

ECONOMIC ASSESSMENT OF FARM-TO-SCHOOL FOOD PURCHASING INCENTIVES: THE  
CASE OF THE BUFFALO CITY SCHOOL DISTRICT

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by

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## ABSTRACT

Farm-to-school and local food system strengthening projects have been widely supported by policy makers with funding provided at both the federal and state levels. Still, many of the outcomes of this inflow of policy and funding remain unclear and the economic impacts of such initiatives remain inadequately researched. In 2018, New York State (NYS) announced an increase to lunch reimbursement of \$0.19 cents per meal (to a total of \$0.25 per meal) if districts purchase at least 30% of their ingredients for their lunch program from New York farms through a policy called the 30% NY Initiative. With detailed school food purchasing data from the Buffalo City School District, one of the largest districts in NYS and the largest to qualify for the Initiative, we analyze the economic impacts of this increased local spending on the NYS economy through a customized input-output model for NYS. Results shows net positive economic impacts of the policy, even when a negative household impact is applied to account for the cost of the initiative to taxpayers. The results reveal changes in spending patterns over the school years, evaluate impacts by type of spending (i.e., entitlement versus budget spending) and by product category, and provide a detailed distribution of impacts across industries.

## BIOGRAPHICAL SKETCH

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## INTRODUCTION

The Farm-to-School (FTS) movement, which can be traced back to the late 1990s, began mostly as a response by a few schools throughout the country to health concerns over the increasing amounts of processed foods that were being served to students under tightening school food budgets. This effort has grown significantly, with the USDA Farm to School Census reporting that 65.4% of School Food Authorities (SFAs) reported participating in FTS activities in the 2018-2019 school year (USDA, 2019). FTS activities are also supported by the USDA Food and Nutrition Service (FNS), with activities ranging from the actual serving of locally produced foods in cafeterias to food exposure activities and agricultural education experiences. There are 30 different types of activities that the USDA considers as falling under F2S program goals (e.g., nutritional programs, food tastings, school gardens, educational activities, local purchasing initiatives), but they vary broadly in use by state, school district, SFA, and how these groups define “local,” for which there is no universal definition (USDA, 2013).

New York State (NYS) created their FTS program within the Department of Agriculture and Markets (NYSDAM) to build connections between local farms and food producers to reap benefits such as preparing children to learn through adequate nutrition, improving health and well-being, strengthening the local economy, and building healthy communities (NYSDAM, n.d.). NYSDAM provides both financial and technical assistance to schools under the umbrella of their FTS program. NYS has seemingly embraced FTS, with over 77% of the state’s SFAs participating in the 2018-2019 school year (USDA, 2019). During the 2017-2018 school year, Governor Cuomo announced the No Student Goes Hungry Program (NSGH) to address food insecurity issues in the state. Under NSGH fell financial and programmatic expansions of NYS’s FTS program as well as incentives for schools to purchase more local foods.

As a part of NSGH, the state will increase the school lunch reimbursement through the National School Lunch Program (NSLP) from 5.9 cents per meal to 25 cents per meal if districts purchase at least

30% of their ingredients for their lunch program from New York farms through a policy called the 30% NY Initiative. This represents an increase in the state reimbursement, rather than the federal reimbursement, by 19.1 cents per lunch, or 323%. Only SFAs are eligible to participate in this program. To qualify for this reimbursement, the SFA must participate in the NSLP that provides free and reduced-price lunch for qualifying students and be able to track the origins of the foods they are serving specifically for lunch. The 30% NY Initiative was announced in 2018 and schools have been able to apply for participation and reimbursement under the initiative since the 2018-2019 school year. Although the intended benefits of the program fall in line with NYS's FTS missions of increasing access to healthy foods and strengthening the local economy by directing school food dollars to NYS farms and food processors, the actual impacts of the policy on the state economy remain unclear, particularly relative to the NYS taxpayers that fund it.

Relatively few economic impact assessments of farm-to-school initiatives have been done. The data is challenging to access, comes in many forms, and academic debates continue surrounding the best ways to evaluate these types of policies to ensure that they are having the intended effect of keeping dollars circulating within local economies. Our objective is to evaluate the economic impacts of the 30% NY Initiative by analyzing actual changes in spending patterns of school districts as a result of participation in the program. This work, as many economic impact assessments do, utilizes the regional economic analysis through IMPLAN software. Specifically, we analyze the economic impacts of Buffalo City School District's (BCSD) food spending patterns for the year previous to the 30% NY Initiative (2017-2018 SY), the first year in which schools could qualify for the initiative (2018-2019 SY), and the second year of the initiative in which schools would have received the financial incentives of their previous year's qualification while meeting the goal again for the next year (2019-2020 SY).

### **30% NY Initiative:**

The 30% NY Initiative stipulates that any NYS food product purchased and used in the reimbursable meals and served through the school's lunch program may contribute toward the 30% threshold. Local foods served during breakfast, snacks, or other food programs do not count towards the policy target. Per the initiative's framework, a New York State Food Product (NYFP) is defined as "a food item that is either grown, harvested, or produced in NYS or a food item that is processed inside or outside of NYS comprising of at least 51% agricultural raw materials grown, harvested, or produced in NYS, by weight or volume" (Bilinski et al., 2022). For products that are not already designated as "New York Grown and Certified," the SFA must complete paperwork documenting that the food is comprised of at least 51% NYS ingredients. Then, any NYS ingredient listed within this documentation that is also a processed product, must also either be "NY Grown and Certified" or have its own documentation.<sup>1</sup>

The incentive for participating is that once an SFA is approved under the initiative, it will receive a total of \$0.191 in state reimbursement for each reimbursable lunch meal claimed in the subsequent school year (i.e., on top of the \$0.059 federal reimbursement). For example, if an SFA applies for additional funding in August 2021, they use their purchasing data from the 2020-2021 school year on their application to meet the 30% threshold and receive the reimbursement for each lunch meal claimed in the following 2021-2022 school year. Reimbursement dollars must be maintained in the SFA's nonprofit food service account and can only be used in the same way as the other SFA budget funds.

The 30% NY Initiative is only based on the food served at lunch (i.e., under the NSLP). Consequently, there is additional complexity involved in reporting by SFAs. They must ensure that they are able to distinguish the NYS foods that are served at lunch, even though breakfasts and other meals may use some of the same food products. For the purposes of this analysis, whether the SFA's spending

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<sup>1</sup> To obtain the NYS Grown & Certified seal, producers must meet certification criteria including that their "products are grown and produced in NYS, farms participate in a third-party food safety verification program, if applicable, and the producers participate in an environmental management program."  
<https://certified.ny.gov/get-certified>

contributed to the 30% initiative or not is technically irrelevant (i.e., whether it was spending for lunch or not). We analyze all food procurement done by the SFA (i.e., not only lunch spending) to see how the initiative has affected spending patterns overall, and how changes in spending contribute to economic impact. Indeed, the policy itself likely influences spending within and across meal selections (e.g., spending more on local for lunch may induce more nonlocal spending in other meal categories).

In the first two years of the program, participation was very low as schools were trying to understand the requirements and how to meet application needs. As of the 2019-2020 school year, 57 SFAs were successful in qualifying for the higher reimbursement out of over 800 school districts in NYS, about 7%. Within this group, small schools (i.e., less than 6,000 students) represented 95% of all qualifying school districts, and 72% had enrollments below 2,000 (Bilinski et al., 2022). Larger districts remain outliers in terms of participation likely due, in part, to location – most qualifying districts are in Western NY and the Southern Tier. These areas are relatively more rural and less densely populated areas, as well as conveniently located in areas of the state with more agricultural production and processing of local food products procured by SD's. The means and methods of how SFAs track their purchases for local and non-local sources also differ, with many SFAs failing to continue counting local purchases once the 30% threshold has been met. Because of this, local purchases are likely underestimated in reporting, including for BCSD.

### **Buffalo City School District:**

BCSD is the second largest school district in the state and one of the poorest, with more than 86% of its students eligible for Free/Reduced Price Lunch (USDA, 2019). It is one of the most diverse school districts in the state demographically and the most diverse school district to qualify for the initiative thus far (Bilinski et al., 2022). It is in Western NY, an area with considerable agricultural production and food processing activity. Accordingly, it represents a district with reasonably proximate NYS food supply but with considerable food procurement demands and low-income households that may make it more difficult to meet the policy targets. In low-income school districts there are many more lunches served, so BCSD

has more incentive to participate in this program as it can receive significant quantities through reimbursement. Other wealthier school districts have comparably low rates of participation in lunch.

Although BCSD was the only district empirically analyzed in this study, we develop a replicable framework that other school districts can apply in assessing the economic impacts of their local spending efforts. Our focus on such a large school district with high purchasing demands and relatively complex spending patterns is also useful in better understanding a wide variety of issues and complications in collecting, processing, and analyzing school purchasing data. Collectively our efforts create a pathway for other districts to analyze their impacts regardless of location and the FTS programs in place.

BCSD's food purchases represent almost one-half of all NY purchases made by qualifying SFAs in the state (Bilinski et al., 2022). Total qualifying food costs of BCSD, the highest spending school district of all qualifying districts, reached over \$5.1 million in the 2019-2020 SY, with the lowest qualifying school district spending only \$21,300. Of BCSD's total spending in that school year, over \$2.1 million was spent on NYFPs.<sup>2</sup> Although some school districts were able to qualify for the initiative relatively easily or even automatically due to large local dairy purchases, BCSD was not one of them. The school district had to strategically adapt their spending patterns in order to achieve the 30% threshold (Bilinski, 2022). Therefore, the impact assessments of BCSDs food purchases both before and during participation in the 30% NY Initiative allow us to estimate how much economic impact their SFAs change in food purchases had on the state economy when incentivized by this policy.

It is not only the shift from non-local to local purchases that is important to the analysis. Since multiplier effects vary across industries, shifting spending from one local product to a different local product will have non-uniform economic impacts on the economy. In other words, it is not only the new local spending that occurs but to which industry that spending accrues to. Technically, school districts could increase local spending directly, but with shifts to industries with lower multiplier effects that could

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<sup>2</sup> The 2019-2020 numbers here are reported by Bilinski, et al. (2022) and differ from our numbers as we calculate local differently. These differences will be explored more in the Data and Methods sections.

result in less total economic impact (i.e., from indirect and induced effects). The backward linkages and different impacts between industries and types of products are important for interpretation of the results.

## Literature Review

FTS programs have been well-researched to understand their efficacy in many target areas. Earlier research focuses on the social impacts of such programs on stakeholders involved and the gains in knowledge obtained (Joshi et al., 2008) while others assess their efficacy as nutritional tools (Graham et al., 2005; Ozer, 2007). In more recent years, attention has focused on the economic implications of FTS initiatives and their influences on purchasing decisions. Generally, a diverse array of economic development benefits from growing local food systems are purported, such as the propensity of local food producers to spend more on labor and other expenses (per dollar of output) that lead to job creation and significant spillover effects on local economies (e.g., Hughes & Boys, 2015; Shideler et al., 2018), as well as benefits to farmers from selling in direct-to-consumer market channels (e.g., Pinchot, 2014). Consequently, F2S and local food system strengthening projects have been widely supported by policy makers with funding provided at both the federal and state levels. Still, many of the outcomes of this inflow of policy and funding remain unclear and the economic impacts of such initiatives remain inadequately researched.

Incentives and policies affecting local food procurement, within and beyond school procurement, can be viewed as economic development strategies in that the purchases within the local economy lead to increased economic activity through import substitution and spillover effects, and that farmers can gain access to new markets, aiding in growth resulting from the increased demand (Becot et al., 2017). Research examining the impact of such incentives on school purchasing decisions found that even an incentive of \$0.05 per meal reimbursement impacted local purchasing decisions in Colorado (Long et al., 2021). Yet the impacts of many public initiatives, the 30% NY Initiative among them, remain relatively ill explored or analyzed, often due to data insufficiency (Jablonski & Schmit, 2015).

