

U.S. Food is Medicine Studies Showing the Strongest Metabolic Results

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Scope and selection criteria. This analysis focuses on U.S. health care and community-based Food is Medicine programs outside the workplace. Studies were selected based on the magnitude of improvement in HbA1c, blood pressure, body weight, or BMI; the credibility of the research design; and the relevance of the intervention to scalable Food is Medicine programs.

Important evidence distinction. The largest reported metabolic improvements generally occurred when food assistance was combined with coaching, cooking instruction, diabetes education, community health worker support, or clinical follow-up. Produce benefits or food subsidies provided largely on their own have produced smaller or inconsistent results. Several of the most dramatic findings come from small or uncontrolled studies and should not be treated as definitive estimates of what every program will achieve.

Overall interpretation. The most supportable model is a highly targeted, six- to twelve-month intervention for patients with uncontrolled metabolic disease that combines meaningful food provision with clinical monitoring, coaching, cooking education, medication coordination, and active engagement support.

1. Food Rx plus community health worker: strongest recent diabetes result

Study: *Food Rx + CHW: A Community Health Worker-Led Medically Tailored Grocery Intervention to Address Food Insecurity and Type 2 Diabetes*

Location: Kansas

Design: Pilot randomized trial involving 31 adults with type 2 diabetes and food insecurity.

Intervention: Participants received 12 weekly home deliveries of produce and shelf-stable foods. One group received food alone; the other received food plus community health worker-led nutrition education, cooking instruction, behavioral support, and referrals.

Metabolic results

- Food-plus-community-health-worker participants had an average HbA1c reduction of 0.85 percentage points at three months.
- At six months, the average HbA1c reduction reached 1.65 percentage points.
- Approximately 81% of participants in the combined intervention had a lower HbA1c at six months.
- The food-only group had no statistically significant HbA1c improvement.
- Neither group had significant changes in weight or systolic blood pressure.

Assessment: This is one of the largest reported HbA1c improvements in a randomized U.S. Food is Medicine study. The contrast between the combined intervention and the food-only arm indicates that the community health worker and behavioral-support components may have been essential. The principal limitation is the very small sample: only 16 people received the combined intervention,

and the reported findings were driven primarily by within-group changes rather than a definitive, adequately powered between-group treatment effect.

Reference: <https://pubmed.ncbi.nlm.nih.gov/41699557/>

2. Duke medically tailored groceries for hypertension

Study: *Medically Tailored Grocery Deliveries to Improve Food Security and Hypertension in Underserved Groups*

Location: Durham, North Carolina

Design: Pilot randomized controlled trial involving 50 Black and Hispanic adults with hypertension and food insecurity.

Intervention: Participants received 12 weeks of home-delivered groceries designed around the DASH dietary pattern, accompanied by in-person nutrition education, transportation assistance, childcare, and home visits where necessary.

Metabolic results

- Average systolic blood pressure declined 14.2 mmHg among intervention participants included in the outcome analysis.
- The control group's systolic blood pressure declined 3.5 mmHg.
- The approximate difference in change between groups was therefore 10.7 mmHg.
- Food-insecurity scores also improved.

Assessment: This is among the strongest U.S. Food is Medicine blood-pressure findings and is especially relevant because it supplied a complete pattern of medically appropriate groceries rather than unrestricted produce vouchers. However, only 13 intervention participants and 15 control participants had sufficient follow-up data for the secondary clinical analysis. The result should be considered highly encouraging pilot evidence rather than conclusive proof.

Reference: <https://pubmed.ncbi.nlm.nih.gov/39942442/>

3. Penn State produce prescription plus diabetes self-management education

Study: *Impact of a Prescription Produce Program on Diabetes and Cardiovascular Risk Outcomes*

Location: Reading, Pennsylvania

Design: Single-group pre/post study involving 97 adults with type 2 diabetes, HbA1c of at least 7%, and overweight or obesity.

Intervention: Participants received seven months of monthly diabetes self-management education and fruit-and-vegetable vouchers valued at approximately \$28 to \$140 per month.

Metabolic results

- Average HbA1c declined 1.3 percentage points.
- Greater voucher redemption was associated with larger HbA1c improvements.
- Changes in diabetes medications were also associated with improved HbA1c.
- BMI did not improve significantly.

Assessment: This is one of the strongest published glycemic results from a moderately sized U.S. produce-prescription program. It supports combining food access with recurring diabetes education.

