

Economic Contribution and Potential Impact of Local Food Purchases Made by Vermont Schools

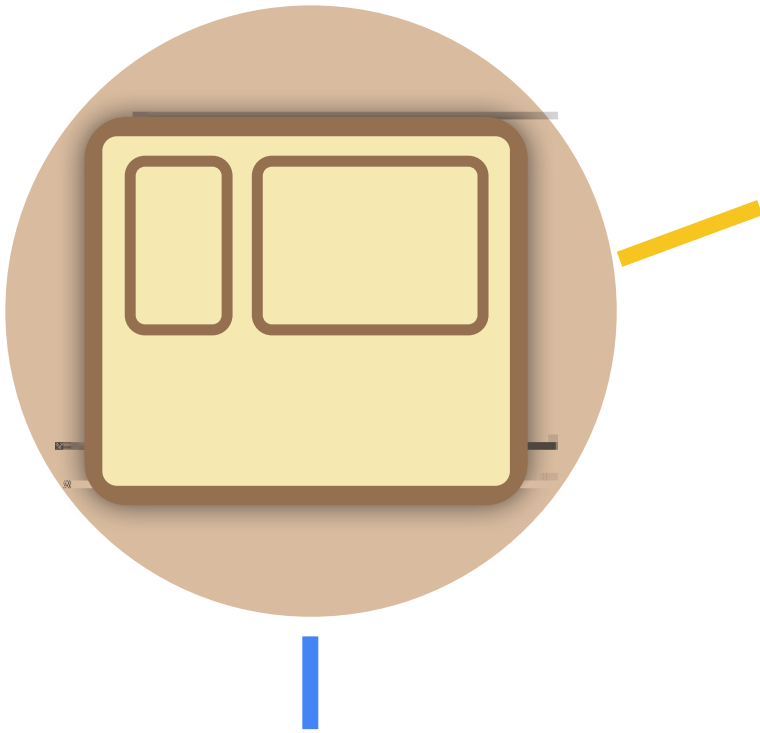
FINAL REPORT

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Prepared for the Vermont Farm to School Network's
Economic Value Working Team

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EXECUTIVE SUMMARY

In 2015, the Vermont Farm to School (FTS) Network's Economic Value Working Team partnered with the Center for Rural Studies (CRS) and the Department of Community Development and Applied Economics (CDAE) at the University of Vermont (UVM) to measure the economic contribution and impacts of FTS in Vermont. The dollar value of local food purchased by Vermont schools had never been quantified before, and the team was interested in understanding the current contribution of local purchasing as well as the estimated impact of several proposals.

To ensure that the results of the study were grounded in past research, an extensive review of the literature was conducted and a number of economic impact studies conducted in other states and regions were identified, most of which demonstrated that increasing local food purchasing by schools had a minimal effect on the broader economy. In some cases this was due to estimating the impact of a change in a small portion of the state on the whole state's economy. For other studies, including this one, increases in local purchasing were assumed to be shifted from non-local purchases (rather than new purchases), implying some loss of business for wholesalers.

This report also considers research on the potential effect of increased fruit and vegetable consumption and FTS programs on children's health, nutrition, and education, though much of this literature was speculative and less conclusive than the economic studies. Lastly, the research on the impact of "universal" school meals was reviewed. While this research is largely optimistic as to impact, most of it is based on pilot implementations of universal meals with gaps in data such as actual administrative savings, cost of implementation, and cost to the taxpayers.

This study of the economic contribution of local food purchasing by schools in Vermont demonstrated a small but measurable impact on the Vermont economy. It should be noted that the estimate of 5.6%

jobs multiplier associated with school local food purchases remains the same but the total number of jobs increases from 7.3 to 10.5.

Scenarios 2a and 2b both looked at the impact of universal school meals on the Vermont economy. While the economic benefit was very small, it appears that at least the costs of the programming would be overcome through economic impact.

In conclusion, while the impact of schools' purchase of local foods may be a small contribution to the overall Vermont economy, the predictability of the school market provides a foundation upon which Vermont producers can reliably expect a market for their products. Further, this research has documented the opportunity for increasing local purchasing by schools in Vermont.