School food purchasing data are complex, often unorganized, and can come in varied forms from alternative vendors. For some school districts, itemized purchasing data may not be available unless specifically requested. Indeed, some estimates of economic impacts from FTS programs analyze

hypothetical or anticipated changes in economic activity (e.g., Holland et al., 2015; Tuck et al., 2010; Haynes, 2009). Others have utilized food marketing data from example school districts to identify likely suppliers (e.g., Gunter, 2011), consider aggregate farm sales data (e.g., Kluson, 2012), or assume a change in local institutional spending to estimate economic impacts (e.g., Roche et al., 2016). Although the approaches differ, their results are stated and interpreted similarly.<sup>3</sup>

As far as we are aware, there have not been any economic impact analyses that evaluate detailed food purchasing data by schools in the presence of local purchasing incentives. Watson et al. (2018) obtain data on school food purchases from Sarasota County (Central Florida) schools over a two-year period and analyze purchasing patterns, but did not estimate total economic impacts of the local spending. Kluson (2012) also obtain food sales data from farms in Sarasota County to assess changes in institutional (school) sales.

To encourage more comprehensive economic assessments of local food system efforts, a “Local Food Economics Toolkit” was developed by the USDA Agricultural Marketing Service to serve as a replicable framework for evaluating alternative community food system efforts (Thilmany et al. 2016). Researchers have used this framework to evaluate school district and other institutional purchases (e.g., Christensen et al., 2018; Christensen et al., 2019; Conner et al., 2017), but even here the framework allows for numerous assumptions in evaluating schools’ purchasing impacts when access to actual purchasing data is not available. For example, Christensen et al. (2019) explore unique FTS supply chains by assessing the impacts of local spending by the Minneapolis (MN) public schools. With data on total expenditures and the percentage of those total purchases expended locally, they estimate the number of farmers selling to the school and the farm expenditure patterns through primary data collection with them. A similar approach is utilized by Christensen et al. (2018) in examining school expenditure patterns for Georgia public schools; estimates are made about the number of farmers and vendors that sell to the

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<sup>3</sup> For additional detail of past FTS analyses, see Becot et al. (2017).

district and the quantities sold, and these local food purchasing “shocks” are extrapolated from high level data on total school purchasing and local food percentages.

Comparatively, we utilize average agricultural industry spending patterns (farm and food processing industries in NYS), but with very detailed school purchasing data distinguished by local and non-local purchases. Our approach is unique in that we analyze the additive impact of a change in spending that results from a specific policy initiative. In so doing, actual, detailed spending by BCSD is analyzed and modeled across multiple years. Doing so allows us to track actual spending changes to meet the policy goal, and the resulting change in economic impact (i.e., before and after). This work is likely the first economic impact assessment of a SFA’s detailed local food purchasing patterns, evaluating the actual differences in spending before and after the implementation of a FTS incentive program.

Most research assessing economic impacts of FTS programs use software called IMPLAN (Impact Analysis for PLANing), which is an input-output (IO) model framework that can be used to estimate the impact of an event on different levels of the economy. Using IMPLAN, studies on FTS impacts (as discussed above) vary in their level of details, access to data, assumptions, and their level of customization within the software. Holland et al. (2015) explore the potential economic impacts associated with a FTS initiative within South Carolina by using EMSI software that also utilizes an IO model at its core.<sup>4</sup> Specifically, they model alternative scenarios of increases in crop production sales for the state that would be expected under increased demand for local food products in schools. They note that they were limited in that the EMSI crop production industry includes all crops in the state, encompassing those often not utilized by schools (e.g., cereals and oilseeds). This highlights the issues in analyzing school food purchasing scenarios without actual purchasing data or models that do not effectively disaggregate larger industry aggregates

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<sup>4</sup> EMSI Labor Market Analytics & Economic Data, <https://www.economicmodeling.com/>

Tuck et al (2010) look at potential impacts of F2S programs in Central Minnesota by developing different pricing scenarios and exploring ways in which farmers would receive alternative prices for their products (i.e., equal price as distributor, current market price, in-between price). They use IMPLAN to model the alternative hypothetical scenarios and find that the impact of regular farm pricing scenario (i.e., schools directly pay the farms their market prices) was the highest, but indirect and induced effects are the most under the school/distributor price scenario (Tuck et al., 2010). Although the research sheds light on the ways that different types of spending can produce different levels of impacts, the lack of assessment of real purchasing data still leaves ambiguity as to what the actual impacts would be of a school district's local food purchasing program.

## Data

Working with BCSD and local Cornell Cooperative Extension (CCE) personnel, we accumulated detailed food purchases made by the district for three school years: 2017-2018 SY, 2018-2019 SY, and 2019-2020 SY. The data came from both government and private vendor sources, in varied formats (e.g., spreadsheets, wholesaler invoices), and many with handwritten notes crucial to identifying local versus non-local purchases. All data was standardized, coded as local or non-local, and margined appropriately (more on margining below). Vendors differed across school years (Table 1), and some had to be contacted directly for access to detailed purchasing data and local/non-local distinctions of products.

The distinction of whether the food was grown or processed in NYS was often complicated or impossible to distinguish as researchers on our own. Access to and interpretation of school vendor data was provided by a Local Food Systems Specialist from Harvest NY.<sup>5</sup> Such specialists work in various regions of the state, collaborating with extension staff, local producers, Cornell faculty, and other stakeholders to promote NYS agricultural industry growth. The extensive knowledge of the CCE Specialist regarding vendors doing business with BCSD allowed us to refine the data as necessary for a more informed and accurate assessment (e.g., defining specific products grown, produced, and/or processed in NYS).

A notable challenge in coding the data for the 2017-2018 SY was that it was before the 30% NY Initiative and, therefore, BCSD was not required to quantify purchases by local versus non-local origin. In concert with BCSD and the CCE specialist, local purchases were defined retroactively. Additionally, school districts have been known to stop tracking their local purchases once they cross the 30% threshold (this is true for BCSD as well). This, and the retroactive tracking of local purchases, may lead to underreporting of local purchases in any of the years. In addition, the 2019-2020 SY was shortened due

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<sup>5</sup> Harvest New York is a team within Cornell Cooperative Extension that specializes in working with projects in the farm and food industries throughout New York State. Their focus covers the topic areas: Local Food Distribution and Marketing, Urban Agriculture, Urban Gardens, Farm-Based Beverages, and Emerging Crops.

Table 1. Buffalo City School District SFA’s Vendors with Locations by School Year

	<b>2017-2018</b>	<b>State</b>	<b>2018-2019</b>	<b>State</b>	<b>2019-2020</b>	<b>State</b>
Entitlement Spending	USDA Foods/USDA Processing*	US**	USDA Foods/USDA Processing*	USA**	USDA Foods/USDA Processing*	USA**
	Pilot Program (Boulevard)	NY			Pilot Program (Boulevard)	NY
					DoD Program (Boulevard)	NY
Budget Spending	Boulevard Produce	NY	Boulevard Produce	NY	Boulevard Produce	NY
	Depew Milk	NY	Depew Milk	NY	Depew Milk	NY
	Slate Foods	NY	Slate Foods	NY	Slate Foods	NY
	Bimbo Bakery	USA**	Mid-State Bakery	NY	Mid-State Bakery	NY
	US Foods	USA**	US Foods	USA**	US Foods	USA**
	Peterson Farms	USA**	Perry’s	NY	Headwater Food Hub	NY
			5 Loaves Farm	NY	Empire State Farms	NY
					Wardynski’s Hot Dogs	NY
					Eden Valley Growers	NY
					Groundworks Market Garden***	NY
				Upstate Niagara Co-op	NY	
				Perfect Granola	NY	

\*USDA Foods are bulk foods that SFAs purchase through the USDA using government entitlement dollars.

\*\*International food distributor.

\*\*\*Groundworks Market Garden’s (all NYS) purchasing data could not be obtained under the time constraint. The purchases were relatively small (i.e., less than \$300) and would not make a significant contribution to the results.

NOTE: Pilot Program and DoD Program are government entitlement spending programs which allow for purchase of foods from individual vendors.

to the closure of schools during the COVID-19 pandemic. BCSD closed schools mid-March 2020 and converted to virtual learning. The SFA shifted to emergency feeding under a different child nutrition program called the Summer Food Service Program, which is not an allowable program under the 30% NY Initiative. Therefore, local spending stopped being counted after this shift, and the data reflects the local spending of a shortened school year.

### **School Food Spending**

There are multiple sources of money SFAs use in purchasing food, generally falling into two forms of payment: entitlement dollars and budget spending. Entitlement dollars are moneys provided to schools participating in the NSLP or other child nutrition programs through different federal governmental offices and programs (e.g., USDA Foods, USDA Department of Defense Program (DoD), USDA Pilot Project).<sup>6</sup> Entitlement dollars are allocated through USDA Foods but can be used in alternative ways through other programs. Allocation of entitlement funds is important in BCSD's purchasing, with USDA commodity food purchases significant enough to make up 15-20% of the lunch plate (CT FTS Collaborative, 2020). The second form of payments are dollars funded through the school food budget (i.e., through district taxpayers). Table 2 provides a broad overview of the spending as well as the local and non-local purchase percentages of the focus years. As shown, entitlement dollars represented 22%, 19%, and 35% of total food spending across the school years, respectively. The percentage of entitlement dollars in 2019-2020 SY is higher because of school closures during the COVID-19 pandemic and a shift in purchasing through entitlement dollars to serve students remotely through the Summer Food Service Program.

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<sup>6</sup> USDA Foods is a program which supports SFAs and American farmers by purchasing American grown and produced foods for use by schools that participate in certain USDA programs through entitlement dollars. The U.S. Department of Defense Fresh Fruit & Vegetable Program (DoD) was created to allow schools to use their entitlement dollars to buy fresh produce. USDA Pilot Project for Unprocessed Fruits & Vegetables was created to allow schools in participating states to use entitlement dollars at vendors of their choice and designate geographic preference to support use of local foods by schools.

Table 2. Food spending of Buffalo City School District, by school year

	2017-2018		2018-2019		2019-2020		
	Local \$	Non-local \$	Local \$	Non-local \$	Local \$	Non-local \$	
<b>Entitlement</b>	USDA Foods	14,971	2,681,789	22,999	3,174,620	4,415	4,161,770
	Pilot Project	96,997	102,315	0	0	295,012	251,349
	DoD Program	0	0	0	0	101,716	145,935
	Total \$	2,896,071		3,197,618		4,960,197	
	% Local	4%		1%		8%	
<b>Budget</b>	Regular Budget	4,646,691	5,404,348	5,688,273	8,160,543	2,925,449	6,244,502
	Total \$	10,051,038		13,848,816		9,169,951	
	% Local	46%		41%		32%	
<b>Total</b>	Total Spend	4,758,658	8,188,451	5,711,272	11,335,162	3,326,591	10,803,556
	Total \$	12,947,109		17,046,434		14,130,147	
	% Local	37%		34%		24%	

Our estimated local spending percentages on total food spending differ from those reported by BCSD for the 30% NY Initiative. In qualifying for the initiative, BCSD reported spending 30% of their school lunch budget (non-entitlement) on local foods in 2018-2019 and 41% in 2019-2020 (Bilinski et al., 2022). Our estimates for total spending in the same years are 34% and 24%, respectively. As previously mentioned, the Initiative only considers non-entitlement local spending for lunch, while ours considers all meals and both entitlement and budget spending, the former of which utilizes less local foods outside of special programs. As reported by BCSD (Bilinski et al., 2022), lunch spending for 2018-2019 totaled \$8,578,463, or 50% of the total food costs presented here (Table 2). Lunch spending for 2019-2020 totaled \$5,141,599 (Bilinski et al., 2022) or 36% of the total food costs.<sup>7</sup>

Lunch spending is a significant portion of total food procurement but ignoring other meal spending underestimates local impact and ignores any reallocation of local spending induced by the policy. BCSD reported a higher percentage of local lunch spending in 2019-2020 relative to 2018-2019;

<sup>7</sup> The large difference between 2018-2019 and 2019-2020 due primarily to COVID-19 adjustments. A similar comparison is unavailable for 2017-2018 since local spending was not tracked pre-initiative.

our estimates suggest a decrease overall (Table 2). The difference suggests shifting within the budget for where local foods were purchased and for what meal. For example, funds previously spent on local food served outside of the lunch program may have shifted to purchasing different local foods appropriate for lunch and, hence, contributing to the policy target. Even if local spending in percentage terms decreases, there can still be an increase in total economic impacts if that local spending is shifted to industries that accrue more of their inputs locally to produce the food products sold to the district.

