Wave equation

$$c = f\ \lambda$$

c : Speed of wave (m/s)
f : Ultrasound frequency (Hz)
λ : Ultrasound wavelength (m)

Speed of ultrasound

$$c = \sqrt{k/\rho}$$

c : Speed of ultrasound (m/s)
k : Stiffness of material (Kg m^{-1} s^{-2})
ρ : Density of material (Kg/m^3)

Acoustic Impedance

$$z = \sqrt{\rho k} = \rho\ c$$

z : Acoustic impedance (Kg m^{-2} s^{-1})
k : Stiffness of material (Kg m^{-1} s^{-2})
ρ : Density of material (Kg/m^3)
c : Speed of ultrasound (m/s)

Reflection of Ultrasound at Interfaces

$$\frac{I_r}{I_i} = \left(\frac{z_2 - z_1}{z_2 + z_1}\right)^2$$

I_i : Incident ultrasound wave intensity
I_r : Reflected ultrasound wave intensity
z_2, z_1 : Acoustic impedances for two media at interface

Larmor equation

$$\omega_o = \gamma\ B_0$$

ω_o : Resonance frequency (Hz)
B_0 : Static magnetic field (pronounced "BE ZERO")
γ : Gyromagnetic ratio (constant for each nucleus, = 42.6 MHz/T for H^1)