



MilkTech International



UW-MRIL

Milk Quality

Introduction

Antibiotics Residues in milk



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Review

High Quality Milk has...

- ☞ Low bacterial counts
- ☞ Low somatic cell counts
- ☞ White appearance
- ☞ No objectionable odors
- ☞ No abnormal substances
 - No dirt sediments
 - No added water
 - No chemical residues
 - No antibiotic residues



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Objectives

☞ In this module you will learn:

- Issues of antibiotics residues in milk,
- Main types of antibiotics used in lactating cows,
- Regulations on drug residues in milk, and
- How to avoid drug residues in milk.

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Why are antibiotics undesired in milk?

☞ Antibiotics in milk can:

- Cause allergic reactions in humans.
 - ✓ Approximately 5-10 percent of the population is hypersensitive to penicillin or other antibiotics.
- Help select for resistant bacteria, both in animals and in humans.
- Interfere with manufacture of dairy products.



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How do antibiotics interfere with the manufacture of dairy products?

- ❶ Delaying starter activity for cheese, butter, and yogurt.
- ❷ Reducing the curdling of milk and cause improper ripening of cheeses.
- ❸ Causing acidification problems in dairy industry (yogurts, cheese).
- ❹ Decreasing the acid and flavor production associated with butter manufacture.



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U.S. regulations prohibit antibiotic residues

🚚 In the U.S. every truck load of milk is tested for antibiotics.

- ❶ If the test is positive, each farm included in truck is tested.

✓ Note: a positive antibiotic test is very costly (farmer may lose dairy permit).

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U.S. regulations: Drug Residue in Bulk Load? = Load Rejected

🚚 In the U.S., if a bulk load of milk from one or more producers tests positive for a drug residue the dairy plant operator shall reject the entire bulk load.

- ❶ Milk from a rejected bulk load may not be used for human food.
 - ✓ The dairy plant operator shall denature or destroy the rejected bulk load in a manner that precludes its use for human food.

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The Grade "A" Pasteurized Milk Ordinance (PMO) requires:

🚚 All bulk milk tankers be sampled and analyzed for animal drug residues before the milk is processed.

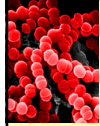
- ❶ any tanker found positive is rejected for human consumption.

Note:
the Grade "A" PMO are the regulations which State Regulatory Agencies use to implement their Grade "A" milk program

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Why are antibiotics sometimes found in milk?

- 🐄 Antibiotics are used in lactating dairy cows to treat their bacterial infections.
 - ❶ Drugs can be administered to dairy cows through:
 - ✓ Intramammary infusion
 - ✓ Intramuscular injection
 - ✓ Intravenous injection
 - ✓ Oral administration
 - ✓ Feed supplementation
 - ✓ Reproductive infusion
 - ❷ **Drug residues can be found in milk, urine or feces.**

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Treatment of mastitis is the most common reason for antibiotic residues

- ❶ Improper control of drugs in mastitis treatment is a major source of residues found in the milk supply.
- ❷ Cows with mastitis can be treated with either intramammary (udder infusion) or systemic antibiotics.
 - ✓ Both intramammary and systemic antibiotics can be excreted in milk.



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Types of antibiotics

- 🐄 Antibiotics commonly used in veterinary medicine belong to six major groups:
 - ❶ Penicillins and cephalosporins (β -Lactams)
 - ❷ Quinolones and fluoroquinolones
 - ❸ Aminoglycosides
 - ❹ Macrolides
 - ❺ Tetracyclines
 - ❻ Sulphonamides



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Antibiotic Detection

- 🐄 Dairy plants systematically test every load of raw milk received for antibiotic residues.
 - ❶ The drug residue test shall be sensitive, at a minimum, to 'beta lactam' drug residues.



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In the US, the action level is exceeded whenever the drug residue level found in the test exceeds the level specified below:

Drug	ppb
Ampicillin	10
Amoxicillin	10
Cephapirin	20
Ceftiofur	100
Cloxacillin	10
Neomycin	150
Novobiocin	100
Penicillin G	5
Sulfadimethoxine	10
Tylosin	50
Erythromycin	50
Gentamicin	30
Dihydrostreptomycin	125
Sulfachloropyridazine, Sulfadiazine, Sulfamerazine, Sulfamethazine, Sulfamethizole, Sulfanilamide, Sulfapyridine, Sulfaquinoxaline, Sulfathiazole	10
Tetracyclines	300

Attention: this table is only to give you an idea of the values for each drug action level. Regulations can change; do not use this table as an official document. Always consult the most updated regulations.


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How to avoid that antibiotics get into milk?

 Milk from cows treated with antibiotics must be discarded during the withdraw period.

- The withdraw period should be specified on the drug label.







 Follow label directions on withdraw period!

- Discard milk from treated cows until it is free from drug residues.

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Summary: DRUG RESIDUES IN MILK

-  Drug residues in milk are associated with their use in the treatment of mastitis and other diseases.
-  Failure to withhold milk from the market for a sufficient length of time after treatment may result in the presence of drug residues in milk.
 - The allergenic properties of certain drugs in common use make their presence in milk potentially hazardous to consumers.
 - Also, substantial losses of products may be sustained by the milk industry because of the inhibitory effects of drug residues on the culturing process.
-  Drug residues should be systematically tested for.
-  Milk from treated cows must be discarded until it is free from drug residues.

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