There are other reasons why our estimate of total percent local spent differs from the 30% NY Initiative reporting. The means with which we account for local spending in our data differs distinctly from the way in which the initiative accounts for it. As will be explained further in the Methods section, we margin total costs for products into their different industries, where necessary. In different cases, this allows for more or less dollars to be allocated as “local” than the 30% NY Initiative would count. The initiative only considers whether products are NYSFPs. It does not distinguish where portions of the total cost for wholesalers, processors, or transportation accrue.

Our data is processed to account for margins as a more accurate way to estimate economic impact by attributing costs appropriately to industries. For example, if a NYSFP is purchased from a non-local processor, the initiative counts all dollars spent on this product as local. Alternatively, we margin out the processing fee as non-local, and thus our count of the dollars that are local on this product would be lower. On the other hand, the initiative does not allow for inclusion of any local dollars from purchases spent on non-local goods that are sold by a New York wholesaler. This spending is still contributing to a New York business, and thus we count the wholesale margin of the cost of these items as local. To explore where spending shifts happened across the focus years, Table 3 presents spending by industry for each year, ranked from highest to lowest in terms of local spending. For ease of exposition, the tables only show industries for which there was positive local spending.<sup>8</sup>

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<sup>8</sup> Full spending distributions by industry and year are shown in Appendix I-III.

Table 3. Local industry spending on food procurement by Buffalo City School District, by school year.

Rank	Industry	\$ Total	\$ Local	% Local
2017-2018				
1	Fluid milk manufacturing	2,550,190	2,308,427	90.5
2	Wholesale margin (grocery & related products)	3,687,704	2,127,010	57.7
3	Fruit farming	611,026	154,472	25.3
4	Truck transportation	191,651	128,628	67.1
5	Vegetable & melon farming	349,649	32,584	9.3
6	Canned fruits & vegetables manufacturing	707,921	2,638	0.4
7	Frozen fruits, juices, & vegetables manufacturing	308,217	2,340	0.8
8	All other food manufacturing	449,121	1,544	0.3
9	Beef cattle ranching & farming	559	559	100.0
10	Meat processed from carcasses	731,379	387	0.1
11	Greenhouse, nursery, & floriculture	2,432	71	2.9
2018-2019				
1	Fluid milk manufacturing	2,745,378	2,538,805	92.5
2	Wholesale margin (grocery & related products)	4,953,606	2,325,290	46.9
3	Fruit farming	452,040	245,788	54.4
4	Ice cream and frozen dessert manufacturing	232,706	204,225	87.8
5	Truck transportation	229,311	160,760	70.1
6	Cheese manufacturing	305,132	62,631	20.5
7	Vegetable & melon farming	230,851	59,983	26.0
8	Canned fruits & vegetables manufacturing	1,176,416	48,312	4.1
9	Frozen specialties manufacturing	596,637	18,367	3.1
10	Meat processed from carcasses	772,152	13,680	1.8
11	Frozen fruits, juices, & vegetables manufacturing	530,281	12,020	2.3
12	Other snack food manufacturing	232,916	10,550	4.5
13	All other food manufacturing	696,155	4,402	0.6
14	Beef cattle ranching & farming	3,511	3,511	100.0
15	Grain farming	2,871	2,628	91.5
16	All other crop farming	324	273	84.4
17	Poultry & egg production	460,881	47	0.0
2019-2020				
1	Wholesale margin (grocery & related products)	3,557,019	1,430,432	40.2
2	Fluid milk manufacturing	1,082,205	1,025,388	94.7
3	Truck transportation	186,818	125,575	67.2
4	Fruit farming	396,654	106,352	26.8
5	Canned fruits & vegetables manufacturing	1,002,878	105,928	10.6
6	Meat processed from carcasses	888,208	100,648	11.3
7	Vegetable & melon farming	282,673	95,703	33.9
8	Ice cream & frozen dessert manufacturing	95,449	87,485	91.7
9	Cheese manufacturing	548,765	72,978	13.3
10	Other snack food manufacturing	192,938	57,010	29.5
11	Beef cattle ranching & farming	35,072	35,072	100.0
12	Frozen specialties manufacturing	830,720	33,403	4.0
13	Grain farming	22,964	21,455	93.4
14	Frozen fruits, juices, & vegetables manufacturing	344,974	20,109	5.8
15	All other food manufacturing	694,377	4,415	0.6

Aside from spending on dairy products, the wholesale margin has the next largest portion of local spending in the first two years, and the largest portion in the last year. Among the significant local spending is on fluid milk. In NYS, most schools can provide local milk due to New York's prominent dairy industry. In all years, fluid milk was the largest food product category in terms of spending, even with \$1 million less spent in 2019-2020 SY as a result of COVID-19 closures causing shifts in purchasing almost entirely to USDA Foods; i.e., non-local dairy (Bilinski, 2022). This contributes to the lower percentage local observed that year. Additionally, BCSD diversified local dairy product spending during the initiative years, with cheese and ice cream manufacturing receiving larger portions of local spending.

At the same time, local spending for beef products increased (i.e., through local farms and processors). Spending in processed beef increased by an order of magnitude in each of the two years of the initiative from \$386 in 2017-2018, to \$13,680 in 2018-2019, and to over \$100,000 in 2019-2020 (even with COVID changes). Furthermore, local spending on vegetables increased 46% after the first year of the initiative, and an additional 37% in the second year. The shifts in spending illuminate the ways in which BCSD's spending changed in order to reach the 30% policy threshold. It shows that, while fewer local dollars were spent as a percent of the total food spending budget, the direct local spending of the school district reached six additional industries in 2018-2019 and 4 additional industries in 2019-2020 compared to pre-initiative.

Schools that participate in the NSLP collect entitlement dollars based on their average daily participation (ADP) in the program; i.e., the average number of lunches served per day. Entitlement dollars can be used to order products from USDA Foods; i.e., foods purchased by the USDA from American farmers, ranchers, dairymen, and fishermen in support of the country's agricultural system and to aid in the supplying the government's nutritional assistance programs (USDA OGS, 2021). The New York State Office of General Services (NYS OGS) – Food Distribution helps schools obtain USDA Foods products by tracking their ADP and allocating their entitlement dollars accordingly. During these school years entitlement dollars are used by BCSD to purchase direct delivery of selected USDA Foods,

pay for the diversion of USDA Foods for further processing, and purchase foods through special additional programs - USDA DoD and USDA Pilot.

The USDA DoD program was created to allow for the purchase of fresh produce using entitlement dollars, and schools can use as much of their entitlement dollars as they want through this program (USDA FNS, 2022). The USDA Pilot project was created to allow schools to utilize existing market connections and channels by allowing them to select the distributor of fresh fruits and vegetables as well as specify a geographic location (USDA AMS, n.d.). Both USDA DoD and USDA Pilot provide pathways for the use of entitlement dollars for local foods in schools.

The types of foods available through entitlement dollars are limited to a list of about 30 products for which there is enough demand from schools through USDA Foods (i.e., demand for at least one full truckload). These large demand constraints mean that typically only very large farms (which tend to lie mostly outside of NYS) can supply the needed quantities of chicken, beef, cheese, apples, etc. to USDA. As a result, entitlement spending is a largely ineffective pathway for accessing local foods in NYS.

Entitlement dollars can also be used to divert USDA Foods products to processors for additional processing (e.g., whole chickens into breaded chicken nuggets, apples into applesauce), but with restriction. In particular, the school must utilize the entire product (e.g., chicken) and only order quantities for which they can utilize at least 10% of the product per month to prevent waste. The schools receive these foods in large shipments throughout the year. If they do not utilize the product purchased, future entitlement dollars will be restricted.

As discussed, entitlement dollars may be used through special programs. USDA DoD focuses on fresh fruits and vegetables and is available to any schools in NYS under three contract areas (i.e., Southern, Eastern, and Western NYS); it was first used by BCSD in 2019-2020. Entitlement dollars from USDA Foods may also be used to purchase additional fresh fruits and vegetables through the USDA Pilot, which emerged from the 2015 Farm Bill. NYS is one of eight states with access to the program to

provide more flexibility for schools in their purchasing options for unprocessed fruits and vegetables (USDA AMS, n.d.). Schools have opportunities to buy fresh fruits and vegetables from multiple vendors under the program, as well as designate a geographic presence if they wish; it was utilized by BCSD in 2017-2018 and 2019-2020. The 2019-2020 school year was the first year in which BCSD utilized all three entitlement programs, suggesting they may be learning how to spend these dollars more strategically to meet local food purchasing goals, even if they do not qualify under the Initiative.

Although funding for entitlement programs is not from the school food budget funds, it is actual spending to firms providing the products and represents a relatively large portion of total food spending. What and how much is purchased using this allocation will likely be adapted and changed for school districts in the face of the 30% NY Initiative. For example, schools may choose to use entitlement dollars to purchase only those USDA Foods that cannot feasibly be purchased locally, while allocating more of their budgeted funds (to which the 30% initiative applies) to local farms, processors, and wholesalers.

## Methods

This analysis utilizes input-output (IO) methods as a way to evaluate the economic impacts or the expansion of output that comes from a public policy or private sector project. IO models distinguish the effects of a shock by the important economic sectors of a region. Since the effects of a shock do not distribute themselves evenly throughout the economy, IO methods allow us to estimate the extent of these impacts and trace how the changes impact different sectors of the economy. The analytical strength of this methodology stems from its ability to estimate the indirect and induced economic effects stemming from the direct expenditures that lead to additional purchases by final users in an economy (Schmit & Boisevert, 2014).

The direct effects are the initial set of expenditures applied to the IO multipliers that represent the change or the shock that results from a policy or project (i.e., the additional local spending due to the 30% NY Initiative, in this work). The indirect effects are the additional business-to-business purchases that take place up the supply chain within the region, stemming from the initial input (i.e., the direct effect). Induced effects are the values from household spending of increased labor income that results from the initial input purchases and follow on indirect effects. The induced effects come from employee and proprietor spending of the businesses within the affected supply chains. The indirect and induced effects make up what are commonly referred to as “ripple” effects through the economy.

Technically, our analysis utilizes an IMPLAN Social Accounting Matrix (SAM) model, rather than an IO model. A SAM incorporates not only economic data for an economy, but social data as well (Van Wyk et al., 2015). The data sources include national income statistics, household income statistics, and IO tables (Cameron, 2003). The SAM has an input-output model at its core, but has additional capacity to disaggregate households, firms, and other institutions (Van Wyk et al., 2015). Due to the ability to distinguish household purchasing patterns by income group, the impacts and multipliers based on the SAM reflect ripple effects throughout the economy with somewhat greater precision than do those based on an IO model (Miller and Blair, 2009, Chapter 11). Although the IO model is useful in assessing

short-term economic impacts, it relies on some assumptions including unlimited supply, constant prices, static framework, constant returns to scale, and fixed technology (Christensen et al., 2018). The model assumes constant prices, which are not realistic in the volatile agricultural industries especially, but likely adequate in short-term analysis (Christensen et al. 2018).

