



## **Milk and Dairy Beef Drug Residue Prevention**

Producer Manual of Best Management Practices

**2016**



National Milk Producers Federation (“NMPF”) does not endorse any of the veterinary drugs or tests identified on the lists in this manual. The lists of veterinary drugs and tests are provided only to inform producers what products may be available, and the producer is responsible for determining whether to use any of the veterinary drugs or tests. All information regarding the veterinary drugs or tests was obtained from the products’ manufacturers or sponsors, and NMPF has made no further attempt to validate or corroborate any of that information. NMPF urges producers to consult with their veterinarians before using any veterinary drug or test, including any of the products identified on the lists in this manual. In the event that there might be any injury, damage, loss or penalty that results from the use of these products, the manufacturer of the product, or the producer using the product, shall be responsible. NMPF is not responsible for, and shall have no liability for, any injury, damage, loss or penalty.

## FOREWORD

The goal of our nation's dairy farmers is to produce the best tasting and most wholesome milk possible. Our consumers demand the best from us and we meet their needs and exceed their expectations every day. Day in and day out, our dairy farmers provide the best in animal husbandry and care for their animals. Continually, we evaluate our best management practices and disease prevention protocols to keep our animals healthy and comfortable. There are occasions where animals may get sick and need antimicrobial therapy to overcome a specific disease challenge. As dairy producers, we strategically and judiciously use our antimicrobial therapy to help an individual animal that has been threatened with a disease. We take this responsibility of judicious antimicrobial use seriously and take many precautions with our antibiotic-treated animals so that their milk or meat does not enter the food supply.

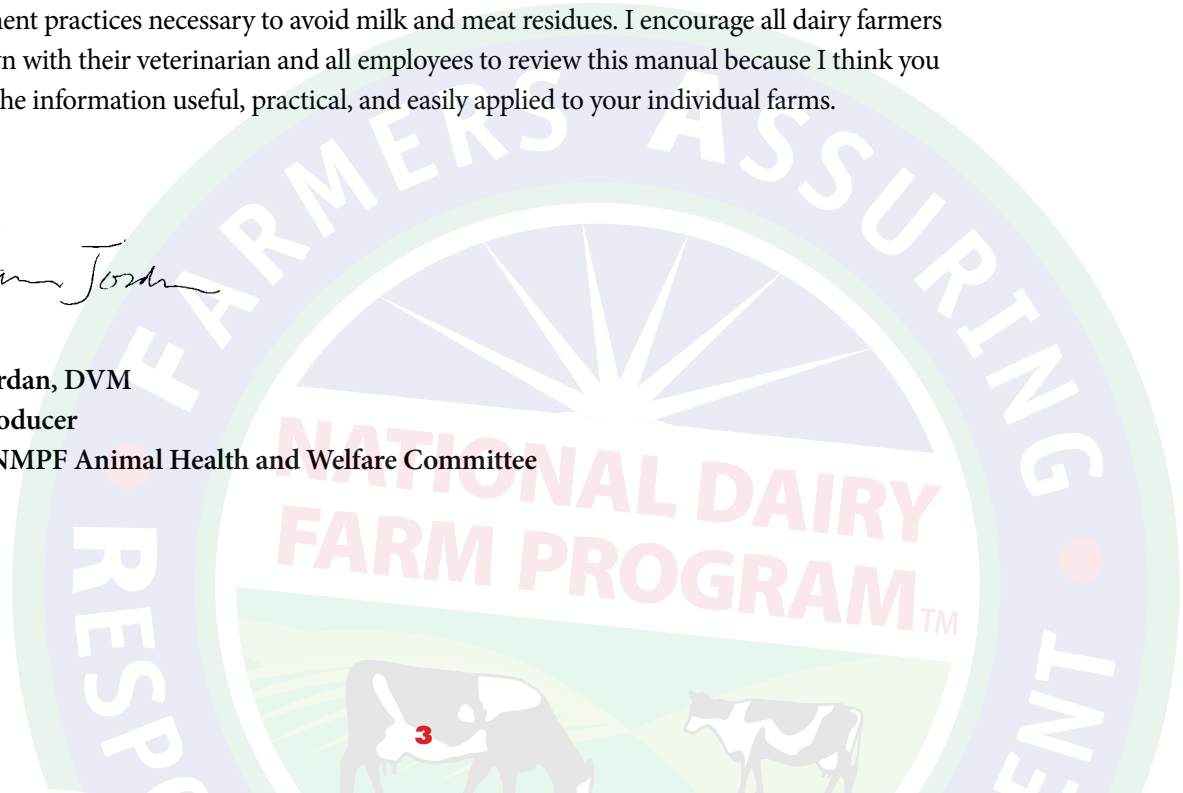
The avoidance of milk and meat residues in the dairy industry takes an on-farm team effort that begins with the VCPR – the Veterinarian-Client-Patient-Relationship. The dairy farm owner/manager/herdsman must work with their veterinarian to develop treatment protocols that ensure that antimicrobials are used correctly. Once a decision is made to use antimicrobials, then protocols must be in place to guide employees on the safe way to handle the animal to prevent an inadvertent milk or meat residue from occurring. Identification of treated animals and recording drug use are essential to prevent residues.

For more than 25 years, each revision of the Milk and Dairy Beef Residue Avoidance Manual has served as the U.S. dairy industry's commitment to antimicrobial stewardship – the judicious and responsible use of drugs in dairy animals. This year's revised Manual is a quick resource to review those drugs approved for dairy animals and can also be used as an educational tool and resource for farm managers as they develop their on-farm best management practices necessary to avoid milk and meat residues. I encourage all dairy farmers to sit down with their veterinarian and all employees to review this manual because I think you will find the information useful, practical, and easily applied to your individual farms.

Sincerely,



**Karen Jordan, DVM**  
**Dairy Producer**  
**Chair – NMPF Animal Health and Welfare Committee**





**PRODUCT INFORMATION**  
NADA 141-299, Approved by FDA.



(Florfenicol and Flunixin Meglumine)  
Antimicrobial/Non-Steroidal Anti-Inflammatory Drug

**For subcutaneous use in beef and non-lactating dairy cattle only. Not for use in female dairy cattle 20 months of age or older or in calves to be processed for veal.**

**BRIEF SUMMARY:** For full prescribing information, see package insert.

**INDICATION:** RESFLOR GOLD® is indicated for treatment of bovine respiratory disease (BRD) associated with *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni*, and *Mycoplasma bovis*, and control of BRD-associated pyrexia in beef and non-lactating dairy cattle.

**CONTRAINDICATIONS:** Do not use in animals that have shown hypersensitivity to florfenicol or flunixin.

**WARNINGS: NOT FOR HUMAN USE. KEEP OUT OF REACH OF CHILDREN.** This product contains material that can be irritating to skin and eyes. Avoid direct contact with skin, eyes, and clothing. In case of accidental eye exposure, flush with water for 15 minutes. In case of accidental skin exposure, wash with soap and water. Remove contaminated clothing. Consult a physician if irritation persists. Accidental injection of this product may cause local irritation. Consult a physician immediately. The Material Safety Data Sheet (MSDS) contains more detailed occupational safety information.

For customer service or to obtain a copy of the MSDS, call 1-800-211-3573. For technical assistance or to report suspected adverse reactions, call 1-800-219-9286.

Not for use in animals intended for breeding purposes. The effects of florfenicol on bovine reproductive performance, pregnancy, and lactation have not been determined. Toxicity studies in dogs, rats, and mice have associated the use of florfenicol with testicular degeneration and atrophy. NSAIDs are known to have potential effects on both parturition and the estrous cycle. There may be a delay in the onset of estrus if flunixin is administered during the prostaglandin phase of the estrous cycle. The effects of flunixin on imminent parturition have not been evaluated in a controlled study. NSAIDs are known to have the potential to delay parturition through a tocolytic effect.

RESFLOR GOLD®, when administered as directed, may induce a transient reaction at the site of injection and underlying tissues that may result in trim loss of edible tissue at slaughter.

**RESIDUE WARNINGS:** Animals intended for human consumption must not be slaughtered within 38 days of treatment. Do not use in female dairy cattle 20 months of age or older. Use of florfenicol in this class of cattle may cause milk residues. A withdrawal period has not been established in pre-ruminating calves. Do not use in calves to be processed for veal.

**ADVERSE REACTIONS:** Transient inappetence, diarrhea, decreased water consumption, and injection site swelling have been associated with the use of florfenicol in cattle. In addition, anaphylaxis and collapse have been reported post-approval with the use of another formulation of florfenicol in cattle.

In cattle, rare instances of anaphylactic-like reactions, some of which have been fatal, have been reported, primarily following intravenous use of flunixin meglumine.

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May 2009 US 344B\_IV



Consumers count on the care you provide to make sure that your animals are healthy and comfortable. And when an animal does get sick, **Resflor Gold®** (florfenicol and flunixin meglumine) helps you do both of those things. Resflor Gold effectively targets the most common causes of BRD – and it provides relief from the fever that comes along with it.



**High-quality food starts with the right care. Visit [ResflorGold.com/FARM](http://ResflorGold.com/FARM) to learn more.**

#### IMPORTANT SAFETY INFORMATION

**NOT FOR HUMAN USE. KEEP OUT OF REACH OF CHILDREN.** This product contains material that can be irritating to skin and eyes. Animals intended for human consumption must not be slaughtered within 38 days of treatment. This product is not approved for use in female dairy cattle 20 months of age or older, including dry dairy cows. Use in these cattle may cause drug residues in milk and/or in calves born to these cows. A withdrawal period has not been established in pre-ruminating calves. Do not use in calves to be processed for veal. Do not use in animals that have shown hypersensitivity to florfenicol or flunixin. Not for use in animals intended for breeding purposes. The effects of florfenicol and flunixin on bovine reproductive performance, pregnancy, and lactation have not been determined. When administered according to the label directions, RESFLOR GOLD may induce a transient local reaction in the subcutaneous and underlying muscle tissue. Brief summary available on adjacent page.

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# Milk and Dairy Beef Residue Prevention

## INTRODUCTION

The U.S. dairy industry is committed to producing safe, abundant, and affordable milk and dairy beef of the highest quality. Healthy animals help make for safe food, and disease prevention is the key to keeping cows healthy. When dairy animals get sick and treatment is necessary, producers and veterinarians use drugs judiciously. Antimicrobials should be used appropriately to prevent residues from occurring in milk or dairy beef. The marketing of milk or beef with drug residues, even unintentionally, is illegal and can result in financial and criminal penalties.





## ANTIMICROBIAL STEWARDSHIP

Antimicrobial stewardship goes beyond an individual dairy farmer's actions and extends across all livestock production, companion animal, and human use of antimicrobials. Misuse and overuse of antimicrobials is one of the world's most pressing public health problems. Infectious organisms adapt to the antimicrobials designed to kill them, making the drugs less effective. In September 2014, President Obama released Executive Order 13676 on Combating Antibiotic-Resistant Bacteria. The Executive Order established a Task Force co-chaired by the Secretaries of Defense, Agriculture, and Health & Human Services with the goal of:

*"... working domestically and internationally to detect, prevent, and control illness and death related to antibiotic-resistant infections by implementing measures that reduce the emergence and spread of antibiotic-resistant bacteria and help ensure the continued availability of effective therapeutics for the treatment of bacterial infections."*

In combination, the National Dairy FARM Program's Animal Care Manual and the Residue Avoidance Manual serve as the roadmap for the U.S. dairy industry's commitment to antimicrobial stewardship. That commitment begins on the farm with coordinated animal health and care programs, including a Herd Health Plan developed in consultation with a licensed veterinarian, or other appropriately trained veterinary consultant. An effective written Herd Health Plan emphasizes prevention, rapid diagnosis and quick decision-making on necessary treatment of all sick or injured dairy cattle on the farm. Even with the best prevention programs, animals can become sick or injured, and judicious and responsible use of antimicrobials (including antibiotics) under veterinary supervision may be necessary to improve the health outcome of the animal.

## ANIMAL DRUGS

There are three classes of animal drugs: Over-the-Counter (OTC), Prescription (Rx), and Veterinary Feed Directive (VFD). OTC drugs can be sold by any person or establishment without a veterinary prescription. Rx drugs can only be sold to the farmer by a veterinarian or pharmacist, and only with a veterinary prescription. VFD is a drug intended for use in or on feed, which is limited by an approved application to use under the professional supervision of a licensed veterinarian. Pulmotil® (tilmicosin) is the first VFD product approved for use in cattle. The Food and Drug Administration (FDA) approved the drug as a treatment for groups of cattle in the early stages of a bovine respiratory disease outbreak to provide 14 days of sustained in-feed therapy. Pulmotil® is approved for use in beef and non-lactating dairy cattle.

In December 2013, FDA finalized [Guidance for Industry #213](#) establishing the procedures for voluntarily phasing out growth promotion indications for medically important antibiotics in alignment with [Guidance for Industry #209](#). With these guidances, animal pharmaceutical companies have agreed to voluntarily revise the FDA-approved use conditions for these products to remove production indications by December 31, 2016. Additionally, the current over-the-counter status will be changed to bring the remaining appropriate therapeutic uses under veterinary oversight by the same date.

In June 2015, the FDA finalized the Veterinary Feed Directive (VFD) <http://www.gpo.gov/fdsys/pkg/FR-2015-06-03/pdf/2015-13393.pdf> VFD to improve efficiency of the program. The VFD regulation mandates the rules and responsibilities of licensed veterinarians in prescribing and administering medically important antibiotics in feed or water. A licensed veterinarian must have an established Veterinarian-Client-Patient-Relationship to prescribe a VFD drug. The final VFD rules also prohibit any "extra-label drug use" so a VFD prescription must conform exactly to the drug manufacturer's label indications including the specific disease or condition being treated.

FDA [Guidance for Industry #152](#) defines medically important antibiotics which will be subject to the VFD when administered in feed or water to include aminoglycosides, lincosamides, macrolides, penicillins, streptogramins, sulfonamides, and tetracyclines. Ionophores, like monensin, are not affected by the guidance, since they have no human medical relevance. Thus the actions should have no effect on the use of ionophore additives in lactating and dry cows or as coccidiostats in growing heifers.

Any use of a drug not specifically listed on the label is called “extra-label drug use” and is regulated by the FDA under the Animal Medicinal Drug Use Clarification Act (AMDUCA) of 1994. Using a prescription or over-the-counter drug in an extra-label manner is illegal unless it is specifically recommended under the guidance of a veterinarian working in the context of a Veterinarian-Client-Patient Relationship (VCPR). There are no legal extra-label uses of VFD drugs.

#### Examples of extra-label drug use:

1. Changing the **dose**, such as giving more penicillin than is listed on the label.
2. Changing the **route** of administration, such as giving flunixin intramuscularly (IM) or subcutaneously (SQ) instead of intravenously (IV).
3. Giving a drug to a **different production class** of animal, such as using Nuflor® in a lactating dairy cow.
4. Giving a drug for an **indication (disease)** not listed on the label, such as using Excede® for diarrhea.
5. Changing the **withholding times**, such as not following milk withholding times for fresh cows after dry treatment administration.
6. Changing the **amount of drug** per injection site.
7. Changing the **duration** of therapy.



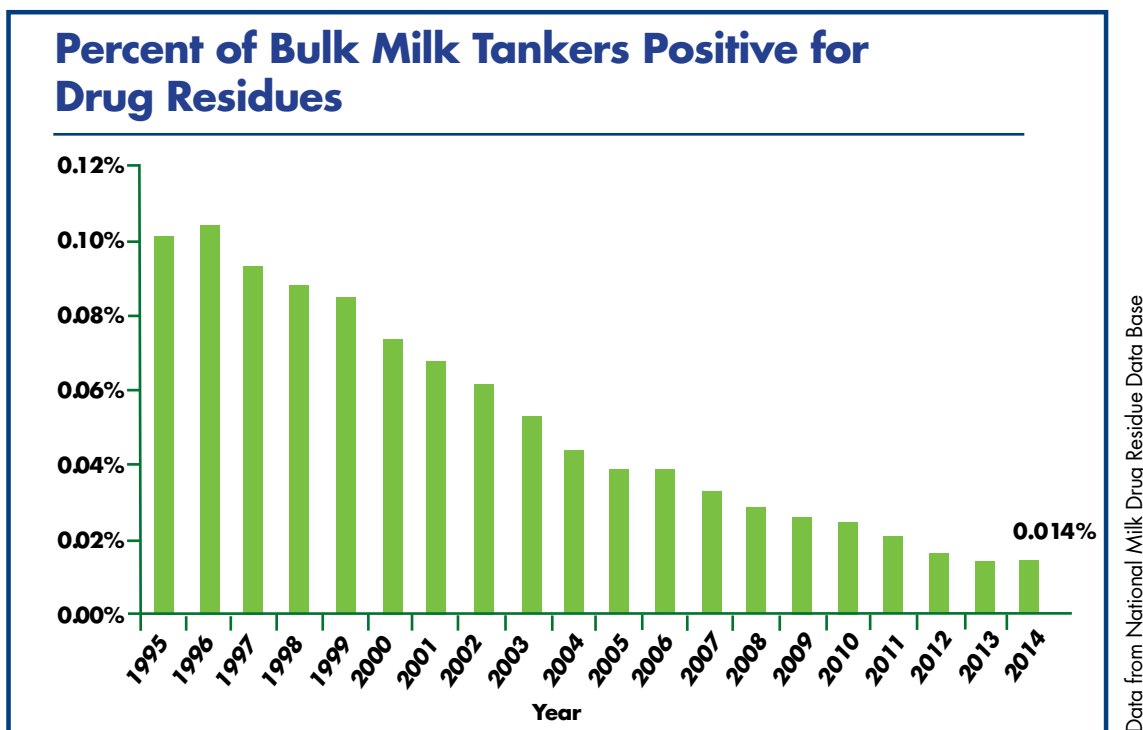


## MILK DRUG RESIDUE TESTING

The Grade “A” Pasteurized Milk Ordinance (PMO), the rules which state regulatory agencies use to implement their Grade “A” milk programs, requires that all bulk milk tankers be sampled and analyzed for beta-lactam drug residues before the milk is processed. Customers (e.g. processors) may also require additional testing for quality assurance purposes.

Any tanker found positive for beta-lactam residue is rejected for human consumption. In 1996, of the 3,384,779 bulk milk pick-up tankers tested, 0.104 percent tested positive.<sup>1</sup> Through increased education and industry advancements, of the 3,147,302 bulk milk pick-up tankers tested by industry and state regulatory agencies from October 2013 to September 2014, 0.014 percent tested positive for drug residues. This signifies a dramatic decrease from an already low-level of occurrence.<sup>2</sup>

**Figure 1. PERCENT OF BULK MILK TANKERS POSITIVE FOR DRUG RESIDUES, 1995–2014.**



## MULTIDRUG SCREENING TEST FOR BULK TANK MILK

In 2010, the Food and Drug Administration developed a multi-class, multi-residue liquid chromatography/tandem mass spectrometry (LC-MS/MS) screening and confirmation method for drug residues in milk. The procedure is detailed in [FDA Laboratory Information Bulletin #4443](#). According to the bulletin’s authors, the intended purpose of this method is to screen samples to determine if a residue is present at the level of interest (i.e., safe / tolerance levels, or established levels of detection) and also to confirm the identity of the compound. An exact quantitative determination of any

residue is not addressed with this procedure and will need to be obtained using other methodology.

This method tests for the following drugs: ampicillin, penicillin G, cloxacillin, cephalapirin, sulfamethazine, sulfadiazine, sulfadimethoxine, sulfathiazole, sulfaquinolaxine, sulfapyridine, sulfachloropyridazine, sulfamerazine, oxytetracycline, tetracycline, chlortetracycline, doxycycline, tylosin, tilmicosin, erythromycin, sarafloxacin, enrofloxacin or ciprofloxacin, flunixin, bacitracin, thiabendazole, virginiamycin, and tripeleminamine. Some testing laboratories have modified this method to include additional drugs.

## MEAT DRUG RESIDUE TESTING

The United States Department of Agriculture (USDA) Food Safety Inspection Service (FSIS) conducts tests for chemicals—including antibiotics and various other drugs, pesticides and environmental chemicals—in meat, poultry, and egg products destined for human consumption. Scheduled sampling plans consist of the random sampling of tissue from healthy-appearing food animals. The development of scheduled sampling plans is a process that proceeds in the following manner:

- 1) determine which compounds are of food safety concern;
- 2) use algorithms to rank the selected compounds;
- 3) pair these compounds with appropriate production classes;
- and 4) establish the number of samples to be collected.<sup>3</sup>

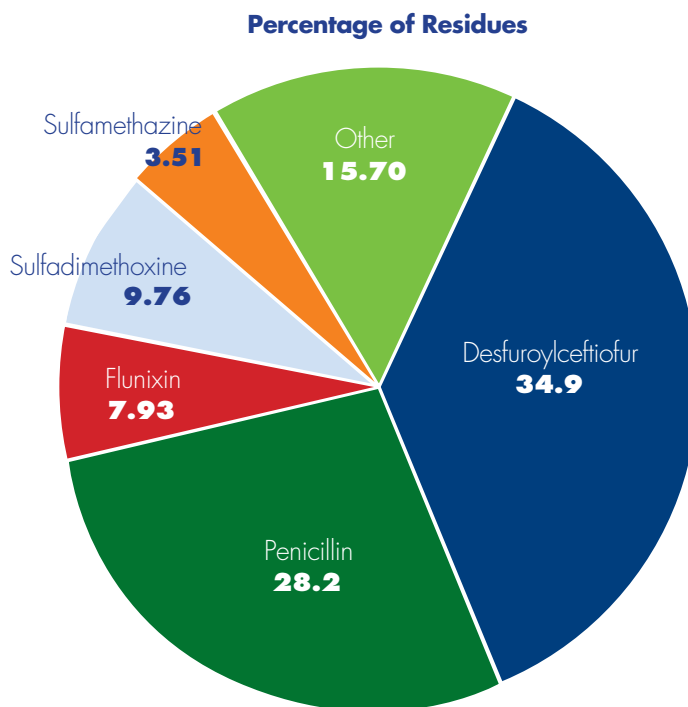
The FSIS HACCP program implemented at slaughter facilities identifies the animals most likely to have drug residues. Animals that display lameness, injection site lesions or signs of illness are targeted for testing. Factors that can contribute to higher risk of residues are found in Figure 3 and can be useful in assessing animals destined for slaughter. If there is any doubt about the potential for drug residues in an animal, they should be withheld from market.

Each year, nearly 3 million adult dairy cows are slaughtered for beef. Of that amount, a very small percentage test positive for a residue. Over the past few years, USDA has made several changes to its residue screening program including implementation of the KIS test, which is more sensitive than earlier tests, and increasing of the number of tests conducted on market dairy cows. In spite of these changes, USDA FSIS reported the number of tissue residues in market dairy cows decreased by 12.5% in the last two years.

Dairy farmers transition their cows from a supplier of milk to a source of beef when deciding to ship a cow to market. Shipping healthier animals reduces the chance that an animal will be targeted for drug residue testing. The risk of violative tissue residues should be minimized if treatment protocols and appropriate withdrawal times are carefully followed and approved animal drugs are used for the class of animal being treated. If treatment records are well maintained and proper doses, routes and frequencies of administration are heeded, the risk of violative tissue residues will be minimized.

**Figure 2. PREVALENCE OF  
DRUG RESIDUES IN CULL  
DAIRY COWS  
APRIL 2014-MARCH 2015**

Data from USDA-FSIS  
National Residue Program  
Quarterly Reports,  
Violations from  
Inspector-Generated In-Plant  
Screening Program



- 1 National Milk Drug Residue Data Base: Fiscal Year 1996 Annual Report. GLH, Incorporated. Lighthouse, FL. February 10, 1997. <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/MilkSafety/Miscellaneous-MilkSafetyReferences/ucm115756.htm>
- 2 National Milk Drug Residue Data Base: Fiscal Year 2014 Annual Report. GLH, Incorporated. Lighthouse, FL. February 12, 2015. <http://www.kandc-sbcc.com/nmdrd/fy-14.pdf>
- 3 2011 FSIS National Residue Program Scheduled Sampling Plans. USDA Food Safety Inspection Service Office of Public Health Science. April 2011. [http://www.fsis.usda.gov/PDF/2011 Blue Book.pdf](http://www.fsis.usda.gov/PDF/2011%20Blue%20Book.pdf)

# Protect Your Farm with Charm

## RESIDUE PREVENTION

### Charm® Antibiotic and Aflatoxin Solutions:

**Charm (SL) Safe Level Test:** Beta-lactam results in 3 or 8 minutes. Charm tests are the industry quality standard.

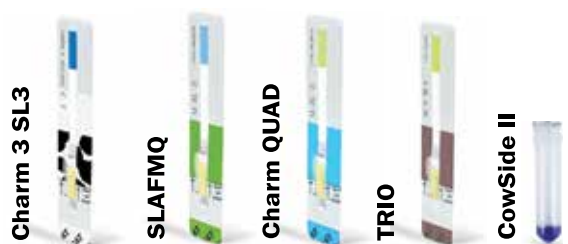
**Charm (SL) Aflatoxin Tests:** Validated test to detect action level of concern and a NEW 3 minute visual test for farm use.

**Charm ROSA® QUAD Tests:** Four drug detections on a single test, customized to meet a variety of 12 different antibiotic families.

**Charm MRL TRIO Test:** The MRL TRIO test detects beta-lactams, sulfa drugs, and tetracyclines in raw commingled cow milk in 3 minutes.

**Broad Spectrum Inhibition:** CowSide® II test for beta-lactams, sulfonimides, aminoglycosides, and tetracyclines is the most comprehensive inhibition test.

Contact Charm Sciences for residue concerns.



659 Andover Street | Lawrence, MA 01843 | 1.978.687.9200 | [info@charm.com](mailto:info@charm.com) | [www.charm.com](http://www.charm.com)

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**Figure 3. TISSUE RESIDUE RISK ASSESSMENT OF A DAIRY COW FOR MARKET**

|  |  |
|--|--|
| <p><b>Low Risk</b><br/>Animal history is documented, recorded and available.</p> <p><input type="checkbox"/> Animal never treated with drugs.</p> <p><b>OR-</b></p> <p><input type="checkbox"/> Single drug administration of lactating/non-lactating animal approved drug – AND<br/>Followed drug label information for dose, route of administration, duration of therapy and withholding time.</p> <p><b>OR-</b></p> <p><input type="checkbox"/> Veterinary oversight of the use of drugs in an extra-label manner.</p> | <p><b>High Risk</b><br/>Animal is displaying lameness, injection sites, surgical evidence or looks sick – AND any of the below apply:</p> <p><input type="checkbox"/> History of animal treatment not documented or not communicated to person sending cow to market.</p> <p><input type="checkbox"/> Route of administration that was used is not as prescribed on the label.</p> <p><input type="checkbox"/> Multiple drug administration without veterinary oversight.</p> <p><input type="checkbox"/> Drug not approved for animal status, e.g. lactating.</p> <p><input type="checkbox"/> Doses or withholding times not followed or unknown.</p> <p><input type="checkbox"/> Duration of therapy not followed.</p> <p>If any of the above high risk attributes exist, consult pharmaceutical, veterinary or screening test experts to determine status of animal before offered for sale –<br/><b>When in doubt hold it out!</b></p> |
|--|--|

FSIS maintains a “[Repeat Residue Violator List for Use by FSIS Inspection Personnel](#)” that contains the names and addresses of producers who have more than one meat residue violation in a 12-month period in animals presented for slaughter. Specific information about the violation can also be found in this list, including the plant where the violation was determined, the drug residues discovered, and their concentrations and tolerances. Violators listed may have had multiple violations documented in the same processing facility or separate facilities. This list is intended to aid inspectors in discovering residue tolerance violations before they

reach consumers. FSIS provides a user guide that explains the information contained in the list.

