

Technical Talk Newsletter – June 2014 # 2



Fact!

Did you know that more antibiotics are used on animals than on humans

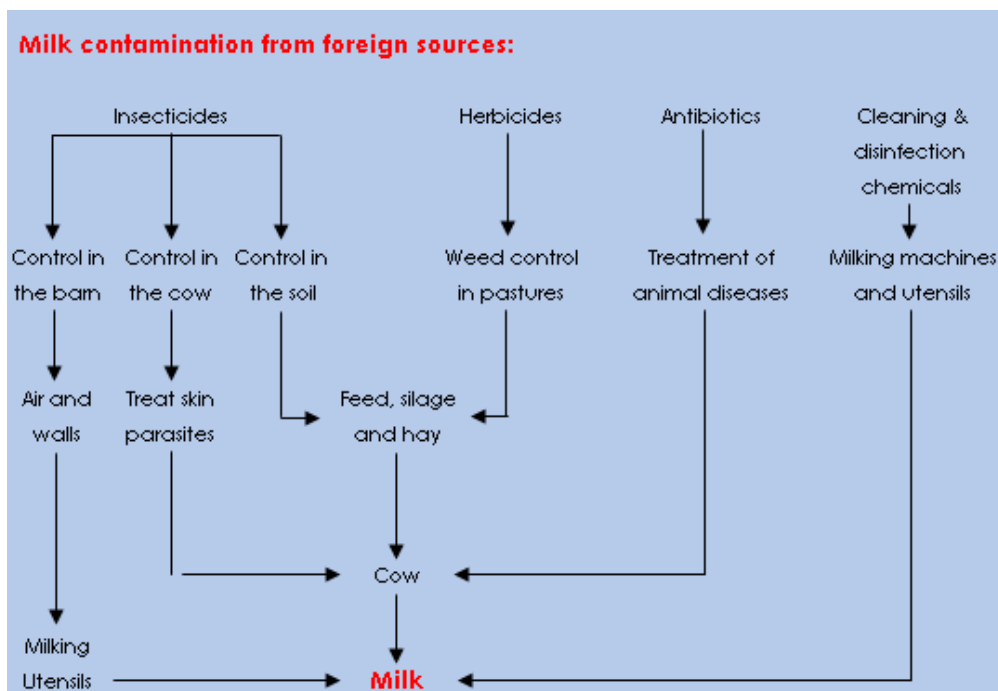
The World Health Organization (WHO) says that more than half of global production is used on farm animals. In the last 30 years the use of penicillin-type drugs in farm animals has increased by 600% and tetracyclines by a whopping 1,500%. Interestingly, the main use of antibiotics in farming is in pigs and chickens where they use it for therapeutic or preventative treatments against serious diseases.

Milk Inhibitors

Contamination of milk supply is of concern for a number of human health reasons.

For processors, the problem with contaminants, especially antibiotics or cleaning and sanitation residues, is that they can have a detrimental effect on starter cultures. This is why they are referred to as “milk inhibitors”.

Many believe that antibiotics are the main source of contaminants in milk. Although partially true, there are many others besides antibiotics that can enter the milk supply.



Understanding the microbial inhibition test

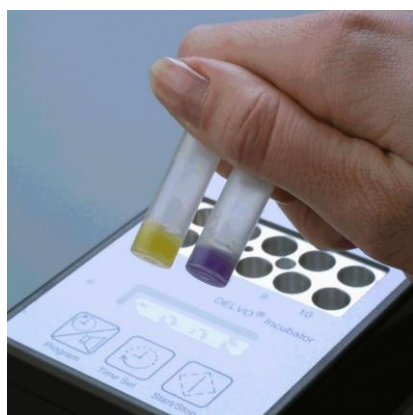
Presence of inhibitors in milk can affect fermentation and coagulation of milk products. This is critical in the manufacture of cultured products such as yogurt and cheese. That's why the microbial inhibition test is a most common test today.

The test is very reliable and cost effective but requires incubation for several hours before the result can be visualized. The test is relatively simple to perform but care is needed in all steps to ensure accurate results.

The test consists of a device that contains pre-measured bacterial spores (typically *Bacillus Stearothermophilus var calidolactis*), media, and a pH indicator. Reagents are unit dosed and compartmentalized to ensure uniformity. This eliminates human error in reagent transfer steps and prevents inadvertent contamination and reagent loss.

The starting colour is typically purple. Once milk is added to the media, the spores germinate and grow, generating acid, which is indicated by colour change to yellow.

If inhibitors are present in the milk, microbial growth is retarded and/or inhibited so that no acid is generated. Thus, antibiotic positive samples remain blue.



Most of the bacterial strains used (varies with the kits used) are sensitive to β -lactam, cephalosporins, sulfonamides, aminoglycosides, macrolides, tetracyclines and other inhibitors.

That is why the inhibition test is used to confirm a positive result after using a rapid test for antibiotics residues.

However, it is still important to test samples even if one gets a negative result using a rapid test for antibiotics residues as there may be other inhibitors in the milk as indicated above.

In addition, only use approved inhibition test with AOAC approval as not all kits are validated and proven to work consistently.

Understanding the difference between external chemicals and natural inhibitors will help determine the action to take. Stay tuned for my next issue where I'll talk about the naturally occurring milk inhibitors and how to verify some of them.

David

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