

## Food Provision

### Overview

This paper outlines our approach to measuring the impact of food provision programs in the Canadian context. In particular, we have explored research related to the short- and long-term benefits to individuals and society of food given to the people who need it most. Appendix III provides a partial bibliography of the studies that we used to inform our model<sup>1</sup>. Studies were selected based on their relevancy to different aspects of our model and availability of quantitative results. Results were weighted according to things like recency, geography, research design, and overall strength. These studies represent a fraction of the existing research literature on the benefits of food provision, a comprehensive review of which would exceed the limits of our resources. We acknowledge this limitation and have done our best to provide as thorough a survey of the research as possible with the studies we have selected.

### The Social Return on Investment (SROI) to Food Provision Programs

#### Outcome Categories

Our research finds multiple categories of outcomes connected to food provision – see Table I. This is not intended as an exhaustive list of all possible outcomes connected to food provision.

**Table I – Food Provision Programs Outcome Categories**

<b>Outcome Category</b>	<b>Description</b>	<b>Client Group</b>
<i>Personal Cost Savings</i>	Cost savings related to food received free of charge or at a discounted price <sup>2</sup> .	Adults, Youth, and Children
<i>Health Care System</i>	Lesser health care costs due to having more to eat.	Adults, Youth, and Children
<i>Quality of Life</i>	Improved quality of life due to having more to eat.	Adults, Youth, and Children
<i>Mortality</i>	Lesser risk of mortality due to having more to eat.	Adults, Youth, and Children
<i>High School Completion</i>	Greater high school completion due to having more to eat.	Youth and Children

<sup>1</sup> We focus on studies that were chosen as relating specifically to food provision, and exclude more general sources of data that inform multiple program models.

<sup>2</sup> A percentage of clients of a food provision program are expected to be food secure. We assume food secure clients would be able to access food on their own even without the program, by purchasing food for themselves. For food secure clients, the main outcome is assumed to be food cost savings, or money saved on food that they no longer have to purchase at full retail price. A greater percentage of clients are expected to be food insecure, who we assume would not have had access to food if not for the program (i.e., would have been unable to purchase food for themselves). For food insecure clients, the other outcomes (improved quality of life, lesser risk of mortality) come into play.

### Social Return on Investment Model

We use a Social Return on Investment methodology to measure the impact of charitable activities. The SROI is an estimate of the total dollar value of social benefits that are realized as a result of a charity's programs divided by the charity's costs. Costs include program, administration, and fundraising costs, as well as the cost of goods in kind used in charitable activities and amortization on assets. Data informing the costs side of the SROI equation come from a charity itself and generally are readily accessible. As such, we focus our research and this paper on the data informing the benefits side of the SROI equation.

The total dollar value of social benefits is the sum of the dollar values of often dozens of individual outcomes (or changes) brought about by a charity's programs. The calculation of the dollar value of a particular outcome requires knowledge of several pieces of information. We summarize these in Table II, providing examples in the context of food provision programs.

**Table II – Basic Components of Social Benefits Model**

<b>Model Component</b>	<b>Description</b>	<b>Example</b>
<i>Number of Clients</i>	The total unique number of clients provided a service or involved in a program (i.e., the total number of clients where each client is counted only once).	The number of clients provided food through a food provision program (e.g., 100).
<i>Baseline Distribution</i>	The percentage of clients in one of potentially multiple, mutually exclusive groups which differ in some important way, leading to different outcomes.	The percentage of clients who are food secure, or marginally, moderately, or severely food insecure (e.g., 37, 19, 28, and 16 percent).
<i>Marginal Success Rate</i>	The percentage of clients who achieve an outcome, net of the percentage of clients who would have achieved the outcome anyway, even without the program.	In the context of high school completion, the percentage of clients who are expected to complete high school, net of the percentage who are expected to have completed high school anyway (e.g., 5 percentage points).
<i>(Annual) Outcome Value</i>	The annual, per person dollar value of a particular change that has happened due to a program or service.	In the context of severely food insecure clients, the average annual value per person of lesser health care costs due to having more to eat (e.g., \$2,200).
<i>Start and End Years</i>	The number of years that must pass after completion of a program, 1) before the annual outcome value begins to take effect (start year), and 2) after which the annual outcome value is no longer considered (end year).	In the context of quality of life, 1) the average number of years until the beginning of improved quality of life, and 2) the start year plus the duration of improved quality of life (e.g., 0 and 1).
<i>(Annual) Drop-Off</i>	The percentage of clients who initially achieve an outcome but lose it over time.	<i>There is no drop-off value in the context of food provision.</i>

