



Healthy Food Pricing Incentives: Designing successful programs

Summary

Healthy food pricing incentives have emerged as an effective strategy for increasing access to healthy food, improving nutrition, and reducing dietary quality inequities. Incentives are monetary awards that reduce the price of healthy foods, making them more affordable. The design and implementation of incentive programs vary widely. We found that the following features are associated with statistically significant increases in the consumption or purchase of healthy foods:

- Providing incentives electronically (e.g. SNAP electronic benefits transfer or supermarket loyalty cards) rather than physically (e.g. paper voucher or coupon).
- Issuing incentives on more than one occasion rather than once.
- Offering incentives for longer periods of time (more than 24 weeks).
- Including a broader selection of healthy foods (e.g. all fruit and vegetable types rather than only fresh produce or incorporating additional types of healthy foods).
- Allowing redemption in stores in contrast to farmers markets.

In addition, neither larger incentives nor adding co-interventions to the incentive appeared related to the effectiveness of the program.

Our findings add to the substantial body of research showing that incentives increase healthy food consumption and purchases, particularly of fruits and vegetables. More knowledge is needed about the most effective ways to implement incentive programs such as what foods to include, incentive amount and type (match, rebate, subsidy, discount), sites for incentive redemption, and the role of nutrition education and other co-interventions. The effects of incentives on overall diet quality are unknown.



Introduction

Poor nutrition is a major contributor to many preventable chronic diseases including obesity, diabetes, cancer and heart, liver and dental disease.^{1,2} In recent years, healthy food pricing incentives have emerged as a promising strategy to improve nutrition. We define a healthy food pricing incentive as a monetary award that reduces the price of healthy foods, making them more affordable.

Healthy Food Pricing Incentive

A monetary award that reduces the price of healthy foods, making them more affordable.

Numerous studies have demonstrated that these incentives increase the purchase and consumption of healthy foods, especially of fruits and vegetables, and particularly among low-income populations. While the science is clear that pricing incentives work, the most recent evidence reviews are current only through 2017 and it remains unknown what specific attributes of incentive programs contribute to success.



Purpose of This Report

This report updates what is known about incentives and their effectiveness. It describes the design features of incentive programs (e.g. incentive amount, how to provide it, where it can be used) and reviews evidence regarding the relationships of these features to statistically significant impacts on healthy food consumption and purchases. We completed two research reports to inform this report: a [systematic literature review](#) of studies published between 2000 and January 2019 and [interviews with leaders in the field](#) conducted in mid-2018.

Systematic review and key informant interview methods

Systematic Review

- We searched the National Institutes of Health PubMed database to identify quantitative peer-reviewed healthy food pricing incentive studies with primary data that were set in the most common food purchasing settings (stores, restaurants, cafeterias, and farmers markets) and that reported on healthy food consumption, purchase or expenditures, and were published in English between January 1, 2000 and January 3, 2019.
- We searched the Cochrane Library and Google, asked experts in the field, and scanned reference lists of incentive review articles and articles included in this review for additional studies.
- Two reviewers independently selected articles for inclusion and cross-checked data extracted from articles.



- Primary outcomes were consumption or purchase of fruits and/or vegetables or of healthy foods more broadly defined.
- The primary analysis examined whether specific program characteristics were associated with statistically significant effects on outcomes.
- We identified 3,793 distinct articles, selected 149 articles for full-text review, and included 29 studies described in 33 articles in the review.³⁻³⁵ We provide examples of a few typical studies on page 5. Information about all the studies is available online in the [systematic review](#).

Key Informant Interviews

- Fourteen experts in the design, implementation and evaluation of incentives from the non-profit, business, government and academic sectors participated in telephone semi-structured interviews.
- We coded notes from the interviews and identified themes and areas of agreement and discordance.

