8	Evaluating the Desirability of Meals: An Illustrative MILP Model to Assess Portfolios with Interdependent Items
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摘　要

Healthy diet has become the popular concern in our society. In order to take long-term advantage, diet suppliers pursue to establish a suitable menu considering clients' inclination and health. Thus, this study aims to find the optimal meals combination of food items by assessing each related item. To meet the requisitions, subordinates are designed to measure the most suitable acceptability on economical, students' appeal and healthy aspects.

A multi-objective mixed integer linear programming (MILP) model is constructed for this problem. We first regulate each meal in five dishes, one soup, and one fruit or drink as elements. The objective function of the proposed model is to maximize the appeal in meals within a time period. The model includes all the related aspects and attributes to discuss comprehensively. This study takes nine measurements into account: range of calorific capacity, maximum of preference, limitation of cost, balanced benefit, variety of cooking methods, variety of colors, variety of presentation forms, variety of flavors, and maximum the variation. In the model, we use software, OPL, to compute all the measurements and five of them considered in the objective function construct the total utility and provide elect portfolio.

We conducted an empirical study at a nursing house. Numerical results provided an optimal 5-day scale meal design under our requirements. Optimal combinations of meals were generated and taken clients' preference and nutrition into account. The empirical study showed that MILP might hopefully provide better combination of meals.