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One of the main issues in the manufacturing of marinated herring is the variation in yield, which in turn, is affected by the processing conditions and the variance in fat content. In the present work, we study these effects on individual herring fillets, with focus on the intermediate brining process. Brining time, brine concentration, marinade composition and storage time were varied. For brine concentrations 8%, 16% and 26%, the diffusion coefficient was $2.31 \times 10^{-9} \text{ m}^2 \text{ s}^{-1}$, which was used for model development of salt change prediction in herring during brining. Conducting experiments on single fillets revealed a correlation between the fat content and the weight change after 35 days of marinating. The greatest change occurred within the first few days and only minor changes were seen during the storage period of up to one year. These results contribute to a better understanding of the herring marinating process, which can aid the optimization process in the industry.