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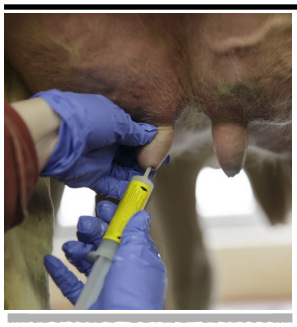
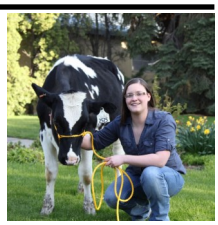
DAIRY PIPELINE

Volume 38, No. 5 June 2017



To infuse or not to infuse: An examination of antibiotic use



Kellie Enger, Ph.D. Student with Dr. Christina Petersson-Wolfe, milk@vt.edu

The use of antibiotics in the dairy industry is an effective tool for the treatment and prevention of disease. However, due to concerns of antibiotic resistant bacteria, antibiotic use is becoming more restricted. Antibiotic resistance has gained global attention and has become a focus for the Center for Disease Control, the Food and Drug Administration, and the World Health Organization. Currently, 23,000 people die each year in the U.S. alone due to antibiotic resistant infections.

More than 65% of antibiotics used on dairies in the U.S. is attributed to intramammary infusion. About 44% of those are used specifically for dry cow therapy. Dry cow therapy can be placed into two categories, blanket dry cow therapy (BDCT) and selective dry cow therapy (SDCT). Blanket dry cow therapy is the infusion of a long term antibiotic into the mammary gland of all quarters of all cows in a herd at dry off. Selective dry cow therapy refers to only treating cows with an existing intramammary infection (IMI) at dry off. In the Netherlands, preventative antibiotic use has been banned since 2012, and other countries are likely to follow suit.

A study by Huxley et al., 2002 examined treating low somatic cell count (SCC) cows at dry off with either an internal teat sealant (ITS) or an antibiotic. There was no difference in IMI cure rate between the two treatment groups over the dry period. Additionally, they observed that using a teat sealant decreased the likelihood of acquiring a new IMI, particularly those caused by environmental pathogens. In 2010, the same group tested a selective dry cow protocol based on SCC. Cows were separated into two groups, either high SCC (>200,000 cells/ml) or low SCC (<200,000 cells/ml). Results from this study showed that use of a combination of ITS and antibiotics in the high-SCC group was most beneficial in reducing new IMI over the dry period. Conversely, no difference was seen in total quarter infections between quarters treated with an ITS alone or a combination of ITS and antibiotic in the low-SCC group. These results indicate that use of antibiotics with ITS is still necessary in high-SCC cows to control new IMI during the dry period; yet, treating low-SCC cows with a teat sealant alone appears to be adequate in controlling IMI.

A recent study by Cameron et al., 2014 showed a 21% reduction in antibiotic use using a petri-film-based culture system. Milk was cultured on petri-film to determine infection status; if cows tested positive for an IMI, all quarters were infused with a combination of antibiotic and ITS. If cows tested negative, all quarters received ITS only. No differences in IMI after calving existed between treatment groups, but presence of an IMI at dry off was a significant predictor of IMI in the subsequent lactation. Thus, it is important to consider IMI status at dry-off to select the most appropriate treatment.

In summary, antibiotic resistance is a major human health concern that requires worldwide compliance to solve the problem. Prudent use of antibiotics should be considered in order to decrease overall use and exposure. Since more than 65% of antibiotics on dairies is used for mastitis, this is a key area to reduce antibiotics. Selective dry cow therapy has been shown to decrease antibiotic use without compromising udder health in low SCC cows. However, in high SCC cows, continued use of a combination treatment of antibiotic and an internal teat sealant at dry off continues to be the best practice in reducing IMI in the subsequent lactation. It is important to note that SCC isn't always a true indicator of mastitis, and bacterial culture is the best method to determine infection status of a cow.

"Selective dry cow therapy has been shown to decrease antibiotic use without compromising udder health in low SCC cows."

DAIRY SCIENCE

Upcoming Events

See VTDairy for details.