Characteristics of Included Studies

Targeted foods/beverages: Fruits and vegetables were included in nearly all of the studies (28 of 29). The majority of studies (19) focused exclusively on fruits and/or vegetables. Ten of these included all forms of fruits and vegetables (i.e. fresh and processed), seven included only fresh produce, one included only fresh fruit, and one included only fresh vegetables. Another ten studies included a broader range of healthy foods along with fruits and vegetables.



Incentive amount: The size of incentive varied widely, from \$1.30 to \$10 per week (median \$6.08) in ten studies or a 10%-100% discount or match (median 30%) in 19 studies. Incentives were capped in 16 of the studies, with the cap ranging from \$5-120 per month per household (\$5.20-\$3,480 [median \$120]) for the entire intervention) or, in two studies, \$10 per shopping trip or day.

Frequency and duration: Frequency of incentive award ranged from once (at the beginning or end of the program) to weekly to every shopping trip. Program duration varied from three weeks to 29 months (median three months).

Redemption sites: The majority of incentives could be used in food stores (13 studies – mostly supermarkets). They were also used in cafeterias or restaurants (six studies), farmers markets (five studies), both stores and farmers markets (two studies), or at multiple locations (three studies).



Incentive type: Discounts were most common (13 studies), followed by rebates (seven), subsidies (seven) and matches (two). See the box below for definitions of incentive types. Half of the programs awarded incentives electronically through an immediate discount at the point of sale or for future use via credit to a debit, gift or SNAP electronic benefits card or bank account. Another half of the studies offered incentives in a physical format, such as paper coupons. These latter incentives were primarily subsidies and matches and generally for future use, although in three studies they could be used immediately.

Types of healthy food pricing incentives

Discount: Offers a reduced price on specific items when they are purchased, often in the form of a percentage off the regular price. Frequently a discount is provided electronically at the point of sale, but could be a coupon received by the consumer prior to purchase.

Match: Matches all or a portion of the amount spent on specific foods. The amount is tied to the dollar amount a consumer spends (e.g. receive \$1 for every \$1 or \$2 spent).

It is often provided as a voucher or token received during the shopping trip or prior.

Rebate: Provides cash back after the purchase of specific foods, often a percentage of the price of the item (e.g. a 30% rebate on \$1 worth of apples would reimburse the consumer \$0.30). The rebate can be used for any type of future purchase.

Subsidy: Provides a fixed cash value amount to purchase specific foods. It is not linked to how much a consumer spends. It is often provided ahead of time in the form of a voucher, token or coupon and in theory could be added electronically to a payment or loyalty card, although this approach was not used in any of the studies.



Co-interventions: Most (22) programs included co-interventions such as nutrition education and skill-building, on-site promotion and placement of healthy foods, food tastings and cooking demonstrations, a media campaign, feedback on purchases, and purchasing restrictions.

Study design: Most (17) included a comparison group and 14 used random assignment to groups.

Country: Most studies took place in the US (19 studies), with smaller numbers in Australia, France, Denmark, Netherlands, New Zealand, Peru, South Africa and the UK.

Population: More than half of studies (16) enrolled exclusively low-income participants, five included a wider range of income groups, seven did not report income and one enrolled high-income participants. Eleven had predominantly non-white participants, nine had predominantly white and nine did not report race/ethnicity.



Examples of studies included in this review

Healthy Incentives Pilot (Olsho 2016²¹): 30% rebates (up to \$60 per household per month) to Supplemental Nutrition Assistance Program (SNAP) participants when purchasing fruits and vegetables (fresh, frozen or canned) at supermarkets, groceries, convenience stores and farmers markets. Rebates were deposited to electronic benefits transfer (EBT) accounts. Total fruit and vegetable intake increased by 0.24 cup/day - a 26% increase, enough to close the gap between current and recommended intake by 20%. The authors suggest that more marketing, promotional and nutritional education activities as well as inclusion of more retailers might lead to greater impacts.