The IMPLAN IO/SAM analysis provides us with several types of economic outputs. The outputs contain the direct, indirect, and induced effects for employment, labor income, value added, and output.<sup>9</sup> The employment results represent the number of jobs associated with the output in terms of average monthly employment. Labor income sums the income earned by the employees and proprietors of non-employee firms impacted by the event. Value added is similar to Gross Domestic Product (GDP), and includes labor income, taxes on production and imports (TOPI) and other property type income (OPTI). Lastly, output represents value added plus intermediate inputs; it is the total value of production.

### **Typical Vendor Data**

Efforts were made to obtain school purchasing data at the most granular level, meaning an itemized invoice whenever possible, to define local versus non-local expenditures across industry sectors (e.g., farm, processing, wholesale, transport). For each vendor, product name, cost, and local or non-local distinctions were collected. It was important to define what industry produced the products purchased in order to assign them to the applicable production functions and multiplier impacts. Noting from which type of funds products were purchased from; i.e., school food budget versus entitlement dollars, allows us to estimate economic impacts separately from these sources.

Since purchasing data are ultimately aggregated by industry inputted into our NYS IO model, it was necessary to assign purchased items to appropriate IMPLAN industry codes. To facilitate this

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<sup>9</sup> For a more detailed explanation of these economic indicators, see <https://support.implan.com/hc/en-us/articles/360038799153-Examining-Results-Interpreting-Direct-Indirect-and-Induced-Effects>

mapping, we utilize the NAICS/IMPLAN crosswalk where necessary.<sup>10</sup> The total cost of each item is divided into its margined components depending on vendor firm association (e.g., farm, processor, or wholesaler) to properly allocate costs and local percentages.<sup>11</sup> Raw (e.g., apples, eggs) and minimally processed foods (e.g., apple slices, chopped raw vegetables) were margined to the applicable farm industry and other processed products (e.g., cheese, lunch meat) to the applicable manufacturing industry. These two margins make up the producer value of the margin, the price received by the producer for the goods or services sold. Since most items purchased by BCSD were purchased through local and non-local wholesalers (i.e., food distributors), the total product cost is further margined through wholesale and transport margins.

For most raw and minimally processed items, industry codes were easily mapped to the appropriate farm industry in IMPLAN (e.g., apples to fruit farming, IMPLAN industry 4). However, some processed food products were not readily identifiable within the NAICS code and IMPLAN industry descriptions, requiring judgement on the best fit.<sup>12</sup> Then, for each product purchased from a wholesale vendor, IMPLAN Commodity Margins were applied to allocate the cost among wholesale, producer (farm or processor), and the transport margins.<sup>13</sup>

Although IMPLAN can differentiate margin components on its own if the spending is coded as the full wholesale purchase price (i.e., including costs of goods sold), it was necessary to construct margin components ourselves given differences in the types of food purchases, and that differed among vendor

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<sup>10</sup> The North American Industry Classification System (NAICS) is the standard used by the Federal statistical agencies to classify business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. IMPLAN industries are based on NAICS codes but represent differing levels of NAICS code rollups. Generally speaking, manufacturing industries are at the 4-5 digit NAICS detail; whereas, agriculture and services are at the 3-4 digit NAICS detail. Choosing the correct IMPLAN industry is vital to an accurate analysis.

<sup>11</sup> Specifically, we use the wholesale margin for IMPLAN industry 398: Wholesale services – Grocery and related product wholesalers. Output in IMPLAN for wholesale industries reflects only the value of the services provided by these sectors in delivering products to purchasers (i.e., sales less cost of goods sold).

<sup>12</sup> A detailed mapping for these product categories is included in Appendix IV.

<sup>13</sup> For coding purposes, and practicality for most food purchases, the transport margin is restricted to the truck transportation services industry in IMPLAN (417). Specifically, once the wholesale and producer margins were allocated, the residual was assigned to IMPLAN industry 417.

location and product sourcing.<sup>14</sup> For items purchased from a local (NYS) wholesaler but the item itself was not grown or produced in NYS, the wholesale margin component is captured as local, but not the cost of goods sold. For NYS processed foods, these products could be sold by a NYS processor but stipulated with a particular percentage of local ingredients (e.g., processed hot dogs with 51% meat input as local). In this case, 100% of the cost is coded as local at the processor level and the allocation of local spending among inputs (e.g., meat) within the processor spending pattern adjusted accordingly.

Each margined component is assigned a LPP that indicates the portion of that cost component that occurs locally. For the wholesale margin, this was either 0% if the wholesaler was located outside of NYS, or 100% for a NYS wholesaler. The producer margin LPP is based on the quantity of raw products (farm) or ingredients (processor) that were local, based on the purchase information collected. If no detailed information is provided, IMPLAN's default LPP for that product is used. The LPP of the transport margin is determined based on the origin of food product (farm or processor); i.e., if local then 100%, if non-local then default LPP (approximately 55%). Intuitively, this makes sense since, even for non-local food products, some local transportation is needed for delivery to BCSD.

### **Entitlement Data Processing**

Food product purchases from entitlement spending were more complicated, requiring alternative coding for inclusion in the model. Items ordered from USDA Foods can only be traced to their most recent origin using Fiscal Year Data State of Origin (SOO) reports posted by the USDA FNS<sup>15</sup>. This origin, however, only represents where the product was processed and packaged and may not fully represent where the products were grown or raised. Ultimately, most products procured from USDA Foods are commodities which are not commonly raised or grown in NYS in the quantities necessary to be purchased through that program. SOO reports lists the value of products procured, by state in the

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<sup>14</sup> Specifically coding at the full wholesale cost, IMPLAN allocates to farm and processing industries based on the average utilization of products for the entire wholesale industry and not specific to the products identified in our data.

<sup>15</sup> State of Origin for USDA Foods <https://www.fns.usda.gov/usda-foods/state-origin-usda-foods>

respective fiscal year. If NYS appeared in the SOO reporting for any commodity, the dollar value in NYS is divided by the total dollars spent on the commodity to find the percentage purchased from NYS. Although schools cannot distinguish where their delivery of this commodity is coming from on the SOO list specifically, we use this computed percentage as the LPP for these items as a reasonable approximation. Only eggs and apples contained any NYS purchases.

Further, USDA Processed Foods invoice data is related to the USDA Foods list when products from the latter are purchased and routed for further processing prior to delivery to BCSD; i.e., the destination shown as an address or company other than “Buffalo Board of Education.” In these cases, purchases from USDA Foods are diverted to secondary processors for further processing (e.g., raw beef into cooked burger patties, cheese into breaded cheese sticks). In this case, vendors are matched across the two lists and for which the costs on each are separate (additive) entitlement purchases. In other words, USDA Foods costs represent the producer value and the USDA Processed foods represent additional processing costs paid. The costs were coded as separate items to account for situations where the final product delivered was attributed to a different industry than the initial USDA Food product (e.g., USDA food as raw whole chickens diverted for further processing as processed poultry products). Accordingly, these costs did not require further margining.

### **Inputting Data into IMPLAN**

For input into the customized NYS IO model, local spending was aggregated across vendors for each year by industry code and local/non-local spending allocation. To allow for examination between types of spending, entitlement spending and regular spending were aggregated and modeled separately. In the special cases where additional information was obtained about the local or non-local nature of the spending pattern to produce the product, spending patterns were edited to accommodate the additional detail (e.g., adjust all milk production industries to 100% for cheese that we know uses 100% NY milk; adjust all food items in the spending pattern to 57% for an eggroll that we know uses 57% NY ingredients).

## Model Scenarios

Constructing IO models and comparing results across years requires additional thought and interpretation. Our primary focus is on how BCSD’s changes in local spending induced by the 30% NY Initiative changed economic impacts to the state economy. However, the nature and structure of the economy is also changing across years due to various market forces. The complete change in impact to the NYS economy accounts for both changes; however, it is useful to consider incidence of the change in total impact accruing from the two components.<sup>16</sup>

In the Full Impact scenario, model results encompass both changes in food procurement spending by the BCSD as well as changes in the overall structure of the NYS economy to which those food procurement activities operate through (Table 4). In the Spending Only scenario, spending by year follows from the “Full Impact” scenario, but operationalized through the structural economy as it existed in 2018. By holding constant the structural economy across spending years and comparing the results to the full impact scenario, one can identify the incidence of changes in impact from spending reallocations and economy-wide structural changes.

Table 4. Modeling scenarios per school year, defined by model year, spending year, and results year

Impact Scenario	Model Year	Spending Year	Results Year
Full 2017-2018	2018	2018	2018
Spending Only 2017-2018	2018	2018	2018
Full 2018-2019	2019	2019	2019
Spending Only 2018-2019	2018	2019	2019
Full 2019-2020	2020	2020	2020
Spending 2019-2020	2018	2020	2020

<sup>16</sup> In IMPLAN, differentiating these components requires consideration of different model attributes. The “Model Year” depicts the overall structure of the economy in that year, including all industry and institutional transactions and linkages within the economy and imported and exported goods and services. The “Spending Year” indicates the year the dollars were actually spent in. The “Spending Year” is most commonly the same as the “Model Year” for analytical purposes (i.e., our full impact scenario). Model results can also be converted to real terms by changing the base year via the “Results Year” option.

Last, we evaluate the Full Impact scenario with added impact of the tax effect on NYS households, i.e., the cost of the reimbursement provided by NYS as an additional ‘negative shock.’ In other words, we reduce total impacts to the NYS economy by considering the reimbursements of the 30% NY Initiative, ultimately, as a cost to taxpayers and to which has its own (negative) economic impacts.<sup>17</sup> Total reimbursement is estimated by calculating  $ADP \times \$0.19 \times 180$  school days. For 2018-2019 the total reimbursement for BCSD’s qualification in the initiative was \$996,793.<sup>18</sup> Although the reimbursement qualified for in one year is released to the district the following year, we attribute the cost as a negative household income change in the qualifying year.<sup>19</sup> The negative impact scenario was only explored for the 2018-2019 qualifying year since it preceded the COVID-19 pandemic and closing of schools in both 2020 and 2021.

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<sup>17</sup> Put differently, if the 30% NY Initiative is funded by an increase in the NYS budget portion funded by taxpayers, there is less income available to be spent by taxpayers privately for other purposes. If funding for the 30% NY Initiative represents a reallocation of previously budgeted expenditures elsewhere, there would be no additional, negative, induced impact unless you account for the negative impact of the lower funding to the prior category.

<sup>18</sup> Since the SFA can only receive reimbursement while actively serving lunches, the actual amount received in the 2019-2020 SY from qualification in the 2018-2019 SY was less than the \$996,793 the school district qualified for because reimbursement stopped when schools were closed due to COVID-19.

<sup>19</sup> IMPLAN has 9 household income categories that vary in their spending patterns. For convenience, we apply the full negative shock to the middle-income household spending pattern of \$30,000-\$40,000 as an average effect.

## Results

Fundamental to interpreting the results of this analysis is understanding that the interpretation of direct effects in the model is slightly different than the norm. Since the direct effects represent spending by the BCSD, they effectively serve as the first round of indirect effects of food procurement (through entitlement and budget dollars). That spending in an IO/SAM framework stimulates additional indirect and induced effects to satisfy procurement demands.

