

Fuel for the Journey: Overcoming Transit Stress in Feedlot Cattle

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In today's segmented beef industry cattle travel to where the resources are. That sometimes means moving across the country, spending 18 hours or more in a truck before reaching their destination. Over the course of their lifetime, calves may be transported 4 to 6 times between various farms, auction markets and feedlots.

Like humans, that kind of travel can be exhausting. But feedlot operators want calves to hit the ground running when they arrive.



Each transit event can cause physiological and psychological stress. Inflammation and oxidative stress can negatively affect animal health and performance, resulting in decreased growth efficiency and decreased resistance to disease,” says Stephanie Hanson, professor of Animal Science at Iowa State University. She and her research team are working to better understand the role of trace minerals and vitamins in cattle health and welfare during long haul transit. Hansen presented her findings at this year’s Driftless Region Beef Conference.

“We need affordable and easy-to-implement strategies to optimize cattle performance and producer profit as cattle are on the road with increasing frequency,” says Hansen.

Calves transported long distances can exhibit muscle fatigue, and oxidative stress, an imbalance between oxidants and antioxidants that can ultimately cause cell and tissue damage.

“As the calf stands for long periods of time, its muscles tire (a calf is 65% muscle), and it pulls down reserves of vitamin C, E and trace mineral dependent enzymes,” says Hansen. “It’s like standing and working on concrete all day. But instead of allowing the calf to overcome muscle fatigue, we expect him to stand and eat, not lay around. So the question for our research is can we overcome the effects of this type of stress nutritionally?”

The ISU team has found that two elements in particular can have a helpful impact – vitamin C and zinc. Both have been shown to help the calf recover more quickly, and that means better feed intake and average daily gain

(ADG), and better immune response, particularly improved bovine respiratory disease (BRD) treatment outcomes.

“Mitigating the effects of transit-induced oxidative stress on immune function could decrease antibiotic usage,” says Hansen.

Injectable vitamin C prevents drops in plasma ascorbate concentrations, an essential antioxidant which is key to disease prevention and management.

Zinc prevents increases in muscle lactate, a marker of muscle fatigue.

Dry matter intake (DMI) of healthy calves during the first week post-arrival is approximately 1.6% of body weight (BW); however, morbid calves reportedly consume less than 1% of BW (Hutcheson, 1987).

When DMI is decreased, the calf is forced to divert energy otherwise spent on growth to immune function.

Hansen’s research shows zinc fed cattle recover DMI post-transit more quickly.

ISU studies have shown vitamin C and zinc supplementation ahead of transport will help calves come back quicker from trucking with post-transit ADG in cattle given zinc improving as much as 20.5% over those without the added mineral. In addition, Hansen has recently shown that feeding 100 ppm of zinc as zinc sulfate added 13 pounds of bodyweight during a 6-week pre-conditioning period prior to trucking.

Both vitamin C and zinc can be given pre- or post-transit at relatively little cost, around one dollar per head each, according to Hansen. Either organic zinc or inorganic zinc sulfate can have a positive effect.

“Providing these supplements as pre-conditioning can be a hard sell when producers are already supplementing the calf’s diet,” says Hansen. “But it’s the perfect time, when they’re focusing on the quality of nutrition. Thirteen pounds for one dollar’s worth of supplement should be an easy sell.”

That is especially true for calves without a known mineral history.

Those invested in preconditioning programs should see a potential way to add premium value and increased demand for their calves.

Hansen’s group is also studying the mechanics of truck transit to identify low stress techniques such as positioning within the truck to better withstand vibration and road bumps.

“Think of gripping the steering wheel and how your body absorbs every bump,” says Hansen.

It’s all about getting cattle to the feedlot ready to start eating and gaining with minimal disease interference.

“Transit stress is unavoidable,” says Hansen, “but we can find ways to control it and make the situation better for the animal and the producer.”