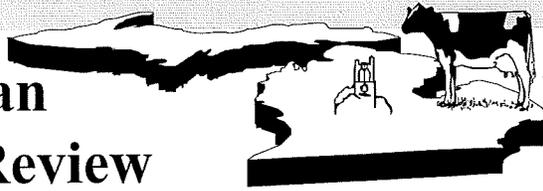


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Cow Behavior and Stray Voltage

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Dairypersons in litigation for stray voltage have tried to correlate behavioral activities of cows such as tail switching, weight shifting, lapping of water, nose pressing, kicking, and apathy to decreased milk production and increased health problems. However, one must understand that cows have basic behavioral needs such as eating, drinking, sleeping or resting, sexual activity, exercise, play, exploration or escape activity, grooming, bonding, and social interaction. Any physical, biological, or physiological event that interferes with fulfillment of these basic behaviors will change a cow's behavior. The changed behavior may be perceived as abnormal by the dairyperson when, in fact, it is a normal response by the calf, heifer, or cow given the circumstances it must deal with at that point in time. The essential message, as stated by Dr. John Roberts (D.V.M., Sturgeon Bay, WI) is that behaviors commonly considered as indications of stray voltage are general behavioral responses that occur from a variety of non-electrical situations and should not be considered specific for stray voltage.

The rest of this paper will be a condensed version of a paper Dr. Roberts wrote for the Wisconsin Stray Voltage Analysis Team to the Wisconsin Public Service Commission. Dr. Roberts points out that psychological effects on behavior are usually stronger and more persistent than negative physiological or physical events. For example, a cow with limited or no feed may show her frustration of watching other cows eating by biting water cups, shifting her weight, prancing in a stall, vocalizing, kicking, or showing increased tongue activity. Another major stress on housed cattle is poor stall design. Stalls that are too small (length and width), uncomfortable (lumpy or lack of bedding), difficult to rise in or have slippery flooring will impact negatively on feet and leg health, resting times, and, therefore, cow behavior. Cows housed on poorly designed stalls will increase incidence of prancing, weight shifting, and general apathy. Nose pressing or leaning is increased with stall discomfort, standing time, foot rot, mastitis, and abdominal pain. Dr. Roberts cites German research that nose pressing causes release of chemicals (endorphin) that counteract pain.

Tail switching has been endorsed by dairypersons in litigation and by some "so-called" experts as a definitive sign of stray voltage. Dr. Roberts discusses two kinds of tail switching; individual random activity and whole herd reflex. Dr. Doug Reinemann's stray voltage research at the University of Wisconsin has shown that tail switching was not related to application of voltage events and, in fact, switching was highly related to environmental temperature. Vocalization by one cow in a barn may cause whole-herd tail switching. Other physical or psychological events related to tail switching include play, use in a defensive manner, flies, lice, and boredom.

Dr. Roberts points out that behavioral events such as lapping at water cups, weight shifting, tail switching, kicking, nose pressing, apathy, and flight are seen in herds regardless of stray voltage status. The correction of a "so-called" stray voltage does not, in most cases, result in any change in behavioral responses. Dr. Roberts offers two explanations: (1) repetitive coping behaviors are so ingrained that they continue after the need has passed; and (2) that stray voltage never was the problem and the real reasons for behavioral modification still exist on the farm. Stanchions that are five feet in length for 1400 to 1600 lb Holstein cows with overgrown hooves will continue to cause unusual cow behaviors well past any voltage consideration.

Dr. Roberts concludes by stating that stray voltage is an electrical issue. Origins of normal or abnormal cow behavior are not specific to electrical stress. One cannot determine the presence of stray voltage or level of voltage based strictly on behavioral activity. Voltages that could affect a cow's behavior and/or production performance must be measured with accurate equipment such as a Fluke Multimeter at cow contact points; for example, parlor stalls, water cups, and feeding equipment. If no or low voltages are measured at cow contact, a dairyperson should look elsewhere for explanations. Dr. Roberts concludes that all aspects of the farm must be evaluated, electrical and non-electrical, to determine and resolve causes of abnormal or undesirable cow behaviors. It is obvious from the Stray Voltage Team's work in Wisconsin, and my observations that the majority of abnormal behaviors reported by dairypersons have no relationship to cow contact voltages under 2 to 3 volts AC.