### Full Impact Scenario

The full impact scenario accounts for actual spending each year by BCSD and the underlying structural economy for each year. The results are presented in Table 5 across four metrics: employment (average monthly jobs), labor income (employee compensation + proprietor income), total value added (labor income + other property income + taxes on production and imports), and output.

For ease of exposition, and since local spending by BCSD is transparent under the output metric, we focus the discussion of results to this metric. In 2017-2018, \$4.8 million of local (direct) spending generated an additional \$3.5 million and \$1.7 million in indirect and induced effects, respectively, for a total impact of \$10.0 million in NYS. This implies that for every \$1.00 in local spending by BCSD, another \$1.10 is generated through backward linkages and labor income spending from the direct and indirect industry effects; i.e., an output multiplier of 2.10. In 2018-2019, direct and total impacts rose to \$5.7 million and \$12.0 million, respectively, or an increase of approximately 20% for each relative to the prior year. Given a negligible change in student enrollments, it makes sense that the direct effects increase under the 30% NY Initiative through the shift to more local spending.<sup>20</sup> A comparable change in total impact is evidenced by the same output multiplier in 2018-2019 (at least to two decimal points). While

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<sup>20</sup> Changes in student enrollments also affect the amount of food procured. However, for BCSD, this effect is negligible, i.e., enrollments were 38,243 in 2017-2018, 38,351 in 2018-2019, and 38,390 in 2019-2020. Adjusting down results in 2018-2019 based on 2017-2018 enrollment would only reduce direct and total impacts for 2018-2019 to \$5.69 million (from \$5.71 million) and \$11.95 million (from \$11.99 million), respectively.

reallocation of food procurement dollars to more local fruits and vegetables and meat products as a result of the policy change occurred, overall multiplier effects remain driven by continued large purchases of local dairy products (Table 3).

Table 5. Full economic impacts of local food spending by the Buffalo City School District, by school year

Impact	Employment	Labor Income \$	Value Added \$	Output \$
2017-2018				
Direct	17.74	1,246,917	1,711,110	4,758,658
Indirect	14.85	1,077,448	1,639,180	3,538,862
Induced	9.86	636,324	1,119,003	1,716,941
Total	42.45	2,960,690	4,469,294	10,014,461
Multiplier	2.39	2.37	2.61	2.10
2018-2019				
Direct	23.15	1,488,403	2,087,775	5,711,272
Indirect	17.19	1,201,115	1,979,248	4,267,274
Induced	11.10	737,282	1,320,914	2,009,599
Total	51.45	3,426,800	5,387,937	11,988,145
Multiplier	2.22	2.30	2.58	2.10
2019-2020				
Direct	13.09	894,442	1,329,683	3,326,591
Indirect	8.95	686,749	1,045,536	2,145,037
Induced	5.80	410,933	712,177	1,073,102
Total	27.84	1,992,125	3,087,396	6,544,730
Multiplier	2.13	2.23	2.32	1.97

Lower local spending in 2019-2020 is driven by school closings due to COVID-19 and a shift to remote food delivery programs for which local spending does not qualify. In addition, entitlement spending increased on a relative basis for which fewer local products are available (Table 2). Of the local spending in 2019-2020, larger relative reductions occurred in dairy products (down 57%) than in fruit and vegetable products (down 10%); local meat spending actually increased. The relatively lower multiplier effects for fruits, vegetable, and meat production and processing in the state (Schmit 2021) contribute to the small reduction in the BCSD spending multiplier to 1.97.<sup>21</sup> Full impact scenario results by type of spending are shown in Table 6.

<sup>21</sup> The reduction in multipliers is relatively small since overall spending remains considerably higher for dairy; i.e., spending on dairy products was \$1.2 million in 2019-2020 relative to the \$328 thousand and \$135 thousand for fruits & vegetables and meat purchases, respectively (Table 3).

Table 6. Full economic impacts of local spending by the Buffalo City School District, by school year and source of spending

Impact	Employment	Labor Income \$	Value Added \$	Output \$
2017-2018 Entitlement Dollars Only				
Direct	0.94	42,105	61,185	111,967
Indirect	0.28	21,161	30,637	49,048
Induced	0.27	17,361	30,524	46,834
Total	1.48	80,627	122,346	207,849
Multipliers	1.57	1.91	2.00	1.86
2017-2018 Budget Spending Only				
Direct	16.8	1,204,813	1,649,925	4,646,691
Indirect	14.57	1,056,286	1,608,543	3,489,814
Induced	9.59	618,963	1,088,479	1,670,107
Total	40.96	2,880,063	4,346,948	9,806,612
Multipliers	2.44	2.39	2.63	2.11
2018-2019 Entitlement Dollars Only				
Direct	0.37	7,520	19,222	22,999
Indirect	0.01	801	1,250	2,206
Induced	0.03	2,288	4,099	6,235
Total	0.42	10,609	24,571	31,441
Multipliers	1.14	1.41	1.28	1.37
2018-2019 Budget Spending Only				
Direct	22.78	1,480,883	2,068,552	5,688,273
Indirect	17.18	1,200,314	1,977,998	4,265,067
Induced	11.07	734,994	1,316,815	2,003,364
Total	51.03	3,416,191	5,363,366	11,956,704
Multipliers	2.24	2.31	2.59	2.10
2019-2020 Entitlement Dollars Only				
Direct	2.62	156,564	231,277	401,143
Indirect	0.89	74,295	109,025	168,079
Induced	0.85	59,992	103,971	156,663
Total	4.36	290,852	444,272	725,885
Multipliers	1.66	1.86	1.92	1.81
2019-2020 Budget Spending Only				
Direct	10.46	737,878	1,098,406	2,925,449
Indirect	8.06	612,454	936,511	1,976,958
Induced	4.96	350,941	608,206	916,439
Total	23.48	1,701,273	2,643,123	5,818,845
Multipliers	2.24	2.31	2.41	1.99

As expected, the multipliers are higher for budget spending than for entitlement spending. This is due to the more limited set of products available for local spending in NYS (e.g., only eggs and apples through USDA Foods in these school years) and the industries that they accrue to have relatively lower backward industry linkages. Given the substantially higher local dollars spent through budget spending,

the aggregate multiplier results presented earlier are very similar. Also note that in the years that BCSD utilized special entitlement programs (i.e., USDA Pilot in 2017-2018, and USDA Pilot and USDA DoD in 2019-2020) multiplier effects are higher. This makes sense given that these special entitlement programs intentionally focus on purchases of more local fresh fruits and vegetables.

The lower multiplier impacts in aggregate in 2019-2020 were contributed to by higher overall utilization of entitlement dollars for local purchases that have lower multiplier effects and shifts in budget spending (due to COVID) that reduced its multiplier effects as well (i.e., from 2.10 in 2018-2019 to 1.99 in 2019-2020). In any event, utilization of special entitlement programs such as Pilot and DoD, demonstrate opportunities for growth in local spending (and impact) relative to traditional entitlement pathways.

Economic impacts summarized by food product category spending (i.e., fruits and vegetables, dairy, protein, and other processed foods are shown in Table 7.<sup>22</sup> As expected from the changes in direct spending, impacts from protein purchases increased by an order of magnitude each year. There is also large growth in impacts from spending on other local processed foods (97%) across the focus years, showing that BCSD is spending significantly more on processed NYSFPs under the policy. By product category, dairy has the highest multiplier effects, and the total output multiplier remains relatively steady across the years. While participating in the initiative, the proportion of total impacts from dairy decrease while other food product categories increase.<sup>23</sup> In addition to the COVID spending disruptions, this finding further explains the reduction in overall impacts across the years. Since we know that spending in dairy reduced across the years (Table 3) and that dairy has the largest multiplier effects among the food categories, we know that shifting existing spending from dairy to other food categories, all else constant, results in a net decrease in total output impact.

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<sup>22</sup> The Fruit and Vegetables category contains spending in IMPLAN industries 2, 3, 4, 6, and 10. Dairy contains industries 8, 83, 84, 85 and 86. Protein contains industries 11, 13, and 90. Other processed foods contains industries 77, 78, 79, 98, and 103.

<sup>23</sup> Graphics showing the proportion of total impacts by category can be referenced in Appendix V.

Table 7. Full economic impacts of local spending by the Buffalo City School District, by school year and product category

Impact	Employment	Labor Income \$	Value Added \$	Output \$
2017-2018 Fruits & Vegetables				
Direct	3.18	66,411	112,356	187,126
Indirect	0.49	25,315	36,037	62,951
Induced	0.4	25,535	44,848	68,801
Total	4.07	117,261	193,241	318,879
Multiplier	1.28	1.77	1.72	1.70
2017-2018 Dairy				
Direct	3.11	308,467	403,209	2,308,427
Indirect	8.8	576,127	909,841	2,387,382
Induced	3.76	242,639	426,629	654,585
Total	15.67	1,127,233	1,739,679	5,350,394
Multipliers	5.04	3.65	4.31	2.32
2017-2018 Protein				
Direct	0	126	154	945
Indirect	0	219	366	969
Induced	0	95	168	257
Total	0.01	440	688	2,171
Multipliers	N/A	3.49	4.46	2.30
2017-2018 Processed Foods				
Direct	0.02	1,106	1,363	6,521
Indirect	0.01	1,053	1,503	2,797
Induced	0.01	593	1,043	1,601
Total	0.04	2,753	3,909	10,919
Multipliers	2.00	2.49	2.87	1.67
2018-2019 Fruits and Vegetables				
Direct	5.56	108,459	288,388	308,672
Indirect	0.13	6,435	10,035	17,481
Induced	0.48	31,653	56,688	86,241
Total	6.16	146,547	355,111	412,393
Multipliers	1.11	1.35	1.23	1.34
2018-2019 Dairy				
Direct	4.34	382,633	486,860	2,805,661
Indirect	10.58	653,811	1,149,334	2,939,234
Induced	4.29	284,659	509,923	775,771
Total	19.21	1,321,103	2,146,116	6,520,665
Multipliers	4.43	3.45	4.41	2.32
2018-2019 Protein				
Direct	0.15	2,182	6,475	17,237
Indirect	0.06	2,428	4,647	10,367
Induced	0.02	1,306	2,334	3,550
Total	0.22	5,916	13,457	31,154
Multipliers	1.47	2.71	2.08	1.81
2018-2019 Processed Foods				
Direct	0.21	14,859	18,730	93,652
Indirect	0.3	18,040	28,803	59,987
Induced	0.14	8,990	16,111	24,511
Total	0.65	41,889	63,644	178,150
Multipliers	3.10	2.82	3.40	1.90

Table 8. Full economic impacts of local spending by the Buffalo City School District, by school year and product category, continued.

2019-2020 Fruits and Vegetables				
Direct	2.86	84,678	130,873	223,511
Indirect	0.55	28,420	45,109	77,219
Induced	0.43	30,417	52,626	79,248
Total	3.83	143,515	228,608	379,977
Multipliers	1.34	1.69	1.75	1.70
2019-2020 Dairy				
Direct	1.65	144,880	243,261	1,185,852
Indirect	3.95	285,911	451,075	1,178,089
Induced	1.58	112,143	194,336	292,815
Total	7.18	542,935	888,672	2,656,756
Multipliers	4.35	3.75	3.65	2.24
2019-2020 Protein				
Direct	0.54	22,472	34,152	135,720
Indirect	0.26	17,173	27,552	54,161
Induced	0.15	10,512	18,199	27,412
Total	0.95	50,157	79,903	217,294
Multipliers	1.76	2.23	2.34	1.60
2019-2020 Processed Foods				
Direct	0.42	31,572	57,016	220,865
Indirect	0.63	38,988	56,900	122,655
Induced	0.26	18,239	31,619	47,647
Total	1.31	88,800	145,534	391,168
Multipliers	3.12	2.81	2.55	1.77

### Distributional Effects

To further analyze impacts across industries, individual IMPLAN industry effects (by direct, indirect, and induced effects) from the full impact model were aggregated into broader industry classifications.<sup>24</sup> Tables 9 through 11 show the impacts of all industries ranked by total output impacts, by year.

