



Proper Dosage

Cutting corners on dosage can cost big in the end for cattle producers.

by *Heather Smith Thomas*

When treating cattle with antibiotics, dewormers and other medications, it is important to use the proper dosage — which is generally determined by weight of the animal. Thus, it is crucial to know the actual weight, rather than guessing. Underdosing may not give the desired results, and overdosing can be harmful. In the case of dewormers, underdosing will not kill all the parasites and may lead to drug resistance.

“There are several reasons to not overdose or underdose,” says Steve Hendrick, DVM, Coaldale Veterinary Clinic, Coaldale, Alberta. Hendrick’s clinic is a feedlot, dairy and cow-calf practice primarily, and he consistently sees producers wasting money by improperly treating animals. Hendrick says underdosing wastes money and the animal gets little or no benefit from the product. On the other side of the coin, the producer is also wasting money overdosing by spending more than needed on that animal.

“If you overdose, it’s costly,” Hendrick explains. “Underdosing runs the risk of not being effective, and a chance for some of the more resistant parasites or pathogens to survive. There is a big push today to try to avoid development of resistant microbes or parasites. One of the main ways producers perpetuate this problem is continuously underdosing.”

Erring on the side of overdose is still not the answer, because there are also disadvantages when overdosing. Not only will it be

expensive, but there may be adverse side effects for the animal if it receives too much of a certain drug. Overuse of antibiotics in some situations may kill off the “good bugs” in the digestive tract and lead to other problems.

Dose matters for deworming

Gary Sides, Ph.D., a cattle nutritionist with Zoetis, points to a study in 2004 that looked at the effects of dewormers used in feedlots. “At that time, there were many producers using just a half dose of Dectomax injectable, trying to save money at processing, and believing this dosage would be adequate,” he explains. “Therefore a group of four veterinarians ran a trial to see if this was effective. They took cattle off grass in California and put them in a feedlot in Nebraska. One third of the cattle were not treated, one third got a half dose of injectable Dectomax dewormer and the other third of the cattle got a full dose of that product.”

When they slaughtered the cattle, they weren’t able to get feed efficiency results because the cattle were all in the same pen, but they had individual identification on all the cattle and did get carcass weight, daily gain and percentage of the cattle grading Choice/Prime. Researchers reported a 22-lb. difference on carcass weight between the full dose and the no dose cattle, and statistically no difference between the no dose and the half dose cattle. It was deduced the half dose had no noticeable benefit. In essence, using it was a waste of money.

“Looking at the percent of cattle grading Choice/Prime, there was also no difference between the half dose and the no dose cattle, but there was a 16% advantage in Choice/Prime in the full dose cattle,” he says.

Viewing the situation as cow-calf operators, producers need to make sure they are actually giving these animals enough dewormer. Sides says very few people actually have 1,000 lb. cows anymore — 1,400 or 1,500 lb. is more accurate. Sides advises producers to keep that statistic in mind when determining what the adequate dosage is for a product.

Parasite resistance is another important reason to never underdose. “Continuous exposure to less than adequate dosage is what selects for resistance in the parasites,” he says. The most susceptible parasites might die, but the resistant ones survive — and they become the predominant population.

This problem may be more of an issue in a pasture cow-calf operation with ongoing worm transmission. Feedlot cattle don’t stay around as long, and the parasites aren’t transmitted or reproducing in a drylot. Thus, the worm resistance could become more of a problem in the long run for the cow-calf or stocker operation.

Regarding efficacy, however, deworming at the proper dosage is just as crucial in the feedlot. “It was a feedlot study that showed reduced gain and grade with inadequate dosage — in cattle consuming the best diet known to science,” Sides recalls. “There wasn’t any nutritional stress on these cattle, but they still had a negative response to a half dose.”

Sides says internal parasites inhibit feed intake and reduce digestibility. Thus, if the parasites aren’t destroyed, the negative response can be measured in the feedlot.

Vaccines are different

Hendrick says vaccines are not an issue regarding dose. They are usually dosed at two milliliters or five milliliters per head, depending on the product. The purpose is to provide antigen to stimulate an immune response, and it is not weight-specific.

Nathan Erickson, assistant professor, Large Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, says some producers ask if they should give the same vaccine dose to a calf versus a mature cow, and the answer is yes. “With vaccines, it’s not about size of the dose; it’s the amount of antigen that is in that dose,” Erickson notes. “Whether the animal is large or small, it needs the same amount of antigen to stimulate immune response.”

Antibiotics and dewormers are a different story regarding size of the animal, but for any injection, each animal needs to be given the dose specified on the label, administered at the proper site on the animal and by the proper route listed on the label — subcutaneous (SubQ), intramuscular (IM) or intranasal (IN).

“If there is an option on the label [SubQ or IM] for an injected drug or medication, go with the SubQ route and dosage, because there is a smaller chance of creating fibrosis or scarring,” Erickson advises. “If the label includes both routes as options, SubQ administration is always preferred over IM injections.”

When giving any injection, make sure the entire dose is deposited where it should go and that none of it leaks back out — or the animal

may not receive an effective dose. “It helps if you use the proper size needle for the animal,” he says. Needle size is dependent on size of the animal, how thick the skin is and the injection method.

When giving oral medication or oral dewormers, Hendrick says to keep in mind there’s a chance the animal won’t swallow the dose. The correct technique – over the tongue and at the back of the mouth – will assure the animal is actually swallowing and not wasting it. If the animal spits it out, money is wasted, and the animal is not treated.

