

# Abstract

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## Epiphyseal plate development in the zinc-deficient rat.

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**OBJECTIVE:** The effect of zinc deficiency on shearing strength, histological changes and proline utilization of the epiphyseal plate of the tibia of the weanling male rat was studied.

**METHODS:** A diet was fed based on sprayed egg white and containing less than 2 mg of zinc per kilogram.

**RESULTS:** Over 27 day, the force required to displace the epiphysis of the zinc-deficient (ZD) rats was always less than that required for pair-fed (PF) controls. After 18 days, approximately 15% more force was required to displace the epiphysis of the PF rats than was required in the ZD rats. The thickness of the outside compact bone next to the epiphyseal plate region as determined by scanning electron microscopy was thicker in the ZD rats than in the PF controls of comparable age. The epiphyseal plates narrowed as the rats aged, and were clearly discernible in PF controls but not in ZD rats.

**CONCLUSIONS:** The incorporation of L-[U-14C]proline into the epiphysis was significantly less in rats deprived of zinc for 16-22 days than in PF controls.

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