<sup>24</sup> For example, the IMPLAN industries Vegetable and melon farming (3), Fruit farming (4), Tree nut farming (5) are aggregated together under Ag production – fruits & vegetables. The mapping of IMPLAN industries into this broader New York model was introduced by Schmit & Liu (2022) and can be viewed in Appendix E.

Table 9. Distribution of direct, indirect, and induced output effects, by industry in New York State, Full Impact Scenario, 2017-2018

	Direct		Indirect		Induced		Total Impacts	
	\$	%	\$	%	\$	%	\$	%
Total	4,758,658	100	3,538,879	100	1,717,117	100	10,014,655	100
Wholesale trade	2,127,010	44.7	457,839	12.9	74,392	4.3	2,659,241	26.6
Ag Manufacturing - Dairy	2,308,427	48.5	197,365	5.6	2,954	0.2	2,508,746	25.1
Ag Production - Dairy	0	0.0	863,554	24.4	791	0.0	864,345	8.6
Real estate & rental	0	0.0	247,240	7.0	317,097	18.5	564,337	5.6
Finance & Insurance	0	0.0	189,521	5.4	248,214	14.5	437,736	4.4
Transportation & warehousing	128,628	2.7	226,571	6.4	45,404	2.6	400,603	4.0
Professional – scientific & tech services	0	0.0	213,734	6.0	87,564	5.1	301,298	3.0
Health and social services	0	0.0	\$21	0.0	286,042	16.7	286,063	2.9
Information	0	0.0	137,280	3.9	95,311	5.6	232,590	2.3
Management of companies	0	0.0	208,167	5.9	19,901	1.2	228,068	2.3
Administrative and waste services	0	0.0	155,930	4.4	46,217	2.7	202,147	2.0
Ag Production – Fruits & Vegetables	187,055	3.9	1,107	0.0	653	0.0	188,815	1.9
Ag Manufacturing – Animal foods	0	0.0	169,198	4.8	849	0.0	170,047	1.7
Retail trade	0	0.0	26,128	0.7	137,001	8.0	163,129	1.6
Other services	0	0.0	47,752	1.3	85,701	5.0	133,453	1.3
Utilities – Generation & distribution	0	0.0	97,650	2.8	33,890	2.0	131,540	1.3
Accommodations & food services	0	0.0	27,291	0.8	91,794	5.3	119,085	1.2
NonAg Manufacturing	0	0.0	72,939	2.1	18,523	1.1	91,462	0.9
Government	0	0.0	55,198	1.6	22,823	1.3	78,021	0.8
Educational services	0	0.0	1,451	0.0	44,084	2.6	45,536	0.5
Arts, entertainment, & recreation	0	0.0	12,795	0.4	30,073	1.8	42,868	0.4
Construction	0	0.0	22,693	0.6	13,778	0.8	36,471	0.4
Ag Support Devices	0	0.0	24,990	0.7	106	0.0	25,096	0.3
Ag Man - Other foods	1,544	0.0	20,734	0.6	1,696	0.1	23,973	0.2
Ag Man - Fertilizer, chemical, machinery	0	0.0	19,929	0.6	372	0.0	20,302	0.2
Ag Prod - Grain, oilseed, & other crops	0	0.0	14,034	0.4	325	0.0	14,359	0.1
Ag Prod - Beef, poultry & other animals	0	0.0	10,341	0.3	332	0.0	10,673	0.1
Ag Man - Grain & oilseed milling	0	0.0	7,598	0.2	370	0.0	7,968	0.1
Ag Man - Fruit, vegetable, & specialty	4,978	0.1	721	0.0	1,103	0.1	6,802	0.1
Ag Manufacturing - Beverages	\$0	0.0	2,027	0.1	3,373	0.2	5,400	0.1
Ag Manufacturing - Meat & seafood	945	0.0	2,128	0.1	1,501	0.1	4,574	0.0
Ag Manufacturing - Bakery & tortilla	0	0.0	558	0.0	3,410	0.2	3,968	0.0
Mining & drilling	0	0.0	2,422	0.1	785	0.0	3,206	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	1,209	0.0	355	0.0	1,564	0.0
Ag Production - Greenhouse & nursery	71	0.0	343	0.0	234	0.0	647	0.0
Forestry and logging, fishing, & hunting	0	0.0	424	0.0	100	0.0	523	0.0

Table 10. Distribution of direct, indirect, and induced output effects, by industry in New York State, Full Impact Scenario, 2018-2019

	Direct		Indirect		Induced		Total Impacts	
	\$	%	\$	%	\$	%	\$	%
Total	5,711,272	100	4,399,607	100	2,098,909	100	12,209,787	100
Ag Manufacturing - Dairy	2,805,661	49.1	244,075	5.5	3,067	0.1	3,052,802	25.0
Wholesale trade	2,325,290	40.7	546,115	12.4	87,810	4.2	2,959,215	24.2
Ag Production - Dairy	0	0.0	1,115,532	25.4	894	0.0	1,116,426	9.1
Finance & Insurance	0	0.0	351,374	8.0	386,343	18.4	737,717	6.0
Real estate & rental	0	0.0	300,130	6.8	377,028	18.0	677,158	5.5
Transportation & warehousing	160,760	2.8	253,101	5.8	57,122	2.7	470,984	3.9
Professional - scientific & tech services	0	0.0	244,893	5.6	99,533	4.7	344,426	2.8
Health & social services	0	0.0	21	0.0	331,547	15.8	331,569	2.7
Ag Production - Fruits & Vegetables	305,771	5.4	6,544	0.1	724	0.0	313,038	2.6
Management of companies	0	0.0	277,292	6.3	25,928	1.2	303,220	2.5
Information	0	0.0	159,483	3.6	109,546	5.2	269,029	2.2
Administrative & waste services	0	0.0	166,697	3.8	49,462	2.4	216,159	1.8
Ag Manufacturing - Animal foods	0	0.0	206,866	4.7	919	0.0	207,785	1.7
Retail trade	0	0.0	27,882	0.6	161,322	7.7	189,204	1.5
Other services	0	0.0	52,093	1.2	101,607	4.8	153,700	1.3
Utilities - Generation & distribution	0	0.0	104,464	2.4	35,825	1.7	140,289	1.1
Accommodations & food services	0	0.0	31,454	0.7	107,694	5.1	139,148	1.1
NonAg Manufacturing	0	0.0	83,789	1.9	20,564	1.0	104,352	0.9
Ag Man - Fruit, vegetable, & specialty	78,699	1.4	5,746	0.1	1,127	0.1	85,572	0.7
Government	0	0.0	57,978	1.3	26,652	1.3	84,630	0.7
Arts, entertainment, & recreation	0	0.0	15,897	0.4	36,350	1.7	52,247	0.4
Educational services	0	0.0	1,584	0.0	48,841	2.3	50,424	0.4
Ag Manufacturing - Other foods	14,953	0.3	29,756	0.7	1,904	0.1	46,612	0.4
Construction	0	0.0	22,931	0.5	15,040	0.7	37,970	0.3
Ag Prod - Beef, poultry & other animals	11,297	0.2	16,581	0.4	341	0.0	28,220	0.2
Ag Prod - Grain, oilseed, & other crops	2,901	0.1	18,909	0.4	364	0.0	22,174	0.2
Ag Support Devices	0	0.0	20,841	0.5	106	0.0	20,947	0.2
Ag Man - Fertilizer, chemical, machinery	0	0.0	14,299	0.3	357	0.0	14,656	0.1
Ag Manufacturing - Meat & seafood	5,940	0.1	5,798	0.1	1,523	0.1	13,262	0.1
Ag Manufacturing - Grain & oilseed milling	0	0.0	7,298	0.2	377	0.0	7,675	0.1
Ag Manufacturing - Beverages	0	0.0	2,181	0.0	4,010	0.2	6,191	0.1
Ag Manufacturing - bakery & tortilla	0	0.0	1,130	0.0	3,542	0.2	4,672	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	3,395	0.1	403	0.0	3,798	0.0
Mining & drilling	0	0.0	2,526	0.1	609	0.0	3,135	0.0
Ag Production - Greenhouse & nursery	0	0.0	383	0.0	310	0.0	693	0.0
Forestry and logging, fishing, & hunting	0	0.0	571	0.0	117	0.0	688	0.0

Table 11. Distribution of direct, indirect, and induced output effects, by industry in New York State, Full Impact Scenario, 2019-2020

	Direct		Indirect		Induced		Total Impacts	
	\$	%	\$	%	\$	%	\$	%
Total	3,326,591	100	2,077,573	100	1,036,696	100	6,489,827	100
Wholesale trade	1,430,432	43.0	328,484	15.8	59,258	5.7	1,818,174	28.0
Ag Manufacturing - Dairy	1,185,852	35.6	119,383	5.7	1,823	0.2	1,307,058	20.1
Ag Production - Dairy	0	0.0	430,638	20.7	475	0.0	431,113	6.6
Real estate & rental	0	0.0	171,977	8.3	206,377	19.9	378,354	5.8
Transportation & warehousing	125,575	3.8	131,780	6.3	24,378	2.4	281,733	4.3
Ag Production - Fruits & Vegetables	202,055	6.1	5,022	0.2	538	0.1	207,615	3.2
Professional - scientific & tech services	0	0.0	125,764	6.1	54,142	5.2	179,905	2.8
Health & social services	0	0.0	11	0.0	178,219	17.2	178,231	2.7
Management of companies	0	0.0	159,584	7.7	13,896	1.3	173,479	2.7
Finance & Insurance	0	0.0	0	0.0	119,594	11.5	168,560	2.6
Ag Man - Fruit, vegetable, & specialty	159,441	4.8	6,607	0.3	750	0.1	166,798	2.6
Information	0	0.0	92,571	4.5	61,622	5.9	154,193	2.4
Administrative & waste services	0	0.0	100,766	4.9	29,922	2.9	130,688	2.0
Ag Manufacturing - Meat & seafood	100,648	3.0	11,745	0.6	852	0.1	113,245	1.7
Retail trade	0	0.0	14,778	0.7	89,460	8.6	104,238	1.6
Ag Manufacturing - Other foods	61,424	1.8	23,281	1.1	1,124	0.1	85,829	1.3
Ag Manufacturing - Animal foods	0	0.0	82,879	4.0	562	0.1	83,441	1.3
Utilities - Generation & distribution	0	0.0	56,305	2.7	19,849	1.9	76,155	1.2
Other services	0	0.0	25,861	1.2	48,929	4.7	74,790	1.2
NonAg Manufacturing	0	0.0	51,802	2.5	12,489	1.2	64,290	1.0
Accommodations & food services	0	0.0	12,013	0.6	46,651	4.5	58,664	0.9
Ag Prod - Beef, poultry & other animals	35,072	1.1	14,364	0.7	204	0.0	49,640	0.8
Government	0	0.0	31,833	1.5	12,628	1.2	44,461	0.7
Ag Prod - Grain, oilseed, & other crops	21,455	0.6	17,962	0.9	254	0.0	39,671	0.6
Educational services	0	0.0	784	0.0	26,243	2.5	27,028	0.4
Construction	0	0.0	12,945	0.6	8,265	0.8	21,210	0.3
Arts, entertainment, & recreation	0	0.0	4,770	0.2	12,460	1.2	17,230	0.3
Ag Support Devices	0	0.0	15,429	0.7	62	0.0	15,490	0.2
Ag Manufacturing - Grain & oilseed milling	4,636	0.1	9,240	0.4	235	0.0	14,111	0.2
Ag Man - Fertilizer, chemical, machinery	0	0.0	13,145	0.6	210	0.0	13,355	0.2
Ag Manufacturing - Beverages	0	0.0	1,079	0.1	2,419	0.2	3,498	0.1
Ag Manufacturing - bakery & tortilla	0	0.0	602	0.0	2,011	0.2	2,613	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	1,829	0.1	233	0.0	2,062	0.0
Mining & drilling	0	0.0	1,203	0.1	281	0.0	1,484	0.0
Ag Production - Greenhouse & nursery	0	0.0	591	0.0	219	0.0	810	0.0
Forestry and logging, fishing, & hunting	0	0.0	546	0.0	64	0.0	610	0.0

From this exposition, the distribution of impacts are revealed. First, much of the results through indirect and induced effects accrue to industries outside of farming and food manufacturing. This makes sense, since school purchasing ultimately effects industries such as real estate, professional services, and health and social services through induced effects via primary household spending categories. The wholesale trade industry ranks high in all years through its direct effects (i.e., margining to local food distributors). Wholesale margins are not attributed as local spending under the 30% NY Initiative unless the wholesalers sell local products. It is apparent that the accounting process for the initiative may be overlooking an industry sector with high impacts for the local economy.