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<i>Baseline Attribution</i>	The amount of credit a charity gets for a particular outcome, typically based on its contribution to the total cost of a service or program.	The share of the total cost of an entire food provision system borne by a focal charity (e.g., 55 percent) <sup>3</sup> .
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In addition to the above, we consider various elements of outcome value depreciation over time. In this context, *attribution decay* accounts for the fact that, over time, other factors besides the initial intervention will contribute to a client's success, such that the original (baseline) attribution percentage should fall incrementally (we have chosen a rate of 10 percent per year). Similarly, *time discounting* is a standard adjustment in the field of economics to value outcomes that are achieved earlier in time more highly than those achieved later in time (we have chosen a discount rate of 3 percent per year). These adjustments apply to all programs.

## An Example SROI

The total dollar value of social benefits of a food provision program will change based on several factors. We identify in Table III the variables affecting the food provision social benefits model.

**Table III – Food Provision Social Benefits Model Variables**

Variable	Description	Example
<i>Number of Clients</i>	The number of clients served.	100
<i>Geography</i>	The province or territory wherein clients are served, or Canada as a whole.	Canada
<i>Age Group</i>	The age group of clients (adults, youth, or children).	Adults
<i>Gender</i>	The gender of clients (female or male <sup>4</sup> ).	Female
<i>Age</i>	The average age of clients.	35
<i>Attribution</i>	The portion of program costs borne by the focal charity.	58 percent
<i>Total Food Distributed</i>	The total pounds of food distributed to clients.	13,000
<i>Means of Food Provision</i>	The means of food provision (direct or indirect) <sup>5</sup> .	Direct
<i>Cost of Purchased Food</i>	The cost per pound of food purchased by a charity which is used in charitable activities.	\$3.61
<i>Food Wastage</i>	The percentage of food meant for clients' consumption which goes to waste before reaching clients.	5 percent
<i>Sources of Food</i>	The percentage of food meant for clients' consumption which is purchased by a charity, donated to it by private donors, corporate donors, or other	33, 33, 13, 20, and 0 percent

<sup>3</sup> Food provision in a charitable context involves many different actors working together to get food to the people who need it. Charities receive food donations from private and corporate donors, and from other charitable food providers, and they may themselves give food to another organization down the line which is responsible for actually giving the food to clients. All the actors in the network incur costs while working toward the same outcome – food to people who need it – such that the costs incurred by a focal charity in this network are only a percentage of the total cost.

<sup>4</sup> Note that the binarization of this variable is for technical reasons, as we do not yet have research specific to non-binary individuals.

<sup>5</sup> We distinguish between food that is provided directly to clients versus indirectly to clients through an intermediary organization. This affects our estimate of the total cost of the food provision system and consequently attribution.

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	charitable organizations (e.g., food banks), or is grown by the charity.	
<i>Food Rescued</i>	The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.	25 and 14 percent
<i>Clients' Needs Levels</i>	The percentage of clients who are food secure, or marginally, moderately, or severely food insecure.	37, 19, 28, and 16 percent
<i>Client Fees</i>	The amount of money clients pay per pound of food given to them.	\$0.00

It is beyond the scope of this paper to identify all of the data that go into the impact model for a food provision program, as each outcome category involves several specific values for each of the components of our model, described in Table II. As such, a full account of each outcome would overwhelm this paper. Instead, based on the information in Table III, we present final estimates of social benefits of a food provision program. In Appendix II we identify the types of data that inform the various components of our model. Some of these data are from program-specific research (e.g., annual health care costs among individuals of different food security statuses), while others are common to multiple program models (e.g., annual outcome values connected to high school completion).

As part of our process, we identify certain 'final' outcomes downstream from the outcome categories identified in earlier sections of this paper. We estimate the total social benefits of a program by summing the values of final outcomes. In cases where the same final outcomes are connected with multiple outcome categories, those with the greatest absolute values are included in the sum. This is to simplify the presentation of our findings and to account for potential double-counting in our model (e.g., overlapping values connected to different education outcomes, in the context of other models). We present in Table IV the total social benefits of our example food provision program. In Appendix I, we present our formula for bringing together all of the various components of our approach to valuing a particular final outcome – for example, in the context of food provision programs, lesser health care system costs.