FSIS also maintains a “[Residue Repeat Violator List for Use by Livestock Markets and Establishments](#)” that contains similar information intended to assist plant owners and operators in identifying residue history of livestock suppliers. This second list documents only the source name and address information of repeat violators, so that livestock marketers and buyers may use precaution when marketing and processing animals from listed suppliers.

August 18, 2011

06:09:58

**FSIS RESIDUE VIOLATION INFORMATION SYSTEM**

**WEEKLY RESIDUE REPEAT VIOLATOR FOR USE BY FSIS INSPECTION PROGRAM PERSONNEL**

Part I: This part is intended to assist Inspection Program Personnel to identify producers with more than one residue violation in the last 12 months either in the same establishment or different establishments.

| Source Name By State | Plant Name / ID   | Sample ID / Date Collected / Tags   | Tissue | Residue    | Value (ppm) | Tolerance |
|----------------------|-------------------|---|--------|------------|-------------|-----------|
| www.fsis.usda.gov    | www.fsis.usda.gov | 524305 6/22/11<br>COWS - DAIRY<br>BACK TAGS<br>930M5555 BACK TAGS 5582 LOT<br>TAG<br>1236 | KIDNEY | PENICILLIN | 0.12        | .05       |
| www.fsis.usda.gov    | www.fsis.usda.gov | 524714 10/25/10<br>COWS - DAIRY<br>BACK TAGS<br>930M6835 BACK TAGS 2420                   | LIVER  | FLUNKIN    | 1.86        | .125      |

The regulatory tolerances for milk and meat antibiotic residues vary depending on the type of drug used and route of administration. The withdrawal times and safety tolerances are only valid if a drug is used according to the label directions AND in the class of animal listed on the label. If a drug is used in a class of animal NOT on the label, then there is NO TOLERANCE established for that drug and any trace amount, even if it is below the safe/tolerance level established for the labeled class, is a violation. All of these products have a tolerance limit if it is used in the labeled class of animal. Extra-label drug use in unapproved classes of animals is discouraged. A complete listing of the tolerances can be found in the FDA Green Book, which lists all approved animal drugs. The Green Book is available in searchable format online.

When there is doubt about an animal drug residue status it is advised to consult experts that can help determine the status of the drug in the animal before it is sent to slaughter. Your herd health veterinarian is a good first resource. The veterinarian can help determine if pharmaceutical companies should be consulted or live animal screening tests employed to determine an animal drug residue status. If you have questions or concerns about potential residues or withdrawal times please contact your local veterinarian. For additional help or information the following phone numbers and websites of pharmaceutical and screening test manufacturers may also help with advice and determine residue status.

**Charm Science, Inc. • 1-800-343-2170**

[www.charm.com](http://www.charm.com)

**Merck's DairyCares365 • 1-800-211-3573**

<https://www.dairycare365.com/solution/residue-prevention-education>

**Zoetis • 1-800-366-5288**

[www.avoidresidues.com](http://www.avoidresidues.com)

## RESOURCES

FDA Green Book, for tissue residue thresholds

<http://www.fda.gov/AnimalVeterinary/Products/ApprovedAnimalDrugProducts/>

FSIS Residue Repeat Violator Lists

<http://www.fsis.usda.gov/wps/portal/fsis/topics/data->

[collection-and-reports/chemistry/residue-chemistry](#)

Food Animal Residue Avoidance & Depletion Program (FARAD) <http://www.farad.org>

2011 PMO - Drug Residue Testing and Farm Surveillance

<http://www.fda.gov/downloads/Food/FoodSafety/Product-SpecificInformation/MilkSafety/NationalConferenceonInterstateMilkShipmentsNCIMSModelDocuments/UCM291757.pdf>

Animal Drugs@FDA, FDA Approved Animal Drug Products <http://www.accessdata.fda.gov/scripts/animaldrugsatfda/>

## **Food Animal Residue Avoidance Databank (FARAD)**

*FARAD is a national, USDA-sponsored, cooperative project, with a primary mission to prevent or mitigate illegal residues of drugs, pesticides and other chemicals in foods of animal origin. Producers should work with the veterinarian with whom they have a valid VCPR for drug residue information first. The veterinarian is the ideal resource to discuss FARAD-specific information regarding withdrawal times, especially for extra-label drug use.*

*FARAD provides the following services:*

- Advice on residue avoidance or mitigation
- VetGram search for required withdrawal times for approved food animal drugs
- FARAD-recommended withdrawal intervals for extra-label use of approved food animal drugs

*Visit [www.farad.org](http://www.farad.org) for more information.*

## RECORDS MANAGEMENT

FDA requires veterinarians to maintain records for two years of all animals treated using extra-label drugs (21 CFR 530.5).<sup>4</sup> Though not a regulatory requirement, a good management practice for producers is to keep records on all animals treated with drugs. The record system should be easily accessible to everyone who works with the animals. Records should be permanent so the veterinarian has a history to which he/she can refer to prescribe effective therapy and to serve as protection in case of regulatory follow-up. The producer needs to be able to show how all drugs purchased were used or disposed.

The treatment record should contain the following basic information:

- Treatment date
- Animal identification
- Dosage
- Route of administration and expected duration
- Withdrawal time for milk and meat
- Individual who administered the drug
- Drug used
- Duration of therapy

4 Code of Federal Regulations 21 CFR 530.5. Food and Drug Administration. April 1, 2015.

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=530.5>



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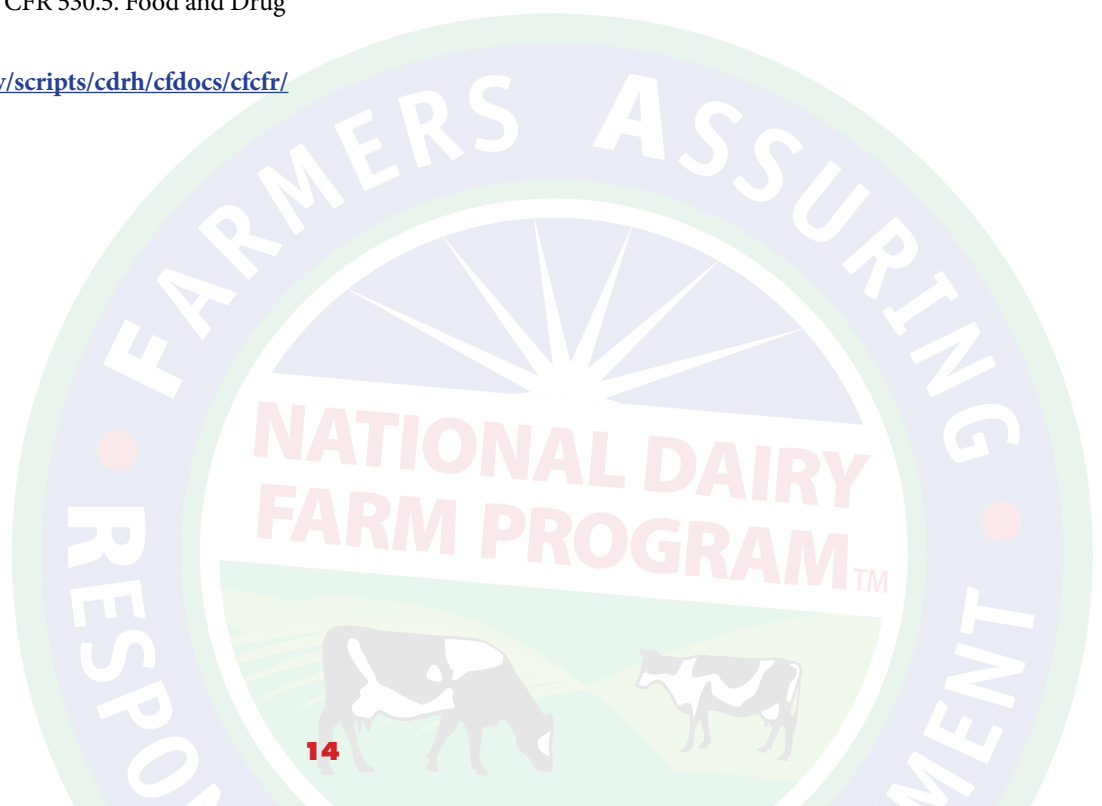
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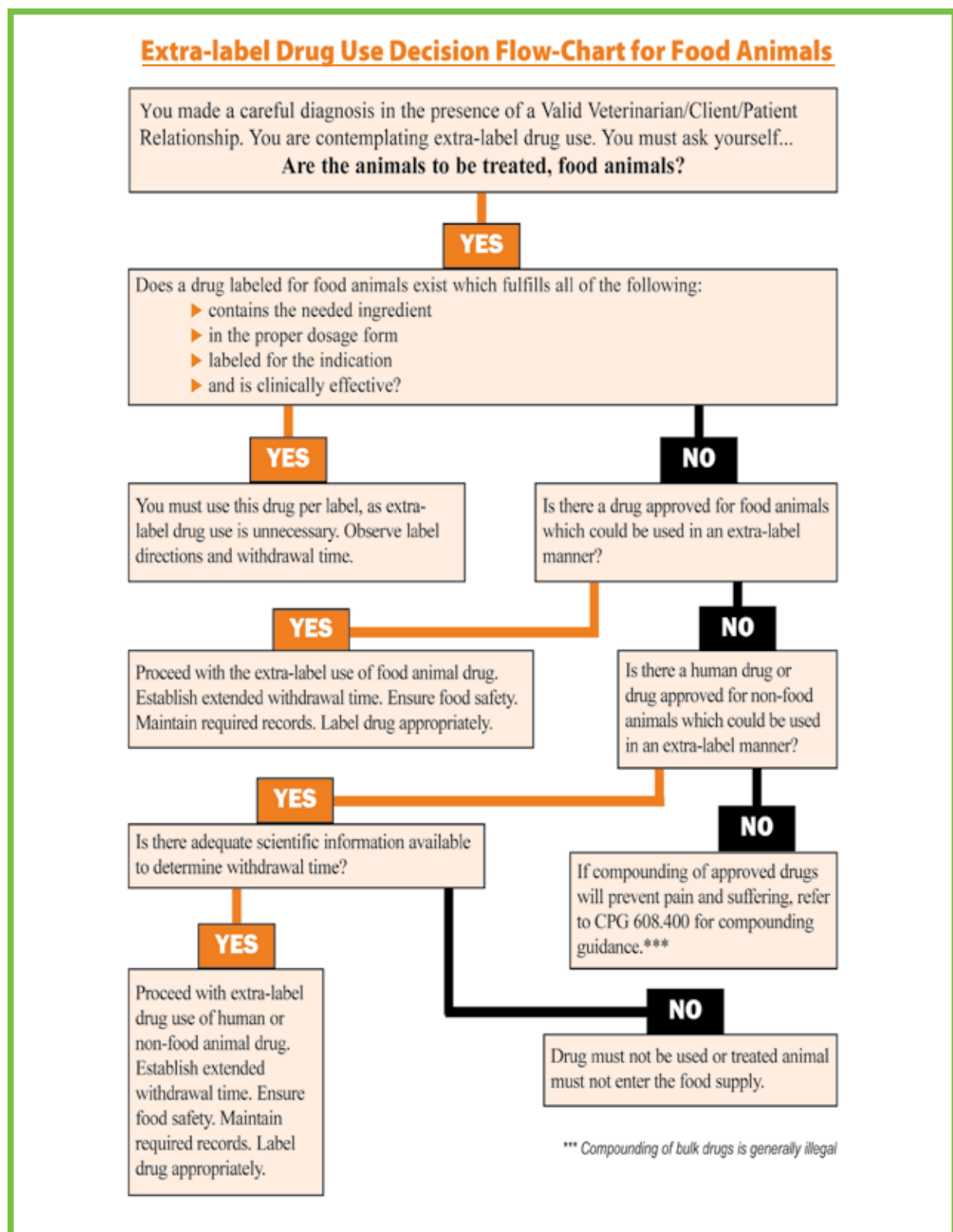
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**Figure 4. EXTRA-LABEL DRUG USE DECISION TREE**



*This chart provided by the Center for Dairy Excellence.*

## Drugs Prohibited From Extra-label Use in Animals (21 CFR Sec. 530.41)<sup>5</sup>

The Code of Federal Regulations (CFR) provides an updated list of animal drugs prohibited from extra-label use and drugs not approved for use in food animals. The lists below are subject to change. Consult the current version of 21 CFR Sec. 530.4 for the most up-to-date list.

### 21 CFR Section 530.41(a):

The following drugs, families of drugs, and substances are prohibited for extra-label animal and human drug uses in food-producing animals.

- 1) Chloramphenicol
- 2) Clenbuterol
- 3) Diethylstilbestrol (DES)
- 4) Dimetridazole
- 5) Ipronidazole
- 6) Other nitroimidazoles
- 7) Furazolidone
- 8) Nitrofurazone
- 9) Sulfonamide drugs in lactating dairy cattle (except approved use of sulfadimethoxine, sulfabromomethazine, and sulfaethoxypyridazine)
- 10) Fluoroquinolones (examples ciprofloxacin, enrofloxacin)
- 11) Glycopeptides
- 12) Phenylbutazone in female dairy cattle 20 months of age or older
- 13) Cephalosporins (not including cephalixin) in cattle, swine, chickens, or turkeys:
  - (i) For disease prevention purposes;
  - (ii) At unapproved doses, frequencies, durations, or routes of administration; or
  - (iii) If the drug is not approved for that species and production class.

[62 FR 27947, May 22, 1997, as amended at 67 FR 5471, Feb. 6, 2002; 68 FR 9530, Feb. 28, 2003; 68 FR 14134, Mar. 24, 2003; 71 FR 14377, Mar. 22, 2006, 77FR745, Jan. 6, 2012]

5 Code of Federal Regulations. 21CFR 530.41.

Food and Drug Administration. April 1, 2013.

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=530.41>

## Drugs not approved for use (illegal to use) in food-producing animals

The following drugs are **not approved for use** in any species of food-producing animal:

- Chloramphenicol
- Clenbuterol
- Diethylstilbestrol (DES)
- Dipyrone
- Gentian violet
- Glycopeptides (example vancomycin)
- Nitrofurans (including topical use)
- Nitroimidazoles (including metronidazole)

Following a thorough literature review, the American Veterinary Medical Association (AVMA), the American Association of Bovine Practitioners (AABP), and the Academy of Veterinary Consultants (AVC) recommend that veterinarians refrain from using aminoglycosides (Amikacin, Gentamicin, Kanamycin, and Neomycin) in cattle except where approved for use by the Food and Drug Administration as these antibiotics can cause very prolonged tissue residues.

### Cephalosporin Extra-label Use Prohibitions

On April 6, 2012, the U.S. Food and Drug Administration Order of Prohibition of Cephalosporins became effective. The FDA order prohibits certain “extra-label” or unapproved uses of the cephalosporin (excluding cephalixin) class of antimicrobial drugs in cattle, swine, chickens and turkeys.

Specifically, the ***prohibited uses*** include:

- using cephalosporin drugs at unapproved dose levels, frequencies, durations, or routes of administration;
- using cephalosporin drugs in cattle, swine, chickens or turkeys that are not approved for use in that species (e.g., cephalosporin drugs intended for humans, companion animals or a different species or class of food animal);
- using cephalosporin drugs for disease prevention.

The following ***exceptions to the prohibition*** apply:

- extra-label use of approved cephalixin products in food-producing animals;
- use to treat or control an extra-label disease indication, as long as this use adheres to a labeled dosage regimen (i.e., dose, route, frequency, and duration of administration) approved for that particular species and production class; and
- extra-label use in food-producing minor species, such as sheep, goats, ducks or rabbits.

### Cephalixin

Cephalixin drug products are excluded from the prohibition order. Cephalixin is currently only approved for use in food-producing animals as an intramammary infusion formulation for dairy cattle and there are currently no approved cephalixin drug products approved for use in humans.

All drugs given to dairy animals must be used for specific disease indications according to label recommendations and withdrawal periods. In dairy animals, cephalosporins can be used in an extra-label manner only for disease indication and only under the recommendation of a veterinarian for which the farm has a current VCPR. Any use of a drug in a manner not listed on the label without a VCPR is illegal.

### Underlying Causes of Antibiotic Residues in Milk and Meat

Drug residues can be avoided by a well-planned drug use program. Reasons given for milk and meat residues result from many on-farm situations. These include, but are not limited to, the following:

- Lack of consultation from a licensed veterinarian.
- Not following veterinarian’s recommendation when using any drug.
- Not following the manufacturer– or veterinarian–prescribed label directions for correct treatment.
- Not following the manufacturer– or veterinarian–prescribed label directions for the appropriate withdrawal period.
- Poor identification of all cattle including bull calves.
- Accidentally milking a treated cow into the bulk tank or not diverting from bulk tank.
- Long-term residue following treatment as a calf.
- Use of medicated milk replacers in calves that may be sold for human consumption.



When multiple treatments are combined or overlapped, the time to clear those drugs from an animal's system can increase. Producers should consult with their veterinarian for appropriate withdrawal times. Animal liver and kidney function, particularly with poor animal metabolism, may not be able to keep up with multiple circulating drugs and therefore withholding times can be prolonged.

In sustainable farm management, you can maximize the value of your market animals and the good reputation of your farm, while reducing increased regulatory oversight risk, with good record keeping and intelligent risk assessment of animals prior to sending animals to market.

By identifying the on-farm areas where incidents can occur that cause residues, producers can look deeper at the underlying issues. Some key underlying problems that lead to residues are:

1. The person(s) in charge of treating the cows is/are not working under a valid veterinarian/client/patient relationship.
2. Employees are not trained properly and continuously in treatment protocols and maintaining written records.
3. The producer does not review all treatment records for veterinarian-recommended withdrawal times prior to marketing milk or meat.

## **Malicious Contamination**

Dairymen should recognize and remember that drug residues in milk may occur because of intentional, malicious contamination. Ensure your antibiotics are stored securely and monitor your farm for any suspicious activity.



## Potential Residue Violations from Extra-label Drug Use In an Unapproved Class of Cattle

Important considerations for ELDU in dairy cattle:

- All ELDU must come from the direction of the veterinarian of record responsible for the VCPR with the dairy.
- FDA defines a lactating dairy cow as a dairy breed animal over 20 months of age. Springing heifers and dry cows are classified as “lactating dairy cattle”.
- Drugs not approved for use in lactating dairy cattle do not have FDA-established tolerances for residues in milk. Further, the tissue tolerance for drugs approved for beef cattle do not apply to lactating dairy cattle.
  - This means that the level which will result in a violative residue in meat or milk from a drug not approved for use in lactating dairy cattle is ANY detectable level above zero (0).
  - Current tests that may be performed on-farm or on bulk tank milk at a processing facility cannot detect levels low enough to assure a negative test means the absence of detectable residues.
  - Animals that are sick or compromised may metabolize drugs at a slower rate than healthy animals, which may result in a significantly extended withdrawal time for both meat and milk.
  - The scientific literature currently available does not provide clear guidance on the length of withdrawal times that must be applied to allow meat and milk residues to drop to zero (0). The labeled meat withdrawal time does not apply to lactating dairy cows if the drug is not approved for lactating dairy cows.
- Always use drugs approved in the class of animal to which the drug is being administered as a first line of therapy.
- Case selection is important. It is not prudent to give a drug with a high risk of residue to an animal that has a poor chance of recovery. Animals that are suffering and have a poor chance of recovery should be euthanized. Animals that are healthy enough for slaughter and are a poor candidate for treatment should be culled/ marketed instead of being treated with an unapproved drug that has a higher risk of creating a milk/meat residue.

- Always record all treatments in your treatment records and keep them for a minimum of two years.
- Regularly review treatment protocols and your treatment records with the veterinarian of record.

The FDA establishes tolerances for drug residues in food animals. These tolerances are based on approved labeled use of the drug. This is because the FDA only has data for drug residue depletion on the approved production class. The main production classes are beef, dairy and veal. Many products have been approved for beef and non-lactating dairy (less than 20 months of age), so the FDA does not have established tolerance levels for these products if used in lactating dairy or veal. If a drug is approved in one production class, usage in another class is considered extra-label drug use (ELDU). Therefore, such use would mean there is not an established tolerance and any detectable level would be a violative drug residue.

What does this mean for dairy producers and their veterinarians? The labeled withdrawal times would not apply to an unapproved production class. While FARAD can provide withdrawal recommendations for ELDU, they generally do not have enough information to project a “zero detectable level”, particularly with the sensitivity of current testing methodologies. Veterinarians and cattle producers should therefore exercise extreme caution using drugs not approved for that production class of animal and consider avoiding such use due to the unknown withdrawal times. Remember that the FDA definition of a lactating dairy cow is a dairy breed animal over 20 months of age. Springing heifers and dry cows are classified as “lactating dairy cattle”.

What are some examples of such use?

**Example** – Using Nuflor® (florfenicol), Micotil® (tilmicosin), or Draxxin® (tulathromycin) in a dairy animal over 20 months of age. The labeled meat withdrawal time for beef cattle would not apply to use in this production class. The meat withdrawal time would be the amount of time for the detection level to be “zero” which is unknown, may be hard to predict, and is subject to the sensitivity of the residue testing methodology. Using the beef labeled withdrawal time for these drugs in lactating dairy cows could result in a violative residue.

**Example** – Using most products in bob veal calves. There are few medications that are approved for male dairy calves intended for veal. Most medication detected in this production class of animal will likely result in a violation.

What else should a producer do to prevent residue violations and minimize liability?

- Keep accurate treatment records and follow all withdrawal times.
- Only use drugs extra-label if you have a valid VCPR, directions from your veterinarian and can ensure that no residue will occur from such use.
- Refrain from using antibiotics and other drugs that are not approved for that production class (i.e. beef cattle antibiotics in lactating dairy cows).
- For veal producers or dairy bull calves that may be marketed soon, use only products that are approved in pre-ruminant calves. Avoid any products with the statement “not for use in calves to be processed for veal”. Consult FARAD’s VetGRAM search for products that are approved in veal.
- For extra-label indications in cattle, use a product approved in that production class as your first treatment option.
- Do not market recently treated cattle. Dairy farmers need to stop marketing recently treated cows that have not responded to treatment. Alternatives for these cows are to hold the animal until she is healthy and free of drug residues or to humanely euthanize. Marketing a cow should not replace euthanasia on dairy farms.
- Do not use prohibited drugs or aminoglycosides (e.g. gentamicin) in cattle. The USDA and FDA are still detecting a significant number of gentamicin residues in cattle.
- Do not use sulfa products extra-label in lactating dairy cows.
- Do not use compounded medications in cattle.
- Monitor the residue violators list that is posted on the FSIS web page.
- Veterinarians and producers should consider that any withdrawal times from projections provided by FARAD are current FARAD recommendations and are subject to change as new research and testing methodologies become available.
- The practice of spraying hairy heel warts with antibiotic sprays in the parlor during milk harvest is a potential source for antibiotic contamination of milk. This practice should be avoided.



**Elanco**  
**Rumensin 90**  
Monensin, USP Granulated

**GREATER MILK PRODUCTION EFFICIENCY<sup>1</sup>\* HAS A WAY OF ENERGIZING A DAIRY FARM.**

Rumensin<sup>®</sup> gives your cows a boost of extra energy<sup>†</sup>—energy that can increase their milk production efficiency.<sup>1\*</sup> To see how you can get the most out of dairy feed with Rumensin, contact your Elanco representative.

The label contains complete use information, including cautions and warnings. Always read, understand, and follow the label and use directions. Consumption by unapproved species or feeding undiluted may be toxic or fatal. Do not feed to veal calves.

\*Production of marketable acidly-corrected milk per unit of feed intake.  
†Energy is a direct result of the Ruminant mode of action.

REFERENCE: 1. Elanco Animal Health, Data on File, NAD 1420, Efficiency Report.

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**Rumensin**  
Feed Energy

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## EXAMPLES OF PRODUCTS AND RISK FACTORS FOR RESIDUES

|   |   |
|---|---|
| Ceftiofur (also known as Ceftriaxone®, Excede®, Excenel®, Naxcel®, Spectramast®)            | <ul style="list-style-type: none"> <li>- Using the withholding time for one product when using another. The withholding times for each product are different.</li> <li>- Not keeping accurate records to record the exact product given (Excede versus Excenel).</li> <li>- Using the drug in an unapproved route of administration. Excede is labeled to be given at the base or pinna of the ear only. Spectramast is the only ceftiofur product labeled for intramammary administration. Using these drugs in a route of administration not listed on the label is prohibited.</li> <li>- All products have a preslaughter withdrawal period, please consult prescribing veterinarian or manufacturer for withdrawal times.</li> </ul> |
| Enrofloxacin (Baytril 100®)   | <ul style="list-style-type: none"> <li>- Extra-label use in food animals is prohibited.</li> <li>- Only labeled for non-lactating dairy animals twenty months of age or less and beef animals for pneumonia.*</li> </ul>  |
| Florfenicol (Nuflor®)   | <ul style="list-style-type: none"> <li>- Sustained release has a longer withdrawal time.</li> <li>- Not approved for dairy cattle over 20 months of age.</li> <li>- No tolerance level for dairy cattle.</li> </ul>   |
| Flunixin (also known as Banamine®, Flumeglumine®, Flu-Nix™, Flunixin meglumine**, Prevail™) | <ul style="list-style-type: none"> <li>- Using the drug in an unapproved route of administration such as intramuscular or subcutaneous. These drugs are only approved for intravenous administration.</li> <li>- Using another administration route results in extended withdrawal times, well beyond the labeled withholding time.</li> </ul>  |
| Gentamicin  | <ul style="list-style-type: none"> <li>- Use of gentamicin results in extended withdrawal times and therefore its use is discouraged by AVMA, AABP and AVC.</li> <li>- Use of gentamicin in lactating dairy cows for intramammary use is not recommended.</li> <li>- FARAD recommends not less than a TWO-YEAR withdrawal and, therefore, the use of this drug should not be considered.</li> </ul>   |
| Neomycin  | <ul style="list-style-type: none"> <li>- Not following withdrawal time on the bag.</li> <li>- Feeding medicated milk replacer to calves to be processed for slaughter.</li> <li>- Extra-label use of oral neomycin products.</li> </ul>   |
| Penicillin  | <ul style="list-style-type: none"> <li>- Increasing the dose without using an extended withdrawal period.</li> <li>- Increasing the frequency or duration of administration without using an extended withdrawal period.</li> <li>- Using the drug in a route of administration not approved, such as intramammary or subcutaneous.</li> <li>- Giving more than 10 CC/injection site (as per label instructions).</li> </ul>  |
| Sulfas  | <ul style="list-style-type: none"> <li>- Using any sulfonamide product not labeled for lactating dairy cows is illegal.</li> <li>- Using a higher dose or frequency of administration will result in extended withdrawal times.</li> <li>- Inadvertently administering a sustained release product when intending to use a daily use product.</li> </ul>  |
| Tetracycline  | <ul style="list-style-type: none"> <li>- Single-site, large-volume injection through non-intravenous route.</li> <li>- Extra-label use such as uterine infusion to treat an infected post-partum uterus.</li> </ul>   |

\*Bovine respiratory disease (BRD); consult product label for actual indications.

