



Western Dairy News

for the West, about the West, from the West

Antibiotic residue prevention in milk and dairy beef

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According to the Pasteurized Milk Ordinance, all farm bulk tank milk and tanker truck milk must be tested for evidence of antibiotic residue prior to processing. Milk found with antibiotic residues is dumped, with the dairy producer bearing the cost for the dumped milk.

Further action may include suspension of the dairy producer's Grade A permit, with reinstatement occurring only after "a representative sample of the producer's milk, prior to commingling with other milk, is no longer positive for drug residue."

Milk residue statistics

At the recent National Mastitis Council Residue Avoidance Committee meeting, members presented data showing a decrease in antibiotic residues in milk and dairy beef over the past few years. According to the National Milk Drug Residue Data Base report for 2004, 0.044% of all samples were positive for a drug residue, down from 0.101% in 1995 (Table 1).

It is important to recognize that the samples reported do not necessarily represent 100% of the milk supply from each state. Nevertheless, the downward trend is great news and is most likely related to successful teamwork among dairy owners, managers, employees, veterinarians, allied industry technical support, milk processors, and university faculty.

Dairy beef statistics

It's important for dairy producers and employees to remember that they're also in the beef business, as dairy cows represent a major source of beef. In the western U.S. alone, over 800,000 head are marketed to slaughter every year.

In recent years, meat packers have implemented Hazard Analysis Critical Control Point plans, and have focused their attention on the quality of cattle coming into the packing plant. According to a large meat packer that processes approximately 1,350 market dairy cattle daily, drug

1. Practice healthy herd management.
2. Establish a valid veterinarian/client/patient relationship (VCPR).
3. Use only FDA-approved over-the-counter or prescription drugs with a veterinarian's guidance.
4. Maintain milk quality. Food safety and quality begins on the dairy.
5. Implement an effective mastitis management program
6. Administer all drugs properly and identify all treated animals.
7. Maintain and use proper treatment records on all treated animals.

Table 1. Bulk tanker truck milk samples positive for antibiotic residues for years 1995, 2000, and 2004.

year	total samples	# positive	percent
2004	3,589,082	1,571	0.044%
2000	3,501,878	2,542	0.073%
1995	3,219,071	3,263	0.101%

Table 2: Tissue residue violations in market dairy cattle (2004)

drug	# carcasses positive	percent
Penicillin	118	55.9%
Gentamycin	34	16.1%
Sulfadimethoxine	31	14.7%
other	28	13.3%

residues in carcasses are also decreasing. Nevertheless, as shown in Table 2, there is room for improvement.

10-point plan for residue prevention

"The Milk and Dairy Beef Residue Prevention Protocol 10-Point Plan" is a manual produced by the Milk and Dairy Beef Quality Assurance Center (www.dqacenter.org) designed for use by dairy producers, veterinarians, and employees. The manual assists in the evaluation of current production practices and the development of a plan to prevent residues in milk and dairy beef. The 10 critical control points of a milk and dairy beef residue prevention plan are:

8. Use drug residue screening tests.
9. Implement employee/family awareness of proper drug use to avoid marketing adulterated milk and dairy beef.
10. Complete the milk and dairy beef residue prevention protocol annually.

After completion of the "10 Point Plan," milk producers may request a Five Star Dairy Quality Assurance rating by a certified professional consultant. Contact the Dairy Quality Assurance Center office at 1-800-533-2479 for more information.

Although antibiotic residues in milk and dairy beef are decreasing, there is still a lot of work to be done to ensure food safety and consumer confidence in the food we produce. Visit www.dqacenter.org or <http://dairybeef.ucdavis.edu>, and contact your veterinarian, local Cooperative Extension, or milk processor to formulate and help implement a strategy to keep the milk and dairy beef that you produce residue-free.

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Maximizing vaccination programs for organic dairies

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Both conventional and organic dairies rely on vaccination programs to help prevent infectious diseases in cattle. However, it could be argued that maximizing every bit of benefit from a vaccination program is even more crucial in organic dairies since treatment alternatives are more limited.

Vaccination of organic dairy cattle is allowed for certification. But within that allowance, overzealous vaccination programs are discouraged. Thus, it is important that organic dairy producers consider how they can help stimulate an effective immune response and ensure that that immunity is present during the time of greatest risk to their cattle.

