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Economics of Dairy Cattle Hoof Health

When it comes to health issues on a dairy farm, lameness is usually a main concern along with mastitis and reproductive issues. Lameness includes any abnormality which causes a cow to change the way she walks. It can be caused by a range of foot and leg conditions including foot rot, digital dermatitis, laminitis, and claw disease. Lameness can be influenced by nutrition, disease, genetic influences, management, and environmental factors. Not only does lameness cause pain and distress for dairy cattle, but it also has a large economic impact on the dairy operation. This fact sheet will mainly focus on the economic costs associated with hoof health but it should be noted it can be difficult to put a price on lameness due to several compounding factors.

Lameness is commonly identified by

locomotion scoring, but it can be difficult to detect until clinical signs are present. There are ranges in the literature stating that a case of lameness can cost \$90 – \$300 (US\$). Even with using \$90 per case, the cost to a 300 cow dairy with a 20 percent incidence rate, would be over \$5,400. Some people associate treatment as the leading cost of lameness, but there are several other areas that cost considerably more money. These include reduced milk yield, reduced fertility, increased labor, and increased risk of culling.

Reduced Milk Yield: A majority of research papers show that clinical lameness reduces milk yield. Lameness can reduce the amount of time at the feed bunk and therefore reduce dry matter intake, which is correlated with milk production. The amount of milk

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Lesion	Reduction in yield (lbs)	Study/Reference
Digital dermatitis	0	Warnick et al., 2001
	0	Amory et al., 2008
	439 – 739	Gomez et al., 2015
General lameness (digital lameness other than white line disease)	794	Green et al., 2002
Sole ulcer	1,266	Amory et al., 2008
White line disease	814	Amory et al., 2008

*Adapted from Willshire et al., 2009

production lost can vary depending whether the study compared lost milk production before or after lameness treatments, affected cows versus unaffected cows, or predicted milk yield. In a study from 2010, Archer et al., found that a severe case of lameness within the first month of lactation could reduce 305-day milk yield by 772 pounds. In a different study from 2008, Bicalho et al., estimated lameness could reduce 305-day milk anywhere from 692 – 935 pounds. The reduction in milk yield also depends on the type of lesion, with a sole ulcer causing the greatest reduction in milk (Table 1). At a milk price of \$15.60 per hundredweight (cwt.) that would amount to a \$198 reduction in milk yield from a single sole ulcer case. Another way to look at this is if a 300 cow herd had a 15 percent incidence rate that could amount to \$8,910 per year in milk loss.

Reduced fertility: Lameness can have a negative effect on dairy cattle fertility. Any time a dairy cow is not cycling properly, not getting pregnant, or potentially losing a pregnancy results in a net loss for the farm. Increased days open can cause higher feed and reproductive costs to the operation. When top-producing cows become lame and potentially culled from the herd, there is also the genetic impact from lost potential daughters. Even with genomic testing, it might be hard to put a price on this loss. As with milk production loss shown in Table 1, research shows the type of lesion can vary in the total amount of time from calving to the conception period by almost 30 days (Willshire et al., 2009).

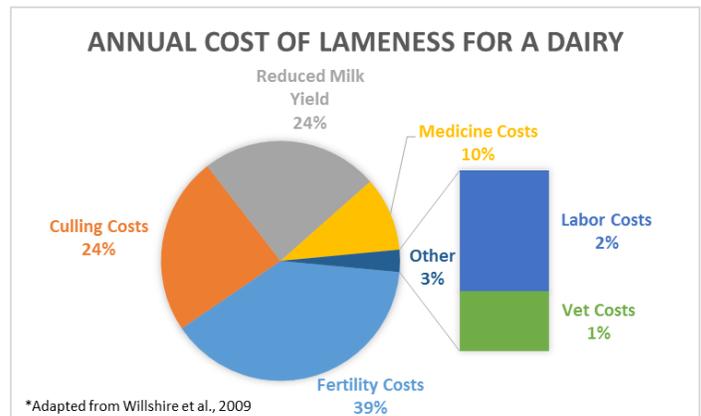
Treatment: Treatment costs may include hoof trimming, antibiotic treatment, bandages, blocks, and milk lost from treatment withdrawals. A majority of hoof trimmers will charge a set-up fee and a per cow, per wrap, and per block fee. Any time additional treatments are needed it adds to the total cost.

Labor: Labor costs vary depending upon whether a veterinarian, herds person, hoof trimmer, or other worker performs the treatments for lameness. For example, a 2013 UW-Extension human resource survey found wages on WI dairy farms can range from \$8.25 - \$14.31 per hour depending on experience and the job category. If a veterinarian performed a majority of the treatments this hourly rate would be substantially higher.

Increased risk of culling: The decision to cull a cow is influenced by several factors, but lameness could be compounded with other factors. According to the literature review conducted by Willshire et al., a sole ulcer lesion has the highest (56 percent) increase in the risk of culling when compared to other lesion types.

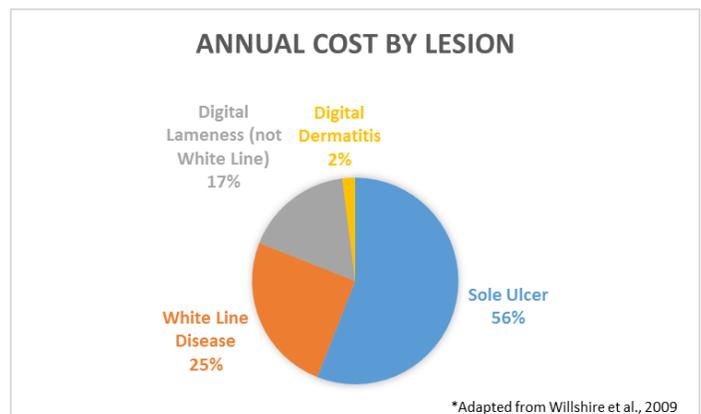
Total cost: The total cost of a lameness event can be determined by adding all the areas together. According to Willshire et al., fertility costs account for 39 percent of the total annual cost of lameness on a dairy herd.

Figure 1.



Milk yield and culling costs tied for second at 24 percent, followed by medicine cost at 10 percent. Other costs, which included labor and veterinary costs accounted for 3 percent of the total. Willshire et al., indicate that sole ulcers are the most expensive type of lesion associated with lameness on a dairy herd.

Figure 2.



Although recently, Gomez et al., 2015, compared cows that experienced digital dermatitis during the rearing period to healthy first lactation cows. Cows that

experienced digital dermatitis had 439 – 739 pounds less milk production on a 305-day record and also worse health outcomes when compared to cows without digital dermatitis. Even though sole ulcers are one of the most difficult diseases to control on a dairy, any reduction in them can make a large economic difference on a farm. In another study, Cha et al., 2010, determined the average cost per lameness case (US\$) was \$216 for sole ulcers, \$133 for digital dermatitis, and \$121 for foot rot. If adjusted for inflation in 2016 that would be \$241, \$148, and \$135 respectively.

If a dairy operation can reduce lameness, especially sole ulcers, there can be a large economic impact to the farm. Some of the best ways to reduce lameness is to improve cow comfort, avoid overcrowding, provide proper ventilation, and develop a monitoring and treatment system. If proper records are kept, you can actually determine your own cost of lameness and then look for ways to make improvements!

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Foot health and lameness are major issues facing dairy farmers because of their common occurrence and a the tremendous economic losses incurred.

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