\*\*Due to the high risk of a violative residue, flunixin must only be used intravenously and not be given by either subcutaneous or intramuscular routes of administration.

## RESOURCES

- Food Safety Concerns of Pesticides, Veterinary Drug Residues, and Mycotoxins in Meat and Meat Products Asian Journal of Animal Sciences <http://scialert.net/qredirect.php?doi=ajas.2010.46.55&linkid=pdf>
- Preventing Drug Residues in Milk and Dairy Cull Cows, Virginia Tech University Extension <http://pubs.ext.vt.edu/404/404-403/404-403.html>
- Dairy Care 365 Residue Prevention, Merck Animal Health <https://www.dairycare365.com/solution/residue-prevention-education>
- Residue Free, Zoetis, Inc. <https://www.zoetisus.com/dairy/avoidresidues/index.html>

### **Rx and Extra-label Use**

***“Federal law restricts this drug to use by or on the order of a licensed veterinarian.”***

This statement is on every prescription drug sold. Any extra-label use of antibiotics must be used as prescribed by a veterinarian, following the written instructions for the specific lifecycle of animals to be treated, including dose, route of administration, frequency of use, and withdrawal times for milk and/or meat.

**Remember, extra-label use will generally require an extended withdrawal time.**

## STEPS TO PREVENT DRUG RESIDUES

Dairy producers realize the importance of eliminating the possibilities of having drug residues in milk and dairy beef. Producers can take the following steps to mitigate or lessen the chances of antibiotic residues:

1. Establish a valid veterinarian/client/patient relationship (VCPR) to ensure proper diagnosis and treatment of disease.
2. Keep records of antibiotic use and identify all treated animals, including treatment protocols.
3. Implement a preventive animal health program to reduce the incidence of disease.
4. Maintain milk quality and implement an effective mastitis management program to reduce the use of antibiotics, including protocol development and review.
5. Implement employee training and awareness of proper animal drug use.
6. Use drugs approved for specific disease indications according to labeled recommendations and withdrawal periods. If ELDU is indicated by a veterinarian's prescription, that veterinarian must establish and document appropriate withdrawal periods.
7. Do not use drugs that are specifically prohibited for use in milking, dry, or growing animals.
8. Segregate and milk treated animals after, or in a separate facility from, all non-treated animals to ensure that milk is not accidentally commingled.
9. Use drug residue screening tests specific for the drug utilized before marketing milk and/or meat from treated animals.
10. If in doubt about residue status, do not market milk and/or dairy beef from treated animals.

## BEST MANAGEMENT CHECKLIST TO AVOID DRUG RESIDUES

### 1. Establish a Valid Veterinarian/Client/Patient Relationship (VCPR)

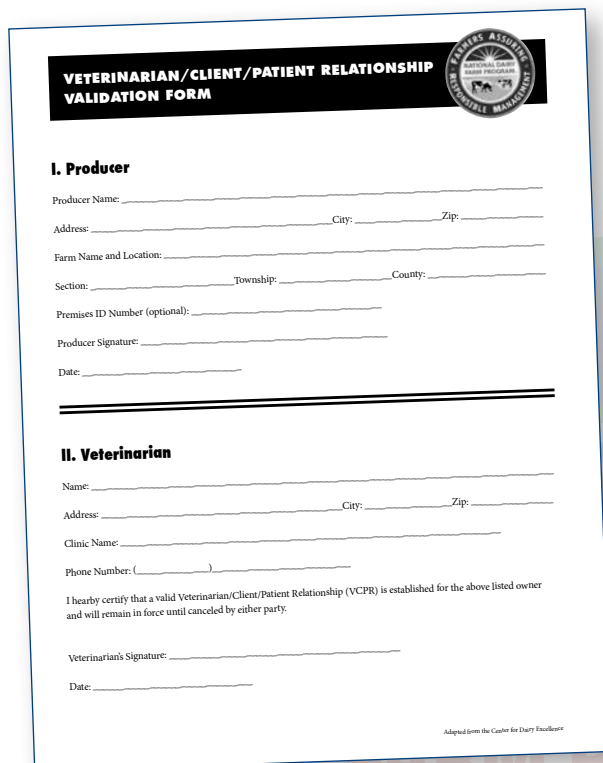
- ☐ A veterinarian has assumed the responsibility for making medical judgments regarding the health of the animals.
- ☐ A veterinarian has made routine and timely visits to the dairy to gain sufficient knowledge of the animals to initiate general or preliminary diagnosis of the medical condition of the animals.
- ☐ A veterinarian is readily available for follow-up in case of adverse reactions or failure of treatment.
- ☐ Employees are aware that it is policy to follow the instructions of a veterinarian.
- ☐ The veterinarian and producer have established an approved drug list.
- ☐ All drugs on the dairy have proper labeling.
- ☐ The veterinarian establishes and reviews antibiotic use protocols in conjunction with the producer/farm management team.

### 2. Use Only Prescription (Rx) Drugs or FDA-Approved Over-the-Counter (OTC) Drugs with Veterinarian's Guidance

- ☐ Only FDA-approved drugs are used to treat animals.
- ☐ Copies of drug inserts and/or product labeling are available for all drugs used on the dairy.
- ☐ Only a veterinarian can prescribe drugs in an "extra-label" manner.
- ☐ A list of current over-the-counter and prescription drugs has been developed that can be used with the dairy cows.
- ☐ Any Veterinary Feed Directive (VFD) feeds on the dairy are stored in such a way that an accidental use cannot occur.

### 3. Administer All Drugs Properly and Identify All Treated Animals

- ☐ Two or more methods are used to identify treated animals.
- ☐ The label and the package insert information is read and followed.
- ☐ Package inserts for drugs the veterinarian and the producer have put on the approved drug list are reviewed.
- ☐ A proper facility to segregate treated animals from untreated animals is available.



**VETERINARIAN/CLIENT/PATIENT RELATIONSHIP VALIDATION FORM**

**I. Producer**

Producer Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip: \_\_\_\_\_

Farm Name and Location: \_\_\_\_\_

Section: \_\_\_\_\_ Township: \_\_\_\_\_ County: \_\_\_\_\_

Premises ID Number (optional): \_\_\_\_\_

Producer Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**II. Veterinarian**

Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip: \_\_\_\_\_

Clinic Name: \_\_\_\_\_

Phone Number: (\_\_\_\_\_) \_\_\_\_\_

I hereby certify that a valid Veterinarian/Client/Patient Relationship (VCPR) is established for the above listed owner and will remain in force until canceled by either party.

Veterinarian's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Adapted from the Center for Dairy Excellence

#### 4. Maintain and Use Proper Treatment Records on All Treated Animals

- ☐ A record system is maintained for all treated animals.
- ☐ Treatment records are reviewed with the consulting veterinarian.
- ☐ Records are used to improve management of potential hazards and to reduce risk to milk quality.
- ☐ Record use is reviewed with family members and/or employees.

#### 5. Implement Employee/Family Training of Proper Drug Use to Avoid Marketing Adulterated Milk and Meat Products

- ☐ Recommendations from the veterinarian are reviewed with employees and/or family members.
- ☐ Employees and/or family members receive regular training on the prevention of milk and meat residues.
- ☐ Properly document when all training sessions took place and who was in attendance.
- ☐ Awareness exists that milk contamination often occurs when the normal pattern of milking changes (vacation, children home from college, sickness, etc.).
- ☐ Treatment records are checked before marketing animals.
- ☐ Employees and/or family members understand the cost and consequences of marketing adulterated meat or milk.
- ☐ Family members and/or employees understand the instructions found on the drug label.
- ☐ Family members and/or employees understand that all treated animals are milked last and/or their milk is diverted from saleable milk to prevent violative residues.

### Intermediate Owners

Residue issues associated with animals sent to slaughter might occur after the animal leaves the farm.

Use a transportation company that is knowledgeable about your animal care expectations and provides for the safety and comfort of the animals during transport. Communicate with the hauler about where the animals are destined to go, especially when selling bull calves. If medicated milk replacers have been given, that animal should be withheld from sale, or the hauler should be clear that the animal has been treated and can affirm that the animal will not go to a terminal market. When not selling animals directly to a terminal market, sell your animals to intermediate owners who have instituted residue prevention programs consistent with those defined in this document. Be sure to document chain-of-custody as you may be held responsible for residues caused outside of your facility.



## 6. Use Drug Residue Screening Tests

- ☐ Withholding times are never decreased for meat or milk from treated animals.
- ☐ Milk from treated dry cows that freshen early is always tested for residues prior to marketing.
- ☐ Milk from newly purchased animals is always tested before adding their milk to the bulk tank.
- ☐ When a cow is treated in an extra-label manner, the milk gets tested.
- ☐ When using bulk tank tests on individual cows, consult the manufacturer's directions to ensure applicability.

## 7. Market Only Healthy Cattle

- ☐ Cattle have a body condition score of 2 or more.
- ☐ Cattle are well-hydrated and alert.
- ☐ Proper withhold times are followed and confirmed prior to sale.
- ☐ Severely lame cattle are NOT marketed (score of 3 on the FARM Locomotion scale).

## Precautions While Administering Drugs

When treating animals with any product that is given IM, SC, IV, or intramammary (IMM), take the following precautions:

- Read both the product label and insert, and consult your veterinarian before administering drugs.
- Use a clean injection site and use a sterile needle for all injections.
- Use the labeled dosage and method of administration least likely to create a drug residue.
- Discard milk from all four quarters even when treating only one quarter with an IMM infusion.
- Milk treated cows last or use a segregated facility (divert milk from bulk tank or saleable milk).
- Thoroughly wash all equipment (inflations, hoses, weigh jars, etc.) that has come in contact with milk from treated cows.
- Make certain that any procedure used to divert milk from treated cows cannot accidentally send contaminated milk into the pipeline.
- Keep medicated feeds separated from non-medicated feeds.
- Ensure that calves fed antibiotic waste milk are not sent to slaughter until withdrawal times are met.
- Train employees on proper injection site selection.

## APPROVED DRUGS AND SCREENING TESTS

NMPF does not endorse any of the veterinary drugs or tests identified on the lists in this manual. The lists of veterinary drugs and tests are provided only to inform producers what products may be available, and the producer is responsible for determining whether to use any of the veterinary drugs or tests. All information regarding the veterinary drugs or tests was obtained from the products' manufacturers or sponsors, and NMPF has made no further attempt to validate or corroborate any of that information. NMPF urges producers to consult with their veterinarians before using any veterinary drug or test, including any of the products identified on the lists in this manual.

Data provided by the manufacturer or marketer is current as of September 2015. Veterinarians needing extra-label information should consult the FDA **Green Book** or contact the Food Animal Residue Avoidance Databank (FARAD) at **888-873-2723** or **[www.FARAD.org](http://www.FARAD.org)**.



# FDA-Approved Drugs for Injectable Use

## Non-lactating Cattle\*\*

| Active Ingredient                  | Drug Type | Meat Withholding Time          | Product Name                        | Manufacturer/Marketer                             |
|------------------------------------|-----------|--------------------------------|-------------------------------------|---|
| Ampicillin trihydrate              | Rx        | 6 days                         | Polyflex®                           | Boehringer Ingelheim Vetmedica, Inc.              |
| Ceftiofur crystalline free acid    | Rx        | 13 days                        | EXCEDE®                             | Zoetis, Inc.                                      |
| Ceftiofur hydrochloride            | Rx        | 4 days                         | EXCENEL® RTU EZ                     | Zoetis, Inc.                                      |
| Ceftiofur sodium                   | Rx        | 4 days                         | Naxcel® Sterile Powder              | Zoetis, Inc.                                      |
| Cloprostenol sodium                | Rx        | None                           | Estrumate                           | Merck Animal Health                               |
| Dinoprost tromethamine             | Rx        | None                           | Lutalyse® Sterile Solution          | Zoetis, Inc.                                      |
|                                    | Rx        | None                           | Prostamate®                         | Bayer HealthCare LLC, Animal Health               |
| Doramectin                         | O-TC      | 35 days                        | Dectomax® Injectable                | Zoetis, Inc.                                      |
| Enrofloxacin                       | Rx        | 28 Days                        | Baytril® 100                        | Bayer HealthCare LLC, Animal Health               |
| Erythromycin                       | Rx        | 21 days                        | Gallimycin-100                      | Bimeda, Inc.                                      |
| Florfenicol                        | Rx        | 44 days                        | Nuflor Gold™                        | Merck Animal Health                               |
|                                    |           | 28 or 38 days##<br>(See label) | Nuflor® Injectable Solution         | Merck Animal Health                               |
| Florfenicol and Flunixin meglumine | Rx        | 38 days                        | Resflor Gold®                       | Merck Animal Health                               |
| Flunixin meglumine                 | Rx        | 4 days                         | Flu-Nix™ D Injection                | Agri Laboratories, Ltd.                           |
|                                    | Rx        | 4 days                         | Banamine                            | Merck Animal Health                               |
|                                    | Rx        | 4 days                         | Flumeglumine®                       | Phoenix Pharmaceutical, Inc./Clipper Distributing |
|                                    | Rx        | 4 days                         | Flunixin Injection                  | Norbrook Laboratories, Ltd.                       |
|                                    | Rx        | 4 days                         | Flunazine                           | Bimeda, Inc.                                      |
| Gonadotropin (chorionic)           | Rx        | None                           | Chorulon®                           | Merck Animal Health                               |
| Gonadorelin diacetate tetrahydrate | Rx        | None                           | Cystorelin                          | Merial Limited                                    |
|                                    | Rx        | None                           | Fertagyl®                           | Merck Animal Health                               |
|                                    | Rx        | None                           | OvaCyst®                            | Bayer HealthCare LLC, Animal Health               |
| Gonadorelin hydrochloride          | Rx        | None                           | Factrel®                            | Zoetis, Inc.                                      |
| Isoflupredone acetate              | Rx        | 7 days                         | Predel® 2x                          | Zoetis, Inc.                                      |
| Ivermectin*                        | O-TC      | 35 days                        | Agri-Mectin® Injection              | Agri Laboratories, Ltd.                           |
|                                    | O-TC      | 35 days                        | IVOMEC 1% Injection for Cattle      | Merial Limited                                    |
|                                    | O-TC      | 35 days                        | Noromectin® Injection               | Norbrook Laboratories, Ltd.                       |
| Ivermectin/Clorsulon*              | O-TC      | 49 days                        | IVOMEC Plus<br>Injection for Cattle | Merial Limited                                    |
|                                    | O-TC      | 49 days                        | Noromectin® Plus Injection          | Norbrook Laboratories, Ltd.                       |
| Oxytetracycline                    | O-TC      | 28 days                        | Agrimycin® 200 Injection            | Agri Laboratories, Ltd.                           |
|                                    | O-TC      | 28 days                        | Bio-Mycin® 200                      | Boehringer Ingelheim Vetmedica, Inc.              |
|                                    | O-TC      | 28 days                        | Liquamycin® LA-200®                 | Zoetis, Inc.                                      |
|                                    | O-TC      | 28 days                        | Oxytetracycline Injection 200       | Norbrook Laboratories, Ltd.                       |
|                                    | O-TC      | 28 days                        | Pennox 200™                         | Pennfield Animal Health                           |
|                                    | Rx        | 28 days                        | Tetradure 300                       | Merial Limited                                    |
|                                    | O-TC      | 28 days                        | Tetroxy LA                          | Bimeda, Inc.                                      |

\*\* The term non-lactating cattle is defined as dairy bulls, dairy calves, and replacement heifers. Read label indications carefully. Some products are not approved for non-ruminating calves and female dairy cattle 20 months of age and older. Some products cannot be used with veal calves. Carefully consult the labels.

## Withholding times depend upon labeled dosage used.

\* Ivermectin is not approved for female dairy cattle of breeding age.

# FDA-Approved Drugs for Injectable Use

## Non-lactating Cattle\*\*

| Active Ingredient             | Drug Type | Meat Withholding Time | Product Name                | Manufacturer/Marketer                |
|-------------------------------|-----------|-----------------------|-----------------------------|--------------------------------------|
| Oxytetracycline hydrochloride | O-TC      | 22 days               | Agri-mycin® 100♦            | Agri Laboratories, Ltd.              |
|                               | Rx        | 18 days               | Bio-Mycin® C                | Boehringer Ingelheim Vetmedica, Inc. |
|                               | O-TC      | 18 days               | Oxy-Tet™ 100                | Boehringer Ingelheim Vetmedica, Inc. |
|                               | O-TC      | 22 days               | Oxytet 100                  | Norbrook Laboratories, Ltd.          |
| Penicillin G (benzathine)     | O-TC      | 30 days               | Combi-Pen™-48               | Bimeda, Inc.                         |
|                               | O-TC      | 30 days               | Hanford's/US Vet            | Norbrook Laboratories, Ltd.          |
|                               |           |                       | Sterile Penicillin G        |                                      |
|                               |           |                       | Benzathine/Penicillin G     |                                      |
| Penicillin G (procaine)       |           |                       | Procaine Aqueous Suspension |                                      |
|                               | O-TC      | 10 days               | Agri-Cillin Injection       | Agri Laboratories, Ltd.              |
|                               | O-TC      | 4 days                | Pro-Pen-G™ Injection        | Bimeda, Inc.                         |
|                               | O-TC      | 10 days               | Hanford's/US Vet            | Norbrook Laboratories, Ltd.          |
|                               |           |                       | Sterile Penicillin G        |                                      |
|                               |           |                       | Penicillin G Procaine       |                                      |
|                               |           |                       | Aqueous Suspension          |                                      |
|                               | O-TC      | 14 days               | Norocillin                  | Norbrook Laboratories, Ltd.          |
| Selenium (sodium selenite)    | Rx        | 30 days               | BO-SE                       | Merck Animal Health                  |
| Sulfachlorpyridazine (sodium) | O-TC      | 5 days                | Vetisulid Injection         | Boehringer Ingelheim Vetmedica, Inc. |
| Sulfadimethoxine              | O-TC      | 5 days                | Di-Methox Injection 40%     | Agri Laboratories, Ltd.              |
| Tilidipirosin                 | Rx        | 21 days               | Zuprevo 18%                 | Merck Animal Health                  |
| Tilmicosin phosphate*         | Rx        | 42 days               | Micotil Injection           | Elanco Animal Health                 |
| Tripelennamine HCL            | Rx        | 4 days                | Recovr Injectable           | Zoetis, Inc.                         |
| Tulathromycin                 | Rx        | 18 days               | DRAXXIN™                    | Zoetis, Inc.                         |
|                               | Rx        | 22 days               | DRAXXIN 25™                 | Zoetis, Inc.                         |
| Tylosin                       | O-TC      | 21 days               | Tylan Injection 50/200      | Elanco Animal Health                 |
|                               | O-TC      | 21 days               | Tylosin Injection           | Boehringer Ingelheim Vetmedica, Inc. |
| Vitamin E                     | O-TC      | None                  | Vitamin E 300               | Agri Laboratories, Ltd.              |
|                               | Rx        | 30 days               | BO-SE                       | Merck Animal Health                  |
|                               | Rx        | None                  | Vital E                     | Merck Animal Health                  |

\*\* The term non-lactating cattle is defined as dairy bulls, dairy calves, and replacement heifers. Read label indications carefully. Some products are not approved for non-ruminating calves and female dairy cattle 20 months of age and older. Some products cannot be used with veal calves. Carefully consult the labels.

♦ Not intended for use in veal calves.

\* Not for use in female dairy cattle 20 months of age or older.



# FDA-Approved Drugs for Intramammary Use

## Non-lactating Cattle\*\*

| Active Ingredient                      | Drug Type | Milk Withholding Time   | Meat Withholding Time | Product Name             | Manufacturer/Marketer                |
|--|-----------|-------------------------|-----------------------|--------------------------|--------------------------------------|
| Ceftiofur hydrochloride                | Rx        | None*                   | 16 days               | SPECTRAMAST™ DC          | Zoetis, Inc.                         |
| Cephapirin (benzathine)                | O-TC      | 72 hours                | 42 days               | Tomorrow Infusion        | Boehringer Ingelheim Vetmedica, Inc. |
| Cloxacillin (benzathine)               | Rx        | None                    | 30 days               | Dry-Clox®                | Boehringer Ingelheim Vetmedica, Inc. |
|  | Rx        | None*                   | 28 days               | Orbenin-DC®              | Merck Animal Health                  |
| Penicillin G (procaine)                | O-TC      | 72 hours<br>Postcalving | 14 days               | Hanford's/US Vet godry™  | G.C. Hanford Mfg. Co.                |
| Penicillin G (procaine)/<br>Novobiocin | O-TC      | 72 hours<br>Postcalving | 30 days               | AlbaDry® Plus Suspension | Zoetis, Inc.                         |

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\* Do not use within 4 weeks (28 days) of calving.

# FDA-Approved Drugs for Oral Use

## Non-lactating Cattle\*\*

| Active Ingredient               | Drug Type | Meat Withholding Time | Product Name   | Manufacturer/Marketer                |
|---------------------------------|-----------|-----------------------|--|--------------------------------------|
| Albendazole                     | O-TC      | 27 days               | Valbazen® Suspension                                     | Zoetis, Inc.                         |
| Amprolium                       | O-TC      | 1 day                 | CORID 9.6% Oral Solution                                 | Merial Limited                       |
|                                 | O-TC      | 1 day                 | CORID 20% Powder   | Merial Limited                       |
| Chlortetracycline hydrochloride | O-TC      | 1 day                 | Chlortetracycline Soluble Powder Concentrate             | Boehringer Ingelheim Vetmedica, Inc. |
|                                 | O-TC      | 1 day                 | Pennchlor 64 Soluble Powder                              | PennField Animal Health              |
| Citric acid                     | O-TC      | None                  | Re-Sorb® Powder  | Zoetis, Inc.                         |
| Decoquinat                      | O-TC      | None                  | Deccox-M   | Zoetis, Inc.                         |
| Dextrose                        | O-TC      | None                  | Re-Sorb® Powder  | Zoetis, Inc.                         |
| Fenbendazole                    | O-TC      | 8 days                | Panacur 10% Paste/Safe-Guard 10% Paste                   | Merck Animal Health                  |
|                                 | Rx        | 8 days                | Panacur 10% Suspension                                   | Merck Animal Health                  |
|                                 | O-TC      | 8 days                | Safe-Guard 10% Suspension                                | Merck Animal Health                  |
| Glycine                         | O-TC      | None                  | Re-Sorb® Powder  | Zoetis, Inc.                         |
| Lasalocid                       | O-TC      | None                  | Crystalx® Iono-Lyx® B300                                 | Ridley Block Operations              |
| Levamisole hydrochloride        | O-TC      | 2 days                | Prohibit Soluble Drench Powder                           | Agri Laboratories, Ltd.              |
| Monensin (sodium)               | O-TC      | None                  | Rumensin 90  | Elanco Animal Health                 |
| Neomycin sulfate                | O-TC      | 1 day                 | Biosol® Liquid   | Zoetis, Inc.                         |
|                                 | O-TC      | 1 day                 | Neo-Sol 50   | Zoetis, Inc.                         |
|                                 | O-TC      | 1 day                 | Neomix® 325  | Zoetis, Inc.                         |
|                                 | O-TC      | 1 day                 | Neomix® Ag 325   | Zoetis, Inc.                         |
|                                 | O-TC      | 1 day                 | NeoMed 325 Soluble Powder                                | Bimeda, Inc.                         |
| Oxfendazole                     | O-TC      | 7 days                | Synanthic® Bovine Dewormer Suspensions, 22.5 % and 9.06% | Boehringer Ingelheim Vetmedica, Inc. |

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## FDA-Approved Drugs for Oral Use Non-lactating Cattle\*\* (continued)

| Active Ingredient              | Drug Type | Meat Withholding Time | Product Name                                  | Manufacturer/Marketer                |
|--------------------------------|-----------|-----------------------|---|--------------------------------------|
| Oxytetracycline dihydrate      | O-TC      | 5 days                | Pennox 343 Soluble Powder                     | PennField Animal Health              |
| Oxytetracycline hydrochloride  | O-TC      | None                  | Oxy 500 Calf Bolus and<br>Oxy 1000 Calf Bolus | Boehringer Ingelheim Vetmedica, Inc. |
|                                | O-TC      | 5 days                | Terramycin® 343 Soluble Powder                | Zoetis, Inc.                         |
|                                | O-TC      | 7 days                | Terramycin® Scours Tablets                    | Zoetis, Inc.                         |
|                                | O-TC      | 5 days                | Terramycin® Soluble Powder                    | Zoetis, Inc.                         |
| Potassium citrate              | O-TC      | None                  | Re-Sorb® Powder                               | Zoetis, Inc.                         |
| Potassium dihydrogen phosphate | O-TC      | None                  | Re-Sorb® Powder                               | Zoetis, Inc.                         |
| Sodium chloride                | O-TC      | None                  | Re-Sorb® Powder                               | Zoetis, Inc.                         |
| Streptomycin sulfate           | O-TC      | 2 days                | Strep Sol 25%                                 | Veterinary Services, Inc.            |
| Sulfachlorpyridazine (sodium)  | O-TC      | 7 days                | Vetisulid® Powder                             | Boehringer Ingelheim Vetmedica, Inc. |
| Sulfadimethoxine               | O-TC      | 7 days                | Albon® Concentrated Solution 12.5%            | Zoetis, Inc.                         |
|                                | Rx        | 12 days               | Albon® S.R. (Sustained Release Bolus)         | Zoetis, Inc.                         |
|                                | O-TC      | 7 days                | Di-Methox 12.5% Oral Solution                 | Agri Laboratories, Ltd.              |
|                                | O-TC      | 7 days                | Di-Methox Soluble Powder                      | Agri Laboratories, Ltd.              |
|                                | O-TC      | 7 days                | SulfaMed-G                                    | Bimeda, Inc.                         |
| Sulfamethazine                 | O-TC      | 10 days               | Sulmet® Oblets                                | Boehringer Ingelheim Vetmedica, Inc. |
|                                | O-TC      | 12 days               | Sustain III - Cattle                          | Bimeda, Inc.                         |
|                                | O-TC      | 12 days               | Sustain III - Calf                            | Bimeda, Inc.                         |
| Sulfamethazine (sodium)        | O-TC      | 10 days               | Sulmet® Drinking Water Solution               | Boehringer Ingelheim Vetmedica, Inc. |
|                                | O-TC      | 10 days               | Sulmet® Soluble Powder                        | Boehringer Ingelheim Vetmedica, Inc. |
|                                | O-TC      | 10 days               | SMZ-Med                                       | Bimeda, Inc.                         |
| Sulfaquinoxaline (sodium)      | O-TC      | 10 days               | Liquid Sul-Q-Nox                              | Boehringer Ingelheim Vetmedica, Inc. |
| Tetracycline hydrochloride     | O-TC      | 4 days                | Polyotic® Soluble Powder                      | Boehringer Ingelheim Vetmedica, Inc. |
|                                | O-TC      | 7 days                | Polyotic® Soluble Powder Concentrate          | Zoetis, Inc.                         |
|                                | O-TC      | 5 days                | Tet-Sol 10                                    | Zoetis, Inc.                         |
|                                | O-TC      | 5 days                | Tet-Sol 324                                   | Zoetis, Inc.                         |
|                                | O-TC      | 5 days                | TetraMed 324 HCA                              | Bimeda, Inc.                         |
|                                | O-TC      | 5 days                | Tetra-Bac 324                                 | Agri Laboratories, Ltd.              |

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## FDA-Approved Drugs for Topical Use Non-lactating Cattle\*\*

| Active Ingredient | Drug Type | Meat Withholding Time | Product Name  | Manufacturer/Marketer                |
|-------------------|-----------|-----------------------|---|--------------------------------------|
| Doramectin        | O-TC      | 45 days               | Dectomax® Pour-On                                   | Zoetis, Inc.                         |
| Eprinomectin      | O-TC      | None                  | Ivomec Eprinex Pour-On<br>for Beef and Dairy Cattle | Merial Limited                       |
| Ivermectin*       | O-TC      | 48 days               | Agri-Mectin Pour-On                                 | Agri Laboratories, Ltd.              |
|                   | O-TC      | 48 days               | IVOMEC (Ivermectin) Pour-On                         | Merial Limited                       |
|                   | O-TC      | 48 days               | Noromectin® Pour-On                                 | Norbrook Laboratories, Ltd.          |
| Moxidectin        | O-TC      | None                  | Cydetin® (moxidectin)<br>0.5% Pour-On for Cattle    | Boehringer Ingelheim Vetmedica, Inc. |

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\* Not for use in female dairy cattle 20 months of age or older.

