

Bibliography of least-cost diet research

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This bibliography is work in progress for the CANDASA project (<https://sites.tufts.edu/candasa>), listing influential papers that use mathematical programming to identify the least costly foods needed to meet nutrient requirements.

Citations listed below focus on applications of least-cost diet methods. The CANDASA project is also concerned with the *data* needed to calculate this “cost of nutrient adequacy” (CoNA), notably a) food prices, b) their nutrient composition, and c) the nutrient requirements of a target population.

In addition to least-cost diets (CoNA), the CANDASA project also considers other ways to measure the cost of healthy foods. One such approach is what we call the “cost of recommended diets” (CoRD), defined as the least-cost items from each food group specified in dietary guidelines. Price indexes using CoRD are based on the lowest-cost items in mutually exclusive food groups, so they can be calculated using simple rank-order optimization rather than mathematical programming. Another approach to measuring the cost of healthy foods is what we call a “nutritious-food price index” (NPI), defined as a consumer price index that weights foods using their nutrient profile scores. Price indexes using NPI are a continuous function of all food prices, using nutritional weights rather than just consumer expenditure as in a CPI.

The bibliography shown here aims to focus only on papers that address the least-cost foods needed to meet nutrient requirements, including calories as well as macro- and micronutrients, with a very few other closely-related papers also included. With only one constraint such as cost of energy, the analysis reduces to rank-order optimization, and when other nutrients are also considered these studies use linear programming, goal programming and related techniques to select foods that achieve nutrient adequacy at least cost. As revealed by this bibliography, there is a long and rich literature on the topic.

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