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Modeling of glucose release from native and modified wheat starch gels during *in vitro* gastrointestinal digestion using artificial intelligence methods

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Abstract

Estimation of the amounts of glucose release (AGR) during gastrointestinal digestion can be useful to identify food of potential use in the diet of individuals with diabetes. In this work, adaptive neuro-fuzzy inference system (ANFIS), genetic algorithm-artificial neural network (GA-ANN) and group method of data handling (GMDH) models were applied to estimate the AGR from native (NWS), cross-linked (CLWS) and hydroxypropylated wheat starch (HPWS) gels during digestion under simulated gastrointestinal conditions. The GA-ANN and ANFIS were fed with 3 inputs of digestion time (1-120 min), gel volume (7.5 and 15 ml) and concentration (8 and 12%, w/w) for prediction of the AGR. The developed ANFIS predictions were close to the experimental data ($r = 0.977$ - 0.996 and $RMSE = 0.225$ - 0.619). The optimized GA-ANN, which included 6-7 hidden neurons, predicted the AGR with a good precision ($r =$

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