# FDA-Approved Drugs for Feed Additive Use

## Non-lactating Cattle\*\*

| Active Ingredient                 | Drug Type | Meat Withholding Time | Product Name                                   | Manufacturer/Marketer   |
|-----------------------------------|-----------|-----------------------|--|-------------------------|
| Amprolium                         | O-TC      | 24 hours              | Corid 1.25% Type C                             | Merial Limited          |
|                                   | O-TC      | 24 hours              | Corid 2.5% Type B                              | Merial Limited          |
|                                   | O-TC      | 24 hours              | Corid 25% Type A                               | Merial Limited          |
| Bacitracin zinc                   | O-TC      | None                  | Baciferm                                       | Zoetis, Inc.            |
| Bacitracin methylene disalicylate | O-TC      | None                  | BMD 30   | Zoetis, Inc.            |
|                                   | O-TC      | None                  | BMD 50   | Zoetis, Inc.            |
|                                   | O-TC      | None                  | BMD 60   | Zoetis, Inc.            |
| Chlortetracycline                 | O-TC      | 7 days                | Aureo S700G                                    | Zoetis, Inc.            |
|                                   | O-TC      | None                  | Aureomycin G                                   | Zoetis, Inc.            |
|                                   | O-TC      | 1 day                 | ChlorMax 50                                    | Zoetis, Inc.            |
| Chlortetracycline calcium         | O-TC      | None                  | Pennchlor™                                     | PennField Animal Health |
| Chlortetracycline hydrochloride   | O-TC      | 0-10 days##           | Pennchlor™ 100-MR                              | PennField Animal Health |
|                                   | O-TC      | 0-10 days##           | CLTC 100 MR                                    | Phibro Animal Health    |
| Decoquinate                       | O-TC      | None                  | Deccox   | Zoetis, Inc.            |
| Fenbendazole                      | O-TC      | 13 days               | Safe-Guard 0.5% Top Dress Pellets              | Merck Animal Health     |
|                                   | O-TC      | 13 days               | Safe-Guard 1.96% Free-Choice Mineral           | Merck Animal Health     |
|                                   | O-TC      | 13 days               | Safe-Guard 20% Salt Free-Choice Mineral        | Merck Animal Health     |
|                                   | O-TC      | 11 days               | Safe-Guard En-Pro-Al                           | Molasses Blade          |
|                                   | O-TC      | None                  | Bovatec Premix***                              | Zoetis, Inc.            |
| Lasalocid                         | O-TC      | None                  | Bovatec Premix***                              | Zoetis, Inc.            |
| Morantel tartrate                 | O-TC      | 14 days               | Rumatel® 88                                    | Phibro Animal Health    |
| Monensin (sodium)                 | O-TC      | None                  | Rumensin 90                                    | Elanco Animal Health    |
| Neomycin sulfate                  | O-TC      | 1 day                 | Neomix® 325 Medicated Premix                   | Zoetis, Inc.            |
|                                   | O-TC      | 1 day                 | Neomix Ag® 325 Medicated Premix                | Zoetis, Inc.            |
| Neomycin-oxytetracycline          | O-TC      | 0-30 days##           | Neo-Oxy 50/50                                  | PennField Animal Health |
|                                   | O-TC      | 0-30 days##           | Neo-Oxy 100/100                                | PennField Animal Health |
|                                   | O-TC      | 0-30 days##           | Neo-Oxy 100/50                                 | PennField Animal Health |
|                                   | O-TC      | 30 days               | Neo-Oxy 100/50 MR                              | PennField Animal Health |
|                                   | O-TC      | 0-5 days##            | Neo-Terramycin® 50/50                          | Phibro Animal Health    |
|                                   | O-TC      | 0-5 days##            | Neo-Terramycin® 50/50D                         | Phibro Animal Health    |
|                                   | O-TC      | 0-5 days##            | Neo-Terramycin® 100/100                        | Phibro Animal Health    |
|                                   | O-TC      | 0-5 days##            | Neo-Terramycin® 100/100D                       | Phibro Animal Health    |
| Oxytetracycline (quaternary salt) | O-TC      | 0-5 days##            | Pennox™  | PennField Animal Health |
| Oxytetracycline hydrochloride     | O-TC      | 0-5 days##            | Pennox™ 100-MR                                 | PennField Animal Health |
| Oxytetracycline dihydrate         | O-TC      | None                  | Terramycin® 50                                 | Phibro Animal Health    |
|                                   | O-TC      | None                  | Terramycin® 100                                | Phibro Animal Health    |
|                                   | O-TC      | None                  | Terramycin® 100MR                              | Phibro Animal Health    |
|                                   | O-TC      | None                  | Terramycin® 200                                | Phibro Animal Health    |
| Poloxalene                        | O-TC      | None                  | Bloat Guard® Liquid Type A - Medicated Article | Phibro Animal Health    |
|                                   | O-TC      | None                  | Bloat Guard® Medicated Top Dressing            | Phibro Animal Health    |
|                                   | O-TC      | None                  | Bloat Guard® Type A Medicated Article          | Phibro Animal Health    |
| Sulfamethazine                    | O-TC      | 7 days                | Aureo S700G                                    | Zoetis, Inc.            |
| Virginiamycin                     | O-TC      | None                  | V-Max™   | Phibro Animal Health    |
|                                   | O-TC      | None                  | V-Max™ 50                                      | Phibro Animal Health    |

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## Withholding times depend upon labeled dosage used.

\*\*\*Approved only for replacement heifers up to freshening or calving.

# FDA-Approved Drugs for Injectable Use

## Lactating Cows

| Active Ingredient                  | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name   | Manufacturer/Marketer                             |
|------------------------------------|-----------|-----------------------|-----------------------|--|---|
| Ampicillin trihydrate              | Rx        | 48 hours              | 6 days                | Polyflex®  | Boehringer Ingelheim Vetmedica, Inc.              |
| Ceftiofur crystalline-free acid    | Rx        | None                  | 13 days               | EXCEDE®  | Zoetis, Inc.                                      |
| Ceftiofur hydrochloride            | Rx        | None                  | 4 days                | EXCENEL® RTU EZ  | Zoetis, Inc.                                      |
| Ceftiofur sodium                   | Rx        | None                  | 4 days                | Naxcel® Sterile Powder   | Zoetis, Inc.                                      |
| Cloprostenol sodium                | Rx        | None                  | None                  | Estrumate  | Merck Animal Health                               |
| Dexamethasone                      | Rx        | None                  | None                  | Dexamethasone Solution   | Phoenix Pharmaceutical, Inc./Clipper Distributing |
|                                    | Rx        | None                  | None                  | Dexium   | Bimeda, Inc.                                      |
| Dinoprost tromethamine             | Rx        | None                  | None                  | Lutalyse® Sterile Solution   | Zoetis, Inc.                                      |
|                                    | Rx        | None                  | None                  | Lutalyse® HighCon Injection  | Zoetis, Inc.                                      |
|                                    | Rx        | None                  | None                  | ProstaMate®  | Bayer HealthCare LLC, Animal Health               |
| Flunixin meglumine                 | Rx        | 36 hours              | 4 days                | Flu-Nix D Injection  | Agri Laboratories, Ltd.                           |
|                                    | Rx        | 36 hours              | 4 days                | Banamine   | Merck Animal Health                               |
|                                    | Rx        | 36 hours              | 4 days                | Flunazine  | Bimeda, Inc.                                      |
|                                    | Rx        | 36 hours              | 4 days                | Flunixin Injection   | Norbrook Laboratories, Ltd.                       |
| Gonadorelin diacetate tetrahydrate | Rx        | None                  | None                  | Cystorelin Injectable  | Meril Limited                                     |
|                                    | Rx        | None                  | None                  | Fertagyl®  | Merck Animal Health                               |
|                                    | Rx        | None                  | None                  | OvaCyst®   | Bayer HealthCare LLC, Animal Health               |
| Gonadorelin hydrochloride          | Rx        | None                  | None                  | Factrel®   | Zoetis, Inc.                                      |
| Gonadotropin (chorionic)           | Rx        | None                  | None                  | Chorulon®  | Merck Animal Health for Chorulon (CG)             |
| Isoflupredone acetate              | Rx        | None                  | 7 days                | Predel® 2x   | Zoetis, Inc.                                      |
| Oxytetracycline                    | O-TC      | 96 hours              | 28 days               | Agrimycin 200  | Agri Laboratories, Ltd.                           |
|                                    | O-TC      | 96 hours              | 28 days               | Bio-Mycin® 200   | Boehringer Ingelheim Vetmedica, Inc.              |
|                                    | O-TC      | 96 hours              | 28 days               | Oxytetracycline Injection 200  | Norbrook Laboratories, Ltd.                       |
|                                    | O-TC      | 96 hours              | 28 days               | Pennox 200 Injectable  | Pennfield Animal Health                           |
|                                    | O-TC      | 96 hours              | 28 days               | Liquamycin® LA-200®  | Zoetis, Inc.                                      |
| Oxytocin                           | Rx        | None                  | None                  | Oxytocin Injection   | Bimeda, Inc.                                      |
| Penicillin G (procaine)            | O-TC      | 48 hours              | 10 days               | Agri-Cillin Injection  | Agri Laboratories, Ltd.                           |
|                                    | O-TC      | 48 hours              | 4 days                | Pro-Pen-G™ Injection   | Bimeda, Inc.                                      |
|                                    | O-TC      | 48 hours              | 10 days               | Hanford's/US Vet Sterile Penicillin G Penicillin G Procaine Aqueous Suspension | Norbrook Laboratories, Ltd.                       |
|                                    | O-TC      | 48 hours              | 14 days               | Norocillin   | Norbrook Laboratories, Ltd.                       |
| Sometribove zinc                   | O-TC      | None                  | None                  | Posilac  | Elanco Animal Health                              |
| Sulfadimethoxine                   | O-TC      | 60 hours              | 5 days                | Di-Methox Injection 40%  | Agri Laboratories, Ltd.                           |
| Tripeleppamine hydrochloride       | Rx        | 24 hours              | 4 days                | Recovr Injectable  | Zoetis, Inc.                                      |



## FDA-Approved Drugs for Intramammary Use Lactating Cows

| Active Ingredient       | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name                    | Manufacturer/Marketer                |
|-------------------------|-----------|-----------------------|-----------------------|---------------------------------|--------------------------------------|
| Amoxicillin trihydrate  | Rx        | 60 hours              | 12 days               | Amoxi-Mast®                     | Merck Animal Health                  |
| Ceftiofur hydrochloride | Rx        | 72 hours              | 2 days                | SPECTRAMAST™ LC                 | Zoetis, Inc.                         |
| Cephapirin (sodium)     | O-T-C     | 96 hours              | 4 days                | Today®                          | Boehringer Ingelheim Vetmedica, Inc. |
| Cloxacillin (sodium)    | Rx        | 48 hours              | 10 days               | Dariclox®                       | Merck Animal Health                  |
| Hetacillin (potassium)  | Rx        | 72 hours              | 10 days               | Hetacin®K;                      | Boehringer Ingelheim Vetmedica, Inc. |
| Penicillin G (procaine) | O-T-C     | 60 hours              | 3 days                | Hanford's/US Vet<br>MASTICLEAR™ | G.C. Hanford Mfg. Co.                |
| Pirlimycin              | Rx        | 36 hours              | 9 days*               | Pirsue® Sterile Solution        | Zoetis, Inc.                         |

\*9-day meat withhold following infusion twice at a 24-hour interval 21-day meat withhold following any extended duration of therapy (infusion longer than twice at 24-hour interval up to 8 consecutive days).

## FDA-Approved Drugs for Oral Use Lactating Cows

| Active Ingredient   | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name                      | Manufacturer/Marketer |
|---------------------|-----------|-----------------------|-----------------------|-----------------------------------|-----------------------|
| Fenbendazole        | O-T-C     | None                  | 8 days                | Safe-Guard 10% Paste              | Merck Animal Health   |
|                     | O-T-C     | None                  | 8 days                | Safe-Guard 10%<br>Suspension      | Merck Animal Health   |
| Magnesium hydroxide | O-T-C     | 12 hours              | None                  | Carmilax Bolus                    | Zoetis, Inc.          |
|                     | O-T-C     | 12 hours              | None                  | Carmilax Powder                   | Zoetis, Inc.          |
| Poloxalene          | O-T-C     | None                  | None                  | Bloat Guard®<br>Top Dressing      | Phibro Animal Health  |
|                     | O-T-C     | None                  | None                  | TheraBloat® Drench<br>Concentrate | Zoetis, Inc.          |
| Sulfadimethoxine    | O-T-C     | 60 hours              | 7 days                | ALBON® Bolus                      | Zoetis, Inc.          |

## FDA-Approved Drugs for Feed Additive Use Lactating Cows

| Active Ingredient | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name                                   | Manufacturer/Marketer |
|-------------------|-----------|-----------------------|-----------------------|--|-----------------------|
| Fenbendazole      | O-TC      | None                  | 13 days               | Safe-Guard 0.5% Top Dress Pellets              | Merck Animal Health   |
|                   | O-TC      | None                  | 13 days               | Safe-Guard 1.96%                               | Merck Animal Health   |
|                   | O-TC      | None                  | 13 days               | Safe-Guard 20% Salt Free-Choice Mineral        | Merck Animal Health   |
|                   | O-TC      | None                  | 13 days               | Safe-Guard 35% Salt Free-Choice Mineral        | Merck Animal Health   |
|                   | O-TC      | None                  | None                  | Rumensin 90                                    | Elanco Animal Health  |
| Monensin (sodium) | O-TC      | None                  | None                  | Rumensin 90                                    | Elanco Animal Health  |
| Morantel tartrate | O-TC      | None                  | 14 days               | Rumatel® 88                                    | Phibro Animal Health  |
| Poloxalene        | O-TC      | None                  | None                  | Bloat Guard® Liquid - Type A Medicated Article | Phibro Animal Health  |
|                   | O-TC      | None                  | None                  | Bloat Guard® Medicated Top Dressing            | Phibro Animal Health  |
|                   | O-TC      | None                  | None                  | Bloat Guard® Type A Medicated Article          | Phibro Animal Health  |
|                   | O-TC      | None                  | None                  | Bloat Guard® Type A Medicated Article          | Phibro Animal Health  |

## FDA-Approved Drugs for Intravaginal Administration Lactating Cows

| Active Ingredient | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name                    | Manufacturer/Marketer |
|-------------------|-----------|-----------------------|-----------------------|---------------------------------|-----------------------|
| Progesterone      | O-TC      | None                  | None                  | EAZI-Breed™ CIDR® Cattle Insert | Zoetis, Inc.          |

## FDA-Approved Drugs for Topical Use Lactating Cows

| Active Ingredient                                 | Drug Type | Milk Withholding Time | Meat Withholding Time | Product Name                                   | Manufacturer/Marketer                |
|---|-----------|-----------------------|-----------------------|--|--------------------------------------|
| Balsam peru oil                                   | O-TC      | None                  | None                  | Granulex Liquid                                | UDL Laboratories, Inc.               |
| Castor oil  | O-TC      | None                  | None                  | Granulex Liquid                                | UDL Laboratories, Inc.               |
| Eprinomectin                                      | O-TC      | None                  | None                  | Ivomec® Eprinex®                               | Merck Limited                        |
|   |           |                       |                       | Pour-On for Beef & Dairy Cattle                |                                      |
| Moxidectin  | O-TC      | None                  | None                  | Cydetin® (moxidectin) 0.5% Pour-On for Cattle  | Boehringer Ingelheim Vetmedica, Inc. |
| Oxytetracycline hydrochloride/Polymyxin B sulfate | O-TC      | None                  | None                  | Terramycin® Ophthalmic Ointment with Polymyxin | Zoetis, Inc.                         |
| Trypsin   | O-TC      | None                  | None                  | Granulex Liquid                                | UDL Laboratories, Inc.               |

# Serum and Urine Screening Tests

## Screening Tests Available as of September 2015

Can be used in any dairy animal for detecting drug residues in serum and urine.<sup>§</sup>

| Residues Detected                            | Test Name                           | Sponsor                          | Specimen | Sensitivity (ppb) |
|--|-------------------------------------|----------------------------------|----------|-------------------|
| Amoxicillin                                  | Charm II Beta-lactam Test           | Charm Sciences                   | Serum    | 500               |
|  |                                     |                                  | Urine    | 2000              |
|  | Charm KIS Test                      | Charm Sciences                   | Serum    | 100               |
|  |                                     |                                  | Urine    | 100               |
|  | Charm SL Beta-lactam Test for Urine | Charm Sciences                   | Urine    | 40                |
|  | Meatsafe™ β-Lactam One-Step Test    | SILVER LAKE Research Corporation | Urine    | ‡                 |
|  | Premi®test                          | DSM                              | Urine    | 5.0               |
| Ampicillin                                   | Charm II Beta-lactam Test           | Charm Sciences                   | Serum    | 200               |
|  |                                     |                                  | Urine    | 800               |
|  | Charm KIS Test                      | Charm Sciences                   | Serum    | 100               |
|  |                                     |                                  | Urine    | 100               |
|  | Charm SL Beta-lactam Test for Urine | Charm Sciences                   | Urine    | 55                |
|  | Meatsafe™ β-Lactam One-Step Test    | SILVER LAKE Research Corporation | Urine    | ‡                 |
|  | Premi®test                          | DSM                              | Urine    | 5.0               |
| Ceftiofur                                    | Charm II Beta-lactam Test           | Charm Sciences                   | Serum    | 500               |
|  |                                     |                                  | Urine    | 2000              |
|  | Charm KIS Test                      | Charm Sciences                   | Serum    | 1000              |
|  |                                     |                                  | Urine    | 1000              |
|  | Charm SL Beta-lactam Test for Urine | Charm Sciences                   | Urine    | 300               |
|  | Premi®test                          | DSM                              | Urine    | 100               |
| Cephalexin<br>(unapproved in dairy cattle)   | Charm II Beta-lactam Test           | Charm Sciences                   | Serum    | 500               |
|  |                                     |                                  | Urine    | 2000              |
|  | Charm SL Beta-lactam Test for Urine | Charm Sciences                   | Urine    | 300               |
|  | Charm KIS Test                      | Charm Sciences                   | Serum    | 1000              |
|  |                                     |                                  | Urine    | 1000              |
|  |                                     |                                  |          |                   |
| Cephapirin                                   | Charm II Beta-lactam Test           | Charm Sciences                   | Serum    | 200               |
|  |                                     |                                  | Urine    | 800               |
|  | Charm KIS Test                      | Charm Sciences                   | Serum    | 100               |
|  |                                     |                                  | Urine    | 100               |
|  | Charm SL Beta-lactam Test for Urine | Charm Sciences                   | Urine    | 85                |
|  | Premi®test                          | DSM                              | Urine    | 100               |
| Chloramphenicol <sup>‡</sup><br>(prohibited) | Charm II Amphenicol Test            | Charm Sciences                   | Serum    | 10                |
|  |                                     |                                  | Urine    | 10                |
|  | Charm II Chloramphenicol Test       | Charm Sciences                   | Serum    | 0.3               |
|  |                                     |                                  | Urine    | 10                |

<sup>§</sup> Inclusion of product names and associated information does not constitute an endorsement by the NMPF. Unless otherwise noted, all information contained herein was provided by the product's sponsor and no further attempts were made to validate or corroborate the sponsor's information. Neither the AVMA, NMPF, FDA, nor FARAD assumes any responsibility for penalties which may result from the use of this table or any of the products listed herein.

<sup>‡</sup> Predicts pass or fail on USDA tissue residue tests.

<sup>‡</sup> The use of chloramphenicol in any food-producing animal is strictly forbidden under federal law. Consider testing for chloramphenicol in purchased new additions to the lactating herd or in other instances where the drug-treatment history is unknown.

# Serum and Urine Screening Tests

## Screening Tests Available as of September 2015

| Residues Detected  | Test Name                             | Sponsor                          | Specimen | Sensitivity (ppb) |
|--|---------------------------------------|----------------------------------|----------|-------------------|
| Chlortetracycline<br>(prohibited as feed additive for lactating dairy cows)  | Charm II Tetracycline Test            | Charm Sciences                   | Serum    | 200               |
|  |                                       |                                  | Urine    | 3000              |
|  | Charm KIS Test                        | Charm Sciences                   | Serum    | 10,000            |
|  |                                       |                                  | Urine    | 10,000            |
|  | Premi®test                            | DSM                              | Urine    | 50                |
| Cloxacillin  | Charm II Beta-lactam Test             | Charm Sciences                   | Serum    | 2500              |
|  |                                       |                                  | Urine    | 10,000            |
|  | Charm KIS Test                        | Charm Sciences                   | Serum    | 500               |
|  |                                       |                                  | Urine    | 500               |
|  | Charm SL Beta-lactam Test for Urine   | Charm Sciences                   | Urine    | 300               |
|  | Meatsafe™ β-Lactam One-Step Test      | SILVER LAKE Research Corporation | Urine    | ‡                 |
|  | Premi®test                            | DSM                              | Urine    | 50                |
| Danofloxacin   | Premi®test                            | DSM                              | Urine    | 600               |
| Dihydrostreptomycin  | Charm II Streptomycin Test            | Charm Sciences                   | Serum    | 100               |
|  |                                       |                                  | Urine    | 2000              |
|  | Charm KIS Test                        | Charm Sciences                   | Serum    | 5000              |
|  |                                       |                                  | Urine    | 5000              |
|  | Premi®test                            | DSM                              | Urine    | 3000              |
| Enrofloxacin*  | Charm Enroflox Test (ROSA Test)       | Charm Sciences                   | Urine    | 100               |
|  | Premi®test                            | DSM                              | Urine    | 600               |
| Erythromycin   | Charm KIS Test                        | Charm Sciences                   | Serum    | 500               |
|  |                                       |                                  | Urine    | 500               |
|  | Charm II Macrolide Test               | Charm Sciences                   | Serum    | 500               |
|  |                                       |                                  | Urine    | 500               |
|  | Premi®test                            | DSM                              | Urine    | 100               |
| Florfenicol  | Charm II Amphenicol Test              | Charm Sciences                   | Serum    | 400               |
|  |                                       |                                  | Urine    | 400               |
| Gentamicin<br>(unapproved in dairy cattle)<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use) | Charm II Gentamicin and Neomycin Test | Charm Sciences                   | Serum    | 250               |
|  |                                       |                                  | Urine    | 2000              |
|  | Charm KIS Test                        | Charm Sciences                   | Serum    | 600               |
|  |                                       |                                  | Urine    | 600               |
|  | Meatsafe™ Gentamicin Strip Test       | SILVER LAKE Research Corporation | Urine    | ‡                 |
|  | Premi®test                            | DSM                              | Urine    | 100               |

‡ Predicts pass or fail on USDA tissue residue tests.

\*Prohibited from use in any kind of lactating cattle.



# Serum and Urine Screening Tests

## Screening Tests Available as of September 2015

| Residues Detected   | Test Name                               | Sponsor                          | Specimen | Sensitivity (ppb) |
|---|---|----------------------------------|----------|-------------------|
| Hetacillin  | Charm II Beta-lactam Test               | Charm Sciences                   | Serum    | 200               |
|   |   |                                  | Urine    | 1000              |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 100               |
|   |   |                                  | Urine    | 100               |
|   | Charm SL Beta-lactam Test for Urine     | Charm Sciences                   | Urine    | 250               |
|   | Meatsafe™ $\beta$ -Lactam One-Step Test | SILVER LAKE Research Corporation | Urine    | ‡                 |
| Kanamycin<br>(unapproved in dairy cattle)<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use) | Charm II Gentamicin and Neomycin Test   | Charm Sciences                   | Serum    | 2000              |
|   |   |                                  | Urine    | 2000              |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 5000              |
|   |   |                                  | Urine    | 5000              |
| Lincomycin<br>(unapproved in dairy cattle)  | Charm II Macrolide Test                 | Charm Sciences                   | Serum    | 2000              |
|   |   |                                  | Urine    | 2000              |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 2000              |
|   |   |                                  | Urine    | 2000              |
|   | Premi®test                              | DSM                              | Urine    | 100               |
| Neomycin  | Charm II Gentamicin and Neomycin Test   | Charm Sciences                   | Serum    | 50                |
|   |   |                                  | Urine    | 10,000            |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 1000              |
|   |   |                                  | Urine    | 1000              |
|   | Premi®test                              | DSM                              | Urine    | 300               |
| Oxacillin   | Charm II Beta-lactam Test               | Charm Sciences                   | Serum    | 2500              |
|   |   |                                  | Urine    | 10,000            |
|   | Charm SL Beta-lactam Test for Urine     | Charm Sciences                   | Urine    | 300               |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 1000              |
|   |   |                                  | Urine    | 1000              |
| Oxytetracycline<br>(prohibited as feed additive for lactating dairy cows)   | Charm II Tetracycline Test              | Charm Sciences                   | Serum    | 200               |
|   |   |                                  | Urine    | 2500              |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 3500              |
|   |   |                                  | Urine    | 3500              |
|   | Premi®test                              | DSM                              | Urine    | 50                |
| Penicillin  | Charm II Beta-lactam Test               | Charm Sciences                   | Serum    | 200               |
|   |   |                                  | Urine    | 800               |
|   | Charm KIS Test                          | Charm Sciences                   | Serum    | 30                |
|   |   |                                  | Urine    | 30                |
|   | Charm SL Beta-lactam Test for Urine     | Charm Sciences                   | Urine    | 25                |

‡ Predicts pass or fail on USDA tissue residue tests.