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INTRODUCTION

The percentage of school districts implementing FTS programs varies by state. FTS is most prevalent

range of percent increases depending on how much food is purchased locally. At the lowest level of purchasing the increase is less than 1%, and at the highest level the increase is around 10%. A relatively large positive direct effect, but small and negative induced effects were found. This is due to the fact that the study accounted for price increases funded through taxes, leading to a reduction in disposable income for households. However, as a whole the total effect is greater than the direct effect, indicating economic growth.

In Oregon, Kane et al. (2010) set out to model the impact of spending an additional \$0.07 per school meal to buy local food in two school districts, based on the premise of a proposed state law. Unlike other studies that assume local food purchases are substituted from existing non-local food purchases, Kane et al. (2010) assumed new spending. Through a grant, the two school districts purchased \$160,000 in local food; the study assumes that this grant led to an additional \$461,000 in local food purchases by these school districts. In total, Kane et al. (2010) calculated the economic contribution of \$1.6 million local food purchases and found a total impact of \$2.1 million, and a multiplier of 1.86. The local purchases that Kane et al. (2010) chose to account for did not include milk and butter, which at the time represented 43% of local food purchase (these purchases were already made and they assumed that they would not spur additional economic activity.) Kane et al. (2010) conclude that local fruits and vegetables require more labor to prepare than non-local fruits and vegetables, which are usually purchased processed. Based on their model, they estimate that between \$.07 and \$.15 per meal would be the optimum amount required as a minimum incentive for schools to switch from current purchasing channels to local foods. However, it is important to note that further analysis is required to school districts in the U.S. to switch from current purchasing channels to local foods.

Table 1. Summary of Identified FTS Economic Impact Studies



at the impact of FTS on dietary intake, 15 found that dietary intake was improved when students were served more fruits and vegetables. Additionally, three of these studies reported improved behavioral items, including self-esteem, money-saving, social skills, responsible behavior, and improved work ethic. One of these studies reported no changes in dietary behavior from FTS, and another study examined BMI and found no significant changes after one year. Only three studies examined parental behavior change, and they indicated a slight increase in parental encouragement of healthy snacking, and a 90% rate of self-reported positive changes in healthy grocery shopping, cooking at home, and conversations with kids about healthy food. However, Joshi, Azuma & Feenstra (2008) acknowledged that the extent of data driven research is still very small. Much of the available research cited results from those responsible for instilling and promoting FTS, potentially biasing results. Further, most studies did not include a control group and few included statistical analysis.

While the most frequent impact of FTS is an increase in fresh fruit and vegetable consumption, other studies have highlighted other impacts such as an increase in student knowledge of growing cycles and seasons, food systems, and healthy foods; increased gardening skills/experiential education opportunities; and an increase in student lunch participation (Aftosmes, 2011; Izumi, et al., 2010; Kolodinsky, Goldstein & Roche 2011; Ridgeway, 2007). Buckwalter (2011) concluded that an increase in the number of years of FTS programming results in a significant increase in the probability that a student met the dietary guidelines recommendations. Conversely, Evans et al. (2012) found increases in fruit and vegetable consumption to be minimal.

Studies have looked at an increase in fruit and vegetable consumption by children beyond the context of FTS program. Kipping et al., 2014 found no significant differences between a control group and an intervention to promote physical activity and fruit and vegetable consumption, whereas significant changes were found in secondary outcomes, such as less screen time and consumption of fewer snacks and high-energy drinks. Fung et al. (2012) found higher intakes of fruits and vegetables, lower total caloric intakes, and increased physical activity. Epstein et al. (2001) examined the effect of parent-focused interventions on families with at least one obese parent by comparing the results of two types of interventions: 1.) promoting increased fruit and vegetable consumption and, 2.) decreasing consumption of foods high in fat and sugar. The study found that the intervention promoting more fruit and vegetables consumption led to significantly greater reductions in percent overweight, and that parents also consumed fewer high fat and sugar calories as a result of switching to more fruits and vegetables. Qian et al. (2013) made the first attempt to evaluate the impact of Fresh Fruit and Vegetable Program (FFVP) on obesity and they concluded that, holding all other conditions constant,, FFVPs can reduce BMI percentile by 4 percent. FFVP could be a cost efficient measure to reduce obesity, as the cost for participation per student is between \$50 and \$75 per year.

