

## Alternative for rapid detection and screening of pork, chicken, and beef using dielectric properties in the frequency of 0.5 to 50 GHz

### ABSTRACT

Dielectric property at high microwave frequency region has been utilized for possible rapid detection and screening of different types of meat, especially for halal authentication. This investigation focused on both raw and sterilized (processed) beef, pork, and chicken samples. Dielectric response that consists of dielectric constant and dielectric loss factor was measured over the range of 0.5 to 50 GHz. All raw and sterilized meat samples could be differentiated by the dielectric values. Two distinct peaks were observed only for both raw and sterilized pork samples at the frequency around 7.43 and 31.19 GHz. These peaks can potentially be linked to compounds that exist only in pork such as DNA, microbes, enzyme, proteins, amino acids, and many others. Dielectric values for sterilized samples were lower than raw samples due to molecule structural changes that occurred in the samples. The dielectric results promise a great potential of utilizing dielectric properties as a rapid on-site detection approach prior to subsequent laborious analysis.

**Keyword:** Dielectric properties; Authentication; Meat; Pork; Detection; Halal