# Serum and Urine Screening Tests

## Screening Tests Available as of September 2015

| Residues Detected  | Test Name                               | Sponsor                          | Specimen | Sensitivity (ppb) |
|--|---|----------------------------------|----------|-------------------|
| Penicillin   | Meatsafe™ $\beta$ -Lactam One-Step Test | SILVER LAKE Research Corporation | Urine    | ‡                 |
|  | Premi®test                              | DSM                              | Urine    | 5.0               |
| Pirlimycin   | Charm KIS Test                          | Charm Sciences                   | Serum    | 500               |
|  | Charm II Macrolide Test                 | Charm Sciences                   | Serum    | 3000              |
|  |   |                                  | Urine    | 3000              |
| Streptomycin   | Charm II Streptomycin Test              | Charm Sciences                   | Serum    | 100               |
|  |   |                                  | Urine    | 2000              |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 10,000            |
|  |   |                                  | Urine    | 10,000            |
|  | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 300               |
|  |   |                                  | Urine    | 1500              |
| Sulfachloropyridazine  | Charm KIS Test                          | Charm Sciences                   | Serum    | 5000              |
|  |   |                                  | Urine    | 5000              |
|  | Premi®test                              | DSM                              | Urine    | 100               |
| Sulfadiazine*<br>(unapproved in dairy cattle)                | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 150               |
|  |   |                                  | Urine    | 500               |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 5000              |
|  |   |                                  | Urine    | 5000              |
| Sulfadimethoxine   | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 150               |
|  |   |                                  | Urine    | 500               |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 2500              |
|  |   |                                  | Urine    | 2500              |
|  | Charm ROSA SDSM Test                    | Charm Sciences                   | Urine    | 400               |
|  | Premi®test                              | DSM                              | Urine    | 100               |
| Sulfadoxine*<br>(unapproved in dairy cattle)                 | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 300               |
|  |   |                                  | Urine    | 800               |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 10,000            |
|  |   |                                  | Urine    | 10,000            |
| Sulfamerazine*<br>(unapproved in dairy cattle)               | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 150               |
|  |   |                                  | Urine    | 500               |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 10,000            |
|  |   |                                  | Urine    | 10,000            |
| Sulfamethazine <sup>oe</sup><br>(unapproved in dairy cattle) | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 400               |
|  |   |                                  | Urine    | 1250              |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 5000              |
|  |   |                                  | Urine    | 5000              |
|  | Premi®test                              | DSM                              | Urine    | 100               |
| Sulfamethizole<br>(unapproved in dairy cattle)               | Charm II Sulfonamide Test               | Charm Sciences                   | Serum    | 300               |
|  |   |                                  | Urine    | 1600              |
|  | Charm KIS Test                          | Charm Sciences                   | Serum    | 2000              |
|  |   |                                  | Urine    | 2000              |

‡ Predicts pass or fail on USDA tissue residue tests.

\* Prohibited from use of any kind in lactating cattle.

<sup>oe</sup> Sulfamethazine is prohibited for use in female dairy cattle 20 months of age or older.

# Serum and Urine Screening Tests

## Screening Tests Available as of September 2015

| Residues Detected  | Test Name                  | Sponsor        | Specimen | Sensitivity (ppb) |
|--|----------------------------|----------------|----------|-------------------|
| Sulfamethoxazole*<br>(unapproved in dairy cattle)                      | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 120               |
|  |                            |                | Urine    | 300               |
|  | Charm KIS Test             | Charm Sciences | Serum    | 5000              |
|  |                            |                | Urine    | 5000              |
| Sulfanilamide*<br>(unapproved in dairy cattle)                         | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 1600              |
|  |                            |                | Urine    | 4000              |
|  | Charm KIS Test             | Charm Sciences | Serum    | 10,000            |
|  |                            |                | Urine    | 10,000            |
| Sulfapyridine*<br>(unapproved in dairy cattle)                         | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 400               |
|  |                            |                | Urine    | 1000              |
|  | Charm KIS Test             | Charm Sciences | Serum    | 10,000            |
| Sulfaquinoxaline*<br>(unapproved in dairy cattle)                      | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 150               |
|  |                            |                | Urine    | 500               |
|  | Charm KIS Test             | Charm Sciences | Serum    | 5000              |
|  |                            |                | Urine    | 5000              |
| Sulfathiazole*<br>(unapproved in dairy cattle)                         | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 300               |
|  |                            |                | Urine    | 1000              |
|  | Charm KIS Test             | Charm Sciences | Serum    | 2500              |
| Sulfisoxazole*<br>(unapproved in dairy cattle)                         | Charm II Sulfonamide Test  | Charm Sciences | Serum    | 250               |
|  |                            |                | Urine    | 600               |
|  | Charm KIS Test             | Charm Sciences | Serum    | 5000              |
| Tetracycline<br>(prohibited as feed additive for lactating dairy cows) | Charm II Tetracycline Test | Charm Sciences | Serum    | 40                |
|  |                            |                | Urine    | 600               |
|  | Charm KIS Test             | Charm Sciences | Serum    | 10,000            |
|  |                            |                | Urine    | 10,000            |
| Tilmicosin   | Charm KIS Test             | Charm Sciences | Serum    | 1000              |
|  |                            |                | Urine    | 1000              |
|  | Premi®test                 | DSM            | Urine    | 50                |
| Tulathromycin*<br>(unapproved in dairy cattle)                         | Charm II Macrolide Test    | Charm Sciences | Serum    | 500               |
|  |                            |                | Urine    | 500               |
|  | Charm KIS Test             | Charm Sciences | Serum    | 500               |
|  |                            |                | Urine    | 500               |
|  | Premi®test                 | DSM            | Urine    | 18,000            |
| Tylosin  | Charm II Macrolide Test    | Charm Sciences | Serum    | 2000              |
|  |                            |                | Urine    | 2000              |
|  | Charm KIS Test             | Charm Sciences | Serum    | 200               |
|  |                            |                | Urine    | 200               |
|  | Premi®test                 | DSM            | Urine    | 50                |

\*Prohibited from use of any kind in lactating cattle.

# DO RIGHT BY *your* COWS.



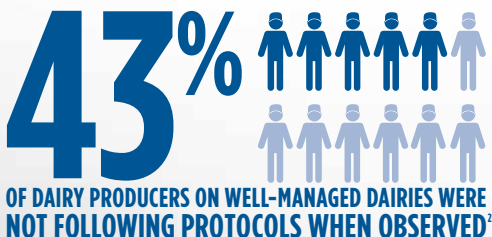
## Follow good protocols for good health and management

Think about the last time you were sick — sick enough to go to the doctor. Did you go home with a prescription for antibiotics? Did you read the instructions? They should have contained clear information for how much medicine to take, as well as when, how and for how many days. Did you follow those directions? If you're like many Americans, you didn't.



## Noncompliance with treatment protocols and prescriptions is a problem

If you don't follow your own prescriptions, are you treating your dairy cattle the same way? If so, you may be risking the wellness and bottom line of your dairy.



## What compliance should mean to you

- ▶ Use the correct treatment
- ▶ Give the correct dosage amount
- ▶ Use the correct route of administration
- ▶ Treat for the correct duration and at the correct time
- ▶ Keep accurate records
- ▶ Work with your veterinarian

## Why compliance should matter to you

Compliance means doing what's right. Compliance ensures your dairy wellness by doing what's right for the health of your animals, your dairy and the food you provide.



Successful treatment requires a full course of therapy with the appropriate drug. Experts establish protocols to treat diseases and offer your cattle the best chance of a recovery.



The price of the medication isn't the only factor in the cost of a treatment. If workers don't complete protocols and the treatment fails, dairies face additional expenses to retreat or cull cows.



Compliance is vital for protecting the food supply. Using products that carry the Residue Free Guarantee™ means you won't have to worry about a violative residue in meat or milk as long as you follow the label.

<sup>1</sup>Residue Free Guarantee: If you use a Zoetis-branded ceftiofur product according to label indications, and experience a violative ceftiofur milk or meat residue, Zoetis will compensate you for the beef market value of the animal or purchase the tanker of milk at fair market value. You must purchase the product from a Zoetis-approved supplier, use the product according to label indications, have documentation of the product purchase and treatment records, and have conducted training on appropriate use to ensure proper dose and route of administration of the product. Extra-label use as prescribed by a veterinarian is excluded from the guarantee. If you experience a ceftiofur residue violation after following label indications and the above steps, contact Zoetis VMIPS (Veterinary Medical Information and Product Support) at 800-366-5288 to report the situation.

<sup>2</sup>Prescription Drug Compliance a Significant Challenge for Many Patients, According to New National Survey, *The Wall Street Journal Online Health Industry Edition*, March 29, 2005.

<sup>3</sup>Wenz JR. Good Health Records: The Foundation of Consistent, Effective Dairy Health Management; Oct. 11, 2012; Rochester, Minn.

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# SIX TIPS FOR PROPER DRUG TREATMENTS

El propietario de la lechería cuenta con que usted brinde el mejor cuidado a las vacas. Si una vaca se enferma, es su responsabilidad brindarle el tratamiento adecuado; para esto debe seguir las indicaciones de las etiquetas de los medicamentos o una receta del veterinario.

## Why compliance can get results

After the first treatment is given, the concentration of the medicine gradually declines. Compliance with the protocol for additional treatments will help keep the level of therapy above the minimum inhibitory concentration (MIC), which is the lowest amount of medicine that will prevent the bacteria from growing. For example, a second dose of EXCEDE® (*ceftiofur crystalline free acid*) Sterile Suspension is needed 72 hours after the first dose to keep the level of therapy high to fight the bacteria associated with metritis.

## Put compliance into action

You count on your employees to care for your animals. Make sure they get the message about why following protocols is the right thing to do. Use the next section to help train your employees and to remind them to be compliant with treatments on your dairy.

Remember, your veterinarian should be your number one resource and partner when it comes to treatment compliance. Developing a valid veterinarian-client-patient relationship (VCPR) should be your first step toward compliance. With a valid VCPR, your veterinarian can help you:

Develop written protocols for common diseases. Protocols should include compliance information as well as how to identify the illness and any milk and meat withholding times.

Keep accurate and consistent health records. This will help with compliance, enhancing overall herd health and avoiding drug residues.

Review the protocols every six months. Involve your employees in the review process to address any possible changes. Also, share the results of record-keeping with your employees to show them how the protocols are working.

**Important Safety Information:** The use of EXCEDE is contraindicated in animals with known allergy to ceftiofur or to the  $\beta$ -lactam group (penicillins and cephalosporins) of antimicrobials. Though safe in cattle when properly administered, inadvertent intra-arterial injection is possible and fatal. EXCEDE has a pre-slaughter withdrawal time of 13 days following the last dose in cattle. Do not use in calves to be processed for veal.

## DETERMINE THE RIGHT TREATMENT

Revise los protocolos para las enfermedades comunes y siga las instrucciones relativas a la enfermedad de la vaca. Usted debe contar con el medicamento adecuado para tratar la enfermedad.



## GIVE THE CORRECT AMOUNT

En la mayoría de los medicamentos, no todas las vacas reciben la misma cantidad. Calcule el peso de la vaca cuidadosamente, con el fin de administrarle la cantidad correcta del medicamento.



## GIVE FOR THE CORRECT NUMBER OF DAYS AND AT THE CORRECT TIME

Una vaca puede comenzar a mejorar antes de terminar el protocolo; sin embargo, debe administrar todas las dosis indicadas para que la vaca se recupere completamente.



## GIVE THE TREATMENT IN THE CORRECT WAY

Existen diversas maneras para administrar el medicamento a las vacas. Asegúrese de comprender las diferencias y de hacer solo lo que el protocolo le indica.



## KEEP ACCURATE RECORDS

Después de brindar tratamiento a una vaca, registre toda la información relativa al tratamiento. Esto permitirá que el veterinario y el encargado del rebaño sepan qué tan bien funcionan los tratamientos.



## ASK FOR HELP

Si no comprende alguna parte del protocolo, no adivine. Solicite ayuda al encargado o al veterinario encargado.



**Zoetis is here to help, too. Visit [AvoidResidues.com](http://AvoidResidues.com) for posters, videos and more information on how to comply with drug treatment protocols.**

DAIRY WELLNESS MAKES A DIFFERENCE™

**zoetis**



For subcutaneous injection in the posterior aspect of the ear where it attaches to the head (base of the ear) in lactating dairy cattle. For subcutaneous injection in the middle third of the posterior aspect of the ear or in the posterior aspect of the ear where it attaches to the head (base of the ear) in beef and non-lactating dairy cattle. Not for use in calves to be processed for veal.

#### CAUTION

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

#### INDICATIONS

EXCEDE Sterile Suspension is indicated for treatment of bovine respiratory disease (BRD, shipping fever, pneumonia) associated with *Mannheimia haemolytica*, *Pasteurella multocida*, and *Histophilus somni* in beef, non-lactating dairy, and lactating dairy cattle.

EXCEDE Sterile Suspension is also indicated for the control of respiratory disease in beef and non-lactating dairy cattle which are at high risk of developing BRD associated with *M. haemolytica*, *P. multocida*, and *H. somni*.

EXCEDE Sterile Suspension is also indicated for the treatment of bovine foot rot (interdigital necrobacillosis) associated with *Fusobacterium necrophorum* and *Porphyromonas levis* in beef, non-lactating dairy, and lactating dairy cattle.

EXCEDE Sterile Suspension is also indicated for treatment of acute metritis (0-10 days postpartum) associated with bacterial organisms susceptible to ceftiofur in lactating dairy cattle.

#### CONTRAINDICATIONS

As with all drugs, the use of EXCEDE Sterile Suspension is contraindicated in animals previously found to be hypersensitive to the drug.

#### WARNINGS

**FOR USE IN ANIMALS ONLY. NOT FOR HUMAN USE.  
KEEP OUT OF REACH OF CHILDREN.**

Penicillins and cephalosporins can cause allergic reactions in sensitized individuals. Topical exposures to such antimicrobials, including ceftiofur, may elicit mild to severe allergic reactions in some individuals. Repeated or prolonged exposure may lead to sensitization. Avoid direct contact of the product with the skin, eyes, mouth and clothing. Sensitization of the skin may be avoided by wearing protective gloves.

Persons with a known hypersensitivity to penicillin or cephalosporins should avoid exposure to this product.

In case of accidental eye exposure, flush with water for 15 minutes. In case of accidental skin exposure, wash with soap and water. Remove contaminated clothing. If allergic reaction occurs (e.g., skin rash, hives, difficult breathing), seek medical attention.

The material safety data sheet contains more detailed occupational safety information. To obtain a material safety data sheet please call 1-800-733-5500. To report any adverse event please call 1-800-366-5288.

Intra-arterial injection may occur during administration of EXCEDE Sterile Suspension via middle third of the ear injection or base of the ear injection directed toward the opposite eye. Intra-arterial injection of EXCEDE Sterile Suspension is likely to result in sudden death of the animal.

#### RESIDUE WARNINGS

- Following label use as either a single-dose or 2-dose regimen, a 13-day pre-slaughter withdrawal period is required after the last treatment.
- Following label use as either a single-dose or 2-dose regimen, no milk discard period is required for this product.
- Use of dosages in excess of 3.0 mg CE/lb. (6.6 mg CE/kg) BW or administration by unapproved routes (subcutaneous injection in the neck or intramuscular injection) may cause violative residues.
- A withdrawal period has not been established for this product in pre-ruminating calves.
- Do not use in calves to be processed for veal.

#### PRECAUTIONS

Following subcutaneous injection in the middle third of the posterior aspect of the ear, thickening and swelling (characterized by aseptic cellular infiltrate) of the ear may occur. As with other parenteral injections, localized post-injection bacterial infections may result in abscess formation. Attention to hygienic procedures can minimize their occurrence.

Following injection at the posterior aspect of the ear where it attaches to the head (base of the ear), areas of discoloration and signs of inflammation may persist at least 13 days post administration resulting in trim loss of edible tissue at slaughter. Injection of volumes greater than 20 mL, in the middle third of the ear, may result in open draining lesions in a small percentage of cattle.

The effects of ceftiofur on bovine reproductive performance, pregnancy, and lactation have not been determined.

#### ADVERSE EFFECTS

Intra-arterial injection may occur during administration of EXCEDE Sterile Suspension via middle third of the ear injection or base of the ear injection directed toward the opposite eye. Intra-arterial injection of EXCEDE Sterile Suspension is likely to result in sudden death of the animal. During the conduct of clinical studies, there was a low incidence of acute death (see ANIMAL SAFETY) confirmed to be the result of inadvertent intra-arterial injection. No other adverse systemic effects were noted for either the antibiotic or formulation during any of the clinical and target animal safety studies.

#### STORAGE CONDITIONS

Store at controlled room temperature 20° to 25°C (68° to 77°F). Shake well before using. Contents should be used within 12 weeks after the first dose is removed.

#### HOW SUPPLIED

EXCEDE Sterile Suspension is available in the following package sizes:

100 mL vial  
250 mL vial

NADA #141-209, Approved by FDA  
www.EXCEDE.com or call 1-866-387-2287  
Revised December 2011



EXD12041

Distributed by  
Pharmacia & Upjohn Company  
Division of Pfizer Inc, NY, NY 10017

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| Residues Detected | Tolerance (ppb)  | Test Name   | Sponsor                     | Sensitivity (ppb) |
|-------------------|------------------|---|-----------------------------|-------------------|
| 2, 4-D            | 100 <sup>#</sup> | 2,4-D RaPID Assay®                                      | Strategic Diagnostics, Inc. | 50.0              |
| Aflatoxin M1      | 0.5              | Charm II Aflatoxin Test (Competitive)                   | Charm Sciences              | 0.5               |
|                   |                  | Charm II Aflatoxin Test (Sequential)                    | Charm Sciences              | 0.5               |
|                   |                  | Charm II Aflatoxin Test (Quantitative)                  | Charm Sciences              | 0.02              |
|                   |                  | Charm ROSA SL Aflatoxin Test (Quantitative)             | Charm Sciences              | 0.5               |
|                   |                  | Charm ROSA MRL Aflatoxin Quantitative Test              | Charm Sciences              | 0.05              |
|                   |                  | Reveal for Aflatoxin M1                                 | Neogen Corporation          | 0.5               |
|                   |                  | SNAP Aflatoxin M1                                       | IDEXX Labs, Inc.            | 0.5               |
| Amoxicillin       | 10 <sup>#</sup>  | BetaStar Plus Beta-lactam Test*                         | Neogen Corporation          | 5.5               |
|                   |                  | Charm II Beta-lactam Test* (Competitive)                | Charm Sciences              | 7.5 •             |
|                   |                  | Charm II Beta-lactam Test* (Quantitative)               | Charm Sciences              | 8.1 •             |
|                   |                  | Charm II Beta-lactam Test* (Sequential)                 | Charm Sciences              | 8.1 •             |
|                   |                  | Charm <i>B. stearothermophilus</i> Tablet Disc Assay*   | Charm Sciences              | 7.5 •             |
|                   |                  | Charm Cowside II Test                                   | Charm Sciences              | 4.0               |
|                   |                  | Charm HPLC-Receptogram                                  | Charm Sciences              | 10.0              |
|                   |                  | Charm SL Beta-lactam Test*                              | Charm Sciences              | 5.6 •             |
|                   |                  | Charm 3 SL3 Beta-lactam Test*                           | Charm Sciences              | 8.4 •             |
|                   |                  | Charm Flunixin and Beta-lactam Test*                    | Charm Sciences              | 5.9 •             |
|                   |                  | Charm MRL Beta-lactam Test                              | Charm Sciences              | 4.0               |
|                   |                  | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences              | 5.0               |
|                   |                  | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences              | 4.0               |
|                   |                  | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences              | 4.0               |
|                   |                  | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences              | 5.0               |
|                   |                  | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences              | 4.0               |
|                   |                  | Charm Quad Test   | Charm Sciences              | 4.0               |
|                   |                  | Charm Quad1 Test  | Charm Sciences              | 4.0               |
|                   |                  | Charm Blue Yellow II Test                               | Charm Sciences              | 3.0               |
|                   |                  | Delvotest BLF   | DSM Food Specialties        | 3.0               |
|                   |                  | Delvotest P 5 Pack*                                     | DSM Food Specialties        | 4.6 •             |
|                   |                  | Delvotest P/Delvotest P Mini*                           | DSM Food Specialties        | 7.7 •             |
|                   |                  | Delvotest T   | DSM Food Specialties        | 4.0               |
|                   |                  | Eclipse® 3G   | ZEU-Inmunotec               | 3.0               |
|                   |                  | New SNAP Beta-lactam*                                   | IDEXX Labs, Inc.            | 7.3               |
|                   |                  | New SNAP Beta-lactam (Visual)                           | IDEXX Labs, Inc.            | 6.9               |
|                   |                  | Penzyme® Milk Test                                      | Neogen Corporation          | 6.0               |

<sup>#</sup> Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

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| Residues Detected | Tolerance (ppb) | Test Name   | Sponsor              | Sensitivity (ppb) |
|-------------------|-----------------|---|----------------------|-------------------|
| Ampicillin        | 10 <sup>#</sup> | BetaStar Plus Beta-lactam Test*                         | Neogen Corporation   | 5.2               |
|                   |                 | Charm II Beta-lactam Test* (Competitive)                | Charm Sciences       | 5.7 •             |
|                   |                 | Charm II Beta-lactam Test* (Quantitative)               | Charm Sciences       | 6.6 •             |
|                   |                 | Charm II Beta-lactam Test* (Sequential)                 | Charm Sciences       | 6.6 •             |
|                   |                 | Charm Cowside II Test                                   | Charm Sciences       | 4.0               |
|                   |                 | Charm <i>B. stearothermophilus</i> Tablet Disc Assay*   | Charm Sciences       | 6.7 •             |
|                   |                 | Charm HPLC-Receptogram                                  | Charm Sciences       | 2.0               |
|                   |                 | Charm SL Beta-lactam Test*                              | Charm Sciences       | 8.5 •             |
|                   |                 | Charm 3 SL3 Beta-lactam Test*                           | Charm Sciences       | 8.0 •             |
|                   |                 | Charm Flunixin and Beta-lactam Test*                    | Charm Sciences       | 6.8 •             |
|                   |                 | Charm MRL Beta-lactam Test                              | Charm Sciences       | 4.0               |
|                   |                 | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 4.0               |
|                   |                 | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 4.0               |
|                   |                 | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 4.0               |
|                   |                 | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 4.0               |
|                   |                 | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences       | 4.0               |
|                   |                 | Charm Quad Test   | Charm Sciences       | 4.0               |
|                   |                 | Charm Quad1 Test  | Charm Sciences       | 4.0               |
|                   |                 | Charm Blue Yellow II Test                               | Charm Sciences       | 3.0               |
|                   |                 | Delvotest BLF   | DSM Food Specialties | 5.0               |
|                   |                 | Delvotest P 5 Pack*                                     | DSM Food Specialties | 4.0 •             |
|                   |                 | Delvotest P/Delvotest P Mini*                           | DSM Food Specialties | 5.1 •             |
|                   |                 | Delvotest T   | DSM Food Specialties | 3.0               |
|                   |                 | Eclipse® 3G   | ZEU-Inmunotec        | 3.0               |
|                   |                 | New SNAP Beta-lactam*                                   | IDEXX Labs, Inc.     | 5.8 •             |
|                   |                 | New SNAP Beta-lactam (Visual)                           | IDEXX Labs, Inc.     | 6.2               |
|                   |                 | Penzyme® Milk Test                                      | Neogen Corporation   | 7.0               |

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| Residues Detected                                  | Tolerance (ppb)   | Test Name  | Sponsor                               | Sensitivity (ppb) |
|--|-------------------|--|---------------------------------------|-------------------|
| Atrazine   | 20 <sup>#</sup>   | Atrazine RaPID Assay®                                      | Strategic Diagnostics, Inc.           | 5.0               |
| Bacitracin<br>(unapproved in lactating dairy cows) | 500 <sup>#</sup>  | Delvotest P/Delvotest P Mini<br>Eclipse® 3G                | DSM Food Specialties<br>ZEU-Inmunotec | >1000<br>600      |
| Carbendazim  | 20 <sup>#</sup>   | Benomyl RaPID Assay®                                       | Strategic Diagnostics, Inc.           | 5.0               |
| Cefoperazone                                       | None <sup>ŷ</sup> | BetaStar Plus Beta-lactam Test                             | Neogen Corporation                    | 8.0               |
|  |                   | Charm II Beta-lactam Test<br>(Competitive)                 | Charm Sciences                        | 20                |
|  |                   | Charm II Beta-lactam Test<br>(Quantitative)                | Charm Sciences                        | 20                |
|  |                   | Charm II Beta-lactam Test<br>(Sequential)                  | Charm Sciences                        | 5.0               |
|  |                   | Charm <i>B. stearotherophilus</i> Tablet Disc Assay        | Charm Sciences                        | 5.0               |
|  |                   | Charm CowSide II Test                                      | Charm Sciences                        | 30                |
|  |                   | Charm 3 SL3 Beta-lactam Test                               | Charm Sciences                        | 1.0               |
|  |                   | Charm SL Beta-lactam Test                                  | Charm Sciences                        | 15                |
|  |                   | Charm MRL Beta-lactam Test                                 | Charm Sciences                        | 9.0               |
|  |                   | Charm MRL Beta-lactam 3 Minute Test                        | Charm Sciences                        | 2.0               |
|  |                   | Charm MRL Beta-lactam 1 Minute Test                        | Charm Sciences                        | 3.0               |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test                | Charm Sciences                        | 8.0               |
|  |                   | Charm MRL Beta-lactam and Tetracycline<br>2 Minute Test    | Charm Sciences                        | 3.0               |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline<br>2 Minute Test | Charm Sciences                        | 2.0               |
|  |                   | Charm Quad Test  | Charm Sciences                        | 3.0               |
|  |                   | Charm Quad I Test  | Charm Sciences                        | 3.0               |
|  |                   | Charm Blue Yellow II Test                                  | Charm Sciences                        | 30                |
|  |                   | Charm Flunixin and Beta-lactam Test                        | Charm Sciences                        | 9.0               |
|  |                   | Delvotest T  | DSM Food Specialties                  | 40                |

<sup>#</sup> Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

<sup>ŷ</sup> No official tolerance or "safe levels" have been established by the FDA.

