Stray Voltage Does Not Cause Mastitis !!!

A dairy cow subjected to stray voltage.
A new alternative electro therapeutic for dairy cows with mastitis using low frequency electrical impulses to reduce swelling and inflammation.
Bacteria Cause Mastitis !!!
It is believed that cows are 10X more sensitive to shock than humans

www.stray_voltage.com
Pre-disposes cows to mastitis by:

• increasing the chance of **liner slip** during milking which can inoculate the teat end with bacteria that colonize the teat end and cause mastitis

• **liner slip** can cause milk droplet projectiles that actually penetrate the teat canal and carry bacteria into the mammary gland and causing mastitis
Liner Slip

Air leakage

Claw turbulence

TEAT END bombardment
Stray Voltage – Mastitis as a result of liner slip seeding teat end with bacteria

THE INFECTION: BACTERIA INVADE THE UDDER

1. Bacteria enter the teat canal at some time between milkings or during milking.
2. Bacteria reproduce in the teat canal, the teat cistern, and the udder cistern.
3. Bacteria continue to reproduce, slowly or rapidly, and get into the alveoli.
Stray Voltage – Somatic cells (white blood cells or leukocytes) enter udder to fight infection and increase the **somatic cell count** in milk.

4. Leukocytes pass from the blood into the alveoli to fight the invading bacteria.
Stray Voltage – Bacterial toxins released by the udder bacteria enter the blood stream making the cow ill.

8. The bacteria may produce toxins that go into the blood and the whole body.
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Pre-disposes cows to mastitis by:

- stressing the immune system to produce cortisol thus decreasing the cow’s ability to fight infections

- blocking oxytocin with epinephrine released when the cow is shocked resulting in poor milk letdown and incomplete milkout

- changing the cow’s behavior making it difficult to get cows into the milking parlor and harder to machine milk
Cortisol release from stress reduces immune response

- Cortisol
Stray Voltage

May reduce milk yield by:

- **Shocking** the cow from shorts in electric water troughs and reducing water intake, thus less milk is produced
- Causing poor **milk letdown** and **poor milkout**
- Increasing the chance that a cow will get **mastitis**
- Mastitis **lowers milk yield**
Stray Voltage

May reduce reproductive performance:

- Cows with mastitis have lower conception rates
- Cortisol may affect reproductive hormones
- Feed and water intake impact reproduction
Short in electric water troughs

- Electric vs frost free troughs
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May reduce milk income by:

- Reducing pounds of **milk harvested** from the cows
- Increasing the milk somatic cell count thus **reducing premiums** for high quality milk

### 2004 Kentucky cell counts by test day 5 breakdown

<table>
<thead>
<tr>
<th>State</th>
<th>Herd test days¹</th>
<th>Cows² per herd</th>
<th>Average daily milk yield</th>
<th>Average SCC</th>
<th>Herd test days³ with SCC greater than</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(no.)</td>
<td>(no.)</td>
<td>(lbs)</td>
<td>(cells/ml, 1000's)</td>
<td>750,000 cells/ml (%)</td>
</tr>
<tr>
<td>Kentucky</td>
<td>1,867</td>
<td>49</td>
<td>62.5</td>
<td>383</td>
<td>9.7</td>
</tr>
</tbody>
</table>

¹ Herd test days
² Cows per herd
³ SCC: Somatic Cell Count
### Milk loss from elevated somatic cell counts

<table>
<thead>
<tr>
<th>SCC</th>
<th>SCS</th>
<th>Milk Loss Cow lbs/cow/day</th>
<th>Milk Loss Heifer lbs/cow/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>25000</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50000</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>100000</td>
<td>3</td>
<td>1.5</td>
<td>0.75</td>
</tr>
<tr>
<td>200000</td>
<td>4</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>400000</td>
<td>5</td>
<td>4.5</td>
<td>2.25</td>
</tr>
<tr>
<td>800000</td>
<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>1600000</td>
<td>7</td>
<td>7.5</td>
<td>3.75</td>
</tr>
<tr>
<td>3200000</td>
<td>8</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>&gt;6400000</td>
<td>9</td>
<td>&gt;10.5</td>
<td>5.25</td>
</tr>
</tbody>
</table>
Some case histories:

*You make the diagnosis and how would you correct the problem?*
Some case histories:

- **Herd JD** – cows quit drinking water from electric fountain*
  - Owner in rubber boots felt no shock
  - Veterinarian in rubber boots felt no shock…..but when he took boots off could feel a shock
  - Volt meter showed current flow to water bowl due to a faulty ground wire
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*Correction*

- rewired trough
Stray Voltage

Some case histories:

• **Herd JW** – cows reluctant to enter a new parlor after a fire had destroyed the old parlor
  
  • Owner had read about stray voltage
  
  • Veterinarian checked and found 4 volts
Stray Voltage

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**Correction**

- Power company monitored and found the same and installed a RONK blocker
Some case histories:

- **Herd HB** – cows try to jump through the rear doors of the parlor
  - Veterinarian checked entry doors and found 14 volts
  - Pulled barn breaker still 14 volts
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  - Veterinarian checked entry doors and found 14 volts
  - Pulled barn breaker still 14 volts
  - Pulled silo breaker voltage went to 0
  - Silo unloader motor had a short

Correction – repaired silo motor
Stray Voltage

Some case histories:

• Herd WD – end of power company grid with old wiring and poor connections both **primary** (power company) and **secondary** (farm side)

• Cows jumped when new motor startups as milk tank compressors, silo unloader, tank agitator

• Cows jumped during thunderstorms when there was lightning
Stray Voltage

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Correction - transient voltage

• Reworking both the primary and secondary grounding corrected the problem
Stray Voltage

Some case histories:

• Herd UL – winter time problem when overhead resistant heaters were in use – cows jumped at unexpected times
Stray Voltage

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- Unbalanced load on the electrical system

Correction

- Installed gas heater and removed electric heaters, balanced the load on the electrical system
Stray Voltage

Some case histories:

• Herd **WK** – cows jumped when their udders were touched by workers
Stray Voltage

Some case histories:

• Herd **WK** – cows jumped when their udders were touched by workers

• **Voltage difference** between pit floor and cow platform

• Workers touching cows **completed a circuit**

Correction

• Rewired pit floor electrical equipment and put rubber mats in for workers to stand on
Some case histories:

- Herd **SA** – Somatic cell count over 1,000,000, bacteria count over 100,000, a few cows with clinical mastitis (lumpy milk) and many cows with sub-clinical mastitis (high somatic cell scores).
Stray Voltage

Some case histories:

• Herd SA – Somatic cell count over 1,000,000, bacteria count over 100,000, a few cows with clinical mastitis (lumpy milk) and many cows with sub-clinical mastitis (high somatic cell scores).

• No Voltage problems - *Strep ag* infection

• Highly contagious mastitis, spread at milking from poor parlor hygiene, easily controlled with post milking teat dip, dry cow therapy and culling non responsive treatments
Stray Voltage

Suspect stray voltage when:

• Cows are **reluctant** to enter the milking parlor
• Cows are **restless** when being milked
• Cows **kick milking cluster off** several times during milking
• **Clinical mastitis increases** even though there are no changes in management or weather
• Cows jump during **lightning** storm
Stray Voltage

What if you suspect you have a problem:

• Contact a veterinarian or extension specialist with expertise in mastitis control

• Request a power evaluation from your power company and an independent electrician

• Make sure the power testing includes a 500 ohm resistor
Volt meter with 500 ohm resistor

500 ohm resistor