June 10, 2017
Franklin County Open Youth Livestock Show

June 10, 2017
State 4-H/FFA Dairy Youth Field Day—Clark & Frederick Counties—dwinston@vt.edu

June 13, 2017
District Holstein Twilight Meeting, Dallera Holsteins

June 21, 2017
Dairy Day at the Harrisonburg Turks

June 24, 2017
Farm Day at the Harrisonburg Children's Museum

June 22, 2017
Franklin County DHIA Banquet & Awards

July-TBD
Vantage No-Till Alliance of Franklin County Field Day

July 6, 13, 20, 27, 2017
Farm Transition and Succession Series 12 pm—3 pm Franklin County

July 9-13, 2017
Southeast Youth Dairy Retreat, Bradenton, FL

August 2, 2017
Dairy Genomics Meeting
Pano's Restaurant
Harrisonburg

September 22 & October 19, 2017
August County Hay/forage Quality Superbowl
Samples & Forms deadline: 9/22; Results Program & Dinner 10/19
Details TBA

If you are a person with a disability and require any auxiliary aids, services or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.

Preventing silage-related injuries and fatalities among farm workers

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Silages are feed ingredients frequently included in diets for dairy cattle. In the United States, approximately 125 million tons of corn silage are produced per year, which are typically stored on farm and fed year-round. Different types of silos exist to store corn silage and these include tower silos, silo bags, pile silos, and bunker silos.

The ensiling process starts with cutting and chopping the whole corn plant in the field. Then, the chopped material is transported, spread, and layered on the floor, and it is then tightly packed to exclude the oxygen and induce an anaerobic fermentation. In both pile and bunker silos, the chopped material is built vertically. The main difference between pile and bunker silos is that in the latter the ensiled material is contained by lateral walls while in the former is not.

Due to the packing process, the resulting density of corn silage ranges from 15 to 50 pounds per cubic foot, which is equivalent to 550 to 1,650 lb per cubic meter. To give some perspective, 1 cubic meter is smaller than a washing machine. Keeping this in mind, can you imagine suddenly getting caught under 3,300-lb avalanche of corn silage?

Multiple chores, such as extracting silage for feeding or collecting samples for analysis, are performed around pile and bunker silos. As these are very common tasks, people approach the silo areas with full confidence and without understanding the associated hazards. The major hazard is being trapped by a silage avalanche, which happens when a piece of the silo face breaks off and falls. This avalanche can easily crush anyone close to the silo face.

Although infrequent, injuries and fatalities caused by silage avalanches have occurred several times in the past. In 1999, a nutritionist was collecting a sample when he was buried by a 6-ton avalanche. Even though he survived, he suffered a spinal cord injury becoming quadriplegic. In 2008, a truck driver parked close to the face of a 50-foot pile silo. An avalanche of silage collapsed on his truck while he was inside the cab. As he was struck in the head, the driver died instantly. In 2010, a 19-year-old worker died after being caught by a silage avalanche originated from a 10-foot pile silo. The worker was shoveling close to the face of the silage when this happened. Also in 2010, while riding his bicycle in the area of a 24-foot pile silo, an 11-year-old boy died after being caught by a silage avalanche. It took 20 minutes to recover the body. In 2013, a farmer died and his employee was severely injured after being buried by a silage avalanche originated from a pile silo.

> "...people approach the silo areas with full confidence and without understanding the associated hazards."

There are many safety precautions workers can take when working around pile and bunker silos. An educational video addressing these safety precautions was recently developed by the Department of Dairy Science at Virginia Tech. This video actually shows an avalanche collapsing from the face of a bunker silo. Also, the video was produced and published in both English (https://youtu.be/SwPkJ2koclg) and Spanish (https://youtu.be/7J1fm9xhCM8) so all farm workers, English or Spanish-speaking, can increase their awareness that working around pile and bunker silos is dangerous.

We thank the Central Appalachian Regional Education and Research Center and the National Institute of Occupational Safety and Health for funding this project.

For more information on Dairy Extension or to learn about current programs, visit us at VT Dairy—Home of the Dairy Extension Program on the web at: www.vtdairy.dasc.vt.edu.

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Dairy Extension Coordinator & Extension Dairy Scientist