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| Residues Detected | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|-------------------|-------------------|---|----------------------|-------------------|
| Cefquinome        | None <sup>¥</sup> | BetaStar Plus Beta-lactam Test                          | Neogen Corporation   | 8.0               |
|                   |                   | Charm II Beta-lactam Test (Competitive)                 | Charm Sciences       | 40                |
|                   |                   | Charm II Beta-lactam Test (Quantitative)                | Charm Sciences       | 40                |
|                   |                   | Charm II Beta-lactam Test (Sequential)                  | Charm Sciences       | 10                |
|                   |                   | Charm <i>B. stearothermophilus</i> Tablet Disc Assay    | Charm Sciences       | 100               |
|                   |                   | Charm CowSide II Test                                   | Charm Sciences       | 60                |
|                   |                   | Charm 3 SL3 Beta-lactam Test                            | Charm Sciences       | 50                |
|                   |                   | Charm SL Beta-lactam Test                               | Charm Sciences       | 30                |
|                   |                   | Charm Flunixin and Beta-lactam Test                     | Charm Sciences       | 75                |
|                   |                   | Charm MRL Beta-lactam Test                              | Charm Sciences       | 20                |
|                   |                   | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 25                |
|                   |                   | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 40                |
|                   |                   | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 20                |
|                   |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 25                |
|                   |                   | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences       | 25                |
|                   |                   | Charm Quad Test   | Charm Sciences       | 20                |
|                   |                   | Charm Quad1 Test  | Charm Sciences       | 15                |
|                   |                   | Charm Blue Yellow II Test                               | Charm Sciences       | 60                |
|                   |                   | Delvotest T   | DSM Food Specialties | 40                |
| Ceftiofur         | 100 <sup>£</sup>  | BetaStar Plus Beta-lactam Test*                         | Neogen Corporation   | 80                |
|                   |                   | Charm II Beta-lactam Test* (Competitive)                | Charm Sciences       | 47 •              |
|                   |                   | Charm II Beta-lactam Test* (Quantitative)               | Charm Sciences       | 8.0 •             |
|                   |                   | Charm II Beta-lactam Test* (Sequential)                 | Charm Sciences       | 58 •              |
|                   |                   | Charm Cowside II Test                                   | Charm Sciences       | > 100             |
|                   |                   | Charm <i>B. stearothermophilus</i> Tablet Disc Assay*   | Charm Sciences       | > 100 •           |
|                   |                   | Charm HPLC-Receptogram                                  | Charm Sciences       | 30-40             |
|                   |                   | Charm SL Beta-lactam Test*                              | Charm Sciences       | 77 •              |
|                   |                   | Charm 3 SL3 Beta-lactam Test*                           | Charm Sciences       | 79 •              |
|                   |                   | Charm Flunixin and Beta-lactam Test*                    | Charm Sciences       | 63 •              |
|                   |                   | Delvotest T   | DSM Food Specialties | 80                |

¥ No official tolerance or "safe levels" have been established by the FDA.

£ The tolerance was established for the marker residue, not the parent compound. The ceftiofur tolerance has been changed from 50 ppb ceftiofur (parent drug) to 100 ppb ceftiofur marker residue [DCA, desfuroylceftiofur metabolite derivative].

★ Evaluated by FDA and Accepted by NCIMS.

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| Residues Detected                          | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|--|-------------------|---|----------------------|-------------------|
| Ceftiofur (cont.)                          | 100 <sup>£</sup>  | Charm MRL Beta-lactam Test                              | Charm Sciences       | 20                |
|  |                   | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 40                |
|  |                   | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 100               |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 20                |
|  |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 70                |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences       | 70                |
|  |                   | Charm Quad Test   | Charm Sciences       | 40                |
|  |                   | Charm Quad I Test                                       | Charm Sciences       | 70                |
|  |                   | Charm Blue Yellow II Test                               | Charm Sciences       | 100               |
|  |                   | Delvotest BLF   | DSM Food Specialties | < 20              |
|  |                   | Delvotest P 5 Pack*                                     | DSM Food Specialties | > 100             |
|  |                   | Delvotest P/Delvotest P Mini*                           | DSM Food Specialties | > 100             |
|  |                   | Delvotest SP-NT   | DSM Food Specialties | 130               |
|  |                   | Eclipse® 3G   | ZEU-Inmunotec        | 60                |
|  |                   | New SNAP Beta-Lactam*                                   | IDEXX Labs, Inc.     | 12 •              |
| Cephalexin<br>(unapproved in dairy cattle) | None <sup>¥</sup> | BetaStar Plus Beta-lactam Test                          | Neogen Corporation   | 500               |
|  |                   | Charm II Beta-lactam Test (Competitive)                 | Charm Sciences       | 45                |
|  |                   | Charm II Beta-lactam Test (Sequential)                  | Charm Sciences       | 40                |
|  |                   | Charm II Beta-lactam Test (Quantitative)                | Charm Sciences       | 40                |
|  |                   | Charm Cowside II Test                                   | Charm Sciences       | 50                |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay    | Charm Sciences       | 85                |
|  |                   | Charm SL Beta-lactam Test                               | Charm Sciences       | 50                |
|  |                   | Charm 3 SL3 Beta-lactam Test                            | Charm Sciences       | 3000              |
|  |                   | Charm Flunixin and Beta-lactam Test                     | Charm Sciences       | 50 •              |
|  |                   | Charm MRL Beta-lactam Test                              | Charm Sciences       | 60                |
|  |                   | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 1000              |
|  |                   | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 1000              |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 30                |
|  |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 2000              |

£ The tolerance was established for the marker residue, not the parent compound. The ceftiofur tolerance has been changed from 50 ppb ceftiofur (parent drug) to 100 ppb ceftiofur marker residue (DCA, desfuroylceftiofur metabolite derivative).

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| Residues Detected                                  | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|--|-------------------|--|----------------------|-------------------|
| Cephalexin (cont.)<br>(unapproved in dairy cattle) | None <sup>Ÿ</sup> | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test  | Charm Sciences       | 2000              |
|  |                   | Charm Quad Test  | Charm Sciences       | 1000              |
|  |                   | Charm Quad 1 Test  | Charm Sciences       | 80                |
|  |                   | Charm Blue Yellow II Test                                | Charm Sciences       | 100               |
|  |                   | Delvotest P/Delvotest P Mini*                            | DSM Food Specialties | 60-100            |
|  |                   | Delvotest P 5 Pack*                                      | DSM Food Specialties | 60-100            |
|  |                   | Delvotest T  | DSM Food Specialties | 30                |
|  |                   | Eclipse® 3G  | ZEU-Inmunotec        | 60                |
| Cephapirin   | 20 <sup>#</sup>   | BetaStar Plus Beta-lactam Test*                          | Neogen Corporation   | 19                |
|  |                   | Charm II Beta-lactam Test*<br>(Competitive)              | Charm Sciences       | 4.2 •             |
|  |                   | Charm II Beta-lactam Test*<br>(Quantitative)             | Charm Sciences       | 4.1 •             |
|  |                   | Charm II Beta-lactam Test*<br>(Sequential)               | Charm Sciences       | 4.1               |
|  |                   | Charm <i>B. stearothersophilus</i><br>Tablet Disc Assay* | Charm Sciences       | 11.7 •            |
|  |                   | Charm Cowside II Test                                    | Charm Sciences       | 10                |
|  |                   | Charm HPLC-Receptogram                                   | Charm Sciences       | 2.0               |
|  |                   | Charm SL Beta-lactam Test*                               | Charm Sciences       | 13.7 •            |
|  |                   | Charm 3 SL3 Beta-lactam Test*                            | Charm Sciences       | 20.0 •            |
|  |                   | Charm Flunixin and Beta-lactam Test*                     | Charm Sciences       | 13.4 •            |
|  |                   | Charm MRL Beta-lactam Test                               | Charm Sciences       | 10                |
|  |                   | Charm MRL Beta-lactam 3 Minute Test                      | Charm Sciences       | 30                |
|  |                   | Charm MRL Beta-lactam 1 Minute Test                      | Charm Sciences       | 20                |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test              | Charm Sciences       | 8                 |
|  |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test     | Charm Sciences       | 25                |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test  | Charm Sciences       | 20                |
|  |                   | Charm Quad Test  | Charm Sciences       | 30                |
|  |                   | Charm Quad 1 Test  | Charm Sciences       | 10                |
|  |                   | Charm Blue Yellow II Test                                | Charm Sciences       | 6                 |
|  |                   | Delvotest BLF  | DSM Food Specialties | 4.0               |
|  |                   | Delvotest P 5 Pack (FDA-Approved)                        | DSM Food Specialties | 8.2 •             |
|  |                   | Delvotest P/Delvotest P Mini*                            | DSM Food Specialties | 7.0               |
|  |                   | Delvotest T  | DSM Food Specialties | 5.0               |
|  |                   | Eclipse® 3G  | ZEU-Inmunotec        | 8.0               |

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| Residues Detected  | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|--|-------------------|---|----------------------|-------------------|
| Cephapirin (continued)   | 20 <sup>#</sup>   | New SNAP Beta-lactam <sup>★</sup>   | IDEXX Labs, Inc.     | 11.7 •            |
|  |                   | New SNAP Beta-lactam (Visual)   | IDEXX Labs, Inc.     | 11.9              |
|  |                   | Penzyme <sup>®</sup> Milk Test  | Neogen Corporation   | 11.6              |
| Chloramphenicol <sup>Ⓓ</sup><br>(prohibited in food producing animals)       | None <sup>‡</sup> | BetaStar 4D Beta-lactam, Tetracycline, Streptomycin, Chloramphenicol Test | Neogen Corporation   | 0.3               |
|  |                   | Charm II Chloramphenicol Test <sup>★</sup>                                | Charm Sciences       | 0.1               |
|  |                   | Charm II Amphenicol Test <sup>★</sup>                                     | Charm Sciences       | 1.0               |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay                      | Charm Sciences       | 20,000            |
|  |                   | Charm HPLC-Receptogram  | Charm Sciences       | 1.0               |
|  |                   | Charm Quad Test   | Charm Sciences       | 0.3               |
|  |                   | Charm ROSA Amphenicol Test  | Charm Sciences       | 0.1               |
|  |                   | Charm ROSA Chloramphenicol Test   | Charm Sciences       | 0.15              |
|  |                   | Delvotest T   | DSM Food Specialties | 3080              |
|  |                   | Eclipse <sup>®</sup> 3G   | ZEU-Inmunotec        | 5000              |
|  |                   | Reveal CPP/STREP Chloramphenicol and Streptomycin                         | Neogen Corporation   | 0.3               |
| Chlortetracycline<br>(prohibited as feed additive in lactating dairy cattle) | 300 <sup>#</sup>  | Charm II Tetracycline Drug Test <sup>★</sup> (Competitive Assay)          | Charm Sciences       | 257 •             |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay                      | Charm Sciences       | 1000 †            |
|  |                   | Charm Cowside II Test   | Charm Sciences       | 100               |
|  |                   | Charm HPLC-Receptogram  | Charm Sciences       | 15                |
|  |                   | Charm ROSA Tetracycline Test  | Charm Sciences       | 250               |
|  |                   | Charm MRL Beta-lactam and Tetracycline                                    | Charm Sciences       | 100               |
|  |                   | 2 Minute Test   | Charm Sciences       | 100               |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline                                 |                      |                   |
|  |                   | 2 Minute Test   | Charm Sciences       | 10                |
|  |                   | Charm MRL Trio Test   | Charm Sciences       | 100               |
|  |                   | Charm Quad Test   | Charm Sciences       | 6                 |
|  |                   | Charm Quad I Test   | Charm Sciences       | 70                |
|  |                   | Charm Blue Yellow II Test   | Charm Sciences       | 200               |
|  |                   | Delvotest P/Delvotest P Mini  | DSM Food Specialties | 250-300           |
|  |                   | Delvotest P 5 Pack  | DSM Food Specialties | 250-300           |
|  |                   | Delvotest T   | DSM Food Specialties | 150               |
|  |                   | SNAP Tetracycline   | IDEXX Labs, Inc.     | 100               |

# Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

★ Evaluated by FDA and Accepted by NCIMS.

• Sensitivities based on evaluations of raw commingled bovine milk samples by test sponsors, independent laboratories, and FDA and reported in FDA memo M-a-85 Revision #14 and FDA memorandum (03/22/12).

Ⓓ The use of chloramphenicol in any food-producing animal is strictly forbidden under federal law. Consider testing for chloramphenicol in purchased new additions to the lactating herd or in other instances where the drug-treatment history is unknown.

‡ No official tolerance or "safe levels" have been established by the FDA.

† The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

# Milk Screening Tests

Not all of the tests listed below have been evaluated by FDA and accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions). These tests are believed to be reliable indicators of antibiotic contamination in milk and should be viewed as tools to screen bulk tank milk.

| Residues Detected                           | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|---|-------------------|--|----------------------|-------------------|
| Clindamycin<br>(unapproved in dairy cattle) | None <sup>‡</sup> | Charm II Macrolide Test                          | Charm Sciences       | 50                |
|   |                   | Charm ROSA Macrolide Test                        | Charm Sciences       | 80                |
| Cloxacillin                                 | 10 <sup>#</sup>   | BetaStar Plus Beta-lactam Test*                  | Neogen Corporation   | 8.2               |
|   |                   | Charm II for Cloxacillin in Milk* (Competitive)  | Charm Sciences       | 8.5 •             |
|   |                   | Charm II Beta-lactam Test* (Competitive)         | Charm Sciences       | 70♦♦              |
|   |                   | Charm II Beta-lactam Test* (Quantitative)        | Charm Sciences       | 8.5 •             |
|   |                   | Charm II Beta-lactam Test* (Sequential)          | Charm Sciences       | 50♦♦              |
|   |                   | Charm <i>B. steartophilus</i> Tablet Disc Assay* | Charm Sciences       | 48♦♦              |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 25                |
|   |                   | Charm HPLC-Receptogram                           | Charm Sciences       | 10                |
|   |                   | Charm SL Beta-lactam Test*                       | Charm Sciences       | 50♦               |
|   |                   | Charm 3 SL3 Beta-lactam Test*                    | Charm Sciences       | 8.6 •             |
|   |                   | Charm MRL Beta-lactam Test                       | Charm Sciences       | 35                |
|   |                   | Charm MRL Beta-lactam 3 Minute Test              | Charm Sciences       | 30                |
|   |                   | Charm MRL Beta-lactam 1 Minute Test              | Charm Sciences       | 20                |
|   |                   | Charm MRL Beta-lactam and Tetracycline Test      | Charm Sciences       | 35                |
|   |                   | 2 Minute Test                                    | Charm Sciences       | 20                |
|   |                   | Charm MRL Beta-lactam and RF Tetracycline        |                      |                   |
|   |                   | 2 Minute Test                                    | Charm Sciences       | 20                |
|   |                   | Charm Quad Test                                  | Charm Sciences       | 30                |
|   |                   | Charm Quad 1 Test                                | Charm Sciences       | 25                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 20                |
|   |                   | Charm Flunixin and Beta-lactam Test*             | Charm Sciences       | 75 •              |
|   |                   | Eclipse® 3G                                      | ZEU-Inmunotec        | 30                |
|   |                   | Delvo P/Delvotest P Mini*                        | DSM Food Specialties | 25♦♦              |
|   |                   | Delvotest BLF                                    | DSM Food Specialties | 17                |
|   |                   | Delvotest P 5 Pack*                              | DSM Food Specialties | 30♦               |
|   |                   | Delvotest T                                      | DSM Food Specialties | 5.0               |
|   |                   | New SNAP Beta-Lactam*                            | IDEXX Labs, Inc.     | 50♦♦              |

# Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

‡ No official tolerance or "safe levels" have been established by the FDA.

★ Evaluated by FDA and Accepted by NCIMS.

• Sensitivities based on evaluations of raw commingled bovine milk samples by test sponsors, independent laboratories, and FDA and reported in FDA memo M-a-85 Revision #14 and FDA memorandum (03/22/12).

♦ 90/95% concentrations were not determined for sensitivities significantly above the tolerance/safe level.

# Milk Screening Tests

Not all of the tests listed below have been evaluated by FDA and accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions). These tests are believed to be reliable indicators of antibiotic contamination in milk and should be viewed as tools to screen bulk tank milk.

| Residues Detected   | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|---|-------------------|---|----------------------|-------------------|
| Danofloxacin<br>(Extra-label use in food animals is prohibited) | None <sup>Ÿ</sup> | Charm Quinolone Test                                    | Charm Sciences       | 10                |
|   |                   | Charm Quad 1 Test                                       | Charm Sciences       | 20                |
| Dapson  | None <sup>Ÿ</sup> | Charm II Sulfa Drug Test (Competitive)                  | Charm Sciences       | 2.0               |
|   |                   | Charm II Sulfa Drug Test (Sequential)                   | Charm Sciences       | 2.0               |
|   |                   | Charm CowSide II Test                                   | Charm Sciences       | 2.0               |
|   |                   | Delvotest T   | DSM Food Specialties | 40                |
| Dicloxacillin<br>(unapproved in dairy cattle)                   | None <sup>Ÿ</sup> | BetaStar Plus Beta-lactam Test                          | Neogen Corporation   | 7.0               |
|   |                   | Charm II for Cloxacillin in Milk                        | Charm Sciences       | 9.0               |
|   |                   | Charm II Beta-lactam Test (Competitive)                 | Charm Sciences       | 45                |
|   |                   | Charm II Beta-lactam Test (Quantitative)                | Charm Sciences       | 5.0               |
|   |                   | Charm II Beta-lactam Test (Sequential)                  | Charm Sciences       | 45                |
|   |                   | Charm <i>B. stearothermophilus</i> Tablet Disc Assay    | Charm Sciences       | 40                |
|   |                   | Charm Cowside II Test                                   | Charm Sciences       | 10                |
|   |                   | Charm HPLC Receptogram                                  | Charm Sciences       | 10                |
|   |                   | Charm SL Beta-lactam Test                               | Charm Sciences       | 50                |
|   |                   | Charm 3 SL3 Beta-lactam Test                            | Charm Sciences       | 7.0               |
|   |                   | Charm Flunixin and Beta-lactam Test                     | Charm Sciences       | 60                |
|   |                   | Charm MRL Beta-lactam Test                              | Charm Sciences       | 30                |
|   |                   | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 25                |
|   |                   | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 15                |
|   |                   | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 30                |
|   |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 20                |
|   |                   | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences       | 20                |
|   |                   | Charm MRL Trio Test                                     | Charm Sciences       | 30                |
|   |                   | Charm Quad Test   | Charm Sciences       | 30                |
|   |                   | Charm Quad 1 Test                                       | Charm Sciences       | 20                |
|   |                   | Charm Blue Yellow II Test                               | Charm Sciences       | 30                |
|   |                   | Delvotest BLF   | DSM Specialties      | 24                |
|   |                   | Delvotest P/Delvotest P Mini                            | DSM Food Specialties | 20                |
|   |                   | Delvotest P 5 Pack                                      | DSM Food Specialties | 15                |
|   |                   | New SNAP Beta-lactam                                    | IDEXX Labs, Inc.     | 50                |

<sup>Ÿ</sup> No official tolerance or "safe levels" have been established by the FDA.

# Milk Screening Tests

Not all of the tests listed below have been evaluated by FDA and accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions). These tests are believed to be reliable indicators of antibiotic contamination in milk and should be viewed as tools to screen bulk tank milk.

| Residues Detected  | Tolerance (ppb)  | Test Name   | Sponsor              | Sensitivity (ppb) |
|--|------------------|---|----------------------|-------------------|
| Dihydrostreptomycin  | 125 <sup>#</sup> | BetaStar 4D Beta-lactam, Tetracycline, Chloramphenicol, Streptomycin Test | Neogen Corporation   | 200               |
|  |                  | Charm II Streptomycin Test  | Charm Sciences       | 75                |
|  |                  | Charm Streptomycin Test   | Charm Sciences       | 75                |
|  |                  | Charm ROSA Neomycin and Streptomycin Test                                 | Charm Sciences       | 125               |
|  |                  | Charm Quad3 Test  | Charm Sciences       | 100               |
|  |                  | Delvotest P/Delvotest P Mini  | DSM Food Specialties | 5000              |
|  |                  | Delvotest T   | DSM Food Specialties | 800               |
|  |                  | Reveal CAP/STREP Chloramphenicol, Streptomycin Test                       | Neogen Corporation   | 200               |
|  |                  |   |                      |                   |
| Enrofloxacin<br>(not approved in lactating dairy cattle 20 months of age or older) | None             | Charm Enroflox Test (ROSA Test)   | Charm Sciences       | 7.0               |
|  |                  | Charm Quinolone Test  | Charm Sciences       | 10                |
|  |                  | Charm Quad1 Test  | Charm Sciences       | 15                |
| Erythromycin   | 50 <sup>^</sup>  | Charm II Macrolide Test   | Charm Sciences       | 25 <sup>†</sup>   |
|  |                  | Charm ROSA Macrolide Test   | Charm Sciences       | 10                |
|  |                  | Charm Quad2 Test  | Charm Sciences       | 30                |
|  |                  | Charm Blue Yellow II Test   | Charm Sciences       | 150               |
|  |                  | Charm <i>B. stearothersophilus</i> Tablet Disc Assay                      | Charm Sciences       | 400 <sup>†</sup>  |
|  |                  | Charm Cowside II Test   | Charm Sciences       | 100               |
|  |                  | Delvotest P/Delvotest P Mini  | DSM Food Specialties | 500               |
|  |                  | Delvotest P 5 Pack  | DSM Food Specialties | 250               |
|  |                  | Delvotest T   | DSM Food Specialties | 150               |
|  |                  | Eclipse® 3G   | ZEU-Inmunotec        | 200               |
|  |                  |   |                      |                   |
| Florfenicol<br>(unapproved in lactating cows, consult with your veterinarian)      | None             | Charm II Amphenicol Test  | Charm Sciences       | 40                |
|  |                  | Charm ROSA Amphenicol Test  | Charm Sciences       | 50                |
| Flunixin   | 2                | Alert Flunixin Test   | Neogen Corporation   | 2.0               |
|  |                  | Charm Flunixin and Beta-lactam Test <sup>★</sup>                          | Charm Sciences       | 1.9 <sup>‡</sup>  |

<sup>#</sup> Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

<sup>^</sup> Values indicate the FDA-established "safe levels" and do not represent official tolerance levels. "Safe levels" are used by the FDA as guides for deciding whether or not to prosecute.

They are not and cannot be transformed into tolerances that are established for animal drugs under section 512 (b) of the Federal Food, Drug & Cosmetic Act. They are not binding, do not dictate any result, do not limit the FDA's discretion in any way, and do not protect milk producers (or milk) from court enforcement action.

<sup>†</sup> The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

• Sensitivities based on evaluations of raw commingled bovine milk samples by test sponsors, independent laboratories, and FDA and reported in FDA memo M-a-85 Revision #14 and FDA memorandum (03/22/12).

<sup>★</sup> Evaluated by FDA and Accepted by NCIMS.

<sup>‡</sup> 5-hydroxyflunixin marker.

# Milk Screening Tests

Not all of the tests listed below have been evaluated by FDA and accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions). These tests are believed to be reliable indicators of antibiotic contamination in milk and should be viewed as tools to screen bulk tank milk.

| Residues Detected  | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|--|-------------------|---|----------------------|-------------------|
| Gentamicin<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use) | 30 <sup>^</sup>   | Charm II Gentamicin and Neomycin Test                   | Charm Sciences       | 24                |
|  |                   | Charm II Gentamicin and Streptomycin Test               | Charm Sciences       | 30 <sup>†</sup>   |
|  |                   | Charm Quad2 Test  | Charm Sciences       | 150               |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay    | Charm Sciences       | 100               |
|  |                   | Charm Cowside II Test                                   | Charm Sciences       | 100               |
|  |                   | Charm Blue Yellow II Test                               | Charm Sciences       | 100               |
|  |                   | SNAP Gentamicin   | IDEXX Labs, Inc.     | 30 <sup>†</sup>   |
|  |                   | Delvotest P/Delvotest P Mini                            | DSM Food Specialties | 1000              |
|  |                   | Delvotest T   | DSM Food Specialties | 80                |
|  |                   | Eclipse® 3G   | ZEU-Inmunotec        | >1000             |
| Hetacillin   | None <sup>‡</sup> | Charm Cowside II Test                                   | Charm Sciences       | 4                 |
|  |                   | Charm II Beta-lactam Test (Competitive)                 | Charm Sciences       | 7.5               |
|  |                   | Charm II Beta-lactam Test (Quantitative)                | Charm Sciences       | 7.5               |
|  |                   | Charm II Beta-lactam Test (Sequential)                  | Charm Sciences       | 7.5               |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay    | Charm Sciences       | 7.5               |
|  |                   | Charm SL Beta-lactam Test                               | Charm Sciences       | 7.5               |
|  |                   | Charm 3 SL3 Beta-lactam Test                            | Charm Sciences       | 8                 |
|  |                   | Charm Flunixin and Beta-lactam Test                     | Charm Sciences       | 5.9               |
|  |                   | Charm MRL Beta-lactam Test                              | Charm Sciences       | 4                 |
|  |                   | Charm MRL Beta-lactam 3 Minute Test                     | Charm Sciences       | 4                 |
|  |                   | Charm MRL Beta-lactam 1 Minute Test                     | Charm Sciences       | 4                 |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test             | Charm Sciences       | 4                 |
|  |                   | Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Charm Sciences       | 4                 |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Charm Sciences       | 4                 |
|  |                   | Charm MRL Trio Test                                     | Charm Sciences       | 4                 |
|  |                   | Charm Quad Test   | Charm Sciences       | 4                 |
|  |                   | Charm Quad 1 Test                                       | Charm Sciences       | 4                 |
|  |                   | Charm Blue Yellow II Test                               | Charm Sciences       | 3                 |
|  |                   | Delvotest P/Delvotest P Mini                            | DSM Food Specialties | 5                 |
|  |                   | Delvotest P 5 Pack                                      | DSM Food Specialties | 5                 |

<sup>^</sup> Values indicate the FDA-established "safe levels" and do not represent official tolerance levels. "Safe levels" are used by the FDA as guides for deciding whether or not to prosecute.

