Indiana State Board of Animal Health (BOAH) veterinarian Dr. Debbie Boyd shares insights on proper drug use from her experiences working with livestock producers in private practice.

Dr. Debbie Boyd joined BOAH's team in 2019. Dr. Boyd grew up in Illinois. After graduating from the University of Notre Dame, she earned a degree from the University of Illinois College of Veterinary Medicine. Dr. Boyd worked in private practice in New Hampshire for 13 years where she saw dairy and beef cattle, small ruminants, horses, and camelids. Dr. Boyd lives in Carroll County, Ind. with her husband and daughter.

Planning Ahead to Avoid Drug Residues

No dairy farmer wants to get the call that a drug residue has been detected in the milk sample from his/her farm, and the entire tanker truck of milk has been dumped at the farm's expense. These calls do occur, but thankfully not very often. In 2015, 17 milk drug residues were detected in Indiana out of over 56,000 tests. In 2020, that number was only seven. However, the goal is for Indiana to be drug residue free.

Preventing drug residues in milk is a daily activity as milk is tested for antibiotics every time it is collected from the farm. Every tanker truck of raw milk is tested at the processing plant before it can be unloaded. If a tanker truck tests positive, the individual farm samples that were collected by the milk truck driver are tested to determine which farm was the source of the drug residue. In addition to these daily tests, farms are also required to submit monthly quality tests to a laboratory where milk is tested for antibiotics in addition to somatic cells and bacteria. These monthly quality tests are done four out of every six months or at least eight times a year. About 25% of positive milk drug residues come from monthly quality tests although they make up a much smaller percentage of the total samples screened. This may be because monthly quality samples are not diluted in a tanker truck with milk from other farms making drug residues easier to detect.

When a positive drug residue is detected, the farm's milk producer permit is suspended until the farm completes the steps required by law. The farm cannot ship milk again until a sample from the farm's bulk tank is tested to be negative of residues by the milk company. At this time, the permit is conditionally reinstated until the farmer completes the drug residue prevention manual in an on-farm meeting with the milk inspector, the private veterinarian, and a BOAH field veterinarian. In addition, a fine may be imposed by the Board of Animal Health. Second offenses within 12 months carry greater penalties, and third offenses may result in a permanent revocation of the farm's milk permit.

Most milk drug residues occur because a treated cow is accidentally milked. While accidents do happen, many residues could be prevented by attention to detail and keeping in mind some tips when treating animals.

1. **Identify cows**. Indiana law requires official identification on all dairy-breed cattle (including crosses) that change ownership and leave the farm. Exhibition cattle of all ages and any breed must also have official ID. Those ID tags can do double-duty to help to prevent accidental milking. Even on small farms, identifying cows with some sort of permanent identification can help prevent mistakes in treating or milking the wrong cow. Of course, the effectiveness relies

on promptly replacing missing IDs. Identifying treated cows with a leg band or paint mark also helps decrease the likelihood of milking a treated cow. Even dry cows that have been treated and will be moved to a separate pen or location can benefit from having a leg band. One of the most common reasons for milk drug residues is accidentally milking a treated dry cow that somehow got back in with the milking herd.

2. **Keep records**. A list of treated animals that is easily accessible to all people milking the cows, such as a dry erase board in the parlor, can be beneficial. However, a more permanent method of record keeping is also important. The PMO recommends that all records of treatments be kept for a minimum of two years in the event there is a need for trace back or follow up if a drug residue is detected in meat or milk.
3. **Understand drug labels**. The label on the outside of a bottle or in the package insert gives information about how the drug has been approved for use by the FDA. A withdrawal time for meat and milk is included if the drug is approved for use in food animals. Any change to the label instructions results in an extra label drug use (ELDU) and may change the withdrawal time. ELDU is allowed by law if it is on the order of a veterinarian under a valid veterinary client patient relationship (VCPR). Examples of ELDU include a change to the dose given, the route of administration, the duration of treatment, species, or class of animals the drug is used for, the disease or indication the drug is used for, and the volume of drug given per injection site.
4. **Involve a veterinarian in treatment decisions**. Most dairy farms probably have a regular veterinarian for routine herd health work so working with that veterinarian to create drug treatment protocols can be a good way to discuss proper drug use on the farm. Treatments for the most common disease conditions on the farm are prepared for in advance and necessary prescriptions or extended withdrawals due to ELDU are arranged for ahead of time.
5. **Utilize on-farm or milk plant testing**. The same tests that are used at the processing plants are available for on-farm use and can be used to test milk from an individual cow or the bulk tank before shipping that milk. Many different tests are available, so make sure you pick the one that will test for the drugs you use. If you know where your milk is taken for processing, you can ask which test the plant uses and use the same one. Check with your milk company for more information.
6. **Train employees**. Everyone who works on the farm should understand the importance of drug residue prevention including milkers and anyone who administers treatments. Even small farms with no outside employees can benefit from drug residue prevention conversations. Drug treatment protocols become even more important when multiple people are treating cows. If the person in charge is not available, the information about treating sick cows should be easily accessible to employees.
7. **Only use necessary treatments**. The fewer drugs used, the fewer chances for a mistake that could result in a drug contaminating raw milk. For instance, consider switching to selective dry cow therapy if you and your vet agree this could work for your farm, or work with your vet to see if there are other areas of management that could be updated.
8. **The most common drugs to cause milk residues are intramammary antibiotics**. The injectable drugs most often resulting in residues are penicillin and ampicillin. A study from Virginia Tech found detectable levels of penicillin in some milk samples 18 days after treatment even though the labeled withdrawal time is 72 hours. Similarly, some cephapirin treated cows were still positive 48 hours after the labeled withdrawal time. Discussing withdrawal times with your

veterinarian is beneficial, even for labeled uses. The drug companies use healthy animals when determining withdrawal times, but sick animals receiving the drugs may have altered metabolisms.

Of the nearly 800 dairy farms in Indiana, very few will experience a milk drug residue. Most of the farms that do have a positive milk drug residue, do so because of an accident—maybe because of lack of focus on the task. A single accident can be a very costly mistake, one that everyone would like to avoid. Taking some time now for education of employees and a consulting visit with your veterinarian could save a headache later.