

# On-farm testing prevents antibiotic residues

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UNIVERSITY PARK — Preventing antibiotic residues in marketed products is a concern to every livestock producer. The penalties for a residue violation can be costly, whether milk is produced, hogs are marketed or steers are fed. In addition, food supplies must be wholesome to meet consumer expectations. American consumers have enjoyed some of the highest quality livestock products in the world, and their respect and confidence must be maintained.

One means of preventing residues is to test any questionable product before it is sold. Tests are now available that can easily be done right on the farm or, if preferred, by a veterinarian.

The Delvotest P for milk is the most widely known on-farm test. Used by many cooperatives to screen members' milk, the Delvotest P detects most antibiotics. The kit consists of 10 ampules containing spores of the organism *Bacillus stearothermophilus* var *caldoolactis* in a solid medium, tablets containing nutrients and a color indicator, and a dosing syringe for measuring milk samples.

To perform the test, break the tip off the ampules, add a nutrient tablet and the milk sample, and incubate for 2 1/2 hours. Results are based on color change. A yellow color is negative and means no antibiotics are present. Positive samples will be purple.

The cost for the Delvotest P is \$1.87 per test. A water bath or block heater is needed to incubate the samples. The block heater sells for about \$95.

A second test for antibiotics in milk is Penzyme. Penzyme detects the presence of betalactam antibiotics. These antibiotics include penicillin, cephalosporins, ampicillin, cloxacillin, oxacillin, nafcillin, amoxicillin and cephalosporins.

Penzyme's kit is similar to Delvotest's. It contains ampules, tablets, and a syringe for measuring the milk sample. Rather than testing for microorganism growth, however, Penzyme tests an enzyme reaction between reagents in the vial and tablet, and antibiotics that may be present in the milk.

Penzyme is a two-step procedure. Remove the cap from the enzyme vial and add the milk sample. Incubate the vial for five minutes. After this first incubation, add one tablet to the vial, swirl gently, and incubate for 15 more minutes. At the end of the incubation, a pink color means a negative result, while yellow indicates the presence of antibiotics. Penzyme tests cost about \$2 each. The incubator sells for \$70.

Another test, which is both inexpensive and versatile, is the LAST (Live Animal Swab Test). This test detects most antibiotics. A similar test, the CAST (Calf Antibiotic Sulfa Test), is designed to check bob veal calves for both antibiotics and sulfas.

Although originally developed to be used only with urine, the LAST has been used to test milk, saliva and blood—all with good results. LAST and CAST are the only tests that can detect residues in the meat of animals prior to marketing.

The LAST kit contains agar gel test plates, a bottle of the test bacteria, *Bacillus subtilis*, paper antibiotic discs, and cotton swabs.

To determine if an animal is ready to market, obtain a urine sample. Follow the directions to

prepare the agar gel plate with the test bacteria. Dip two cotton-tipped swabs in the urine and place them on the plate along with the antibiotic disc. Incubate for 18-24 hours. At the end of this time, if the bacteria on the plate have grown up to the swabs, and there is no growth around the antibiotic disc, the test is negative. A clear zone of no growth around the swab tips indicates the antibiotics are still present in the animal's system and the animal should not be marketed.

The FDA officially recognized the LAST test for urine only, but trials on milk samples give promising results. The LAST did have some false positives (too sensitive), but no false negatives on milk samples. For a test of this type, it is much better to obtain a few false positives than to have false negative results.

The LAST has also been used on swabs that have been placed on hogs' mouths to absorb the saliva.

One of the major advantages of the LAST is its low cost. The supplies for each test cost about \$1.10. For \$10 or \$12, you can make an incubator using a Styrofoam cooler and an automatic aquarium heater.

One of the biggest drawbacks to

the LAST is the recommended 18-24 hour incubation. Often, however, you start to see results in as little as 10 hours.

A free booklet that tells how to perform the LAST, how to make your own incubator, and where to order supplies can be obtained by writing: Publications Office, FSIS-ILA Room 1163-S, U.S.D.A. Washington, D.C. 20250 and asking for Agriculture Handbook Number 601, "How to Perform the Live Animal Swab Test for Antibiotic Residues."

The Penzyme test is available from SmithKline Animal Health Products, 1600 Paoli Pike, P.O. Box 2650, West Chester, PA 19380. Or, you may call 1-800-523-4835 Ext. 281-7506. For the Delvotest P, contact Nedco Inc., Verona, N.Y. 13478, or call 315-363-9141.

Many milk plant and private veterinarians do residue testing or provide testing supplies.

As more emphasis is placed on our food supply being "natural," "organic," and "untainted," the public is going to be looking closely at the possibility of antibiotics getting into our food chain. On-farm antibiotic tests are one way the producer can protect both himself and the consumer from the possibility of drug contamination of marketed food products.

## When to test for antibiotics

In order for any antibiotics test to be beneficial, it must be used whenever there is the possibility of a residue problem. Listed below are some occasions when the tests could be useful:

For milk testing:

1. Screen milk from cows that have been treated with an antibiotic, a route of administration or a dosage level for which withdrawal times are not available.
2. Screen milk from cows that have been dry treated and that calve early.
3. Check bulk tank milk if it is suspected that milk from a treated cow was accidentally added to the tank.
4. Check purchased cows for residue before adding their milk to the tank.
5. Check routine-treated cows to make sure antibiotic has cleared their milk.