<sup>†</sup> The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

<sup>‡</sup> No official tolerance or "safe levels" have been established by the FDA. Hetacillin is rapidly and almost completely metabolized to ampicillin in animals.



# Milk Screening Tests

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| Residues Detected   | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb)      |
|---|-------------------|--|----------------------|------------------------|
| Kanamycin<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use) | None <sup>‡</sup> | Charm II Gentamicin and Streptomycin Test            | Charm Sciences       | 1000                   |
|   |                   | Charm Quad3 Test                                     | Charm Sciences       | 100                    |
|   |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay | Charm Sciences       | 1000                   |
|   |                   | Delvotest T  | DSM Food Specialties | 1310                   |
|   |                   | Eclipse® 3G  | ZEU-Inmunotec        | 2000                   |
|   |                   |  |                      |                        |
| Lincomycin<br>(unapproved in dairy cattle)  | None <sup>‡</sup> | Charm Cowside II Test                                | Charm Sciences       | 150                    |
|   |                   | Charm II Macrolide Test                              | Charm Sciences       | 100                    |
|   |                   | Charm Quad2 Test                                     | Charm Sciences       | 150                    |
|   |                   | Charm Blue Yellow II Test                            | Charm Sciences       | 150                    |
|   |                   | Delvotest P/Delvotest P Mini                         | DSM Food Specialties | 400-1000               |
|   |                   | Delvotest P 5 Pack                                   | DSM Food Specialties | 400-1000               |
|   |                   | Delvotest T  | DSM Food Specialties | 180                    |
|   |                   | Eclipse® 3G  | ZEU-Inmunotec        | 150                    |
| Neomycin<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use)  | 150 <sup>#</sup>  | Charm II Gentamicin and Neomycin Test                | Charm Sciences       | 20 <sup>†</sup>        |
|   |                   | Charm Cowside II Test                                | Charm Sciences       | 150                    |
|   |                   | Charm ROSA Neomycin and Streptomycin Test            | Charm Sciences       | 150                    |
|   |                   | Charm Quad3 Test                                     | Charm Sciences       | 250                    |
|   |                   | Charm Blue Yellow II Test                            | Charm Sciences       | 150                    |
|   |                   | Delvotest P/Delvotest P Mini                         | DSM Food Specialties | 1000-5000 <sup>†</sup> |
|   |                   | Delvotest T  | DSM Food Specialties | 60                     |
|   |                   | Eclipse® 3G  | ZEU-Inmunotec        | 1500                   |
| Novobiocin  | 100 <sup>#</sup>  | Charm II Novobiocin Test                             | Charm Sciences       | 100 <sup>†</sup>       |
|   |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay | Charm Sciences       | 1000 <sup>†</sup>      |
|   |                   | Delvotest P/Delvotest P Mini                         | DSM Food Specialties | 600                    |
|   |                   |  |                      |                        |
| Oxytetracycline<br>(prohibited as feed additive for lactating dairy cattle)   | 300 <sup>#</sup>  | Charm II Tetracycline Drug Test* (Competitive Assay) | Charm Sciences       | 119 <sup>•</sup>       |
|   |                   | Charm Cowside II Test                                | Charm Sciences       | 100                    |
|   |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay | Charm Sciences       | 1000 <sup>†</sup>      |
|   |                   | Charm HPLC-Receptogram                               | Charm Sciences       | 15                     |
|   |                   | Charm ROSA Tetracycline Test                         | Charm Sciences       | 250                    |
|   |                   |  |                      |                        |

<sup>‡</sup> No official tolerance or "safe levels" have been established by the FDA.

<sup>#</sup> Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

<sup>†</sup> The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

<sup>•</sup> Evaluated by FDA and Accepted by NCIMS.

• Sensitivities based on evaluations of raw commingled bovine milk samples by test sponsors, independent laboratories, and FDA and reported in FDA memo M-a-85 Revision #14 and FDA memorandum (03/22/12).

# Milk Screening Tests

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| Residues Detected   | Tolerance (ppb)  | Test Name  | Sponsor              | Sensitivity (ppb) |
|---|------------------|--|----------------------|-------------------|
| Oxytetracycline (continued)<br>(prohibited as feed additive for lactating dairy cattle) | 300 <sup>#</sup> | Charm MRL Beta-lactam and Tetracycline                     | Charm Sciences       | 100               |
|   |                  | Charm MRL Beta-lactam and Tetracycline<br>2 Minute Test    | Charm Sciences       | 100               |
|   |                  | Charm MRL Beta-lactam and RF Tetracycline<br>2 Minute Test | Charm Sciences       | 10                |
|   |                  | Charm MRL Trio Test  | Charm Sciences       | 100               |
|   |                  | Charm Quad Test  | Charm Sciences       | 6.0               |
|   |                  | Charm Quad 1 Test  | Charm Sciences       | 70                |
|   |                  | Charm Blue Yellow II Test                                  | Charm Sciences       | 100               |
|   |                  | Delvotest P/Delvotest P Mini                               | DSM Food Specialties | 300               |
|   |                  | Delvotest P 5 Pack   | DSM Food Specialties | 400               |
|   |                  | Delvotest T  | DSM Food Specialties | 80                |
|   |                  | Eclipse® 3G  | ZEU-Inmunotec        | 50                |
|   |                  | SNAP Tetracycline  | IDEXX Labs, Inc.     | 50                |
| Penicillin  | 5 <sup>^</sup>   | BetaStar Plus Beta-lactam Test*                            | Neogen Corporation   | 4.7               |
|   |                  | Charm II Beta-lactam Test*<br>(Competitive)                | Charm Sciences       | 3.0 •             |
|   |                  | Charm II Beta-lactam Test*<br>(Quantitative)               | Charm Sciences       | 3.4 •             |
|   |                  | Charm II Beta-lactam Test*<br>(Sequential)                 | Charm Sciences       | 3.4 •             |
|   |                  | Charm Cowside II Test                                      | Charm Sciences       | 3.0               |
|   |                  | Charm <i>B. stearothermophilus</i><br>Tablet Disc Assay*   | Charm Sciences       | 3.8 •             |
|   |                  | Charm HPLC-Receptogram                                     | Charm Sciences       | 5.0               |
|   |                  | Charm SL Beta-lactam Test*                                 | Charm Sciences       | 3.6 •             |
|   |                  | Charm 3 SL3 Beta-lactam Test*                              | Charm Sciences       | 3.8 •             |
|   |                  | Charm Flunixin and Beta-lactam Test*                       | Charm Sciences       | 2.0 •             |
|   |                  | Charm MRL Beta-lactam Test                                 | Charm Sciences       | 3.0               |
|   |                  | Charm MRL Beta-lactam 3 Minute Test                        | Charm Sciences       | 3.0               |
|   |                  | Charm MRL Beta-lactam 1 Minute Test                        | Charm Sciences       | 3.0               |
|   |                  | Charm MRL Beta-lactam and Tetracycline Test                | Charm Sciences       | 3.0               |
|   |                  | Charm MRL Beta-lactam and Tetracycline<br>2 Minute Test    | Charm Sciences       | 3.0               |
|   |                  | Charm MRL Beta-lactam and RF Tetracycline<br>2 Minute Test | Charm Sciences       | 2.5               |
|   |                  | Charm MRL Trio Test  | Charm Sciences       | 3.0               |
|   |                  | Charm Quad Test  | Charm Sciences       | 3.0               |

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★ Evaluated by FDA and Accepted by NCIMS.

• Sensitivities based on evaluations of raw commingled bovine milk samples by test sponsors, independent laboratories, and FDA and reported in FDA memo M-a-85 Revision #14 and FDA memorandum (03/22/12).

# Milk Screening Tests

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| Residues Detected  | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|--------------------|-------------------|--|----------------------|-------------------|
| Penicillin (cont.) | 5 <sup>^</sup>    | Charm Quad 1 Test                                    | Charm Sciences       | 4.0               |
|                    |                   | Charm Blue Yellow II Test                            | Charm Sciences       | 2.0               |
|                    |                   | Delvotest BLF  | DSM Specialties      | 3.0               |
|                    |                   | Delvotest P 5 Pack <sup>★</sup>                      | DSM Food Specialties | 2.1 •             |
|                    |                   | Delvotest P/Delvotest P Mini <sup>★</sup>            | DSM Food Specialties | 3.1 •             |
|                    |                   | Delvotest T  | DSM Food Specialties | 2.0               |
|                    |                   | Eclipse <sup>®</sup> 3G                              | ZEU-Inmunotec        | 2-3.0             |
|                    |                   | New SNAP Beta-lactam <sup>★</sup>                    | IDEXX Labs, Inc.     | 3.0               |
|                    |                   | New SNAP Beta-lactam (Visual)                        | IDEXX Labs, Inc.     | 3.1               |
|                    |                   | Penzyme <sup>®</sup> Milk Test                       | Neogen Corporation   | 5.0               |
| Pirlimycin         | 400 <sup>#</sup>  | Charm II Macrolide Test                              | Charm Sciences       | 80                |
|                    |                   | Charm ROSA Macrolide Test                            | Charm Sciences       | 80                |
|                    |                   | Charm ROSA Pirlimycin Test                           | Charm Sciences       | 250               |
|                    |                   | Charm Quad2 Test                                     | Charm Sciences       | 100               |
|                    |                   | Charm Blue Yellow II Test                            | Charm Sciences       | 100               |
|                    |                   | Charm Cowside II Test                                | Charm Sciences       | 50                |
|                    |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay | Charm Sciences       | 100               |
|                    |                   | Delvotest P/Delvotest P Mini                         | DSM Food Specialties | 80                |
|                    |                   | Delvotest P 5 Pack                                   | DSM Food Specialties | 80                |
| Polymixin B        | None <sup>ŷ</sup> | Delvotest P/Delvotest P Mini                         | DSM Food Specialties | 30                |
| Rifaximin          | None <sup>ŷ</sup> | Delvotest T  | DSM Food Specialties | 40                |
| Spectinomycin      | None <sup>ŷ</sup> | Charm Quad3 Test                                     | Charm Sciences       | 200               |
|                    |                   | Charm Cowside II Test                                | Charm Sciences       | 1000              |
|                    |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay | Charm Sciences       | 1000 <sup>†</sup> |
|                    |                   | Delvotest T  | DSM Food Specialties | 1850              |
|                    |                   | Eclipse <sup>®</sup> 3G                              | ZEU-Inmunotec        | >2500             |

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<sup>★</sup> Evaluated by FDA and Accepted by NCIMS.

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<sup>#</sup> Tolerance is the maximum legally allowable level or concentration of a drug or chemical in a food product at the time milk is marketed or the animal is slaughtered.

<sup>ŷ</sup> No official tolerance or "safe levels" have been established by the FDA.

<sup>†</sup> The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

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| Residues Detected  | Tolerance (ppb)   | Test Name   | Sponsor              | Sensitivity (ppb) |
|--|-------------------|---|----------------------|-------------------|
| Streptomycin<br>(AVMA, AABP and Academy of Veterinary Consultants [AVC] advocate their members voluntarily refrain from use) | None <sup>ŷ</sup> | BetaStar 4D Beta-lactam, Tetracycline, Chloramphenicol, Streptomycin Test | Neogen Corporation   | 200               |
|  |                   | Charm II Gentamicin and Streptomycin Test                                 | Charm Sciences       | 20 <sup>†</sup>   |
|  |                   | Charm Cowside II Test   | Charm Sciences       | 1000              |
|  |                   | Charm ROSA Streptomycin Test  | Charm Sciences       | 75                |
|  |                   | Charm ROSA Neomycin and Streptomycin Test                                 | Charm Sciences       | 150               |
|  |                   | Charm Quad3 Test  | Charm Sciences       | 175               |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay <sup>★</sup>         | Charm Sciences       | 1000 <sup>†</sup> |
|  |                   | Delvotest P/Delvotest P Mini  | DSM Food Specialties | 4000              |
|  |                   | Delvotest T   | DSM Food Specialties | 400               |
|  |                   | Eclipse <sup>®</sup> 3G   | ZEU-Inmunotec        | 1500              |
|  |                   | Reveal CAP/STREP Chloramphenicol, Streptomycin Test                       | Neogen               | 200               |
| Sulfachlorpyridazine*<br>(unapproved in lactating dairy cattle)  | 10 <sup>^</sup>   | Charm II Sulfa Drug Test <sup>★</sup>                                     | Charm Sciences       | 5                 |
|  |                   | Charm Cowside II Test   | Charm Sciences       | 50                |
|  |                   | Charm MRL Trio Test   | Charm Sciences       | 10                |
|  |                   | Charm Quad1 Test  | Charm Sciences       | 20                |
|  |                   | Charm Blue Yellow II Test   | Charm Sciences       | 50                |
|  |                   | Charm ROSA Sulfa Test   | Charm Sciences       | 1                 |
|  |                   | Charm HPLC Receptogram  | Charm Sciences       | 10                |
| Sulfadiazine*<br>(unapproved in lactating dairy cattle)  | 10 <sup>^</sup>   | Charm II Sulfa Drug Test (Competitive Assay)                              | Charm Sciences       | 4.9 <sup>•</sup>  |
|  |                   | Charm Cowside II Test   | Charm Sciences       | 50                |
|  |                   | Charm HPLC-Receptogram  | Charm Sciences       | 5                 |
|  |                   | Charm ROSA Sulfa Test   | Charm Sciences       | 2                 |
|  |                   | Charm MRL Trio Test   | Charm Sciences       | 5                 |
|  |                   | Charm Quad1 Test  | Charm Sciences       | 20                |
|  |                   | Charm Blue Yellow II Test   | Charm Sciences       | 50                |
|  |                   | Delvotest T   | DSM Food Specialties | 50                |
|  |                   | Eclipse <sup>®</sup> 3G   | ZEU-Inmunotec        | 100               |
| Sulfadimethoxine   | 10 <sup>#</sup>   | Charm II Sulfa Drug Test <sup>★</sup> (Competitive Assay)                 | Charm Sciences       | 4.0 <sup>•</sup>  |
|  |                   | Charm Cowside II Test   | Charm Sciences       | 25                |
|  |                   | Charm ROSA Sulfa Test   | Charm Sciences       | 4                 |
|  |                   | Charm MRL Trio Test   | Charm Sciences       | 5                 |
|  |                   | Charm <i>B. stearothersophilus</i> Tablet Disc Assay                      | Charm Sciences       | 10,000            |
|  |                   | Charm HPLC-Receptogram  | Charm Sciences       | 5                 |
|  |                   | Delvotest T   | DSM Food Specialties | 40                |

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<sup>†</sup> The sensitivity of the test method was determined by independent research at Virginia Polytechnic Institute and State University.

<sup>\*</sup> Prohibited from use of any kind in lactating dairy cattle.

<sup>^</sup> Values indicate the FDA-established "safe levels" and do not represent official tolerance levels. "Safe levels" are used by the FDA as guides for deciding whether or not to prosecute. They are not and cannot be transformed into tolerances that are established for animal drugs under section 512 (b) of the Federal Food, Drug & Cosmetic Act. They are not binding, do not dictate any result, do not limit the FDA's discretion in any way, and do not protect milk producers (or milk) from court enforcement action.

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# Milk Screening Tests

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| Residues Detected   | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|---|-------------------|--|----------------------|-------------------|
| Sulfadoxine*<br>(unapproved in lactating dairy cattle)    | None <sup>ŷ</sup> | Charm II Sulfa Drug Test                         | Charm Sciences       | 7.0               |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 100               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 8                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 100               |
|   |                   | Charm Quad I Test                                | Charm Sciences       | 100               |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 100               |
|   |                   | Delvotest SP-NT                                  | DSM Food Specialties | 110               |
| Sulfamerazine*<br>(unapproved in lactating dairy cattle)  | 10 <sup>^</sup>   | Charm II Sulfa Drug Test                         | Charm Sciences       | 4.0 <sup>†</sup>  |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 100               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 3                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 10                |
|   |                   | Charm Quad I Test                                | Charm Sciences       | 40                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 100               |
|   |                   | Charm HPLC-Receptogram                           | Charm Sciences       | 5                 |
|   |                   | Delvotest SP-NT                                  | DSM Food Specialties | 50-100            |
| Sulfamethazine*<br>(unapproved in lactating dairy cattle) | 10 <sup>^</sup>   | Charm II Sulfa Drug Test*<br>(Competitive Assay) | Charm Sciences       | 9.4 <sup>•</sup>  |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 100               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 8                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 8                 |
|   |                   | Charm Quad I Test                                | Charm Sciences       | 20                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 100               |
|   |                   | Charm HPLC-Receptogram                           | Charm Sciences       | 5                 |
|   |                   | Delvotest T                                      | DSM Food Specialties | 150               |
|   |                   | Eclipse® 3G                                      | ZEU-Inmunotec        | 150               |
|   |                   | SNAP Sulfamethazine Test                         | IDEXX Labs, Inc.     | 10                |
| Sulfamethizole*<br>(unapproved in lactating dairy cattle) | 10 <sup>^</sup>   | Charm II Sulfa Drug Test                         | Charm Sciences       | 6.0 <sup>†</sup>  |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 20                |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 1                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 5                 |
|   |                   | Charm Quad I Test                                | Charm Sciences       | 50                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 50                |
|   |                   | Charm HPLC-Receptogram                           | Charm Sciences       | 5                 |

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<sup>•</sup> Sulfamethazine is illegal for use in female dairy cattle 20 months of age or older.

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| Residues Detected   | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|---|-------------------|--|----------------------|-------------------|
| Sulfamethoxazole*<br>(unapproved in lactating dairy cattle) | None <sup>‡</sup> | Charm II Sulfa Drug Test                         | Charm Sciences       | 20 <sup>†</sup>   |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 50                |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 1                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 5                 |
|   |                   | Charm Quad1 Test                                 | Charm Sciences       | 50                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 50                |
|   |                   | Charm HPLC-Receptrogram                          | Charm Sciences       | 5                 |
|   |                   | Delvotest SP-NT                                  | DSM Food Specialties | <50               |
| Sulfanilamide*<br>(unapproved in lactating dairy cattle)    | 10 <sup>^</sup>   | Charm II Sulfa Drug Test                         | Charm Sciences       | 20                |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 200               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 50                |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 1000              |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 200               |
|   |                   | Charm HPLC-Receptrogram                          | Charm Sciences       | 10                |
| Sulfapyridine*<br>(unapproved in lactating dairy cattle)    | 10 <sup>^</sup>   | Charm II Sulfa Drug Test                         | Charm Sciences       | 10                |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 100               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 10                |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 15                |
|   |                   | Charm Quad1 Test                                 | Charm Sciences       | 20                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 100               |
|   |                   | Charm HPLC-Receptrogram                          | Charm Sciences       | 5                 |
| Sulfaquinoxaline*<br>(unapproved in lactating dairy cattle) | 10 <sup>^</sup>   | Charm II Sulfa Drug Test*                        | Charm Sciences       | 3                 |
|   |                   | Charm CowSide II Test                            | Charm Sciences       | 100               |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 3                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 10                |
|   |                   | Charm Quad1 Test                                 | Charm Sciences       | 20                |
|   |                   | Charm HPLC Receptrogram                          | Charm Sciences       | 2                 |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 100               |
| Sulfathiazole*<br>(unapproved in lactating dairy cattle)    | 10 <sup>^</sup>   | Charm II Sulfa Drug Test*<br>(Competitive Assay) | Charm Sciences       | 7.3 <sup>•</sup>  |
|   |                   | Charm Cowside II Test                            | Charm Sciences       | 50                |
|   |                   | Charm ROSA Sulfa Test                            | Charm Sciences       | 1                 |
|   |                   | Charm MRL Trio Test                              | Charm Sciences       | 5                 |
|   |                   | Charm Quad1 Test                                 | Charm Sciences       | 20                |
|   |                   | Charm Blue Yellow II Test                        | Charm Sciences       | 50                |
|   |                   | Charm HPLC-Receptrogram                          | Charm Sciences       | 5                 |
|   |                   | Delvotest T                                      | DSM Food Specialties | 50                |
|   |                   | Eclipse® 3G                                      | ZEU-Inmunotec        | 50                |

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| Residues Detected  | Tolerance (ppb)   | Test Name  | Sponsor              | Sensitivity (ppb) |
|--|-------------------|--|----------------------|-------------------|
| Sulfisoxazole*<br>(unapproved in lactating dairy cattle)               | None <sup>†</sup> | Charm II Sulfa Drug Test                                   | Charm Sciences       | 6.0               |
|  |                   | Charm Cowside II Test                                      | Charm Sciences       | 50                |
|  |                   | Charm ROSA Sulfa Test                                      | Charm Sciences       | 8                 |
|  |                   | Charm MRL Trio Test  | Charm Sciences       | 80                |
|  |                   | Charm Quad I Test  | Charm Sciences       | 20                |
|  |                   | Charm Blue Yellow II Test                                  | Charm Sciences       | 50                |
| Tetracycline<br>(prohibited as feed additive for lactating dairy cows) | 300 <sup>#</sup>  | Charm II Tetracycline Drug Test*<br>(Competitive Assay)    | Charm Sciences       | 67 <sup>•</sup>   |
|  |                   | Charm Cowside II Test                                      | Charm Sciences       | 100               |
|  |                   | Charm <i>B. stearothersophilus</i><br>Tablet Disc Assay    | Charm Sciences       | 1000              |
|  |                   | Charm HPLC-Receptogram                                     | Charm Sciences       | 5.0               |
|  |                   | Charm ROSA Tetracycline Test                               | Charm Sciences       | 90                |
|  |                   | Charm MRL Beta-lactam and Tetracycline Test                | Charm Sciences       | 30                |
|  |                   | Charm MRL Beta-lactam and Tetracycline<br>2 Minute Test    | Charm Sciences       | 30                |
|  |                   | Charm MRL Beta-lactam and RF Tetracycline<br>2 Minute Test | Charm Sciences       | 10                |
|  |                   | Charm MRL Trio Test  | Charm Sciences       | 30                |
|  |                   | Charm Quad Test  | Charm Sciences       | 6.0               |
|  |                   | Charm Quad I Test  | Charm Sciences       | 20                |
|  |                   | Charm Blue Yellow II Test                                  | Charm Sciences       | 100               |
|  |                   | Delvotest P/Delvotest P Mini                               | DSM Food Specialties | 300               |
|  |                   | Delvotest P 5 Pack   | DSM Food Specialties | 300               |
|  |                   | Delvotest T  | DSM Food Specialties | 75                |
|  |                   | Eclipse® 3G  | ZEU-Inmunotec        | 100               |
|  |                   | SNAP Tetracycline  | IDEXX Labs, Inc.     | 50                |
| Thiamphenicol <sup>†</sup>   | None              | Charm II Amphenicol Test                                   | Charm Sciences       | 50                |
|  |                   | Charm ROSA Amphenicol Test                                 | Charm Sciences       | 5                 |
| Tilmicosin <sup>†</sup>  | None              | Charm II Macrolide Test                                    | Charm Sciences       | 20                |
|  |                   | Charm ROSA Macrolide Test                                  | Charm Sciences       | 40                |
|  |                   | Charm Quad2 Test   | Charm Sciences       | 40                |
|  |                   | Charm Cowside II Test                                      | Charm Sciences       | 50                |
|  |                   | Delvotest T  | DSM Food Specialties | 60                |
| Trimethoprim <sup>†</sup>  | None              | Charm CowSide II Test                                      | Charm Sciences       | 300               |
|  |                   | Delvotest T  | DSM Food Specialties | 110               |
| Tulathromycin <sup>†</sup><br>(unapproved in lactating dairy cattle)   | None              | Charm II Macrolide Test                                    | Charm Sciences       | 20                |

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| Residues Detected                                  | Tolerance (ppb) | Test Name                    | Sponsor              | Sensitivity (ppb) |
|--|-----------------|------------------------------|----------------------|-------------------|
| Tylosin<br>(unapproved in<br>lactating dairy cows) | 50 <sup>#</sup> | Charm II Macrolide Test      | Charm Sciences       | 50 <sup>†</sup>   |
|  |                 | Charm ROSA Macrolide Test    | Charm Sciences       | 40                |
|  |                 | Charm Quad2 Test             | Charm Sciences       | 30                |
|  |                 | Charm Cowside II Test        | Charm Sciences       | 30                |
|  |                 | Delvotest P/Delvotest P Mini | DSM Food Specialties | 100               |
|  |                 | Delvotest P 5 Pack           | DSM Food Specialties | 100               |
|  |                 | Delvotest T                  | DSM Food Specialties | 50                |
|  |                 | Eclipse® 3G                  | ZEU-Inmunotec        | 40                |

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# Milk Screening Tests

Screening Tests Available as of September 2015 for Detecting Residues in Bulk Tank Milk.

**Only Use Drugs Approved for Lactating Dairy Cows.**

**Tests listed below have been neither evaluated by FDA nor accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions) for current listing.**

| Test Name   | Residues Detected At or Below Safe/Tolerance Levels  |
|---|--|
| 2,4 D RaPID Assay                                       | 2,4-D  |
| Atrazine RaPID Assay                                    | Atrazine   |
| Benomyl RaPID Assay                                     | Carbendazim  |
| Charm Cowside II Test                                   | Amoxicillin, Ampicillin, Cephapirin, Chlortetracycline, Hetacillin, Neomycin, Oxytetracycline, Penicillin, Pirlimycin, Tetracycline, Tilimicosin, Tylosin  |
| Charm MRL Beta-lactam Test                              | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Hetacillin, Penicillin   |
| Charm MRL Beta-lactam 3 Minute Test                     | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Hetacillin, Penicillin   |
| Charm MRL Beta-lactam 1 Minute Test                     | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Hetacillin, Penicillin   |
| Charm MRL Beta-lactam and Tetracycline Test             | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Oxytetracycline, Penicillin, Tetracycline   |
| Charm MRL Beta-lactam and Tetracycline 2 Minute Test    | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Oxytetracycline, Penicillin, Tetracycline   |
| Charm MRL Beta-lactam and RF Tetracycline 2 Minute Test | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Oxytetracycline, Penicillin, Tetracycline   |
| Charm MRL Trio Test                                     | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Oxytetracycline, Penicillin, Sulfachlorpyridazine, Sulfadiazine, Sulfadimethoxine, Sulfamerazine, Sulfamethazine, Sulfamethizole, Sulfaquinoxaline, Sulfathiazole, Tetracycline |
| Charm Quad Test   | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Dihydrostreptomycin, Hetacillin, Oxytetracycline, Penicillin, Streptomycin, Tetracycline  |
| Charm Quad1 Test  | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Oxytetracycline, Penicillin, Tetracycline   |
| Charm Quad2 Test  | Erythromycin, Lincomycin, Pirlimycin, Tilimicosin, Tylosin   |
| Charm Quad3 Test  | Dihydrostreptomycin, Neomycin  |
| Charm Blue Yellow II Test                               | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Hetacillin, Lincomycin, Neomycin, Oxytetracycline, Penicillin, Pirlimycin, Tetracycline, Tilimicosin, Tylosin   |

# Milk Screening Tests

Screening Tests Available as of September 2015 for Detecting Residues in Bulk Tank Milk.