Overall, very little research has been published connecting FTS to increased fruit and vegetable consumption or childhood obesity. However, many suggest that FTS programming could increase the amount of fruits and vegetables consumed by school children, which would have a significant impact on children's health. It could also have economic implications, primarily in the form of reduced healthcare expenditures.

Impact of FTS on Education and Student Engagement

Another area that Vermont stakeholders have described as an important outcome of FTS is student education. Some studies have looked at the impact of FTS programs and education and student engagement. Snelling (2013) studied the impact of elective health courses on students in 6th through 8th grade and found that it led to an increase in knowledge of fruit and vegetable consumption, an increase in physical activity, and an increase in academic scores. Along similar lines, Ozer (2007) developed a framework to assess the direct and indirect effects of school gardens. School gardens have been seen as a relatively low cost strategy for improving health and educational outcomes for schools that struggle with obesity, low educational achievement, and limited parental involvement. Ozer (2007) frames the direct effects as the garden lessons that can be directly tied to the curriculum, such as science, math, social studies classes, etc. He suggests that indirect effects include school engagement, student bonding, nutrition, and parental engagement. Additionally Ozer (2007) notes that garden learning provides an opportunity for students who struggle in conventional classroom settings to “shine” in light of the different skills.

The perceptions, attitudes and level of support offered by school food service professionals can be significant in determining the success of FTS and F2I programs. Deblieck, et al. (2010) found that building staff awareness of farm-to-cafeteria endeavors was critical to achieving successful programs.

Impact of FTS on Food Access

The National School Lunch Program, and other school-based nutrition programs, help to ensure access to healthy food for schoolchildren, as they are provided for free or at a reduced price to income-qualified students. In an effort to address increasing childhood obesity and increase consumption of fruits and vegetables, the 2010 Healthy Hunger-free Kids Act (HHFKA) made a variety of changes to the National School Lunch Program and other school-based nutrition programs. Not all of the changes were popular and early outcomes were not positive. Hong, I. (2015) indicated that in the school year following the implementation of the HHFKA, school lunch participation dropped by 1.2 million students (3.7%). Attributed in part to children's reactions to new lunch content and nutritional standards, participation has decreased primarily due to the departure of large numbers of "full price" students from the program and the large variety of vending machine, a la carte, and off-site food options. In addition, Amin et al., (2015) found that plate waste increased in the first year of the new fruit and vegetable requirements, suggesting that students, when forced to take a vegetable, often discarded it.

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Hunger and food access advocates have called for providing these “universal school meals” to all students at all schools, not just schools whose students almost entirely qualify for free school meals. FTS programs also seek to address food security and equity; by increasing the volume of meals provided, universal meals may provide school food service with economies of scale, enabling them to offer higher quality, more locally produced food to its students. Truly universal meals would require a large investment, however, estimated in 2010 to cost an additional \$13.2 billion (Poppendieck, 2010).

The economic scenarios developed in this research seek to build on this body of research by first establishing the current economic contribution of local food purchasing by Vermont schools, and then considering the possible economic effects of increased food local purchasing by schools, as well as increasing the number of schools participating in “universal school meals”.

Table 2. List of Scenarios



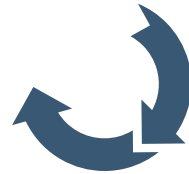
- ▶ The **induced effect** results from the effects of the changes in household income due to the economic activity from the direct and indirect effects. For example, employees of farms, food manufacturers and wholesalers spend their paycheck buying food at the grocery store or paying the mortgage on their house.

The sum of the direct, indirect and induced effects is the total economic impact (Figure 1). In an economic impact study, only economic transactions that takes place in the area under study are counted; other transactions are considered a linkage. For instance, the purchase of Vermont carrots is included in the analysis but the purchase of carrots from New York State is *not* included in the analysis.

For each of the effects (direct, indirect and induced), results include the output-(also referred to as total sales) value added, labor income, and employment.

