



# DAIRY VETERINARY NEWSLETTER

October 2009

## New Antibiotic Residue Testing Methods and Targeting of Cull Dairy Cows for Residue Testing of Kidneys at Slaughter Facilities

Recently I attended the American Association of Bovine Practitioners meeting in Omaha, Nebraska. As usual it was a good meeting and it was nice to see many of the veterinarians I know there. Other meetings I have attended this year have noticeably fewer people attending, almost certainly because of the economy. I did not notice this as much at the AABP meeting; it seemed well attended as usual.

The meeting of the AABP Milk Quality and Udder Health Committee was productive. It included an update from a veterinarian working with a pharmaceutical company. He mentioned that the FDA was replacing the use of the Fast Antimicrobial Screen Test (FAST) with the KIS<sup>TM</sup> (Kidney Inhibition Swab) test for slaughtered cow residue testing. Many actual livestock slaughter inspection procedures fall under the authority of the USDA Food Safety and Inspection Service (FSIS). After the meeting, I found FSIS Notice 50-09, dated 7/15/09, regarding this change. It can be found at <http://www.fsis.usda.gov/OPPDE/rdad/FSISNotices/50-09.pdf>

This notice stated that beginning July 20, 2009, the phased replacement of the FAST with the KIS<sup>TM</sup> test was to begin, first implemented at 101 designated cattle slaughter facilities. The FAST test was to remain in use at all facilities for livestock other than cattle. It was interesting to me that some training materials called "Performing the KIS<sup>TM</sup> test" were scheduled to arrive on the same date as the notice, July 15, 2009. That was a Wednesday and the new methods were to go into effect on a Monday. However, later in the announcement it says that training is to be completed before use of the KIS<sup>TM</sup> test and appears to allow for testing to have begun later than July 20, only after personnel were trained.

Also included in the FSIS notice was information that the KIS<sup>TM</sup> test comes in packs of 25 tests and includes Negative Control tablets that are reconstituted and then good for 5 days. It says the test is to be read between 3 and 16 hours after incubation, and results are based on "distinct color changes". It also indicates that if there is "doubt as to the test outcome", one remedy is to take a digital photograph of the test results and send it to the Public Health Veterinarian (PHV) "assigned to cover that establishment [to] verify the results". I had never heard of using digital photos to verify a color-change test result before. I think digital cameras are pretty good now compared to how they used to be. However, I do not always think they capture colors perfectly.

The plan includes provisions for samples with KIS<sup>TM</sup> test positive results to be sent to the FSIS laboratory. "Action on retained carcass disposition will be dictated by FSIS laboratory results, if the carcass is not already condemned for other pathology". Therefore there is a confirmatory testing plan in place.

The veterinarian at the AABP milk quality meeting had also mentioned confirmatory testing during the initial use of the KIS<sup>TM</sup> test, using a 30-substance High Pressure Liquid Chromatography (HPLC) test. He reported

that as of September, 2009, 135 of the first 158 ceftiofur-positive kidney residues detected (85%) were from cull dairy cows. Apparently ceftiofur is most commonly found in kidneys of dehydrated cows, where it is therefore concentrated (I suspect that other antibiotics or substances found in kidneys would also be more likely to be detected because of concentration caused by dehydration). The FDA and/or USDA may continue to target cull dairy cows for more frequency of testing kidneys for prohibited substance residues at slaughter plants. The concept that cull dairy cows are “more likely to be antibiotic residue-positive” and are therefore selected for more proportional testing is not new. However, these statistics do not indicate whether at least 85% of all cattle tested at these selected slaughter plants are cull dairy cows, in which case they would not be overrepresented among animals testing for residues. *Of much more usefulness would be to know the proportion of various ages, breeds, and sex of cattle that are antibiotic-residue positive*. It may very well be the case that the proportion of cull adult dairy cows positive for antibiotic residues is higher than for other classes of animals, but they also may just be the most common class of animals slaughtered at some plants. I am familiar with 2 large slaughter facilities in the eastern US where the vast majority of animals going through each day are cull dairy cows, so it is logical that most animals testing positive are dairy cattle.

### **The KIS™ test**

(The following is not an endorsement or advertisement by me or Utah State University, just an attempt to provide information.) The KIS™ test is marketed by Charm Sciences, Inc. Their website states that, “KIS Test is designed to absorb kidney serum at slaughter facilities. If antimicrobial drugs are present, microbial growth in the KIS vial is inhibited, which prevents a color change to yellow. Thus, positives remain blue”. Therefore its principle and color change scheme is very similar to the “Delvo” or Delvotest P Milk Test™.

The website also says, “The KIS Test has been successfully applied to beef and pork kidney. The KIS Test has also been adapted for on-farm testing of antibiotics in water, feed extracts, poultry serum, and live animal urine samples, making it an ideal tool for pre-harvest HACCP”. To date, other ante-mortem urine tests to predict whether animals will have antibiotic or other carcass residues found at slaughter have not performed well; data on accuracy of this new test for such purposes would be of interest.