Because there was no control group, the 1.3-point reduction cannot be attributed entirely to the food program; medication changes, additional clinical attention, and regression toward the mean could account for part of the improvement.

Reference: <https://pubmed.ncbi.nlm.nih.gov/34426064/>

4. Nine-program national produce-prescription evaluation

Study: *Impact of Produce Prescriptions on Diet, Food Security, and Cardiometabolic Health Outcomes: A Multisite Evaluation of Nine Produce Prescription Programs in the United States*

Location: Twenty-two sites in 12 states

Design: Multisite pre/post evaluation involving 3,881 participants, including 2,064 adults.

Intervention: Programs provided produce incentives averaging approximately \$63 per month for four to ten months, commonly accompanied by nutrition education.

Metabolic results

- Among adults with HbA1c of at least 6.5%, HbA1c declined 0.29 percentage points.
- Among adults with hypertension, systolic blood pressure declined 8.38 mmHg and diastolic blood pressure declined 4.94 mmHg.
- Among adults with overweight or obesity, BMI declined 0.36 kg/m².
- Fruit and vegetable intake increased approximately 0.85 cups per day.
- The odds of food insecurity decreased by approximately one-third.

Assessment: This is the strongest study for scale, geographic diversity, and simultaneous improvements in diabetes, hypertension, weight, diet, and food security. The blood-pressure findings were particularly notable. Its chief limitation is the absence of a control group. Participants were selected partly because they had abnormal baseline measurements, creating a meaningful possibility of regression toward the mean.

Reference: <https://pubmed.ncbi.nlm.nih.gov/37641928/>

5. Kentucky medically tailored meals and grocery-prescription network

Study: *Development of a Statewide Network Hub for Screening, Referral, and Enrollment into Food as Medicine Programs Across Kentucky*

Location: Urban and rural Kentucky

Design: Feasibility and quasi-experimental program evaluation without a control group, involving 75 Medicaid-eligible participants across three program types.

Intervention: Participants received medically tailored meals, grocery prescriptions, or meal kits for adults with hypertension or type 2 diabetes.

Metabolic results

- Systolic blood pressure declined an average of 9.67 mmHg among medically tailored meal participants.
- Systolic blood pressure declined 6.89 mmHg among grocery-prescription participants.

Assessment: This study is notable because it tested multiple Food is Medicine delivery models within a statewide referral and enrollment structure. The results suggest that both prepared meals

and medically appropriate groceries can meaningfully reduce blood pressure. However, geographic location determined program assignment, there was no usual-care control group, and each program arm was small.

Reference: <https://scholars.uky.edu/en/publications/development-of-a-statewide-network-hub-for-screening-referral-and/>

6. Detroit Fresh Rx randomized diabetes trial

Study: *A Pilot Randomized Controlled Trial of a Fruit and Vegetable Prescription Program at a Federally Qualified Health Center in Low-Income Uncontrolled Diabetics*

Location: Detroit, Michigan

Design: Randomized controlled trial involving 112 participants: 56 intervention participants and 56 control participants.

Intervention: The 15-week program provided up to \$80 in produce-purchasing benefits at a farmers market located at the health center.

Metabolic results

- HbA1c declined from 9.64% to 9.14%, a 0.50-percentage-point reduction, in the Fresh Rx group.
- Control-group HbA1c remained essentially unchanged, moving from 9.38% to 9.41%.
- Blood pressure and BMI did not significantly change.
- Despite the favorable pattern, the formal between-group differences were not statistically significant.

Assessment: This trial provides better causal evidence than uncontrolled pre/post evaluations. It suggests that even a relatively small and short produce benefit may improve glycemic control, although the study did not definitively establish a treatment effect in the between-group analysis. The \$80 maximum food benefit was also much lower than the benefit offered by many current programs.

Reference: <https://www.sciencedirect.com/science/article/pii/S2211335521001005>

7. ProduceRx for adults with obesity and food insecurity

Study: *A Pilot Randomized Controlled Trial of a Produce Prescription Program Combined With Behavioral Weight-Loss Counseling*

Location: United States

Design: Pilot randomized controlled trial involving 32 adults with obesity and food insecurity.

Intervention: Participants received weekly behavioral weight-loss counseling and \$20 per week in produce vouchers for 12 weeks, compared with a wait-list control group.

