

NORTHWESTERN UNIVERSITY

THE MEASUREMENT OF
THERMAL CONDUCTIVITY OF BEEF

A THESIS

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ABSTRACT

A guarded hot plate apparatus for measuring the thermal conductivity of meat by a steady state method is discussed. The apparatus is not limited only to meat, but is applicable to many materials of low conductivity that are supplied in sheet form.

Measurements of the thermal conductivity of beef are presented and compared with published results. The meat samples are taken from an eye of loin cut, U. S. Good grade. The results apply for heat flow parallel to the grain of the samples, and the accuracy of the results are estimated to be within [†] 2.75% error.

A structural model is developed for the beef samples so that the thermal conductivity may be extrapolated for samples in a moisture content range of 60-80 per cent.

An extensive review of the literature on thermal properties of meat is presented. The properties listed are the thermal conductivity, specific heat, and the thermal diffusivity.

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