Output/total sales: The output/total sales are usually the largest numerically. However, they do not represent the best measure because double counting typically occurs. That is, the output number includes the total amount of sales revenue from all industries. For example, milk used to make yogurt or cheese can be counted as sold multiple times: when the dairy farmer sells the milk to the cheese or yogurt maker, when the food manufacturer sells the finished product to a wholesaler, and last when the wholesaler sells the milk or yogurt to a school.

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model, and the means of assessing impact (Deller, 2009). The limitations of IMPLAN stem from the fact that IMPLAN is a static model that does not take into account price elasticities and changes in consumer or industry behavior. The time required for all effects to be completed is also unspecified.

In the IMPLAN version used for this study, the economy, including transactions between industries, institutions and households, is represented by 536 sectors that are based on the North American Industry Classification System (NAICS) codes. For instance, the agricultural sector is represented by 19 sectors, including vegetable and melon farming, fruit farming, and cattle ranching and farming.

The data needed to conduct the analysis included total food purchases, number of meals, and local food purchases. Since total food purchases (local and non-local) made by all schools in Vermont were not available, total food purchases were estimated using data provided by the Vermont Agency of Education, including the number of lunches served and an estimate of \$2.01 spent on food per lunch. Based on these estimates from the Agency of Education and institutional purchase data provided by

Vermont Farm to Plate Network, extrapolations were made for scenarios 1 through 3 using local and total food sales, number of meals, and amount spend on food.

To calculate the current amount of local food purchased by schools, data were obtained from several sources: one school food management company, the school food director association, two distributors, and three food hubs. These data included information on the type of food purchased and the amount of food purchased. NOFA Vermont and the Vermont Sustainable Jobs Fund provided guidance to ensure adequate coverage of local food purchases made by schools. The data were reviewed to ensure that there was no double counting. The data source and information on the type of local food purchased allowed us to categorize how the purchases were made (directly from farmers, directly from food processors, or directly from wholesalers), which is important information to include in the analysis. The data on food type from the wholesalers were further categorized between farm products and processed food (for example, whole fruits and vegetables versus yogurt, a processed milk product.) Based on these data, we found that in 2014, 5.6% of the food purchased by Vermont schools was local. In comparison, a recent study found that in 2014 local sales represented 6.9% of the \$189 million of the Vermont food bill (Becot and Conner, 2015).

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Table 3. Allocation of Local Food Purchases by Vermont Schools for Data Analysis

	Baseline Estimate	Scenario 1	Scenario 2a	Scenario 2b	Scenario 3
Food purchased directly from the farm sector	\$135,175	\$202,762	\$5,352	\$37,713	-\$135,175
Food purchased directly from the food processing sector	\$165,050	\$247,575	\$6,535	\$46,048	-\$165,050
Farm products purchased from wholesalers or food hubs	\$146,610	\$219,915*	\$5,805*	\$40,903*	-\$132,535
Processed food purchased from wholesalers or food hubs	\$468,108	\$702,162*	\$18,535*	\$130,601*	-\$424,574
Wholesale sector margins	N/A	-\$21,458	-\$1,756	-\$5,092	\$87,194
Truck transportation sector margins	N/A	-\$9,321	-\$763	-\$2,212	\$37,878
TOTAL	\$914,943	\$1,341,635	\$33,708	\$247,961	-\$732,262

* These purchases were margined. That is, a share of these purchases was allocated to the sector of production and a share of the expenses were allocated to the wholesale and truck transportation sectors.

Scenarios 1 through 3 accounted for the wholesaler and transportation opportunity costs in order to account for the substitution effect. The substitution effect takes place when purchases are shifted from one sector to another, rather than additional purchases being made. In the case of the FTS program, it is likely that schools are not buying more food, but are buying more Vermont food and less non-Vermont food. While the purchase of local food directly from farmers and processors most likely represents a positive economic impact for the farmers and the state economy, it is important to consider the opportunity cost for the wholesale and transportation sectors. That is, the sales that they did not make because food was purchased directly from producers and processors instead. The loss of business for the wholesale and transportation sectors was calculated using the margins of these sectors (9.53% and 4.14% respectively). The margins for these sectors are from the IMPLAN data are based on national averages.