Proper restraint is also important when medicating animals. This enables producers to use proper technique, whether giving oral medication or an injection. For instance, when giving a subcutaneous injection the animal should be restrained so the entire dose gets deposited under the skin and doesn’t leak out. Producers may think they are administering the proper dose, but if it doesn’t get there, they are underdosing.

When giving antibiotics, there are several important considerations. “One reason it is important to always administer according to label directions, with proper dosage, is for withdrawal times,” Erickson says. “The withdrawal times established for that antibiotic are based on giving the correct dose, for the correct duration and by the correct method. If an animal is overdosed or given an antibiotic more days than recommended, or by incorrect route, it may take longer for residues to be eliminated from the animal’s body.”

He says correct dosage is always important for multiple reasons that include food safety, minimizing the chance for development of resistant pathogens and parasites, and efficacy – for the health of the animal.

Strive for accuracy

To be most effective, the dosage should always be appropriate for size and age of the animal. “This means knowing the weight of the animal you are treating,” Hendrick says. “I’ve had the opportunity to work in research herds and ranchers’ herds, running cattle through the chute, and we often wager bets on what a certain animal weighs before it’s on the scale. Producers might think their cows weigh about 1,200 lb., when in reality they have some that weigh 1,600 to 1,800 lb. When trying to estimate weight, people can easily be off by 200 lb. or more.”

One study in South Africa had health professionals and producers estimating cattle weights, and, in general, the producers tended to underestimate the weight of their animals. By using weight tapes or, even better, using a scale, producers can improve accuracy of weight-based dosage and also become better at estimating weights.

“I know from experience looking at feedlot animals or going out on a ranch to treat calves, once you get them restrained or on the ground it’s tough sometimes to estimate their weight,” Hendrick says. Some people are better at assessing weight than others, but it can be deceptive comparing animals that are short and stocky versus tall and leggy or long-bodied or short-backed and thick.

The average of the herd is what producers often go by when running cattle through for delousing or deworming treatments and setting the dose gun for a certain dose. “The problem with that is that there’s often a swing of 100 to 200 lb. either way in a group,” he explains. “The ideal situation is to have a scale at your squeeze chute so you could dose each animal correctly. This is impractical when treating animals out on the range, but a scale in your chute system is very helpful.”

With antibiotics like Draxxin, Excede and Advocen or any of the dewormers, the dosage is always by body weight and cattle need to be dosed accordingly Sides explains. When pharmaceutical companies do trials and studies to get FDA approval for their product, it’s very important to get the right dosage for the body weight.

“This is why the processing chutes that have digital scales are very useful and helpful,” he says. Producers can know immediately and accurately what the animal weighs when it steps into the squeeze chute for treatment. Visual estimates are often misleading, and weight tapes are usually not accurate enough.

“You do need to know the weight of your animal, and this will be more difficult in a pasture situation where you



A chute with a scale can increase accuracy on dosage in an efficient matter.

are roping the animal and trying to guess the weight,” Erickson notes. “If you are on a Verified Beef program it is important that you are dosing those animals correctly and have records showing that you are dosing them correctly.”

When using a topical pour-on product for deworming or delousing, follow label directions for the dose, applying it all the way from withers to tailhead. Some delousing products also recommend applying them along the top of the neck and on the poll.

“Some producers feel that as long as it hits the animal, it’s acceptable, but maybe it doesn’t all get on the animal,” Hendrick says. “Putting it down the middle of the back is not always possible or practical, but if people knew how important this is, they might make more effort to do this, rather than just squirting it on the side of the animal.”

Proper topical application of a delousing product will help control lice, especially biting lice that an injectable product won’t control. According to Erickson, the only way those lice come into contact with the product is by moving through it, so producers need to spread it along the entire topline of the animal.

Proper dosage is also important with calves. When treating sick calves that might be dehydrated, be aware of the dangers of overdosing with certain antibiotics and with anti-inflammatories. “If the calf is severely dehydrated some drugs can be hard on the kidneys and other organs,” Hendrick explains. “Since calves are so small, it doesn’t take much for them to become severely dehydrated if they have scours.”

An overdose could be risky for a calf, especially with anti-inflammatory medications that tend to damage the kidneys if there’s not enough fluid to dilute the drugs when they are being excreted in the urine. “A calf’s body generally contains a higher water content than an adult, and they also dehydrate more readily,” he says. They would be more likely to suffer kidney damage with overdose of certain drugs than an older animal would.

Their metabolism is also a little different. Calves may metabolize antibiotics more rapidly, which means producers also need to make sure they are not underdosing with most other antibiotics. “In these situations, stick to the high end of the labeled dosage, and not underdose, in calves,” Hendrick advises. “Most producers are OK

with this because, from a dose standpoint, even with a very expensive antibiotic, you are not giving very much to a 100-lb. calf – compared with a 1,400-lb. cow, dosing by weight.”

Most stockmen try to cut operating costs in order to survive financially. There are appropriate ways to cut costs and inappropriate ways. Skimping on needed drugs usually ends up costing more in the long run. If dewormers can help cattle be healthier and more feed efficient, using the proper dose pays off – especially when feed costs are high.

“If a feeder is looking at expensive corn and high-priced cattle, and tries to save money by using just a partial dose of dewormer, those cattle don’t perform as well,” Hendrick says. “All we have to do is make up one lb. of gain or half a lb. of feed efficiency to make up that difference.” In the end, producers haven’t saved money; they have had to spend more money for feed or have had lower finishing weights. **HW**



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