**Table IV – Total Social Benefits, Example Food Provision Program**

<b>Outcome Category</b>	<b>Final Outcome</b>	<b>Total Social Benefits (\$)</b>
<i>Personal Cost Savings</i>	Cash on Hand, Cost Savings (Food)	17,433
<i>Health Care System</i>	Public Systems, Health Care	41,936
<i>Quality of Life</i>	Quality of Life, Mental Health	32,465
	Quality of Life, Physical Health	97,395
<i>Mortality</i>	Mortality, All Causes	4,333
		193,562

As can be seen in Table IV, the total social benefits of our example food provision program is about \$200,000, or \$2,000 in short- and long-term benefits per client. The SROI to this example program would then be calculated by dividing the total social benefits by the total cost of the program. Thus, if the program costs \$2,000 per client, the SROI would be 1.0. If it costs \$400, the SROI would be 5.0. That is, \$5 of social value created for every \$1 of costs.

These estimates are based on a particular set of circumstances, and there is a wide range of possible results for food provision programs. As identified in Table III, our food provision model involves several variables, differences in any one of which will affect the estimate of total social benefits. Depending on the unique circumstances of and data available from a charity, estimates of the impact of

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a program could vary considerably. In particular, the onus is on charities to provide data about things like clients' needs levels and sources of food used in charitable activities. When charity data are not available, we make conservative assumptions about things like needs levels and food sources, such that specific estimates of total social benefits may be smaller than those in this paper.

## Appendix I – Charity Intelligence Outcome Valuation Formula

As it relates to the total social benefits of a charity program, we calculate the total dollar value of a particular outcome, for all clients who are candidate for it, using the following formula.

$$TV = \frac{(ba \times c \times bd \times msr \times ov \times ((1 - do) \times (1 - ad))^{-ys} \times (((1 - do) \times (1 - ad) \times (1 - td))^{ys} - ((1 - do) \times (1 - ad) \times (1 - td))^{ye}))}{1 - ((1 - do) \times (1 - ad) \times (1 - td))}$$

where:

*TV* is the total value of a particular outcome, for all clients

*ba* is baseline attribution

*c* is the total number of clients candidate for a particular outcome

*bd* is baseline distribution percentage

*msr* is the marginal success rate

*ov* is the annual per person value of an outcome

*do* is drop-off

*ys* is year start

*ye* is year end

*ad* is attribution decay

*td* is time discounting

Based on our example food provision program, we estimate the total dollar value of lesser health care system costs due to food provision. This value is a summation of three estimates, based on the food security (needs) levels of clients (marginally, moderately, or severely food insecure). Below, we identify the data informing the components of our model for valuing an outcome, for severely food insecure clients. Our intention here is not to explain the derivation of these data, but just to illustrate how the formula for valuing a given outcome works.

Model Component	Value
<i>Number of Clients</i>	100
<i>Baseline Distribution</i>	16.0 percent
<i>Marginal Success Rate</i>	100.0 percentage points
<i>(Annual) Outcome Value</i>	\$2,240
<i>Start Year</i>	0.0
<i>End Year</i>	1.0
<i>Drop-Off</i>	0.0 percent
<i>Baseline Attribution</i>	58.0 percent
<i>Attribution Decay</i>	10.0 percent
<i>Time Discounting</i>	3.0 percent

Inputting these data into the formula, we get:

$$= \frac{(58.0\% \times 100 \times 16.0\% \times 100.0\% \times \$2,240 \times ((1 - 0.0\%) \times (1 - 10.0\%))^{-0.0} \times (((1 - 0.0\%) \times (1 - 10.0\%) \times (1 - 3.0\%))^{0.0} - ((1 - 0.0\%) \times (1 - 10.0\%) \times (1 - 3.0\%))^{1.0})}{1 - ((1 - 0.0\%) \times (1 - 10.0\%) \times (1 - 3.0\%))}$$

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$$= \$20,804^6$$

The comparable values for marginally and moderately food insecure clients are \$5,244 and \$15,888. Summing these together, we get \$41,936 for the total value of lesser health care system costs.

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<sup>6</sup> The difference between this figure and what you would get by the formula is due to rounding in the provided data.

