



'Software Disease' –

The Hazards of Plastic, Net Wrap and Twines

Plastic, net wrap and twines may be the silent killers on your operation.

by Heather Smith Thomas

Cattle, especially young ones, are curious and like to chew on anything within reach. They may eat baling twines, plastic bags and other debris that ends up in their pen or pasture. The strange material may taste or smell interesting, so the animals chomp it down.

Sometimes they accidentally ingest foreign objects in their feed just because they eat hurriedly and don't bother to chew their feed very much the first time around. Every year a few cattle die mysteriously, often after a slow decline with loss of weight and diarrhea, and the owner and veterinarian may be clueless about the cause of death unless the animal is opened up to find material plugging the gastrointestinal tract.

To illustrate this point, Gary McIntyre, Colorado Springs veterinarian at Airway Veterinary Hospital, was once called out to a ranch to check a steer that was slowly wasting away with watery diarrhea and getting weaker each day. The steer was a little bloated and wasn't eating much but drank a lot of water. His temperature was normal, his heart and lungs seemed fine, he didn't have hardware and none of the fecal or blood tests that were taken showed any indication of disease. The steer finally died, and McIntyre did a necropsy and discovered denim pants plugging up the stomach.

Ingestion of various materials, usually plastic, has become a common killer today because cattle have access to more litter. The pasture or pen may be next to a highway where litter from passing cars blows over the countryside. If cattle are within a mile of dumpsters, construction sites or a subdivision's garbage that may blow over the fields, they may find interesting objects to chew on. Plastic bags, party balloons, weather balloons and other "fallout" from human activity may end up inside cattle, and there's no way to remove the blockage without surgery. Without knowing the problem, few veterinarians are going to perform exploratory surgery on cattle. The result is a quiet, slow, painful way to die, with no definitive symptoms.

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Rumen contents from Dustin McCullen's cow after his vet did a necropsy.

will ever know the animal ate it. If it's a large blockage, however, the animal may stop passing manure and stop eating. The GI tract is "full" so there's no room for more feed. A partial blockage leads to diarrhea, since only the liquid contents of the gut can make it through. This leads to suspicion of diseases like coccidiosis, Salmonella, BVD, E. coli, Johne's disease, liver flukes or other parasites, but there is no treatment for "plastic disease." The best prevention is to pick up every piece of garbage found in

pastures, including old hay twines, and never to re-bale broken bales without first removing the twines.

Net wrap and twines

A growing number of cattle producers are discovering the risks for cattle when leaving net wrap or twines on big bales of hay or straw when feeding or when using a bale processor to chop forage as it is being fed. Dustin McCullen has a cow-calf herd near Dixon, Mont., and last year had a cow losing weight, with diarrhea. After she died, he had his



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veterinarian, Beth Blevins, come to do a postmortem examination.

"A few years ago we started noticing an occasional cow start wasting away, with little or no appetite," McCullen says. "They would go downhill pretty fast once they started losing weight. We'd lose about one cow per year. We first noticed it about six years ago, after we bought a new baler that used net wrap on the big round bales."

McCullen recalls his cows losing weight quickly, ultimately

leading to their death, and he could not figure it out. Around the same time, one of his neighbors was having similar troubles and, after taking a cow to the butcher, realized she had a rumen full of net wrap.

"I'd been suspecting something like this with our cattle, so when I had a cow losing weight last year we had our vet post her," he explains. "Sure enough, the rumen had a big wad of net wrap in it."

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Earlier, he had suspected something like hardware.

“We’d put magnets in these cows and give them antibiotics, but nothing would help them” he recalls. “The cows were basically starving to death in spite of lots of feed available. The rumen was full with the net wrap causing impaired digestion so not much going through and they couldn’t eat very much.”

Symptoms were similar to Johne’s disease, but McCullen says after they found the net wrap in the cow the vet had cut open, they suspected

that’s what was killing the other cows. He says the wad of net wrap removed from the rumen was huge and was mixed and tangled amongst the hay in one big mess.

Before this incident, McCullen says he would often put straw bales in a round bale feeder to keep the straw from shattering and being wasted. He would leave the net wrap on and come back the next day and take the net wrap out of the empty feeder.

“I think sometimes the cows would get hold of that net wrap

and eat it,” he says. “I’m a little surprised it would make it to the rumen. You wouldn’t think it could pass that far, but this is where it ends up. Since it can’t get on into the small intestine; it just stays in the rumen.”

He recalls this cow even having a slight infection in her small intestine where the net wrap was rubbing against the opening, irritating the tissue. He says she’d been a hard-fleshing cow for a few weeks, and then she started acting really sick. He suspects

her behavior was caused by the irritation and infection.