SHELF: Supermarket Healthy Eating for Life (Ball 2015⁵): 20% discount on all fruits and vegetables (fresh, canned and frozen) at the time of supermarket purchase upon swiping a loyalty card. A second study arm received a behavioral intervention that included mailed skill-building nutrition information and tools, recipes and an online nutrition forum that included peer-to-peer discussions and support from a dietician. The discount increased purchases of fruit by 364 grams/week (35%) relative to controls and of vegetables by 233 grams/week (15%). The behavioral intervention had no effect.

Herman (2008¹³): \$10 weekly fruit and vegetable vouchers for WIC participants for use at farmers markets in one group or at supermarkets in a second group. Both groups saw an increase in fruit and vegetable consumption relative to the control group: about 2.8 servings per day in farmers markets and 1.6 servings per day in supermarkets (2 servings per day overall).

Michels (2008¹⁹): 20% discount of healthy food items in a hospital cafeteria along with distribution of education materials. Purchases of healthy foods increased and unhealthy foods decreased during the intervention by 6% relative to baseline. However, calories purchased did not change significantly.

Findings

Healthy food pricing incentives increase healthy food in the diet

Incentives increase healthy food consumption and purchases, particularly of fruits and vegetables.

Twenty-three of the 29 studies in our review showed a significant increase in fruit and/or vegetable consumption or purchases. Increases in consumption relative to comparison groups ranged from 0.28 - 0.38 times per day, 0.8-1.8 servings per day or 0.11-0.24 cups per day. For purchases, the increase ranged from 31-278 grams per day or \$0.34-\$8.16 per week. Incentives seemed more effective in increasing vegetable outcomes compared to fruit outcomes. Of the 11 studies that assessed both fruit and vegetable outcomes separately, eight reported significant effects on vegetables versus three on fruits.

Several prior reviews, including three published in 2017 or 2018, confirm that incentives increase consumption or purchases of healthy foods.³⁶⁻⁴⁸ Gittelsohn and colleagues reviewed 30 pricing intervention studies and found 23 reported increases in purchases or consumption of healthy products or decreases in unhealthy ones.³⁷ Most focused on fresh produce. Afshin and colleagues



included 23 intervention and 7 prospective cohort studies in a review quantifying the effects of changes in food prices on diet.³⁶ Decreases in prices of healthy foods overall, and of fruits and vegetables in particular, increased consumption. Study design, setting, duration, age of participants, presence of additional intervention components (e.g. education, healthy food promotion) did not influence the impact of incentives. Hartmann-Boyce and colleagues conducted a review of several real-world grocery store interventions and found that price decreases were more effective in increasing purchases of healthy foods compared to store environment changes and education interventions.³⁸

Features of effective healthy food pricing incentives

Our systematic review suggests that certain features of incentive programs are associated with significant increases in consumption or purchases of healthy foods:

- Providing incentives electronically (e.g. SNAP electronic benefits transfer or supermarket loyalty cards) rather than physically (e.g. paper voucher or coupon).
- Issuing incentives on more than one occasion rather than once.
- Offering incentives for longer periods of time (more than 24 weeks).
- Including a broader selection of healthy foods (e.g. all fruit and vegetable types rather than only fresh produce or incorporating additional types of healthy foods).
- Allowing redemption in stores in contrast to farmers markets.

In addition, neither larger incentives nor adding co-interventions to the incentive appeared related to the effectiveness of the program.

What foods/beverages should be eligible for healthy food pricing incentives?

Including a broad selection of healthy foods (e.g. all fruit and vegetable types rather than only fresh or additional types of healthy foods) increased the likelihood of finding significant increases in consumption or sales.

Considerations: It may be simplest to include only fresh produce for programs focused on stores as it is easy to determine which products are eligible. Including frozen and canned fruits stretches the incentive value further as they are generally less expensive than fresh produce. They are also less perishable, making it easier for some types of stores to stock them. However, packaged foods may have added sodium and sugars, requiring exclusion of products that exceed thresholds for these ingredients and thus complicating program implementation. On balance, including canned and frozen produce is reasonable.