**Only Use Drugs Approved for Lactating Dairy Cows.**

**Tests listed below have been evaluated by FDA and accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions) for current listing. These tests are believed to be reliable indicators of antibiotic contamination in milk and should be viewed as tools to screen bulk tank milk.**

| Test Name   | Residues Detected At or Below Safe/Tolerance Levels                               |
|---|---|
| BetaStar Plus Beta-lactam Test (Evaluated by FDA and Accepted by NCIMS)                               | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Cloxacillin, Penicillin           |
| Charm II Beta-lactam Test<br>(Competitive) (Evaluated by FDA and Accepted by NCIMS)                   | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Penicillin                        |
| Charm II Beta-lactam Test<br>(Quantitative) (Evaluated by FDA and Accepted by NCIMS)                  | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Cloxacillin, Penicillin           |
| Charm II Beta-lactam Test<br>(Sequential) (Evaluated by FDA and Accepted by NCIMS)                    | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Penicillin                        |
| Charm <i>B. stearotherophilus</i> Tablet Disc Assay<br>(Evaluated by FDA and Accepted by NCIMS)       | Amoxicillin, Ampicillin, Cephapirin, Penicillin                                   |
| Charm SL Beta-lactam Test<br>(Evaluated by FDA and Accepted by NCIMS)                                 | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Penicillin                        |
| Charm 3 SL3 Beta-lactam Test<br>(Evaluated by FDA and Accepted by NCIMS)                              | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Cloxacillin, Penicillin           |
| Charm Flunixin and Beta-lactam Test<br>(Evaluated by FDA and Accepted by NCIMS)                       | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Cloxacillin, Flunixin, Penicillin |
| Charm II Test for Cloxacillin in Milk<br>(Competitive Assay) (Evaluated by FDA and Accepted by NCIMS) | Cloxacillin   |
| Charm II Sulfa Drug Test<br>(Competitive Assay) (Evaluated by FDA and Accepted by NCIMS)              | Sulfadiazine, Sulfadimethoxine, Sulfamethazine, Sulfathiazole                     |
| Charm II Tetracycline Test<br>(Evaluated by FDA and Accepted by NCIMS)                                | Chlortetracycline, Oxytetracycline, Tetracycline                                  |
| Delvotest P 5 Pack (Evaluated by FDA and Accepted by NCIMS)   | Amoxicillin, Ampicillin, Cephapirin, Penicillin                                   |
| Delvotest P/Delvotest P Mini (Evaluated by FDA and Accepted by NCIMS)                                 | Amoxicillin, Ampicillin, Cephapirin, Penicillin                                   |
| New SNAP Beta-Lactam Test Kit<br>(Evaluated by FDA and Accepted by NCIMS)                             | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Penicillin                        |



# Milk Screening Tests

Screening Tests Available as of September 2015 for Detecting Residues in Bulk Tank Milk.

**Only Use Drugs Approved for Lactating Dairy Cows.**

**Tests listed below have NEITHER been evaluated by FDA nor accepted by the NCIMS for residue testing. Refer to M-a-85 or M-I-92-11 (latest revisions).**

| Test Name   | Residues Detected At or Below Safe/Tolerance Levels   |
|---|---|
| Charm HPLC-Receptogram                              | Amoxicillin, Ampicillin, Ceftiofur, Cephapirin, Chlortetracycline, Cloxacillin, Penicillin, Sulfadiazine, Sulfadimethoxine, Sulfamethazine, Sulfachlorpyridazine, Sulfamerazine, Sulfamethizole, Sulfanilamide, Sulfapyridine, Sulfaquinoxaline, Sulfathiazole, Oxytetracycline, Tetracycline |
| Charm II Beta-lactam Test (Competitive)             | Hetacillin  |
| Charm II Beta-lactam Test (Quantitative)            | Hetacillin  |
| Charm B. <i>stearotherophilus</i> Tablet Disc Assay | Hetacillin, Pirlimycin  |
| Charm II Gentamicin and Neomycin Test               | Gentamicin, Neomycin  |
| Charm II Novobiocin Test                            | Novobiocin  |
| Charm II Macrolide Test                             | Erythromycin, Pirlimycin, Tilmicosin, Tulathromycin, Tylosin  |
| Charm ROSA Macrolide Test                           | Erythromycin, Pirlimycin, Tilmicosin, Tulathromycin   |
| Charm Pirlimycin Test                               | Pirlimycin  |
| Charm II Streptomycin Test                          | Dihydrostreptomycin, Gentamicin   |
| Charm ROSA Sulfa Test                               | Sulfadiazine, Sulfadimethoxine, Sulfamethazine, Sulfathiazole, Sulfachlorpyridazine, Sulfamerazine, Sulfamethizole, Sulfamethoxazole, Sulfapyridine, Sulfaquinoxaline   |
| Charm SL Beta-lactam Test                           | Hetacillin  |
| Charm 3 SL3 Beta-lactam Test                        | Hetacillin  |
| Charm ROSA Streptomycin Test                        | Dihydrostreptomycin   |
| Charm ROSA Tetracycline Test                        | Chlortetracycline, Oxytetracycline, Tetracycline  |
| Charm II Aflatoxin Test                             | Aflatoxin M1  |
| Charm SL Aflatoxin Test (Quantitative)              | Aflatoxin M1  |
| Charm MRL Aflatoxin Quantitative Test               | Aflatoxin M1  |
| Delvost P 5 Pack                                    | Pirlimycin, Tetracycline  |
| Delvost P/Delvotest P Mini                          | Pirlimycin, Tetracycline  |
| Penzyme® Milk Test                                  | Amoxicillin, Ampicillin, Cephapirin, Penicillin   |
| Reveal for Aflatoxin in M1                          | Aflatoxin M1  |
| SNAP Tetracycline Test                              | Chlortetracycline, Oxytetracycline, Tetracycline  |
| SNAP Aflatoxin M1 Test                              | Aflatoxin M1  |
| SNAP Gentamicin Test                                | Gentamicin  |
| SNAP Sulfamethazine Test                            | Sulfamethazine  |

# Addresses and Telephone Numbers of Companies Marketing Drug Residue Tests

**Charm Sciences Inc.**

659 Andover St.  
Lawrence, MA 01843  
Phone: 800-343-2170

**DSM Food Specialties USA, Inc.**

45 Waterview Blvd.  
Parsippany, NJ 07054  
Phone: 800-662-4478

**IDEXX Laboratories, Inc.**

One IDEXX Drive  
Westbrook, ME 04092  
Phone: 800-321-0207

**NEOGEN Corporation**

620 Leshner Place  
Lansing, MI 48912  
Phone: 800-234-5333

**SILVER LAKE****Research Corporation**

911 So. Primrose Ave. Ste. N  
Monrovia, CA 91016  
Phone: 888-438-1942

**Strategic Diagnostics, Inc.**

111 Pencader Drive  
Newark, DE 19702  
Phone: 800-544-8881

**Zeus-Inmunotec, S.L.**

Polígono Plaza  
C/Bari, 25 dpdo.  
50197 Zaragoza SPAIN  
(34) 976.731533



**NATIONAL DAIRY  
FARM PROGRAM™**

## Appendix: Pharmaceutical Administration

### Injections — Site and Techniques

Moving the injection site area to the neck stops costly damage to economically important cuts of beef. It also makes it easier for packers to identify lesions at the plant level, so they do not inadvertently end up on a consumer's plate. To lessen injection site defects, the preferred site for all injections has now been reduced to the smaller injection area of the neck region compared with the larger area introduced as the preferred site in the 1990s (Fig. 2).

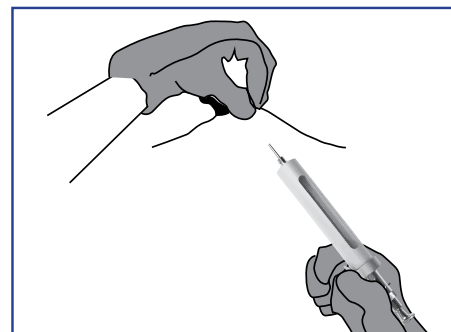
This is particularly important when administering intramuscular (IM) products. The reason for this is even the shoulder chuck primal contains value-added cuts in today's beef trade. The food industry has introduced a number of new, "value added" beef cuts utilizing this area of the carcass. Furthermore, the food industry has moved to a modified atmosphere packaging process for case-ready meats. This process contains 80% oxygen and 20% carbon dioxide mixture, which can cause green discoloration of the meat close to an injection site, even when no blemish or lesion has occurred.

Several animal health products are now approved for injection into the ear of cattle. This location is excellent from a Quality Assurance perspective as ears are removed at harvest and do not enter the food chain. Certain antibiotics are approved for the ear injection site. The exact location on the ear depends on the product. However, the route approved for lactating dairy cows is the base of the ear. The ear must be very clean, and care must be taken to avoid blood vessels. Read product labels carefully. An example of the base of ear (BOE) injection technique can be found on the internet at: [https://www.zoetisus.com/products/pages/excede\\_beef/RouteOfAdmin.aspx](https://www.zoetisus.com/products/pages/excede_beef/RouteOfAdmin.aspx)

Whenever possible, choose products formulated and labeled for injection under the skin (subcutaneous/SQ) rather than intramuscular (IM). Figures 1 and 2 illustrate proper injection site and techniques.

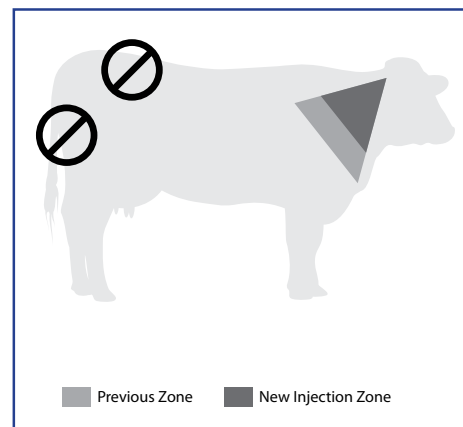
### Fig 1. "Tent" Technique for SQ injection

Calf necropsy demonstrations prove that when SQ products are given with one hand sliding the needle under the skin, some of the product and needle penetrate the muscle. The "tent" technique ensures that the product is truly being administered in the subcutaneous region.



### Fig. 2. New Injection Zone

To lessen injection site defects the preferred injection site has been reduced to the smaller (dark red) injection area shown above – particularly with IM products. This has become necessary to ensure the quality of new value-added products from the chuck. Even in the absence of blemishes, case-ready packaging processes can cause discoloration of meat near an injection site.



### Needle Selection

Primary considerations in needle selection are: route of administration, size of the animal, and location or site of the injection. Secondary considerations include: viscosity of the fluid (how thick and tenacious the fluid is) and volume injected.

|  | Route of Administration |             |          |                     |          |             |                         |             |             |
|--|-------------------------|-------------|----------|---------------------|----------|-------------|-------------------------|-------------|-------------|
|  | SQ                      |             |          | IV                  |          |             | IM                      |             |             |
|  | (1/2 - 3/4 inch needle) |             |          | (1 1/2 inch needle) |          |             | (1 - 1 1/2 inch needle) |             |             |
|  | Cattle Weight lbs.      |             |          | Cattle Weight lbs.  |          |             | Cattle Weight lbs.      |             |             |
| Injectable Viscosity   | <300                    | 300-700     | >700     | <300                | 300-700  | >700        | <300                    | 300-700     | >700        |
| <b>Thin</b><br>Example: Saline   | 18 gauge                | 18-16 gauge | 16 gauge | 18-16 gauge         | 16 gauge | 16-14 gauge | 20-18 gauge             | 18-16 gauge | 18-16 gauge |
| <b>Thick</b><br>Example: Tetracycline  | 18-16 gauge             | 18-16 gauge | 16 gauge | 16 gauge            | 16 gauge | 16-14 gauge | 18 gauge                | 16 gauge    | 16 gauge    |
| SELECT THE NEEDLE TO FIT THE CATTLE SIZE (THE SMALLEST PRACTICAL SIZE WITHOUT BENDING) |                         |             |          |                     |          |             |                         |             |             |

## Appendix: Pharmaceutical Administration

### Proper Sanitation is Essential

- Keep the contents of the bottle sterile.
- Clean transfer needles regularly to avoid contamination.
- Do not go back into the vaccine bottle with a needle once it has been used for anything else.
- When vaccinating groups, change needles frequently.
- When using killed vaccines, keep a saucer or sponge of alcohol or disinfectant nearby, and wipe off the needle after each use. However, do not disinfect needles between injections when using a modified live vaccine, as the disinfectant can destroy the vaccine.
- Make sure the injection site is clean. Injecting into a wet or muddy site increases the risk for spreading disease, and it increases the incidence of injection site lesions.

### Cleaning Syringes and Needles

The use of disposable equipment is recommended and preferred. However, if used, reusable syringes, needles, and other injection equipment should be heat-sterilized by boiling. If any disinfectants are used—including alcohol—they must be thoroughly rinsed from equipment because they neutralize vaccines and chemically react with some antibiotics. If disinfectant is used, syringes should be thoroughly rinsed with sterile water before use. Sterile water can be purchased. Distilled water is not sterile water.

Consult your veterinarian before sterilizing equipment to ensure proper techniques. Improper sterilization can reduce the effectiveness of future injections and result in infection at the injection site. Do not contaminate modified live virus products with disinfectants as effectiveness will be decreased or even eliminated.

### Needle Quality Control and Safety

Single-use needles are preferred; they also help prevent the spread of blood-borne diseases like Leukosis. This virus is a leading cause of carcass condemnation in slaughter facilities. At the very least, be sure to change needles at a maximum of every 10 head to prevent using a dull needle, which can develop a burr on the end.

Change needles immediately if the needle bends. Do not straighten it or use it again. Obtain a new needle if the needle in use becomes contaminated with feces or an irritating chemical. Your veterinarian must determine how animals will be handled should a needle break in the neck muscle. A broken needle is an emergency, and time is of the essence. Broken needles migrate in tissue. If not immediately handled, they will be impossible to find—requiring the animal to be destroyed.

Under no circumstances should animals with broken needles be sold or sent to a packer.

### Needle Storage/Disposal

Store unused needles in protected area using these disposal guidelines:

- Place in container with secure lid.
- Place container in rigid container lined with plastic.
- Dispose of as solid waste.

### Drug Storage

Maintain complete physical control over the drug inventory on your dairy, limit access to authorized persons who are trained in proper drug use, and keep complete records of treatment. Animal health products usually have specific storage requirements. Some require refrigeration. All should be stored in a clean place where they cannot become dirty or contaminated. Observe and obey the manufacturer's recommended storage instructions for each product. Where refrigeration is needed, be sure it is kept clean and located in a safe place—not likely to be overheated or contaminated by dirt or manure. Animal health products should be stored away from feed ingredient or mixing areas unless regularly mixed feed additives. Storage of partially used medication or vaccine bottles is discouraged because they may become contaminated and could cause infections or tissue reactions, if re-used.

The [Grade "A" Pasteurized Milk Ordinance](#) requires that drugs intended for treatment of non-lactating dairy animals be segregated from those drugs used for lactating animals. Drugs indicated for use in dry dairy animals shall be stored with the "Non-Lactating Drugs". Therefore, drugs intended for use in dairy calves, dairy heifers, dairy bulls and dry dairy cows must be segregated from drugs for cows that are currently being milked. The only drugs that should be stored with the "Lactating Drugs" are drugs that are specifically indicated on the manufacturer's drug label or on a veterinarian's prescription label for extra-label drug use to be used in lactating dairy animals. Therefore the Grade "A" Pasteurized Milk Ordinance requires separate shelves in cabinets, refrigerators or other storage facilities for "[Non-Lactating Drugs](#)" and "[Lactating Drugs](#)".

### RESOURCE

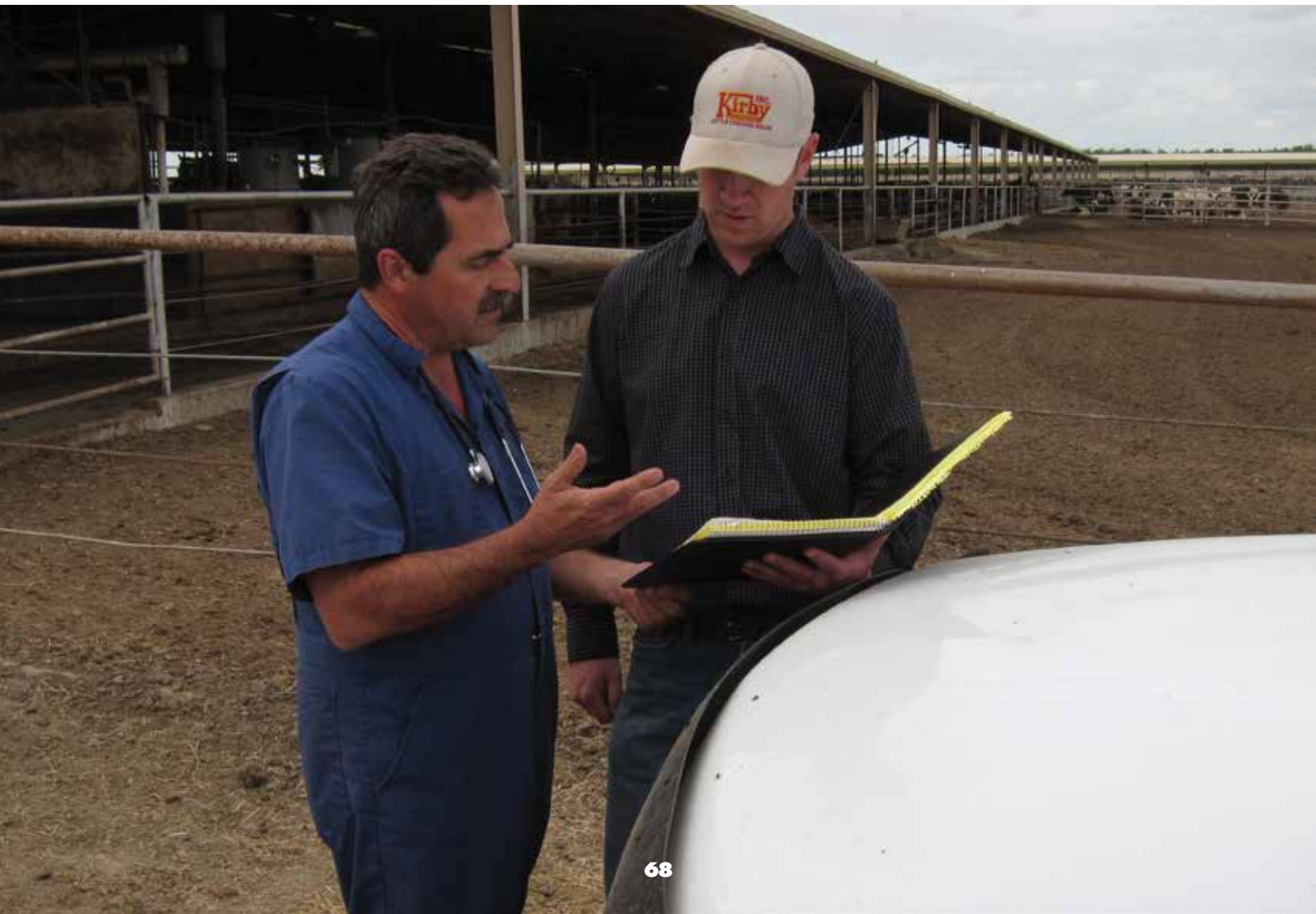
2013 Grade "A" Pasteurized Milk Ordinance MO - Drug Residue Testing and Farm Surveillance <http://www.fda.gov/downloads/Food/FoodSafety/Product-SpecificInformation/MilkSafety/NationalconferenceonInterstateMilkShipmentsN-CIMSModelDocuments/UCM291757.pdf>

## RESOURCES

VCPR Form

Sample Record-Keeping Forms

- 8-Step Plan for Keeping Records
- Recommended or Approved Drug List
- Sample Animal Treatment Plan
- Beginning Drug Inventory
- Record of Drug Purchases
- Daily Treatment Record
- Drug Disposal Record
- Certificate of Review





# VETERINARIAN/CLIENT/PATIENT RELATIONSHIP VALIDATION FORM



## I. Producer

Producer Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip: \_\_\_\_\_

Farm Name and Location: \_\_\_\_\_

Section: \_\_\_\_\_ Township: \_\_\_\_\_ County: \_\_\_\_\_

Premises ID Number (optional): \_\_\_\_\_

Producer Signature: \_\_\_\_\_

Date: \_\_\_\_\_

---

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## II. Veterinarian

Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip: \_\_\_\_\_

Clinic Name: \_\_\_\_\_

Phone Number: (\_\_\_\_\_) \_\_\_\_\_

I hereby certify that a valid Veterinarian/Client/Patient Relationship (VCPR) is established for the above listed owner and will remain in force until canceled by either party.

Veterinarian's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# 8-STEP PLAN for Keeping Records

(Please duplicate record pages for additional records as needed.)

## Why keep drug records?

- Prevent an accidental violative residue
- Save money
- Ensure effective herd health plan
- Reduce liability (drug records are required by law)
- Improve your veterinarian's effectiveness

### **STEP 1**

#### **Recommended or Approved Drug List** (Page 70)

Early in your discussion with your herd health veterinarian you need to make a narrow list of drugs to be used on your dairy. The intent is to reduce the scope of drugs used. A short list will permit you to focus your knowledge and will help to prevent an accidental violation of antibiotic residue laws.

### **STEP 2**

#### **Animal Treatment Plan** (Page 71)

When practicing preventive medicine or treating early symptoms of a disease or infection, it is important to be consistent. The second step is for you to establish a treatment plan for your herd health practices. Review with your herd health veterinarian.

### **STEP 3**

#### **Beginning Inventory** (Page 72)

You and your herd health veterinarian should discard all old drugs and all drugs not on your approved drug list (Step 1) then annually inventory the remaining drugs and other appropriate information.

### **STEP 4**

#### **Record Medicated Feed Purchases**

Accidental antibiotic residues can occur from feeding practices as well as injections or other medical treatments. Be sure to clean feed equipment between batches. Carefully avoid disposing of leftover feed from feeder calves, hogs, etc., to lactating dairy cattle.

### **STEP 5**

#### **Record of Drug Purchases** (Page 73)

Most successful dairy producers will record every purchase of drugs the day they are purchased. The FDA requires a paper trail of all drugs used on your dairy, so it is important to record the purchase of drugs promptly.

### **STEP 6**

#### **Daily Treatment Record** (Page 74)

Milking and the sale of market cows will bring your Daily Treatment Record into use. Dairy producers that have accidentally marketed milk or dairy beef with violative residues state that it is important to keep these records. Properly identify treated cows. Develop good habits to properly manage antibiotics.

### **STEP 7**

#### **Monthly Economic Comparison** (Page 74)

When do you "cull" a market cow from your herd? Every month you should review the investment you are making in each cow in the milking string. Compare your expenses by using the Daily Treatment Records.

### **STEP 8**

#### **Drug Disposal** (Page 75)

Periodic review of drugs in storage will mean you occasionally throw away drugs which have expired. By recording your daily animal treatments and any discarded drugs, you create a paper trail of what has happened to all drugs purchased. This eight-step antibiotic management system may prevent you from incurring a costly and embarrassing antibiotic accident!



(These are the only drugs to be used on my dairy.)

---

Veterinarian

[illegible]

## Animal Treatment Plan (review with veterinarian)

72

[illegible]







# Daily Treatment Record Herd

Developed by the American Association of Bovine Practitioners

[illegible]





## Milk and Dairy Beef Residue Prevention

# 2016

### Producer's Certificate of Participation *presented to*

\_\_\_\_\_  
Producer/Dairy Name

\_\_\_\_\_  
Permit Number

\_\_\_\_\_  
Field Representative of Cooperative or Proprietary Dairy

\_\_\_\_\_  
Date

I have reviewed the Milk and Dairy Beef Residue Prevention manual with \_\_\_\_\_, D.V.M., V.M.D. I agree to implement appropriate management procedures to avoid violative drug residues from the milk or dairy beef produced at my dairy. I understand that I am responsible for any drug residues that occur in my milk or meat animals. I am renewing my commitment to meeting the consumers' concern for quality.

\_\_\_\_\_  
Producer Signature

\_\_\_\_\_  
Date

I have reviewed the Milk and Dairy Beef Residue Prevention manual with \_\_\_\_\_, I have explained the manual to the producer named above. The producer acknowledges that he/she understands the best management practices and the actions that need to be implemented. Upon request by the dairy producer, I will provide additional recommendations designed specifically for this dairy including individual consultation as needed.

\_\_\_\_\_  
Consulting Veterinarian's Signature

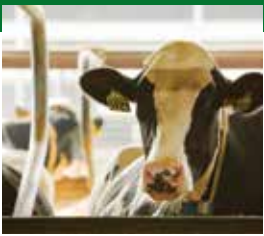
\_\_\_\_\_  
Date

National Milk Producers Federation (NMPF) has prepared the Milk and Dairy Beef Residue Manual as part of its Farmers Assuring Responsible Management (FARM) program. This certificate affirms both the commitment of the dairy producer to adhere to the terms of that manual, and the oversight and supervision of the producer's consulting veterinarian. NMPF makes no separate guarantees or representations with respect to producer's adherence.





# The National Dairy FARM Program: Farmers Assuring Responsible Management™



## The National Dairy FARM Program™

is a nationwide, verifiable animal well-being program designed to demonstrate that U.S. milk producers are committed to the highest animal care standards.



### Education

Participating producers will be provided training materials that include a comprehensive animal care resource manual, a quick-reference user guide, animal care instructional videos and other educational materials. An on-farm instructor may be available from your cooperative or other source.

### On-Farm Evaluation

Once a producer completes the education component, an on-farm evaluation will be completed by a trained veterinarian, extension educator, co-op field staff member, university personnel, or otherwise qualified personnel who have completed National Dairy FARM Program training. The producer then receives a status report and, if necessary, an action plan for improvement.

### Third-Party Verification

To protect the integrity and credibility of the program, and enhance consumer trust, the National Dairy FARM Program includes objective third-party verification – a quantifiable validation that producers are meeting their ethical obligation for on-farm animal care.

[www.nationaldairyfarm.com](http://www.nationaldairyfarm.com)



# HELPING THE CATTLE INDUSTRY STAND STRONG.



PREVENTION WORKS.



Boehringer Ingelheim Vetmedica, Inc. is proud to partner with the Beef Quality Assurance (BQA) program, including Dairy Animal Care and Quality Assurance (DACQA). Together, we can help show how the dairy industry is contributing to a safe, reliable beef supply in ways that are good for the animal, the producer and the consumer.

Visit [bivi-bqa.com](http://bivi-bqa.com) to learn more.







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and Consumers

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email: [info@nmpf.org](mailto:info@nmpf.org)

