Pork Prose

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STRAY VOLTAGE

What Is It?

Stray voltage is the electrical current that is sometimes present on "grounded" metal equipment around farm buildings. It's also called transient voltage, tingle voltage, and neutral-to-earth voltage.

If, for example, a strong enough voltage is present on a nipple waterer, electricity will pass through a hog to the floor when he stops by for a drink of water. And provided the current flow is high enough, the hog may reduce his water intake or be just plain irritable.

How Do We Measure Stray Voltage?

With a voltmeter, of course, but not any one will do. First, the voltmeter must be able to separate direct current and alternating current. Because of low levels of electrolysis that might occur around manure and metal, some direct current may be present in the building. This is of little consequence but the meter must be able to block it or it will provide a false high reading.

A simple test recently demonstrated to me by Dr. Steve Spencer is to measure the voltage on a dry cell while the voltmeter is set for alternating current. If the voltmeter is blocking the direct current, the reading will be 0.

Second, a 500-1000 ohm resistor (sometimes called a banana plug) must be connected in parallel to leads on the voltmeter. This resistance approximates that of the hog, so that whatever voltage you measure, will also approximate the voltage sensed by the hog.

Finally, to be sure that your measurements are consistent, always measure the voltage between the equipment (waterer, feeder, etc.) and a ground rod driven away from the building.

Where Does Stray Voltage Come From?

Shorts in electrical equipment, unbalanced 120-volt loads on a 240-volt service, improper grounding of equipment, and dirt or corrosion around electrical connections are just a few sources.

Occasionally, the voltage enters through the neutral lead from the power company itself, but more often the problem starts somewhere on the farm.

What Are The Effects On Hog Production?

Studies show that hogs can sense a current flow of about .25 milliamps. Assuming the hog has a resistance of 1000 ohms, that translates to only .25 volts. When the voltage reaches a high enough level, hogs reduce their drinking time. Still higher voltages will reduce water and feed intake.

Pigs often appear agitated or restless during periods of high stray voltage. Stray voltage may occur only when certain equipment or fans are operating, so it isn't constant. And it may fluctuate with the electrical demand experienced by power plant.

The critical question is how much voltage can a hog tolerate before it begins to affect his behavior and cost you money?

As the shown in Table 1, it depends on the study:

Table 1. Effects of stray voltage on hog production

RESEARCHER	VOLTAGE	EFFECT
Gustafson	3 V	Drinking time reduced
Stetson	.5 V	Agitation and reduced water consumption in sows
Kaune	.275 V	Disruption in watering behavior
Gillespie	(not measured)	Reduced water consumption & appetite until ground corrected
Wright	3.7 V	Water consumption reduced 25%
Robert	5 V	Drinking time reduced

In most studies, problems didn't start until the potential exceeded 2 volts. But the Stetson study did document unusual behavior in lactating sows at a level of only .5 volts.

How Do You Correct Stray Voltage?

Correcting the problem is generally easy. Finding he source is the challenge.

Use a qualified electrician to assist. Often the power company is more than willing to help.

Some solutions that have been documented:

- Installation of improved ground rods
- Replacement of connections on main wiring
- Installation of a neutral isolating switch (isolates stray voltage originating from power company on neutral wire)
- Replacement of faulty motors, switches or other electrical devices
- Correction of unbalanced loads in circuit panel
- Bonding and grounding of crates, penning, and other equipment.

Summary

1. Stray voltage is electrical current that may pass from waterers or equipment through the hog when it contacts the equipment. If the potential is high enough, hogs will drink and eat less, and may show agitation. Watch for these signs, and contact an electrician or your county agent if you suspect a problem.

2.Stray voltage usually originates from poor grounds, faulty equipment, or unbalanced 120-volt loads on a 240-volt service. Finding the source of the stray voltage is sometimes difficult, but once the source is identified, it's normally easy to correct.

3. Most studies show that hogs are not adversely affected until the potential reaches 2 volts. But if you have a problem, take actions whenever practical to reduce the reading to less than .5 volts.

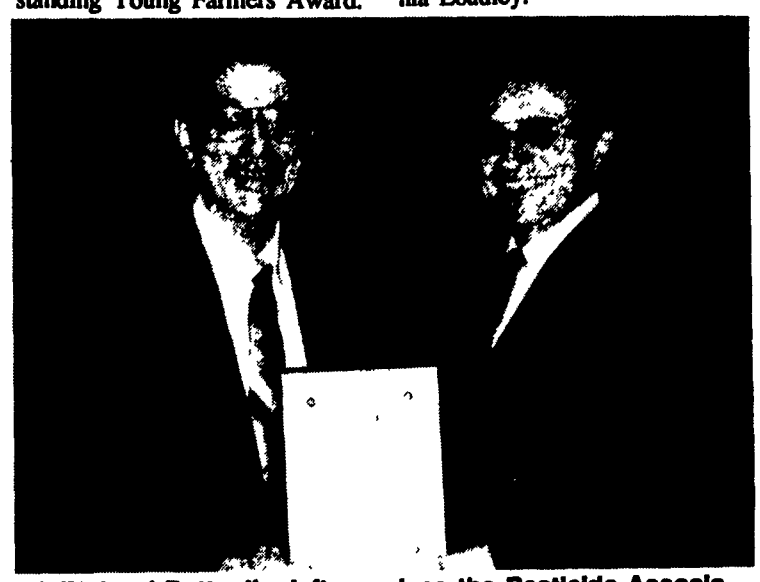
Battaglia Receives Distinguished Service Award

RUTGERS, N.J. — T. Richard Battaglia of Hammonton recently received the Distinguished Service Award from the Pesticide Association of New Jersey. He was recognized for his outstanding service to the agricultural chemical industry.

Battaglia and his wife, Virginia, are owners of Hammonton Package Sales Co. They distribute and sell fruit and vegetable specialty containers and agricultural chemicals in southern New Jersey. He has been an active member of the Pesticide Association of New Jersey for more than 20 years and was recognized for his service to that association, the agrichemical industry, and the agricultural community.

As a former fruit grower, Battaglia has been active in the peach industry for a long time. He is former president of the National Peach Council, where he received the "President's Award" for his efforts as both an officer and director from New Jersey. He is also a past president and longtime director of the New Jersey Peach Promotion Council and the Camden County Board of Agriculture. He is a past recipient of the Outstanding Young Farmers Award.

Battaglia is a past member of the State Farmers Home Administration and has received its service award. The Battaglias are lifelong residents of Hammonton, where they have raised two children, Richard Battaglia and Virginia Loadley.



T. Richard Battaglia, left, receives the Pesticide Association of New Jersey's Distinguished Service Award from Rocco DiGerolamo, association treasurer.