Incentives should not be limited to local produce unless supporting local agriculture is the primary goal of the program as this adds considerable complexity to program implementation.



What should the amount of healthy food pricing incentives be?

Larger incentives did not appear to be associated with significant outcomes, nor did presence or absence of an incentive cap.

Considerations: There is a trade-off between providing larger incentives without caps (greater cost per participant) and numbers of people who benefit. Some of the key informants suggested a minimum of a 20-30% price decrease for supermarkets and 50% for farmers markets. They noted that larger incentives may be needed to attract people to farmers markets. They also suggested that if a cap were included, it should range from \$50 to \$100 per month per household.

How often and for what duration should the incentive be awarded?

Significant outcomes seemed somewhat more likely in programs that delivered incentives on more than one occasion, compared to those that gave the incentive once. An association between the time when the incentive could be used (immediately or in the future) and significant outcomes was not apparent. Programs of longer duration (greater than 24 weeks) were associated with significant outcomes.

Considerations: While it may be simpler to provide the incentive once upon enrollment, more frequent provision may be associated with better outcomes. It would seem that immediate redemption of incentives would increase use, but this hypothesis has not yet been tested.

What type of incentive should be offered?

The type of incentive did not appear to be associated with significant study outcomes.

Considerations: This finding should be viewed with caution, as there were relatively few studies in each category. More information is needed on this topic.

How should the incentive be provided?

Studies with electronic provision of incentives had significant findings more often than those with physical incentives.

Considerations: In addition to possibly greater effectiveness, electronic provision provides a seamless customer experience in which incentives can be used immediately. Providing incentives electronically at the point of sale for immediate use may increase redemption rates. Electronic systems also facilitate data collection and monitoring.





Where should healthy food pricing incentives be redeemed?

Programs in which participants used their incentives at stores seemed more likely to report significant findings compared to programs based exclusively at farmers markets.

Considerations: If the primary goals of the program are to improve nutrition by increasing healthy food access and maximizing redemption rates, then redemption at supermarkets (and other stores that are participants' preferred and accessible shopping sites) may be the appropriate approach. If the goal is to support local agriculture or build community, then redemption at farmers markets could be considered. Each site comes with its own set of challenges. At supermarkets, assuring consistent staff training, cashier turnover, and modifying electronic data systems may be issues. Farmers markets may find it difficult to implement electronic payment systems, serve relatively small numbers of customers, are often seasonal, may have locations that are difficult for low-income people to access, and often have higher prices relative to supermarkets. Smaller groceries may lack electronic systems and find it difficult to stock a variety of perishable produce items. Cafeterias and restaurants may face challenges with cashier training and turnover.



Is it useful to add additional co-intervention components to the pricing incentive?

An association between the presence of a co-intervention and study significance was not apparent.

Considerations: Among the 22 studies that included both incentives and one or more additional co-intervention strategies, nine looked at the co-intervention independent of incentives. The remaining 13 studies combined the two and were unable to assess the effect of incentives independent of other interventions. The apparent lack of additional benefit from co-interventions suggests that innovative or enhanced co-interventions should be evaluated. Prior reviews have concluded that current evidence does not show a significant impact from store-based nutrition education.⁴⁶⁻⁴⁸ Our key informants offered mixed opinions about adding education co-interventions. Among those who endorsed this approach, cooking and nutrition education were most commonly mentioned.





Additional considerations for healthy food pricing incentive programs

The findings from the studies in the systematic review did not address all of the issues relevant to incentive program implementation. We gained additional insights from the key informant interviews, web pages and online documents, discussions in the studies in our systematic review, and conclusions of other systematic reviews.