From 2017-2018 to 2018-2019 we see a significant increase in the indirect effects to dairy production as a result of the increased local dairy product purchases. Although direct output for the dairy manufacturing sector increased by 17.7% in 2018-2019, the indirect effects in dairy production sector increased by 22.5% (through the backward linkage from processing to farm production). This coincides with more diverse local spending throughout the dairy manufacturing sector (Table 3) and includes higher spending on more diverse dairy (i.e., cheese and ice cream manufacturing instead of just fluid milk manufacturing). There are also indirect effects accruing to animal feed manufacturing, stemming through the indirect effects to dairy production and, to a lesser degree, beef farming.

Although dairy is the only agricultural production industry as well as the only agricultural manufacturing industry to appear in the top 10 sectors by total impact in 2017-2018, production and manufacturing of fruits and vegetables do appear later through BCSD's transition to more local procurement. The pre-initiative percentage of total impacts for all fruit and vegetable production and processing<sup>25</sup> of 2.1% of total impacts, increases to 3.5% and 6.4% in the following two years, tripling in impact over the span of the study period. Note also, the seasonality effect for fruits and vegetables do not exist for milk production. This increase reflects the diversification in spending by BCSD (Table 3).

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<sup>25</sup> In this case all fruit and vegetable processing would encompass fruit and vegetable production, grain production, fruit, vegetable, and specialty manufacturing, and greenhouse production.

Distribution of impacts by employment and school year are presented in Tables 12 through 14.<sup>26</sup> From these we can see that BCSD's spending creates higher total output for dairy production in comparison to other agricultural production sectors, but spending in the fruit and vegetable production industry creates higher employment impacts. This is intuitive since fruit and vegetable production are more labor intensive per dollar of output than dairy production. The finding sheds light on some of the benefits of the diversification in spending that resulted from participation in the initiative, including that increased local spending on fruits and vegetables leads to increased employment impacts in NYS. Note that these positive employment impacts affect not only employees but owners of non-employee firms as well, so it likely has a stronger relative impact towards smaller-scale fruit and vegetable farmers.

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<sup>26</sup> Graphs presenting the top 10 industries by total output and employment impacts by year can be found in Appendix VI.

Table 12. Distribution of direct, indirect, and induced employment effects, by industry in New York State, Full Impact Scenario, 2017-2018

	Direct		Indirect		Induced		Total Impacts	
	Empl	%	Empl	%	Empl	%	Empl	%
Total	17.74	100	14.73	100	9.79	100	42.3	100
Ag Manufacturing - Dairy	3.11	17.5	0.26	1.8	0	0.0	3.37	8.0
Ag Production - Fruits & Vegetables	3.18	17.9	0.02	0.1	0.01	0.1	3.2	7.6
Wholesale trade	10.67	60.1	1.87	12.7	0.22	2.2	12.76	30.2
Ag Production - Dairy	0	0.0	2.81	19.1	0	0.0	2.81	6.6
Transportation & warehousing	0.76	4.3	1.62	11.0	0.3	3.1	2.7	6.4
Health & social services	0	0.0	0	0.0	2.46	25.1	2.46	5.8
Administrative and waste services	0	0.0	1.56	10.6	0.44	4.5	2.01	4.8
Professional - scientific & tech services	0	0.0	1.15	7.8	0.42	4.3	1.59	3.8
Real estate & rental	0	0.0	1.05	7.1	0.52	5.3	1.59	3.8
Other services	0	0.0	0.46	3.1	1.12	11.4	1.57	3.7
Retail trade	0	0.0	0.22	1.5	1.34	13.7	1.53	3.6
Accommodations & food services	0	0.0	0.35	2.4	1.13	11.5	1.46	3.5
Management of companies	0	0.0	0.89	6.0	0.09	0.9	0.98	2.3
Finance & Insurance	0	0.0	0.32	2.2	0.54	5.5	0.85	2.0
Ag Support Devices	0	0.0	0.63	4.3	0	0.0	0.64	1.5
Educational services	0	0.0	0.02	0.1	0.52	5.3	0.54	1.3
Government	0	0.0	0.39	2.6	0.12	1.2	0.5	1.2
Arts, entertainment, & recreation	0	0.0	0.14	1.0	0.28	2.9	0.42	1.0
Information	0	0.0	0.18	1.2	0.15	1.5	0.34	0.8
Ag Prod - Grain, oilseed, & other crops	0	0.0	0.18	1.2	0.01	0.1	0.19	0.4
Construction	0	0.0	0.1	0.7	0.06	0.6	0.16	0.4
Ag Manufacturing - Animal foods	0	0.0	0.16	1.1	0	0.0	0.16	0.4
NonAg Manufacturing	0	0.0	0.12	0.8	0.01	0.1	0.13	0.3
Ag Prod - Beef, poultry & other animals	0	0.0	0.12	0.8	0	0.0	0.12	0.3
Utilities - Generation & distribution	0	0.0	0.08	0.5	0.03	0.3	0.12	0.3
Ag Man - Fruit, vegetable, & specialty	0.02	0.1	0	0.0	0	0.0	0.02	0.0
Ag Manufacturing - bakery & tortilla	0	0.0	0	0.0	0.02	0.2	0.02	0.0
Ag Manufacturing - Other foods	0	0.0	0.02	0.1	0	0.0	0.02	0.0
Ag Production - Greenhouse & nursery	0	0.0	0	0.0	0	0.0	0.01	0.0
Mining & drilling	0	0.0	0	0.0	0	0.0	0.01	0.0
Ag Manufacturing - Meat & seafood	0	0.0	0	0.0	0	0.0	0.01	0.0
Ag Man - Fertilizer, chemical, machinery	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Forestry and logging, fishing, & hunting	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Grain & oilseed milling	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Beverages	0	0.0	0	0.0	0	0.0	0	0.0

Table 13. Distribution of direct, indirect, and induced employment effects, by industry in New York State, Full Impact Scenario, 2018-2019

	Direct		Indirect		Induced		Total Impacts	
	Empl	%	Empl	%	Empl	%	Empl	%
Total	23.15	100	17.07	100	11.01	100	51.33	100
Wholesale trade	11.87	51.3	2.14	12.5	0.24	2.2	14.25	27.8
Ag Production - Fruits & Vegetables	5.52	23.8	0.11	0.6	0.02	0.2	5.65	11.0
Ag Manufacturing - Dairy	4.34	18.7	0.35	2.1	0	0.0	4.69	9.1
Ag Production - Dairy	0	0.0	3.61	21.1	0	0.0	3.61	7.0
Transportation & warehousing	1.03	4.4	2.12	12.4	0.44	4.0	3.61	7.0
Health & social services	0	0.0	0	0.0	2.75	25.0	2.75	5.4
Administrative & waste services	0	0.0	1.61	9.4	0.48	4.4	2.09	4.1
Real estate & rental	0	0.0	1.22	7.1	0.6	5.4	1.81	3.5
Retail trade	0	0.0	0.23	1.3	1.53	13.9	1.74	3.4
Other services	0	0.0	0.47	2.8	1.21	11.0	1.69	3.3
Accommodations & food services	0	0.0	0.37	2.2	1.27	11.5	1.65	3.2
Professional - scientific & tech services	0	0.0	1.15	6.7	0.45	4.1	1.62	3.2
Management of companies	0	0.0	1.02	6.0	0.1	0.9	1.11	2.2
Finance & Insurance	0	0.0	0.33	1.9	0.58	5.3	0.92	1.8
Educational services	0	0.0	0.01	0.1	0.55	5.0	0.56	1.1
Ag Support Devices	0	0.0	0.53	3.1	0	0.0	0.54	1.1
Government	0	0.0	0.41	2.4	0.12	1.1	0.53	1.0
Arts, entertainment, & recreation	0	0.0	0.13	0.8	0.36	3.3	0.49	1.0
Information	0	0.0	0.2	1.2	0.16	1.5	0.37	0.7
Ag Prod - Grain, oilseed, & other crops	0.04	0.2	0.28	1.6	0.01	0.1	0.33	0.6
Ag Prod - Beef, poultry & other animals	0.13	0.6	0.18	1.1	0	0.0	0.32	0.6
Ag Manufacturing - Animal foods	0	0.0	0.2	1.2	0	0.0	0.2	0.4
Ag Man - Fruit, vegetable, & specialty	0.18	0.8	0.01	0.1	0	0.0	0.19	0.4
Construction	0	0.0	0.1	0.6	0.07	0.6	0.17	0.3
NonAg Manufacturing	0	0.0	0.13	0.8	0.01	0.1	0.16	0.3
Utilities - Generation & distribution	0	0.0	0.08	0.5	0.03	0.3	0.11	0.2
Ag Manufacturing - Other foods	0.03	0.1	0.05	0.3	0	0.0	0.08	0.2
Ag Manufacturing - bakery & tortilla	0	0.0	0	0.0	0.03	0.3	0.03	0.1
Ag Manufacturing - Meat & seafood	0.01	0.0	0	0.0	0	0.0	0.02	0.0
Ag Production - Greenhouse & nursery	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Forestry and logging, fishing, & hunting	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Ag Manufacturing - Grain & oilseed milling	0	0.0	0	0.0	0	0.0	0.01	0.0
Ag Man - Fertilizer, chemical, machinery	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Mining & drilling	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Beverages	0	0.0	0	0.0	0	0.0	0	0.0

Table 14. Distribution of direct, indirect, and induced employment effects, by industry in New York State, Full Impact Scenario, 2019-2020

