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Stray Voltage: A Veterinarian's Perspective

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I recently attended a three day conference at which the subject was "Stray Voltage and Dairy Farms". The conference featured over 20 speakers from throughout the U.S., all knowledgeable with the "stray voltage" problem but from many different disciplines.

I was reminded of many aspects of electricity that I had not thought about since my college days. I will address the subject of stray voltage from a veterinary and cow health standpoint.

Stray voltage is better called "neutral to earth" voltage and is defined usually as being less than 10 volts. When this "neutral to earth voltage" is measured between two points that livestock can touch simultaneously, a current flow may occur. The amount of current flow is influenced by the voltage and the resistance that exists through the animal's body and points of contact.

Much research has been conducted over the past 40 years on the subject of "stray voltage". Interestingly, conclusions of recent research reinforce the finding of previous researchers. Researchers have found that cows are quite tolerant to voltage and

that there are differences in individual cows as to their tolerance level. Forty years ago, researchers in New Zealand determined that three volts or less did not cause the cows any problems. This level has been shown to be valid by several researchers in recent years.

Most notably, the problem is not the voltage, but the actual flow of current that may flow through the cow's body. This would typically be from a point of contact with her muzzle through her body and exiting through her feet. The cow's body has a natural resistance that has been measured at 500 ohms. Remembering the principles of electricity, the greater the resistance, the less the current flow, measured in amperes. Anything that could be done to increase the resistance in the cow's environment will lessen the flow of electricity through the cow's body. Clean and dry environments will do wonders to stop any potential flow of electricity.

Much is written in the popular press about the stress effects of "stray voltage" on cows. Research at Cornell University and other sites have shown that the cow does not respond to currents up to at least eight milliamperes. Much has been written

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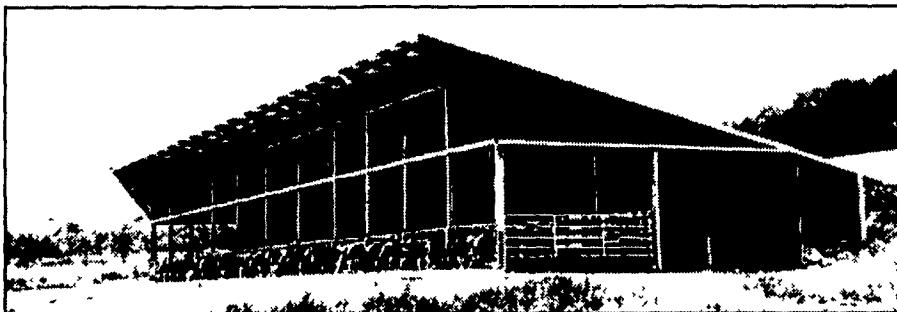
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