

Application of GAB and Henderson Model in Study of Moisture Sorption Characteristics of White and Yellow Gari Sold in Abia, Ebonyi, and Enugu South-eastern States of Nigeria

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Abstract

Moisture sorption characteristics of gari sold in Ebonyi, Enugu, and Abia state were studied. The gari samples were coded thus; Abia white gari sample (ABW), Abia yellow gari sample (ABY), Ebonyi white gari sample (EBW), Ebonyi yellow gari sample (EBY), Enugu white gari sample (ENW) and Enugu yellow gari sample (ENY), accordingly. The equilibrium moisture content (EMC) was determined using a standard Gravimetric method with tetraoxosulphate (VI) salt and water mixtures providing equilibrium relative humidity (ERH) 15, 25, 35, 45, 55 and 65 % to yield a water activity (aw) range of 0.0972 - 0.9811 at 30, 40 and 50 °C for adsorption and desorption isotherm arms. The sorption data generated were fitted into GAB and Handerson models. A sigmoidal behaviour (type II) was observed which is a typical attribute of a dry carbohydrate dense food. There was a general increase in the equilibrium moisture content (%) with increasing water activity. A little difference was observed between the sorption behaviour of ABW, EBW and ENW; ABY, EBY and ENY gari sample. The equilibrium moisture content decreased with increase in temperature at constant water activity. The goodness fit of the two models were determined using four statistical parameters; coefficient of determination (r^2), root mean square error (RMSE), percentage mean relative deviation modulus (%p) and chi square (χ^2). GAB model appeared as the most suitable model than Henderson model. EBW and EBY gari samples proves to be of good shelf stability.

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