Metabolic results

- ProduceRx participants lost 2.4% of their initial body weight.
- Wait-list participants gained approximately 0.4%.
- The approximate net difference was 2.8% of initial body weight over 12 weeks.
- Eating self-efficacy also improved.

Assessment: This is one of the strongest randomized U.S. findings specifically addressing obesity through a produce prescription. The magnitude is clinically promising for a 12-week program, but the study included only 32 participants and combined produce benefits with weekly weight-loss counseling. It therefore supports the combined model rather than proving that vouchers alone cause weight loss.

Reference: <https://pubmed.ncbi.nlm.nih.gov/40198763/>

8. Veggie Rx matched-control obesity evaluation

Study: *Veggie Rx: An Outcome Evaluation of a Healthy Food Incentive Programme*

Location: Albany, New York

Design: Retrospective pre/post evaluation involving 54 program participants matched with 54 nonparticipants.

Intervention: The program served low-income clinic patients with obesity, hypertension, or type 2 diabetes through healthy-food incentives.

Metabolic results

- Intervention participants experienced an average BMI reduction of 0.74 kg/m².
- The difference in BMI change between intervention and matched controls was statistically significant.
- The available study abstract did not report significant diabetes or blood-pressure results.

Assessment: This is a useful obesity-focused example because it included a matched comparison group rather than relying solely on participants' baseline values. Nevertheless, it was retrospective and nonrandomized, so participants who elected to engage in Veggie Rx may have been more motivated than comparison patients.

Reference: <https://pubmed.ncbi.nlm.nih.gov/27539192/>

9. Geisinger Fresh Food Farmacy pilot

Study: *Geisinger Fresh Food Farmacy early program evaluation*

Location: Pennsylvania

Design: Early program pilot involving approximately 37 patients with poorly controlled type 2 diabetes and food insecurity.

Intervention: The program supplied healthy groceries sufficient for the participant's household, diabetes education, group support, recipes, monitoring, and clinical-care coordination.

Metabolic results

- Average HbA1c reportedly declined approximately 2.1 percentage points, from roughly 9.6% to 7.5%.
- Program reports also described improvements in glucose, total cholesterol, LDL cholesterol, and triglycerides.

Assessment: Geisinger is frequently cited as having one of the largest Food is Medicine HbA1c reductions in the country. However, the dramatic 2.1-point figure comes primarily from a very

small early pilot and program-reported analyses, not a large, fully published controlled trial. It is best presented as an influential proof of concept rather than definitive effectiveness evidence.

Reference: <https://pubmed.ncbi.nlm.nih.gov/31120339/>

10. Meta-analysis of food-prescription programs

Study: *The Effect of Food Prescription Programs on Chronic Disease Management in Primarily Low-Income Populations: A Systematic Review and Meta-Analysis*

Location: United States-focused evidence base

Design: Systematic review and meta-analysis of 17 studies: 13 pre/post studies, three randomized trials, and one post-intervention survey.

Intervention: The included programs varied but generally provided produce prescriptions, food-pharmacy benefits, nutrition education, or related food-support interventions.

Metabolic results

- BMI declined an average of approximately 0.40 kg/m².
- Fruit and vegetable intake increased approximately 0.77 servings per day.
- The pooled analyses did not find statistically significant overall improvements in HbA1c or systolic blood pressure.

Assessment: This review provides an important counterweight to the individual high-performing programs. On average, produce and food-pharmacy programs appeared to produce modest weight and diet improvements, but consistent diabetes and blood-pressure effects had not yet been demonstrated across the literature. The finding indicates that program structure—not simply providing food—largely determines whether metabolic improvement occurs.

Reference: <https://pubmed.ncbi.nlm.nih.gov/35108144/>

Most defensible conclusions

1. **Diabetes:** Medically tailored groceries or produce paired with community health workers, diabetes education, cooking support, and ongoing monitoring produced HbA1c reductions of approximately 0.5 to 1.65 percentage points in the stronger published studies, with some uncontrolled pilots reporting reductions exceeding two percentage points.
2. **Hypertension:** DASH-oriented groceries and medically tailored meals produced systolic blood-pressure reductions of approximately 7 to 14 mmHg in several recent pilots.
3. **Obesity:** Produce prescriptions combined with structured behavioral counseling generated approximately 2.4% weight loss over 12 weeks, while less-intensive programs generally produced smaller BMI changes.