His vet reported she had never seen any other cases because most people don’t check. She claimed they might have a cow or two that just wasted away but they never know what the problem might be.

“In our experience there has been no reason for the weight loss,” McCullen explains. “Sometimes it might be a four-year-old cow, or a 14-year-old cow. The symptoms are similar to Johne’s and hardware disease, but after dragging that big wad of net wrap out of this cow we are fairly certain that’s what happened to the other cows.”

All the affected cows declined in flesh and eventually had to be euthanized. McCullen says he ran into the most trouble when feeding frozen bales because it was nearly impossible to take the net wrap off. In contrast, he says he did not run into the same trouble with twine. He suspects twine is more easily digested if accidentally ingested. Additionally, he says the problem might depend on how much twine the cow has eaten and whether it breaks apart going through the stomachs.

Beth Blevins, the veterinarian who did the necropsy on McCullen’s cow, says cows may keep ingesting more pieces of net wrap and they get all tangled together as a bigger wad, making it even harder for the mass to pass on through. Diagnosis is difficult in the living cow because the wad of net wrap would not be detectable with ultrasound.

“It would look just like part of the rumen contents, mixed in with all the hay and feed,” she says.

The plastic doesn’t seem to break down in the rumen. She recalls the net wrap appearing fresh with the exception of changing to a darker color.

“Also, I think when rumen material starts layering over the top of it, this would tend to protect it,” she explains. “The rumen has bacteria for fermentation digestion, but it doesn’t have the acid that’s in the abomasum. The acid might break it down, but the net wrap didn’t make it to the stomach; it stayed in the rumen.” **HW**

NDSU studies

Carl Dahlen, beef specialist at North Dakota State University (NDSU) Animal Science Department, became interested in “software disease” after the NDSU diagnostic lab necropsied a case of acute bloat associated with ingestion of a large wad of net wrap. He decided to compare various materials to see how well they break down in the rumen or move on through.

Cattle often eat small pieces of net wrap or twine, but sometimes they start chewing on large wads and just keep swallowing the material, ending up with a big mass in the rumen.

“We need to do studies looking at long-term implications of ingesting this material,” he says. “Our study was a short-term look at what happens to it in the rumen.”

Six types of material were evaluated: sisal twine, biodegradable twine, three different kinds of net wrap and hay (brome grass). The hay was a control sample for comparison. Each of the materials was cut into small pieces, and two grams of each sample was put into nylon bags and placed in the rumen of two forage-fed Holstein steers.

“The nylon bags would not degrade in the rumen, yet the rumen fluid could come into the bag and bacteria action could occur in the bags,” Dahlen says. “We kept some of these samples inside the cattle for 14 days.”

After being in the rumen for various lengths of time from four days to 14, the bags were taken out and rinsed to remove all extra material and rumen fluid, drained, and dried and then weighed.

“Nothing was disappearing,” he says. “After 14 days in the rumen, none of the three types of net wrap or the biodegradable twine samples disappeared. Most of the hay sample was digested and gone, and more than 70% of the sisal twine disappeared over the 14-day period. Biodegradable twine breaks down in UV light, but there is no UV light in the rumen, so it doesn’t break down in there.”

Dahlen and other researchers did another study, feeding steers net wrap. These steers were from one of the judging classes scheduled to be harvested in the meat lab. One group was fed net wrap until



Ingesting twines, net wrap, plastic bags and other garbage that often ends up in cattle pastures and pens can be fatal.

harvest and another group was fed net wrap up until 14 days before harvest. That group would have 14 days to continue eating and not have any new net wrap coming into their rumen. Dahlen says they wanted to see if the net wrap might go on through and if the rumen could clear itself of this material or if this material would still be there after 14 days.

He explains the study looked at what might happen in the rumen if the net wrap is floating free in there while the animal burps, chews its cud, etc. The net wrap could come up with the other material and be chewed more, and the rumen is churning and pulling everything around inside it during the digestive process. Dahlen says they wondered if that might clear net wrap out of the system.

“We opened those cattle up and there was still net wrap all through the rumen, even in the steers that hadn’t been fed any more net wrap for 14 days,” Dahlen explains. “That shows it is staying in there and may just keep accumulating. The other thing we saw, because we were looking through all these rumens, was that cattle eat all kinds



of interesting things. There were rocks, little pieces of plastic from the covering of a silage pile and more.”

Dahlen says they have heard of cattle eating plastic bags and other things that block the natural digestion processes. He explains these objects can either block on the front end and lead to bloat, or block the other end, and the material can’t leave the rumen as readily.

This blockage would create lingering effects like impaction or weight loss because the rumen is full and the animal can’t eat much. Dahlen says these cattle tend to go off feed and to lose weight and may have diarrhea because only the fluid can get past the blockage. **HW**