for determining whether the chain length is sufficient, the position of the tie rail is adequate and the manger is placed at a height that lets cows easily access food. Neck lesions usually result from prolonged rubbing. This can occur from the cows rubbing against the rails or chain in the stall or at the trough.

In the sample of farms, the percentage of cows with neck injuries averaged 30.1 per cent for tiestalls, 9.8 per cent for freestalls, and 11.3 per cent for farms with automated milking (see Figure 3).

The good news is the results show more than half the producers with tiestalls and over three-quarters of producers with freestalls or a milking robot are keeping the neck injury rate of their cows near or below 10 per cent.

Often with tiestalls, a rail too far back will cause neck injuries because the cows will put pressure on their neck and rub it against the rail when eating. With freestalls, injuries are primarily caused by rubbing against a poorly positioned rail at the trough.

**Assess cow injuries on your farm**

Assessing cow injuries starts on the farm. Taking steps to reduce cow injuries and identifying injured cows will enable producers to:

1) determine the extent of the problem on the farm;
2) treat the animals and make the necessary changes;
3) increase cow longevity;
4) improve the farm’s profitability;
5) prepare for the proAction Initiative;
6) demonstrate that solutions are easy to implement.

Producers surveyed across the country told us the acceptable level of injuries should be below five or 10 per cent. Not many of them chose 20 per cent as an acceptable maximum. Some producers were concerned our cow injury assessment was too harsh. We encouraged them to carry out the injury assessment on their own herds. As a result, they too found rates of injuries that aligned with our assessment.

Producers can train themselves to take the measurements by using the training tools to do their own assessment on their farms. A short summary of the procedures is available at https://www.dairyresearch.ca/cow-comfort.php#self.

Keep in mind, for milking robots, the assessment was done at the head gates. For milking parlours, only hock injuries were assessed in the milking parlour. In situations where there was no head gate on freestall farms (robotic or parlour), the strategy for assessing neck, knee and hock injuries is to observe the cows when encouraging them to get up in their stall, starting with the hocks, then the neck and lastly the knees as the cow gets up and then backs away. The assessor should follow the cow’s movement by positioning him or herself behind, then beside and finally in front of the cow.

We tested these standardized procedures with the people we trained, including staff with and without cow experience. All of them, with our training, successfully assessed the animals’ injuries, and the results did not differ much among people.

**Conclusion**

Hock, knee and neck injuries can be prevented easily and at low cost with only minor modifications to the stall. Through the support of Dairy Farmers of Canada (Dairy Research Cluster) and Action concertée FQRNT-Novalait-MAPAQ-AAFC, Canadian researchers have been able to develop tools for producers to identify injured cows and risk factors associated with these on-farm injuries. Taking these steps will help reduce injuries and ensure better comfort for cows and greater profitability for the farm.

Dr. Anne Marie de Passillé and Dr. Jeff Rushen, University of British Columbia; Dr. Elsa Vasseur, University of Guelph; Dr. Doris Pellerin, Université Laval; and Shelley Crabtree, Dairy Research Cluster. This research was funded by FQRNT-Novalait-MAPAQ-AAFC and the Dairy Research Cluster (Dairy Farmers of Canada, Agriculture and Agri-Food Canada, the Canadian Dairy Network and the Canadian Dairy Commission).