

## Is lameness prevention worth the cost?

by Karmella Dolecheck and Jeffrey Bewley

**L**AMENESS is a common and costly problem for dairy herds. Yet, the most recent National Animal Health Monitoring System (NAHMS) dairy survey found that 35 percent of U.S. dairy farms surveyed never used a footbath. Additionally, 7 percent of farms never conducted preventative hoof trimming and 20 percent conducted trimming only when cows were visibly lame.

With these numbers in mind, we used a simulation model to explore the amount that a farmer should be willing to pay to implement lameness prevention in their herd. This depended on their current lameness prevalence rates and the effectiveness of the prevention strategy they want to use.

### Using different scenarios

Three foot disorders were included in the model: digital dermatitis, sole ulcer, and white line disease. We considered two different scenarios: a farmer investing in infectious foot disorder prevention (reducing digital dermatitis) and a farmer investing in noninfectious foot disorder prevention (reducing sole ulcer and white line disease). Additionally,

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we considered how incidence of each disorder before prevention implementation would influence the value of prevention.

In Scenario 1, we evaluated herds that had 20 percent, 40 percent, or 60 percent incidence of digital dermatitis before prevention was implemented. In Scenario 2, we evaluated herds that had a 5 percent, 15 percent, or 25 percent incidence of both sole ulcer and white line disease in cows that were parity 3 or greater before prevention was implemented. Younger cows were assumed to have a lower incidence.

Finally, instead of looking at how valuable a particular prevention strategy was, we allowed the effectiveness of prevention to vary. In each scenario, we calculated the change in the total cost of lameness before and after lameness prevention implementation. That value represents how much could be spent on lameness prevention before the investment would no longer break even, using our assumptions of a typical U.S. dairy farm.

### Incidence rate matters

The table shows the expected value of prevention per cow per year for the different scenarios we tested. To directly interpret the table values, consider the value per cow per year as the amount

that you could spend on a prevention strategy before it would not be cost-effective.

For example, if you were interested in using a formalin footbath to prevent digital dermatitis, you might assume that the cost was \$12 per bath and that you required 0.78 baths per cow per year (assuming the bath was used one time per day, three times per week, and changed after 200 cow passes). Therefore, the estimated cost of using a formalin bath would be \$9 per cow each year.

Looking at the table, we see that a herd with 20 percent incidence of digital dermatitis before prevention use would only see profitability from this prevention strategy if it is highly effective, whereas a herd with 40 percent or 60 percent incidence would see profitability if the prevention strategy had medium or high effectiveness.

Overall, the most important take-away messages from our simulation were:

- The greater the incidence rate of foot disorders before prevention was used, the more valuable prevention was.
- The more effective prevention was, the more valuable it was.

Although not perfect, the results from our model help determine when you should consider investing

in lameness prevention based on current herd incidence rates. Additionally, various prevention strategies can be compared based on their expected effectiveness and cost per cow per year.

Estimated value of lameness prevention						
Prevention focus	Incidence rate before prevention			Prevention value, based on effectiveness (\$/cow/year)		
	Digital dermatitis	Sole ulcer	White line disease	Low (0 to 10% reduction)	Medium (40 to 50% reduction)	High (90 to 100% reduction)
Infectious foot disorders	20	15	15	\$0.6 ± 0.4	\$5.9 ± 2	\$12.2 ± 3
	40	15	15	\$1.2 ± 0.9	\$11.7 ± 4	\$24.4 ± 6
	60	15	15	\$1.8 ± 1.3	\$17.6 ± 6	\$36.5 ± 9
Noninfectious foot disorders	30	5	5	\$0.6 ± 0.4	\$6.0 ± 0.8	\$12.4 ± 1.5
	30	15	15	\$1.9 ± 1.1	\$17.9 ± 2.4	\$37.3 ± 4.6
	30	25	25	\$3.2 ± 1.9	\$29.7 ± 4.1	\$62.2 ± 7.6

Values based on type of prevention, preprevention incidence rate of foot disorders, and prevention effectiveness.

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