Outreach, enrollment and marketing: Outreach to increase participation in incentive programs contributes to success. Partnerships with WIC, Medicaid and SNAP programs and community-based organizations that are well-connected to potential users are effective approaches. Incentive programs should be user-friendly: easy to understand, easy to use, with simple enrollment processes, and available where the participants prefer to shop. Most programs serve people enrolled in SNAP or WIC. Eligibility could be expanded to people eligible for SNAP or WIC but not enrolled, the working poor with incomes above SNAP and WIC thresholds, Medicaid-enrolled or eligible people, or those with health conditions needing specific diets, such as people with diabetes. Communities could consider prioritizing households with children. A note of caution - aggressive program promotion has led to early closing of enrollment when demand for incentives exceeded supply.



Training: Training for frontline staff issuing and redeeming incentives, especially supermarket cashiers, is critical for program success. Staff must be able to inform customers about incentives and issue them properly. Staff turnover and the complexities of working within large food retail companies are challenges.

Partnerships: Successful programs are built on strong partnerships. Partners have included Farmers Market Associations, local food advocates, SNAP and WIC programs, health care providers, supermarkets and other food stores, and public health agencies.

Co-benefits: Healthy food pricing incentives may offer benefits beyond impacts on food purchases and consumption. If goals are to support local agriculture and the local economy, then redemption at farmers markets or including local produce may be considered. However, geographic restrictions on eligible products may add considerable administrative complexity. If a goal is to improve self-management of chronic diseases, provision of incentives through a food prescription program at health care sites is an option.



Challenges of healthy food pricing incentive programs

Additional challenges have surfaced in the implementation of incentive programs.

Funding: Securing funds to sustain and scale-up pilot or demonstration projects, often launched with one-time grant funding, may be the greatest challenge to realizing the potential of the incentive strategy. It is encouraging that the 2018 Farm Bill includes \$250 million over five years to support incentives through continuation of the Food Insecurity Nutrition Incentive program, although this level of funding will only support modest expansion. Additional potential funding streams include SNAP enhancements, and other revenue sources such as sugary drink taxes, and hospital community benefit funds. If incentive program evaluations were to demonstrate increased revenues in stores through generation of additional business, the stores themselves might fund incentives.

Technology: Setting up electronic transaction systems and overcoming interoperability barriers is a common challenge as it requires adequate funding, staffing resources, and addressing technical challenges.

Defining healthy foods: If more than fresh produce is included in an incentive program, expect challenges defining what foods are eligible. Maintaining a list of eligible processed and packaged foods is difficult as product nutritional content changes over time, new products are introduced, and agreement on the nutrition criteria for inclusion may be difficult.



Fraud and misuse: None of the studies or key informants reported fraud as a major problem, but potential for misuse remains a concern. Paper vouchers are vulnerable to fraud and should include anti-fraud features. Assuring that incentives are applied only to eligible food items at time of payment has been an issue.

What we still need to learn about healthy food pricing incentives

While it is clear that pricing incentives increase consumption and purchases of targeted foods, much remains unknown about how best to design programs to maximize impact and efficiency. Our ability to reach more definitive conclusions about desirable program features was limited by the broad range of study designs, outcome measures, and analytic methods employed. Well-designed studies are now needed to learn which program features contribute most to effectiveness, how to implement programs efficiently and sustainably, and how incentives can be tailored to specific populations.

Study design: Future evaluations should use strong research designs and include common outcome measures to allow comparison across studies and pooling of data. Measures should include overall diet quality of all household members, and specifically assess substitution effects (including changes in less



healthy food consumption and total daily energy intake). Information on health outcomes such as weight, diabetes and intermediate biomarkers is also needed.

Program features and design: New studies should directly compare different approaches to provision of incentives, especially incentive size and whether it should vary by food type (e.g. higher rate for vegetable incentives as these may have a smaller impact relative to fruits or providing larger incentives for a smaller set of foods), mechanism (e.g. rebate, subsidy, etc.), timing (e.g. availability for immediate use or in the future), duration of program enrollment, and redemption sites. Given the enthusiasm for including co-interventions and the lack of evidence that they add additional benefit, future research should assess the added value and required intensity of nutrition education and skill building, healthy product placement and promotion (e.g. signage, shelf talkers, point of purchase marketing, product labels, taste tests), and discouraging intake of less healthy foods. Assessment of whether effects are sustained after participants exit a program is needed.