For testing urine from meat-producing livestock:

1. Test animals after off-label use of medication — drugs given to a different species or by a different route than that specified on the label.
2. Test urine after withdrawal time if more than the recommended dose of drug may have been given.
3. Test animal after withdrawal time if a combination of drugs has been used.
4. Check very debilitated animals after treating, since these animals may have longer drug clearance times.
5. Test any animal before shipment to slaughter if there is a possibility of drug residue.

## WYE ANGUS SALE tops \$80,000

COLLEGE PARK, Md. — The 7th annual sale of Wye Angus bulls, cows and calves by the University of Maryland on Mar. 25, grossed just over \$80,000.

The animals—consisting of 28 yearling bulls, and nine cows with calves at their side—brought \$80,625, with an average price of \$1,456 per bull and \$4,428 per cow, according to Dr. W. Lamar Harris, director of the university's Agricultural Experiment Station (UMAES).

UMAES operates the Wye Research and Education Center where the animals are raised for research. The center was also the

site of the sale.

"The Wye herd is the only repository in the world of black Angus breeding stock for which meticulous records of ancestry have been kept for more than 40 years," Harris said.

This is the second year the university, through its University of Maryland Foundation, has offered females in its annual sale.

"This gives serious minded breeders the opportunity to work with genetic material that has taken decades to develop," said Ed Oliver, a consultant to this year's sale.



## Pork Prose

by  
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Is there any merit to growing and feeding grain sorghum (milo) to hogs on Delmarva? We asked the question about a year and a half ago. At that time it was a crop we didn't know much about. And the market for milo was poor or non-existent. But since then interest has been growing — especially among hog producers. And at the University of Delaware, we're starting to generate some useful information. Here's what we've found in regard to the feeding value of grain sorghum.

Trail 1: Effect of Grain Sorghum in Young Growing Pigs

	Corn-Soy Diet	Milo-Soy Diet
Daily Feed Intake, lbs.	2.39	2.51
Daily Gain, lbs.	1.09	1.16
Feed/Gain	2.24	2.17

Although the numbers seem to be in favor of the milo, there is no statistical difference between the two groups in regard to feed intake, growth rate, or feed efficiency. So this pilot study showed a lot of promise.

Our next step was to see what milo could do in the field. Delaware extension crops specialist Frank Webb planted more than 60 hybrids in the spring of 1984 to test their yield potential. In addition, he set up three side-by-

side plots — containing corn, bird-resistant milo and non-bird-resistant milo.

After harvest, each of the grains from these side-by-side plots was used to formulate a hog finishing diet. The corn diet was formulated to contain 14 percent crude protein. For the other diets, we substituted milo for corn on a pound-for-pound basis. Pigs were on test for 50 days. Field results and animal performance are shown below.

Trial 2: Field Results & Hog Performance Using Corn, Milo, or Bird-resistant Milo

	Non-bird-Resistant		Bird-Resistant
	Corn	Milo	Milo
Pioneer Variety	3358	8650	B864
Yield, bu/acre	113	80	119
Initial Wt.	108	109	108
Final Wt.	223	216	214
Daily Feed Intake, lbs.	7.4	7.2	6.9
Daily Gain, lbs.	2.31 <sup>a</sup>	2.14 <sup>b</sup>	2.11 <sup>b</sup>
Feed/Gain	3.19	3.36	3.25

<sup>a, b</sup> means within a line with different superscripts are statistically different (P .05).

Under our conditions there was little difference in hog performance between the bird-resistant and non-bird resistant varieties of milo. Together, the pigs on the milo diet grew about 8 percent slower than those on the corn-soy diet. And, as the table shows, no statistical differences in feed conversion were found among the dietary treatments. But when the milo data was combined and compared to that of corn, pigs on the corn diets were about 4 percent more efficient. That difference was significant.

What does all of this mean if you're a hog producer? If you grow a pig from 50 to 220 pounds, using milo instead of corn will require an extra 6.5 days and 20 additional pounds of feed. If you assume that the overhead cost of keeping a hog around for another week is 10 cents a day, and corn prices are in the range of \$2.50 to \$3.50 a bushel, then the break-even prices for feeding milo will be about 25 cents a bushel under corn price.

Some notes of caution:

• Other varieties, especially the bird-resistant hybrids, may not provide the same level of performance that we observed.

• Milo has a higher protein content than corn. But because of

the limited lysine, we recommend that formulation be on a pound-for-pound basis.

• Although these trials were completed without problems, we still have only two trials. More data is needed. More data is coming.

• Unless you stop raising corn altogether, you'll probably need additional storage for the milo. The added costs may reduce some of its advantages.

• If you continue to raise more than one grain, you'll have additional handling.

• Milo is not as simple to dry as corn because of its small kernel size. Check drier manufacturer's recommendations if you have questions.

In summary, our studies so far indicate that milo is comparable to corn as a field crop. In dry years it may even be better. And as a grain for hogs, it's only slightly inferior to corn. The data may not be enough to convince anyone that milo is the only way to go — but it's sure something to think about.

For more information, you can write for the results of the 1984 Delaware sorghum variety trials. The address is: University of Delaware Substation, RD #2, Box 48, Georgetown, DE 19947.