



**Ontario  
Federation of  
Agriculture**

## **Fact Sheet**

### **Identifying Tingle Voltage**

All grounded electrical equipment can produce tingle voltage. Although you may not feel it, your livestock might.

Tingle voltage is electricity that exists between grounded equipment and the earth. It is also referred to as 'stray voltage', 'neutral-to-ground' or 'neutral-to-earth'.

When electricity is grounded, the 'ground' disperses the electrical charge through the earth. This charge can resurface if it comes into contact with a conductor.

Stray voltage can be caused by equipment in the barn or by overloaded wires in or out of the barn.

Any conductor, such as water lines or wet concrete floors, that touches both the earth and part of the barn can carry stray voltage up from the ground into a point that could transmit a shock when touched by livestock. Feeders, water bowls, metal stalls, stanchions and pipe-lines are a few possible contact points for your livestock.

This effect is common as concrete is a better conductor than soil.

Peak energy use times and wet weather may have higher levels of stray voltage.

Large animals are more sensitive to tingle voltage than humans. People rarely feel stray voltage below 30 volts. However, livestock often show avoidance reactions at 0.25 volts.

### **The symptoms**

Although most livestock is susceptible to tingle voltage, dairy cattle exhibit the most visible symptoms.

#### **For Cattle:**

- cattle lap water from the trough or bowl;
- feed in the bottom of the manger is not cleaned up;
- milk out is slow and uneven;
- cows are reluctant to enter the milk parlour and quick to leave;
- slow growth in calves and heifers;
- somatic cell counts are high;
- unexplained spontaneous abortions of calves;
- bulls become markedly more irritable.

#### **For Pigs:**

- pigs often take to ear and tail biting;
- mastitis and baby pig scours are common;
- piglet mortality may increase.

#### **For Horses:**

- horses may paw the ground and shy away from watering or feeding troughs;
- behaviour and handling becomes more difficult.

#### **For Pets:**

- cats leave the farm, become ill, cease to bear litters or have small, unhealthy litters, or die;
- coats are usually dull and shaggy and eyes are runny.

Household electrical problems often occur in conjunction with tingle voltage symptoms. For example, high rates of incandescent lamp failures.

#### **Other household symptoms:**

- computers have to be protected by surge arresters to prevent periodic failure;
- radio and TV failure - repair persons comment the set was hit by lightning even if it wasn't;
- increase in motor burnouts;
- occasional shocks from water lines or faucets;

telephones are noisy, have lots of service calls and may experience false rings.

Health problems have been observed in people exposed to large amounts of tingle voltage, but have not been proven to be caused by tingle voltage.

Farmers and their families who suffer from immune disorders such as allergies or rheumatoid arthritis find their symptoms worsen or go into remission in close coordination with livestock symptoms.

Periods of fatigue increase.

Sleep disorders may increase.

## **Action**

Have an electrician examine your wiring and correct all deficiencies looking particularly for ground faults.

Contact your hydro office and have a hydro representative visit the farm and take voltage readings.

It is hydro's responsibility to reduce voltage from their wires to the earth to below 10 volts.

It is the farmer's responsibility to address levels of less than 10 volts and any voltage that goes stray from the farm's wiring.

An effective form of reduction for stray voltage coming into a barn on the wires is a tingle voltage filter which reduces stray voltage on the ground system to levels well below the level at which animals begin to show signs of stress.

*This information is provided for the general guidance and benefit of OFA members, and should not be relied upon to replace the requirement for specific professional advice.*