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Food Substitution by Diet Optimization with Machine Learning

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Diet modelling has proved to be an effective tool for the design of healthy and sustainable diets. Recent studies have focused on improving the acceptability of diets by consumers by combining diet optimization with machine learning techniques from different research disciplines such as food recommender systems and food substitution. With our research, we are the first to combine diet optimization with recipe completion. In comparison to more traditional diet modeling approaches, the recipe completion diet model provided more creative options for substituting food items, resulting in increased nutritional adequacy of diets. However, the designed meals also contained a higher number of inappropriate substitutions. To improve the quality of personalized substitutions, recipe completion algorithms need further advancements, enabling them to acquire a more comprehensive set of rules for composing acceptable diets.