The KIS™ test can be used with a 4, 8 or 20-place incubator. A description and instructions for use of the KIS™ test can be found at [http://www.charm.com/images/stories/pdf/KIS\\_test.pdf](http://www.charm.com/images/stories/pdf/KIS_test.pdf) (One of the images from that fits on page 3, the next page.) The online instructions are mostly pictorial, but there appears to be a cutting edge at the bottom of a cylinder to cut into kidney tissue, which one then swabs with an enclosed swab tip. The swab is immersed in a plastic reagent tube. Results shown are “Negative” which looks green but apparently is supposed to be yellow, “Caution” which appears as a green bottom layer and a purple top layer, and “Positive” which looks like a light purple top layer and a deeper purple bottom layer.

At the committee meeting, the veterinarian from the pharmaceutical industry reported that the most common residues found in cull dairy cows using the KIS™ test were:

Sulfadimethoxine  
Tetracycline  
Flunixin meglumine  
Penicillin

No numbers or percentages were provided, just list of the above antibiotics as the most common detected.

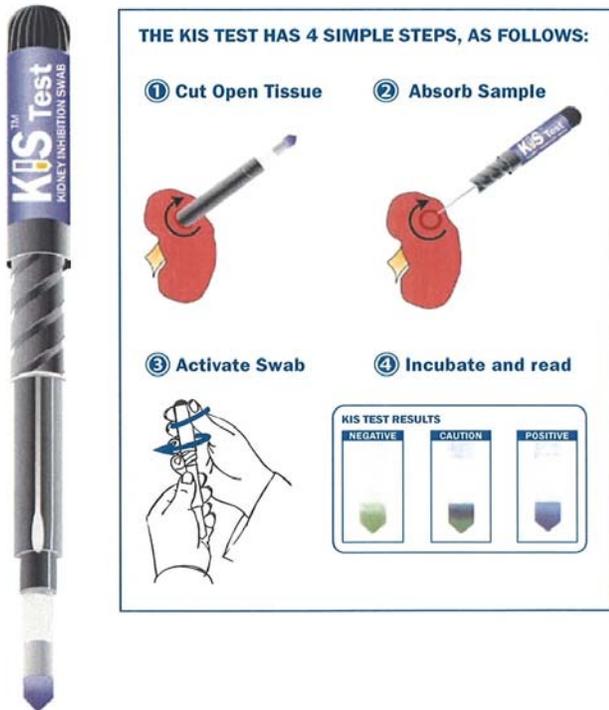
If one looks at the recent FDA warning letters, posted on the FDA website, to members of the dairy industry regarding cull dairy cow residues, two things are apparent: a greater variety of antibiotics in addition to

penicillin are being detected, and flunixin meglumine is an increasingly common cause of carcass residues in dairy cattle.

The Charm website shows the following concentrations of antibiotics (or members of the same drug family) in parts per billion that result in positive test results using the KIS™ test:

<u>Drug</u>	<u>PPB</u>	<u>US Kidney Tolerance</u>
Penicillin G	<b>30</b>	50
Oxytetracycline	<b>3000</b>	12000
Tylosin	400	200
Gentamicin	750	400
Sulfadimethoxine	250	100
Sulfamethazine	500	100
Neomycin	<b>4000</b>	7200

Note that for penicillin G, oxytetracycline, and neomycin, the KIS™ test may produce positive test results at concentrations below the US kidney tolerance level. This has also been true with some other antibiotic residue tests in use for many years. I did not find any information indicating that the KIS™ test detects anti-inflammatory drugs such as flunixin meglumine. Why it is showing up in the residue list above and in FDA warning letters regarding residues is not clear in terms of how it is being detected by slaughter plant testing, but it is obviously being detected and resulting in violative residues.



**New Bulk Tank Testing Methods also in the Future?**

It was also stated at the AABP meeting that the FDA had plans to implement new test methods, possibly the KIS™ test or something similar on bulk tank milk. The Sept. 15, 2009 issue of the JAVMA (235:6, pg. 650) has a news segment regarding this, by Greg Cima. The FDA apparently had interest in testing past repeat violator farms' milk tanks, which would be a biased sample. However, they have not yet proposed the change

to the National Conference on Interstate Milk Shipments (NCIMS), whose rules regulate the vast majority of milk shipped in the US. This was opposed by the National Milk Producers Federation and this was identified at the AABP meeting as a contributing reason as to why NCIMS was not sent this proposal this year. As of October, 2009 I can find no information regarding such a proposal to test bulk tank milk by FDA using new methods or any information regarding the NCIMS considering it.

New test methods with high apparent relative sensitivity to antibiotics in addition to the beta-lactam family, and increased detection of anti-inflammatory drugs are probably going to be adopted soon at all facilities slaughtering dairy cattle. Continued targeting of adult dairy cows, possibly increasingly so if they appear visibly dehydrated, for kidney testing at slaughter plants can also be expected. New methods may also be applied to bulk tank milk residue testing as well.

It is always nice to hear from our readers, including suggestions for future topics of interest. I can be reached at (435) 797-1899 M-W, (435) 797-7120 Th-F or [David.Wilson@usu.edu](mailto:David.Wilson@usu.edu).

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