

## **Nuclear magnetic studies of hydration properties of freeze-dried heart muscle**

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Heart muscle is a by-product of the meat industry and a potential source of protein as a functional ingredient in new food products. Nuclear magnetic resonance spectroscopy was employed to examine the hydration properties of freeze-dried beef, pork and chicken heart muscle. The relationship between proton NMR transverse relaxation rates and solid concentration showed a nonlinear dependence for freeze-dried beef, pork, and chicken heart muscle. However the relationship between proton NMR transverse relaxation rates and solid concentration was linear in the lower concentration ranges up to 10% solid / total. Hydration parameters were calculated from the proton NMR relaxation data in this low concentration range. The effect of heat treatment of freeze-dried heart muscle was also investigated, showing that the hydration parameters decreased. This study has implications for quality controls of meat products by NMR measurements and also provides information about the basic hydration properties of heart muscle for the development of new food products.