Diagnosing Stray Voltage Problems

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Stray Voltage Awareness Workshop

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Objective

To learn how problems in the dairy parlor may or may not be signs of a stray voltage issue.

What is the problem?
Could the problem be caused by stray voltage?
What is stray voltage?
Who can help?
What is Stray Voltage?

- Simple definition:
  Stray voltage (also called neutral-to-earth voltage) is a voltage difference between two animal contact points that induces current flow through the animal.

- Much more complete definition to come later today!
**Common Problems on Dairy Farms**

**Could it be Stray Voltage?**

Most suspected stray voltage problems are actually something else. Follow the chart below to identify possible causes of your problem.

- Are cows reluctant to enter parlor or do they seem nervous (i.e. step back, go around constantly) during milking?
  - Yes
  - Carefully inspect the parlor for the cause of cattle irritation. Cattle are very sensitive to changes in color, sound, or light; moving objects, lack of feed (if food is typically available during milking), or items out of place.
  - No
  - Can you see anything in the parlor that may annoy or frighten cattle?
    - Yes
    - Malfunctioning milking equipment can also cause irritation to cows. Is milking equipment working properly?
      - Yes
      - Contact your electrician and your electric provider. They will visit your farm and do a thorough inspection. Be prepared to describe: a) any recent changes to your farm’s electrical system, b) when you first noticed problems, and c) any actions taken in attempt to resolve the problem.
      - No
      - Consult your extension agent or veterinarian for help in identifying the cause of poor production.
    - No
      - Stray voltage does NOT cause mastitis. Contact your veterinarian for help in identifying possible causes of mastitis.

- Has milk production increased?
  - Yes
  - If a cow is exposed to stray voltage at a metal waterer, she will drink less. This can lead to a decrease in milk production. Do cows hesitate between drinks? Note: Changes in drinking behavior are often interpreted as a stray voltage issue. However, the only behavior definitely linked to stray voltage is hesitation between drinks.
  - No
    - Increased milk production can be the result of many health and/or management problems.

- Have you observed an increase in mastitis occurrence?
  - Yes
  - Stray voltage does NOT cause mastitis. Contact your veterinarian for help in identifying possible causes of mastitis.
  - No

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**What is Stray Voltage?**

Stray voltage, or neutral-to-earth voltage, is a voltage difference between two animal contact points that induces current flow through the animal. For example, there are sometimes small voltage differences between watering troughs and the floor of a dairy barn. If a cow is in contact with both, she will experience small current flows through her body. Sometimes stray voltage is not harmful, but it can cause animals to be unusually nervous in the milking parlor and/or reduce their feed and water consumption. However, such symptoms may also be caused by any number of other problems on a dairy farm. Therefore, a sound understanding of stray voltage is important in dairy management.
Common Problems on Dairy Farms

- Increase in cases of mastitis
- Decrease in milk production
- Cows nervous or reluctant to enter parlor
Increased cases of mastitis

- Stray voltage does NOT directly cause mastitis - common misconception

- But, stray voltage makes cows uncomfortable and may inhibit milk letdown (this *can* increase risk of mastitis)

If more mastitis cases are observed, who can help?
Veterinarian, County extension agent, etc.
Common Problems on Dairy Farms

- Increase in cases of mastitis
- Decrease in milk production
- Cows nervous or reluctant to enter parlor
Decrease in Milk Production

- There are many, many possible causes of decreased milk production.
- One possibility is decreased water consumption.
Stray Voltage & Drinking Behavior

**Myths**

Stray voltage on metal waterers:
- Causes cows to lean against side of bowl
- Urine drinking
- “Lapping” water

• The only behavior definitely linked to stray voltage is hesitation between drinks

If cows are not drinking enough, who can help? Veterinarian, County extension agent, Farm supplier, etc.
Stray Voltage & Drinking Behavior

A temporary delay in drinking after first exposure is the behavior most repeatedly identified in stray voltage studies.

If cows are hesitating between drinks, it may be a sign of stray voltage. Who can help? Electrician and electrical provider
Common Problems on Dairy Farms

- Increase in cases of mastitis
- Decrease in milk production
- Cows nervous or reluctant to enter parlor
Cows are very sensitive to changes in their environment. If cows are reluctant to enter the parlor it should be carefully inspected for changes in:

- Color
- Light
- Moving objects
- Shortage of feed
- Items out of place
Cows are reluctant and/or nervous

Malfunctioning milking equipment can be uncomfortable and cause irritation to cows. If cows seem nervous or restless during milking, carefully inspect milking equipment.
Cows are reluctant and/or nervous

If cows act nervous, but no distractions can be found and equipment is working properly, stray voltage may be a problem.

If cows act nervous during milking, it may be a sign of stray voltage. Who can help? Electrician and electrical provider
Summary

Remember -- *Most suspected stray voltage are actually something else!* So, consider all sources of the problem.

Stray voltage might be an issue if:

- Cows hesitate between drinks
- Cows are reluctant or nervous in dairy parlor and no other distraction can be identified.
Thank you

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