To summarize, several assumptions were made:

- ▶ The scenarios presented in this report considered local food purchased by Vermont schools.
- ▶ The scenarios primarily represent small incremental changes in procurement where the additional food procurement could likely be met with current local food supply.
- ▶ These scenarios assume that the school generates additional sales for Vermont farmers and food producers and thus leads to a proportional loss of sales by the wholesaler sector.
- ▶ These scenarios assume that the price of local food remains constant though schools purchasing a greater amount of local food might be faced with higher cost of food and/or higher transactional costs. We did not have adequate information to estimate the impact on prices.
- ▶ The scenarios assume that local food purchased by schools are *not* taken away from other direct to consumer channels, such as retail grocers or restaurants.
- ▶ The scenarios further assume that any increases in local food purchased is done within the school food budget and do not represent an additional cost.

Results

Baseline estimate - Contribution of the 2014 local food purchases by Vermont schools on the Vermont economy

In 2014, local food purchases by schools generated a total of \$1.4 million in economic activity, including \$915,000 in sales in the farm and food processing sectors and \$374,000 in sectors related to the farm and food processing sectors (Table 4). A more conservative, accurate measure of the economic contribution of an activity is the total value added measure, which includes wages, profits, dividends, interests, rents, and excise taxes (from the indirect and induced effects). The purchase of local food by schools contributed \$485,000 in total value added, with \$219,000 of that in the farm and food processing sectors. Lastly, local school food purchases supported 7.3 jobs in the local economy, with 3.2 of those jobs in the farm and food processing sectors. It is important to note that in the model that we used, the job number does not represent a full-time equivalent (FTE) position and that one person can have more than one job. While it is possible to convert the number of job to FTE positions, we choose not as FTS sales are most likely part of a larger portfolio of markets for farmers and food processors.

Another measure of the contribution of an activity is the multiplier effect. The total multiplier effect is calculated by dividing the total effect from the direct effect. The multiplier shows how much a dollar or a job in the initial industry adds to the economy. For the baseline estimate, every dollar contributed in value added in the farm and food processing sectors, such as wages, profit adds an additional \$1.20 is added to in the economy. Similarly, for every job in the farm and food processing sectors, 1.3 jobs are supported in the Vermont economy.

If 75% of Vermont schools doubled their local food purchases from 5.6% to 11.2%, \$2.1 million in sales would be generated in the Vermont economy including \$1.3 million in the farm and food processing sectors and \$560,000 in sectors related to the farm and food processing sectors (Table 4). \$693,000 would be generated in value added, with \$335,000 of that in the farm and food processing sectors. 10.5 jobs would be supported in the Vermont economy, with 4.5 of those jobs in the farm and food processing sectors. These results are net of any changes in the wholesale and transportation sectors.

The multiplier values is similar to the multiplier values of the baseline estimate as this increase would not structurally impact the economy. For Scenario 1, every dollar contributed in value added in the farm and food processing sectors, such as wages, profit adds an additional \$1.20 is added to in the economy. Similarly, for every job in the farm and food processing sectors, 1.3 jobs are supported in the Vermont economy.

While this effect can be considered modest, it should be noted that the scenario assumes that the increased local purchasing is accomplished using the existing school food budget, and not through a programmatic investment, such as state funds. For this reason, no additional costs are associated with the increase in local purchasing.

Scenario 2b - 40 schools who meet the criteria of the VT universal meal program participate and increase their purchase of local food by 10 percentage points

While possible pilot project would cover up to five schools, Scenario 2b models the impact of an increased by 10 percentage points for 40 schools that meet the criteria of the project. Based on the 2014-2015 school year data from the Vermont Agency of Education, 40 schools would represent \$255,000 in local food purchases and generating \$390,000 in total sales in the Vermont (Table 4). The purchases in local food would generate a total of \$125,000 in value added, with \$62,000 of this in the farm and food processing sectors. Last, it would support 1.9 jobs in the Vermont economy with 0.8 of these jobs in the farm and food processing sectors.

