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Texture Change of Beef and Salmon Meats Caused by Refrigeration and Use of Pulse NMR as an Index of Taste

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Food samples undergo various physical changes during long period refrigeration and their taste gradually diminishes. The amount of squeezable drip and salt-soluble protein in beef fillet and salmon meat were measured as indices of taste during the course of refrigeration and compared with sensory tests. Both meat samples showed similar degradation tendency. The amount of squeezable drip increased rather rapidly within 15 h, although the increase did not directly correlate with the sensory tests. The amount of salt-soluble proteins, which is one of the typical indices of denaturation of protein, decreased gradually with lengthening refrigeration period and was well consistent with the sensory tests. The mobility of water molecules in the food samples was examined by measuring the spin-spin relaxation time T_2 measured by the CPMG method of pulse NMR. The spin echo signals of pulse NMR were analyzed by Gauss-Newton nonlinear regression analysis. The experimental curves were satisfactorily taken into account according to the two-component approximation in which each sample was assumed to contain two kinds of water components with different relaxation times, short- and long- T_2 . The relative amount of the short- T_2 component corresponded well with the sensory tests and also with the decrease in salt-soluble protein that was representative of the texture items. It was concluded that the mobility of water molecules as determined by the relaxation times holds promising

information to evaluate the degradation degree of meat samples during long-period refrigeration.

Keywords: [refrigeration](#), [beef](#), [salmon](#), [squeezeable drip](#), [salt-soluble protein](#), [NMR](#), [relaxation time](#)

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