## Appendix II – Types of Data Informing Social Benefits Model Components

<b>Personal Cost Savings</b>	
<i>Number of Clients</i>	<ul style="list-style-type: none"> <li>The number of clients provided food through a food provision program.</li> </ul>
<i>Baseline Distribution</i>	<ul style="list-style-type: none"> <li>The distribution of clients based on food security (needs) level – food secure, or marginally, moderately, or severely food insecure.</li> </ul>
<i>Marginal Success Rate</i>	<i>There is no marginal success rate value in the context of personal cost savings.</i>
<i>(Annual) Outcome Value</i>	<ul style="list-style-type: none"> <li>The retail cost per pound of food provided to clients.</li> <li>The average number of pounds of food provided to clients.</li> <li>The amount of money clients pay for the food given to them.</li> </ul>
<i>Start and End Years</i>	<i>In the context of personal cost savings, outcome values are counted over one year, concurrent with the year in which food was given to clients.</i>
<i>(Annual) Drop-Off</i>	<i>There is no drop-off value in the context of food provision.</i>
<i>Baseline Attribution</i>	<ul style="list-style-type: none"> <li>The total pounds of food provided to clients by the charity.</li> <li>The means of food provision – direct or indirect.</li> <li>The total operating costs of the charity and of other charitable organizations part of the food provision network.</li> <li>The cost per pound of food purchased by the charity, for use in charitable activities.</li> <li>The percentage of food meant for clients' consumption that goes to waste before reaching clients (i.e., food wastage)</li> <li>The percentage of food meant for clients' consumption that is purchased by the charity, donated to it by private donors, corporate donors, or other charitable organizations, or is grown by the charity.</li> <li>The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.</li> </ul>
<b>Health Care System</b>	
<i>Number of Clients</i>	<ul style="list-style-type: none"> <li>The number of clients provided food through a food provision program.</li> </ul>
<i>Baseline Distribution</i>	<ul style="list-style-type: none"> <li>The distribution of clients based on food security (needs) level – food secure, or marginally, moderately, or severely food insecure.</li> </ul>
<i>Marginal Success Rate</i>	<i>There is no marginal success rate value in the context of health care system costs.</i>
<i>(Annual) Outcome Value</i>	<ul style="list-style-type: none"> <li>The annual costs to the health care system per food secure or marginally, moderately, or severely food insecure person.</li> <li>The number of pounds of food required per marginally, moderately, or severely food insecure person to move up one or more levels of food security.</li> <li>The average number of pounds of food provided to clients.</li> </ul>
<i>Start and End Years</i>	<i>In the context of health care, outcome values are counted over one year, concurrent with the year in which food was given to clients.</i>
<i>(Annual) Drop-Off</i>	<i>There is no drop-off value in the context of food provision.</i>



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<i>Baseline Attribution</i>	<ul style="list-style-type: none"> <li>• The total pounds of food provided to clients by the charity.</li> <li>• The means of food provision – direct or indirect.</li> <li>• The total operating costs of the charity and of other charitable organizations part of the food provision network.</li> <li>• The cost per pound of food purchased by the charity, for use in charitable activities.</li> <li>• The percentage of food meant for clients' consumption that goes to waste before reaching clients (i.e., food wastage)</li> <li>• The percentage of food meant for clients' consumption that is purchased by the charity, donated to it by private donors, corporate donors, or other charitable organizations, or is grown by the charity.</li> <li>• The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.</li> </ul>
<b>Quality of Life</b>	
<i>Number of Clients</i>	<ul style="list-style-type: none"> <li>• The number of clients provided food through a food provision program.</li> </ul>
<i>Baseline Distribution</i>	<ul style="list-style-type: none"> <li>• The distribution of clients based on food security (needs) level – food secure, or marginally, moderately, or severely food insecure.</li> </ul>
<i>Marginal Success Rate</i>	<i>There is no marginal success rate value in the context of quality of life.</i>
<i>(Annual) Outcome Value</i>	<ul style="list-style-type: none"> <li>• The annual cost per person of lesser quality of life related to mental health between food secure and marginally, moderately, and severely food insecure individuals.</li> <li>• The annual cost per person of lesser quality of life related to physical health between food secure and marginally, moderately, and severely food insecure individuals.</li> <li>• The number of pounds of food required per marginally, moderately, or severely food insecure person to move up one or more levels of food security.</li> <li>• The average number of pounds of food provided to clients.</li> </ul>
<i>Start and End Years</i>	<i>In the context of quality of life, outcome values are counted over one year, concurrent with the year in which food was given to clients.</i>
<i>(Annual) Drop-Off</i>	<i>There is no drop-off value in the context of food provision.</i>
<i>Baseline Attribution</i>	<ul style="list-style-type: none"> <li>• The total pounds of food provided to clients by the charity.</li> <li>• The means of food provision – direct or indirect.</li> <li>• The total operating costs of the charity and of other charitable organizations part of the food provision network.</li> <li>• The cost per pound of food purchased by the charity, for use in charitable activities.</li> <li>• The percentage of food meant for clients' consumption that goes to waste before reaching clients (i.e., food wastage)</li> <li>• The percentage of food meant for clients' consumption that is purchased by the charity, donated to it by private donors, corporate donors, or other charitable organizations, or is grown by the charity.</li> <li>• The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.</li> </ul>