Participant characteristics: Greater knowledge of the shopping patterns of target populations would allow tailoring of programs to specific groups of participants. Whether the effectiveness of incentives varies by race/ethnicity or socioeconomic status is unknown as few studies have specifically addressed this issue.



Economic effects: Deeper understanding of incentive effects on measures of participant economic well-being, including food security, total food expenditures, and net household income would allow fuller appreciation of potential benefits. More knowledge about economic effects on food retailers, distributors, manufacturers and producers would be valuable, especially impacts on total revenues and whether the costs of incentives might be offset by additional sales. Documenting the extent of other co-benefits, including support of local economies and agriculture and on community building is needed. Cost-effectiveness evaluation from the perspectives of government, the health sector, and food system stakeholders would provide useful data for resource allocation decisions.

Program implementation: The field would benefit from better descriptions of program implementation and lessons learned, including factors associated with higher program participation and incentive redemption rates.

Intensity versus reach: Exploration of the trade-offs between maximizing effect size at the individual level through more intensive programs with large incentives and high or no caps that reach fewer participants versus enrolling larger numbers of participants with less intensive programs, perhaps through modeling studies, would be valuable.



Conclusion

Good quality evidence from scientific studies supports the use of pricing incentives to increase consumption and purchases of healthy foods, especially fruits and vegetables. What is less evident are the specific program characteristics associated with improvements in nutrition. Our review suggests that providing the incentive electronically on more than one occasion for 24 weeks or longer, including a broad selection of healthy foods (e.g. processed fruit and vegetables in addition to fresh produce or additional types of healthy foods), and focusing on redemption in stores may contribute to success. More information is needed to validate these conclusions, better understand the effects of incentive amount and type (match, rebate, subsidy, discount), optimize outreach and enrollment, and explore the role of nutrition or cooking education and other co-interventions. The effects of incentives on overall diet quality remain unknown.

Pricing incentives increase purchases and consumption of healthy foods. It is now up to policy makers, food producers and retailers, community organizations and institutions, and advocates to make incentives more widely available to people who most need them and to optimize program design.

Additional Resources

A Qualitative Evaluation of the United States Department of Agriculture's Food Insecurity Nutrition Incentive Grant Program. (2018). Gretchen Swanson Center for Nutrition. (2018).

<http://www.centerfornutrition.org/her-fini>

The Power of Produce: Healthy Food Incentives Empower Families, Support Farmers and Lift Up Communities, The Food Trust's Center for Healthy Food Access, Fair Food Network and Wholesome Wave (2018).

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Acknowledgments

We thank each of the following individuals for sharing their thoughts, expertise, and resources with us:

Tatiana Andreyeva, *University of Connecticut and Rudd Center for Food Policy & Obesity*

Alyssa Auvinen, *Washington State Department of Health*

Kylie Ball, *Deakin University*

Skye Cornell, *Wholesome Wave*

Joel Gittelsohn, *Johns Hopkins Bloomberg School of Public Health*

Oran B. Hesterman, *Fair Food Network*

Bridget Igoe, *City of Seattle*

Allison Karpyn, *University of Delaware*

Julia Koprak, *The Food Trust*

Francois Millard, *Vitality Group International*

Courtney Parks, *Gretchen Swanson Center for Nutrition*

Michele Polacsek, *University of New England*

Hilary Seligman, *EatSF and University of California, San Francisco*

Dwayne Wharton, *The Food Trust*

Parke Wilde, *Tufts University*

Jim Krieger and Kirsten Leng (Healthy Food America) authored this report, conducted the systematic review and key informant interviews and are responsible for the content of this report. Diana Loudon (University Libraries, University of Washington) assisted with the systematic review database search. Leslie Bennett assisted with the systematic review article selection.

This work was partially supported by a Nimble Fund Grant from the Pacific Hospital Preservation and Development Authority.