

Stray Voltage

"Stray voltage" is the common term used to describe "neutral-to-earth" voltage in a cow or livestock contact area, usually in the barn. Neutral-to-earth voltage is a low-level voltage (usually 10 volts AC) present on metal equipment that has been either grounded to the electrical system or connected to the grounded neutral conductor.



Stray voltage occurs when the cow or livestock touches a contact point and the voltage drives a current through the cow, which causes a behavioral response for the cow or livestock.

Symptoms of Stray Voltage

Cows can sense voltages at approximately one-tenth the level that humans can. Humans have inherently higher body resistance than cows and generally have shoes or boots on when working in barns, which increase resistance. Consequently, humans do not feel what animals feel. The most commonly mentioned symptoms of stray voltage that, in some cases, may lead to animal health problems include:

- Cows reluctance to enter milking parlor or stalls
- Reluctance to consume water or feed
- Nervous cows in milking parlor or stalls
- Poor milk production
- Uneven or incomplete milk out

Cows live in an environment in which many factors can lead to animal health problems. Eliminating stray voltage is no guarantee these problems will go away. Cows may have the same symptoms from disease, nutrition problems, malfunctioning milking equipment or even food and water contamination.

Causes of Stray Voltage

Because of high electrical usage, higher humidity, corrosive silage acids, urine, and manure, a dairy barn is not an ideal environment for electrical wiring and equipment. There are a variety of factors, both on and off your farm, that can affect stray voltage levels. In most cases, stray voltage can be traced to any of the following:

- Faulty, improper or outdated electrical equipment or wiring
- Poor grounding conditions
- Unbalanced 120 volt loads
- Dirty or damaged electrical boxes and devices
- Poor connection on the neutral or ground wire system
- Incorrectly grounded trainers or fences

Managing Stray Voltage

Stray voltage is not a mystery. There are fairly simple electrical tests that can be performed by qualified individuals to determine whether stray voltage is present at unacceptable levels on your farm. Where stray voltage cannot be eliminated, it can be reduced so that your animals are not affected.

If you think that you may have a stray voltage problem, call a qualified electrician to review your farm wiring, call your milk dealer or representative to check your equipment, and notify your electric cooperative. Riverland Energy Cooperative stands ready to investigate that possibility. We have the equipment and trained personnel to offer assistance and advice pertaining to stray voltage.