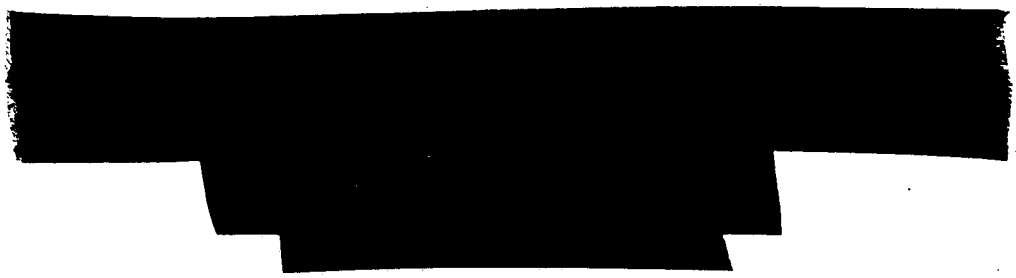
GROWTH OF RATS AND MICE EXPOSED TO 60-HZ ELECTRIC FIELDS



ABSTRACT

Considerable controversy exists concerning possible effects of 60-Hz electric field exposure on growth. Results of past research studies are conflicting; both enhanced and depressed growth have been reported, and none of the reported effects have been confirmed independently by other researchers. We have conducted an extensive series of experiments in an attempt to resolve the current controversy by using an exposure system that has been documented to be free of secondary electric field factors, such as corona, ozone, hum, vibration and spark discharges.

In eight separate experiments, body and organ weights were determined in juvenile (age, 26 days) and young adult (age, 56 days) male and female Sprague Dawley rats and in young adult (age, 60 days) male and female Swiss Webster mice that were exposed or sham exposed to 60-Hz electric fields at 100 kV/m for 30 days or 120 days. A number of other parameters were measured in the various experiments that were related to metabolism and growth, including: daily food and water consumptions; oxygen consumption and carbon dioxide production rates; metabolic rates; circulating concentrations of thyroxin, TSH, and growth hormone; content of liver lipid, protein and glycogen; rates of periosteal and endosteal bone growth; tibia weight; concentrations of blood glucose, blood urea nitrogen and serum triglycerides.

In the studies using rats, there were no reproducible, significant differences between exposed and sham exposed animals in any of the parameters measured. The parameters measured in mice (body and organ weights, food consumption and serum chemistry) were essentially the same for exposed and sham exposed animals. Our failure to confirm the various effects reported by other researchers suggests that such effects may be caused by secondary factors and not by the direct interaction of the electric field with the subject.