Scenario 3 - Vermont schools no longer purchase local food

Scenario 3 is a counterpoint to the other scenarios where we model the impact of Vermont schools no longer purchasing local food. Under such a scenario, all food purchases would be made through wholesale distributors and local farmers and processors would lose these sales. For the purpose of this exercise we only modeled the current level of local food (5.6%) shifting to non-local food.

Vermont schools no longer purchasing local food would represent a total loss of \$1.2 million in sales including a loss of \$856,000 in the farm and food processing sectors. Additionally, \$357,000 would be lost in value added with \$280K of the total loss in the farm and food processing sectors. 6.3 jobs would be lost in the total economy with 4.7 of these jobs in the farm and food processing sectors.

Table 4. Res lts of the Scenarios

DISCUSSION & CONCLUSION

This research presents the first study of the economic contribution of school-based local purchasing to the Vermont economy. While the current local food purchases are modest (5.6%), school food services are self-sufficient and local purchasing is not supported by grants or deficit funding. Understanding that the current contribution of local spending is just 5.6% of total food spending by Vermont schools puts the VT FTS network goal of 50% regionally, sustainably sourced food in context, and makes clear what an ambitious target that will need to be reached by 2025. School food service operates on a fairly fixed budget, which even if participation rates increase (as is expected with stronger FTS programming), the goal will require systematic, structural changes to how local food is produced, processed and distributed to institutional markets and, will likely impact food and transactional costs.

The literature review suggests that researchers have found that farmers serving local and regional markets, as well as smaller scale farmers, tend to not only spend more money locally, but also differently than how it is assumed in IMPLAN and therefore actually have a higher multiplier and

unintended consequences. The structural changes that will be required in the Vermont economy in order to achieve the large increases in local purchasing will likely include shifting jobs from the wholesale and transportation sectors to the farm and production sectors. However, wholesale and transportation jobs are typically higher paying and include benefits (and less risk) than farming jobs. Further, currently there is a shortage of supply of many local products and schools are very price constrained in their purchasing. If demand for local food increases, prices will likely increase in the short term, making it difficult for schools to sustain the increased purchasing. As the supply increases to meet demand, it is likely that the prices of local products will decrease, which would put additional pressure on farm and producer wages.

There are however, other benefits to FTS programming besides the direct economic effect. FTS advocates in Vermont and previous studies describe the economic effect as just one part of the total expected FTS contribution. Improved health and educational opportunities for students are seen as other important outcomes of FTS. However, these outcomes have not been measured as quantifiably as economic outcomes. In addition, these changes imply long term changes to the existing systems in order to effect behavior change. Longitudinal studies will be needed to determine the effects of FTS on health and education.

Improving access to healthy food for all Vermont students, and providing better quality food at Vermont schools, are both important outcomes for FTS. Providing school meals at no cost to all students, commonly referred to as universal meals, shares the goal of improving access to healthy food for all Vermont students and has been linked with FTS in proposed legislation. Scenarios 2a and 2b present the economic impact of some proposed Vermont state legislation, though it should be noted that this pilot program is intended to primarily pilot increased universal school meal adoption, not direct economic growth. It should be noted that while it is expected that universal meals reduces administrative costs for qualified schools, the proposed pilot program is to cover the costs that schools incur in providing school meals to all students. So while the program may result in some savings (or at least no additional cost) to the school, the taxpayer will need to absorb the cost of this program. At the time of this report, no estimate was available for the likely costs of the program.

Research in the fields of farm-to-school, economic modeling of small-scale agriculture, and the outcomes of improved nutrition on student health, engagement and educational performance has been building up over approximately the last decade. Several researchers within the last 2-4 years have

these studies should not be discounted as the findings are all pointed in the same direction: increasing local, healthy fruit and veggie consumption and connecting students with experiential education opportunities including farm visits and school gardening improves attitudes toward healthy food, environmental perspectives, and school experience in general.

Whether or not FTS leads to students eating more fruits and vegetables has not been resolved in the literature. Joshi, Azuma and Feenstra (2008) concluded that FTS programs consistently increase the amounts of fruit and vegetables consumed by children in the cafs3624 Tm[amounts of fruit and v)10.2 (ege)-5 ma

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