

FREQUENCY DEPENDENT ULTRASONIC ATTENUATION
COEFFICIENT ASSESSMENT IN FRESH TISSUE

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Ultrasonic attenuation measurements were made at 1.4, 4.2, 7.0 and 9.8 MHz using a phase insensitive radiation force balance technique. Ultrasonic attenuation coefficient versus ultrasonic frequency relationships were determined for three tissue types (liver, spleen and pancreas) of three animals (bovine, porcine and sheep) using linear regression analysis techniques. Fresh tissues were used in all cases. Measurements were made at room temperature, in saline, within three and one half hours of slaughter. Comparisons were made between the nine resulting curves and showed that the frequency dependency of the ultrasonic attenuation coefficient ranged from $f^{0.985}$ to $f^{1.33}$ while the magnitude of the attenuation coefficient at 1 MHz varied from .077 to .039 cm^{-1} . Additional analyses are currently underway to measure tissue constituent concentrations (i.e. amino acids) and more specifically hydroxyproline. Preliminary estimates tend to indicate a correlation between hydroxyproline and attenuation. {This work partially supported by the U.S. National Institute of General Medical Sciences}