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<b>Mortality</b>	
<i>Number of Clients</i>	<ul style="list-style-type: none"> <li>The number of clients provided food through a food provision program.</li> </ul>
<i>Baseline Distribution</i>	<ul style="list-style-type: none"> <li>The distribution of clients based on food security (needs) level – food secure, or marginally, moderately, or severely food insecure.</li> </ul>
<i>Marginal Success Rate</i>	<ul style="list-style-type: none"> <li>The difference in annual mortality rate among food secure and marginally, moderately, or severely food insecure individuals.</li> <li>The number of pounds of food required per marginally, moderately, or severely food insecure person to move up one or more levels of food security.</li> <li>The average number of pounds of food provided to clients.</li> </ul>
<i>(Annual) Outcome Value</i>	<ul style="list-style-type: none"> <li>The cost per person of a full year of lost life.</li> </ul>
<i>Start and End Years</i>	<i>In the context of mortality, outcome values are counted over one year, concurrent with the year in which food was given to clients.</i>
<i>(Annual) Drop-Off</i>	<i>There is no drop-off value in the context of food provision.</i>
<i>Baseline Attribution</i>	<ul style="list-style-type: none"> <li>The total pounds of food provided to clients by the charity.</li> <li>The means of food provision – direct or indirect.</li> <li>The total operating costs of the charity and of other charitable organizations part of the food provision network.</li> <li>The cost per pound of food purchased by the charity, for use in charitable activities.</li> <li>The percentage of food meant for clients' consumption that goes to waste before reaching clients (i.e., food wastage)</li> <li>The percentage of food meant for clients' consumption that is purchased by the charity, donated to it by private donors, corporate donors, or other charitable organizations, or is grown by the charity.</li> <li>The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.</li> </ul>
<b>High School Completion<sup>7</sup></b>	
<i>Number of Clients</i>	<ul style="list-style-type: none"> <li>The number of clients provided food through a food provision program.</li> </ul>
<i>Baseline Distribution</i>	<ul style="list-style-type: none"> <li>The distribution of clients based on food security (needs) level – food secure, or marginally, moderately, or severely food insecure.</li> <li>The baseline distribution values associated with high school completion.</li> </ul>
<i>Marginal Success Rate</i>	<ul style="list-style-type: none"> <li>The difference in rate of high school completion between food secure and food insecure students.</li> <li>The number of pounds of food required per marginally, moderately, or severely food insecure person to become food secure.</li> <li>The average number of pounds of food provided to clients.</li> <li>The average age of clients relative to the number of years until high school completion.</li> <li>The marginal success rate values associated with high school completion.</li> </ul>

<sup>7</sup> For more information on educational attainment, see the Educational Support summary paper.

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<i>(Annual) Outcome Value</i>	<ul style="list-style-type: none"><li>• The annual values per person of outcomes associated with high school completion.</li></ul>
<i>Start and End Years</i>	<ul style="list-style-type: none"><li>• The start and end years of outcomes associated with high school completion.</li></ul>
<i>(Annual) Drop-Off</i>	<i>There is no drop-off value in the context of food provision.</i>
<i>Baseline Attribution</i>	<ul style="list-style-type: none"><li>• The total pounds of food provided to clients by the charity.</li><li>• The means of food provision – direct or indirect.</li><li>• The total operating costs of the charity and of other charitable organizations part of the food provision network.</li><li>• The cost per pound of food purchased by the charity, for use in charitable activities.</li><li>• The percentage of food meant for clients' consumption that goes to waste before reaching clients (i.e., food wastage)</li><li>• The percentage of food meant for clients' consumption that is purchased by the charity, donated to it by private donors, corporate donors, or other charitable organizations, or is grown by the charity.</li><li>• The percentage of food donated by private versus corporate donors that would have gone to waste if not for a charity's redistribution efforts.</li></ul>

### Appendix III – Bibliography of Studies Used to Inform Food Provision Model

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