It must be emphasized that sound herd management and husbandry can ultimately have a greater impact on the health of cattle than any vaccine. Providing clean efficient facilities with adequate shelter will minimize exposure to environmental pathogens as well as minimize environmental climate stress. Don't forget that providing shade and cooling in summer is just as important as providing protection from wind and rain in winter.

Quarantine all new animals

Basic biosecurity and biocontainment practices should be in place and enforced. To prevent the introduction of diseases, all new additions to the herd should be tested for specific pathogens. These may include *M. paratuberculosis* (Johne's disease), BVDV, BLV, *Strep. agalactia* and *Mycoplasma bovis* mastitis, hairy heel warts, internal parasites as well as other diseases.

Animals should enter a quarantine pen for a period of at least three weeks before being introduced to the rest of the herd to allow them to stop shedding potential infectious viruses or bacteria that may infect other animals.

For herd biocontainment there should be a designated sick pen area. Animals with acute disease should be removed from contact with other animals and placed in the sick area for treatment until the disease is resolved. This will help minimize the spread to other in contact animals.

Young livestock should not be housed with adult livestock. This will help decrease the spread of pathogens such as Johne's to the young animals, as well as help minimize the risk of spreading BVDV from a possible PI calf back to pregnant adult cattle. With a little attention and effort, you can clear some specific pathogens out of your herd and prevent that disease.

There are many factors that can affect the type, magnitude, and duration of im-

mune response to a vaccine. Stress in general is immunosuppressive and can potentially decrease response to vaccination. There are many things that can stress cattle including social stress, climate stress, environmental stress including frequent housing changes, changes in the availability and type of feed or water, and impatient



or aggressive animal handling. The goal should be to maintain a stable environment with minimal intervention and changes.

Vitamins and minerals important

Nutrition also has a major impact on immune responses. The primary dietary nutrients that impact the immune system are Energy, Protein, Selenium, Copper, Zinc, Vitamin E, and Vitamin A

Appropriate attention should be made to vitamin and mineral supplements in the feed. If you are uncertain of your vitamin and mineral status you can work with your veterinarian to test blood or liver tissue samples to ensure that nutritional requirements are being met.

Proper energy balance is best evaluated by monitoring the body condition score of cattle. Animals that are too thin or too fat have decreased immune responses. Lastly, there is increasing evidence that subacute

rumen acidosis can suppress immune responses. Periodic evaluation of rumen fluid pH in select lactation groups can help monitor this so that appropriate changes to the ration can be made.

It is critical that vaccines be administered in a manner that will maximize their ability to prevent disease. One of the first considerations is whether to use a killed or modified live vaccine. Some of the newly released killed and modified live vaccines from a variety of biological companies have undergone significant improvements over the last decade.

New virus isolates, higher antigenic loads, and better adjuvants have been incorporated into several of these vaccines. Review those that you are currently using with your veterinarian to determine if you are using one of these newer products.

Differences between immune response to killed and modified live vaccines are becoming less pronounced. Both types typically give excellent humoral antibody responses. Modified live vaccines are still generally believed to provide better cytotoxic immunity, which is important for viral infections but not as important for bacterial infections.

Some modified live vaccines can now also be used in pregnant cattle if they have been vaccinated by the same product within a year. Thus, the decision to use a modified live or killed vaccine now depends more on your management and when you want to vaccinate to maximize protection for a specific disease.

As a general rule of thumb, modified live vaccines initially take two weeks to provide an effective immune response and killed vaccines take up to five weeks from the first dose. Booster responses can be seen within one week for both vaccines.

Remember that killed vaccines generally require two doses to obtain an appropriate immune response. Failure to give them in the interval recommended on the label can result in a lower or possibly even a failed immune response. If these vaccines do not properly immunize on the first attempt, they may not provide adequate response on later boosters as well.

Maternal colostrum antibody interference can still affect the response to both modified live and killed vaccines. For young calves there seems to be a window between one and three weeks of age, and again after five weeks, when they will respond best to vaccination. While there is evidence of eliciting some cell mediated immunity and memory when young calves are vaccinated, it is still important to make sure that you vaccinate all calves again at four to seven months of age and also one month prior to breeding replacement heifers.

Developing a strong immune response to vaccination is a complex process. By paying attention to your management, nutrition of animals, timing of your vaccination program, and the type of vaccines used, you can help maximize the benefit of this tool in raising healthy cattle.

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