	Direct		Indirect		Induced		Total Impacts	
	Empl	%	Empl	%	Empl	%	Empl	%
Total	13.09	100	8.8	100	5.71	100	27.73	100
Wholesale trade	6.83	52.2	1.05	11.9	0.14	2.5	8.04	29.0
Ag Production - Fruits & Vegetables	2.75	21.0	0.08	0.9	0	0.0	2.83	10.2
Transportation & warehousing	0.79	6.0	1.22	13.9	0.26	4.6	2.25	8.1
Ag Manufacturing - Dairy	1.64	12.5	0.15	1.7	0	0.0	1.8	6.5
Health & social services	0	0.0	0	0.0	1.5	26.3	1.5	5.4
Ag Production - Dairy	0	0.0	1.21	13.8	0	0.0	1.21	4.4
Administrative & waste services	0	0.0	0.85	9.7	0.25	4.4	1.09	3.9
Real estate & rental	0	0.0	0.74	8.4	0.32	5.6	1.06	3.8
Professional - scientific & tech services	0	0.0	0.63	7.2	0.25	4.4	0.91	3.3
Retail trade	0	0.0	0.1	1.1	0.78	13.7	0.89	3.2
Other services	0	0.0	0.25	2.8	0.64	11.2	0.87	3.1
Accommodations & food services	0	0.0	0.14	1.6	0.55	9.6	0.72	2.6
Management of companies	0	0.0	0.59	6.7	0.05	0.9	0.64	2.3
Finance & Insurance	0	0.0	0.18	2.0	0.33	5.8	0.51	1.8
Ag Prod - Beef, poultry & other animals	0.34	2.6	0.13	1.5	0	0.0	0.47	1.7
Ag Support Devices	0	0.0	0.47	5.3	0	0.0	0.47	1.7
Ag Prod - Grain, oilseed, & other crops	0.11	0.8	0.29	3.3	0.01	0.2	0.42	1.5
Ag Man - Fruit, vegetable, & specialty	0.32	2.4	0.01	0.1	0	0.0	0.33	1.2
Government	0	0.0	0.25	2.8	0.06	1.1	0.31	1.1
Educational services	0	0.0	0.01	0.1	0.28	4.9	0.29	1.0
Arts, entertainment, & recreation	0	0.0	0.06	0.7	0.16	2.8	0.25	0.9
Ag Manufacturing - Meat & seafood	0.2	1.5	0.02	0.2	0	0.0	0.23	0.8
Information	0	0.0	0.09	1.0	0.07	1.2	0.17	0.6
Ag Manufacturing - Other foods	0.1	0.8	0.03	0.3	0	0.0	0.14	0.5
Construction	0	0.0	0.05	0.6	0.04	0.7	0.09	0.3
Ag Manufacturing - Animal foods	0	0.0	0.08	0.9	0	0.0	0.08	0.3
NonAg Manufacturing	0	0.0	0.06	0.7	0	0.0	0.06	0.2
Utilities - Generation & distribution	0	0.0	0.03	0.3	0.01	0.2	0.05	0.2
Ag Production - Greenhouse & nursery	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Forestry and logging, fishing, & hunting	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Ag Manufacturing - Grain & oilseed milling	0.01	0.1	0	0.0	0	0.0	0.01	0.0
Ag Manufacturing - bakery & tortilla	0	0.0	0	0.0	0.01	0.2	0.01	0.0
Ag Man - Fertilizer, chemical, machinery	0	0.0	0.01	0.1	0	0.0	0.01	0.0
Mining & drilling	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Sugar & confectionary	0	0.0	0	0.0	0	0.0	0	0.0
Ag Manufacturing - Beverages	0	0.0	0	0.0	0	0.0	0	0.0

## Spending Change Only Scenario Results

In the results of this scenario, we see the impacts of BCSD's food purchasing if we just change the spending patterns but leave the structure of the economy the same. Comparing these results to the full impact scenario allows us to empirically determine how much of the change in impacts was the result of overall changes in the economy. The outputs of this scenario are shown in Table 15.

Table 15. Economic impacts of spending changes by Buffalo City School District holding structure of the overall economy at 2018 levels, by year

Impact	Employment	Labor Income \$	Value Added \$	Output \$
2017-2018				
Direct	17.74	1,246,917	1,711,110	4,758,658
Indirect	14.85	1,077,448	1,639,180	3,538,862
Induced	9.86	636,324	1,119,003	1,716,941
Total	42.45	2,960,690	4,469,294	10,014,461
Multipliers	2.39	2.37	2.61	2.10
2018-2019				
Direct	21.92	1,461,645	2,013,169	5,711,272
Indirect	17.47	1,273,922	1,935,620	4,222,738
Induced	11.46	749,310	1,317,108	2,021,101
Total	50.85	3,484,878	5,265,898	11,955,111
Multipliers	2.32	2.38	2.62	2.09
2019-2020				
Direct	13.64	891,739	1,232,424	3,326,591
Indirect	9.67	714,490	1,080,104	2,257,639
Induced	6.65	440,309	773,610	1,187,217
Total	29.96	2,046,538	3,086,138	6,771,448
Multipliers	2.20	2.29	2.50	2.04

The change in total output impact from 2017-2018 to 2018-2019 is approximately 19.4%, less than the 19.7% change in the full impact scenario. Put differently, since the 2017-2018 model results are identical for both scenarios, the total output impact for the spending only scenario in 2018-2019 is .3% less (\$11.96 million) than the full impact scenario (\$11.99 million). While small, this suggests that changes in the overall economy in 2019 complemented and are additive to the shift purely in local spending. In other words, more localized linkages developed in the industries where BCSD spending occurred and/or the industries backward linked to those industries (i.e., from indirect and induced industry effects), albeit only modestly.

The opposite result occurred in 2020 – the COVID year. Here, holding the economy constant, total impacts dropped 43.4% from the previous year. This compares with a decrease of 45.4% in the full impact scenario. In this case, changes in the overall economy restricted the degree of local transactions (i.e., lower local backward linkages) from the year prior resulting in even larger reductions beyond the pure drop-in-spending effect. Given major supply chain disruptions in many sectors of the economy induced by COVID-19, the result makes intuitive sense considering the range of industries effected via indirect and induced effects. The differences in multipliers across scenarios tell an equivalent story.

As expected, the overall results are driven primarily by the larger local budget spending, which show the same relative effects as before – positive localized spending effects in the economy in 2019 and negative localized spending effects in 2020. However, the same is not true for entitlement spending. Here, given the industries purchased from in both 2019 and 2020, spending only changes are higher in both years, not just 2019 as indicated in the budget and aggregate spending results. 2018-2019 is also the year where only traditional entitlement spending occurred and which indicate the industries involved had lower localized spending in 2019 relative to the year prior; i.e., the entitlement output multiplier for 2018-2019 is 1.69 for the spending scenario only and 1.37 for the full impact scenario. Again, the results were broken out by spending type to view the impacts of entitlement spending and budget spending (Table 16).

Table 16. Economic impacts of spending changes by Buffalo City School District holding structure of the economy at 2018 levels, by spending type and year

Impact	Employment	Labor Income \$	Value Added \$	Output \$
2017-2018 Entitlement Dollars Only				
Direct	0.94	42,105	61,185	111,967
Indirect	0.28	21,161	30,637	49,048
Induced	0.27	17,361	30,524	46,834
Total	1.48	80,627	122,346	207,849
Multipliers	1.57	1.91	2.00	1.86
2017-2018 Budget Spending Only				
Direct	16.8	1,204,813	1,649,925	4,646,691
Indirect	14.57	1,056,286	1,608,543	3,489,814
Induced	9.59	618,963	1,088,479	1,670,107
Total	40.96	2,880,063	4,346,948	9,806,612
Multipliers	2.44	2.39	2.63	2.11
2018-2019 Entitlement Dollars Only				
Direct	0.34	7,511	12,452	22,999
Indirect	0.06	3,188	4,508	7,939
Induced	0.05	2,970	5,214	8,000
Total	0.44	13,669	22,175	38,938
Multipliers	1.29	1.82	1.78	1.69
2018-2019 Budget Spending Only				
Direct	21.58	1,454,134	2,000,717	5,688,273
Indirect	17.41	1,270,734	1,931,112	4,214,799
Induced	11.42	746,340	1,311,894	2,013,101
Total	50.4	3,471,208	5,243,724	11,916,173
Multipliers	2.34	2.39	2.62	2.09
2019-2020 Entitlement Dollars Only				
Direct	2.72	151,724	215,191	401,143
Indirect	0.97	79,260	114,877	182,720
Induced	0.96	63,316	111,252	170,733
Total	4.64	294,300	441,319	754,596
Multipliers	1.71	1.94	2.05	1.88
2019-2020 Budget Spending Only				
Direct	10.92	740,015	1,017,234	2,925,449
Indirect	8.7	635,229	965,227	2,074,919
Induced	5.69	376,993	662,359	1,016,484
Total	25.31	1,752,238	2,644,819	6,016,852
Multipliers	2.32	2.37	2.60	2.06

### **Cost Estimate of 30% NY Initiative**

The 30% NY Initiative provides a financial reimbursement to qualifying school districts. We argue that the cost of this reimbursement ultimately falls on the NYS taxpayer and assume that the cost of the reimbursement amount qualified for in the 2018-2019 school year represents the cost to the taxpayer. This cost is applied to the Full Impact scenario model as a negative shock, additive to the full impact results presented in Table 5. The total estimated cost of reimbursement for the 2018-2019 qualifying year was \$0.99 million. When it is applied as a negative household impact to average income households in NYS, there is a total negative output impact of -\$1.26 million due to the induced effects of this negative shock on households. This is considered the total negative impact or cost of the initiative to taxpayers, to be used in carrying out a benefit cost assessment for the policy.

## Conclusions

As found in the results of the Full Impact scenario for the 2017-2018 year, direct and total impacts in the pre-initiative year totaled \$4.8 million and \$10 million, respectively. The increase in total impacts from participating in the initiative came to an increase of \$.95 million and \$1.97 million for direct and total outputs, respectively. The increase in impacts is a result of the increased local spending by BCSD after participating in the 30% NY Initiative. Thus, the \$1.97 million increase in total impacts represents the total benefits to NYS of BCSD's participation in the initiative. This benefit can then be compared to the cost of the 30% NY Initiative, made up of the cost of reimbursement plus its multiplier effects that accrue via households introduced earlier.

As previously found, the negative total impact accrued by the negative shock of the cost of the initiative to taxpayers was -1.26 million. This means that the gain of approximately \$1.97 million between 2017-2018 and 2018-2019 had a cost to the taxpayer of about \$1.26 million. Here it is evident that the total economic benefits of the change in spending while participating in the initiative outweigh the costs to taxpayers. A benefit-cost ratio (BCR) was calculated by dividing \$1.97 million by 1.26 million (i.e., the total benefits divided by the total costs) and it resulted in a BCR of 1.56. In other words, for every \$1.00 of reimbursement under the initiative, total economic impact increases \$1.56 in NYS.

The 30% NY Initiative has a net positive economic impact on the NYS economy. This analysis reflected that these impacts are not only the result of increased spending, but they are also attributed to overall changes in the structural economy as well as differences in local spending within the industries where local dollars are ultimately spent. Particularly, 2019 was observed to be a year more conducive to local spending, while poor multiplier effects in 2020 reflected the challenges faced by local businesses during the pandemic. We observed shifting in the budget that suggests changes to where local foods were purchased and for what meal. Pre-initiative, the impacts of BCSDs spending came mostly from dairy (i.e., fluid milk) and the wholesale margin, but after participating in the initiative, we saw diversification of

industries in the overall spending, as well as within dairy (i.e., cheese and ice cream). Notable increases in local dollars went to local beef and fruits and vegetables.

Dairy is a highly impactful industry within the state, and local spending in this sector (and changes in this spending) make up a large portion of the total economic impacts. Even so, we see that participation in the initiative caused changes in the proportion of their total impacts by food category as well. Dairy has large multiplier effects on the economy, but other sectors hold important impacts as well. Notably, BCSDs spending revealed higher employment impacts for the fruit and vegetable production sector than the dairy production sector, even though the quantity of fluid milk and processed dairy products was much higher.

Additionally, the analysis yielded interesting results on the difference in impacts between entitlement and regular budget spending which revealed fundamental structural differences in the way that these different types of spending move through their supply chains. Economic multipliers for budget spending are much higher than for entitlement spending, attributed to the nature of the products that tend to be available for purchase with entitlement dollars. Nonetheless, the multiplier effect of entitlement spending increased during the years where BCSD participated in special entitlement programs (USDA DoD and USDA Pilot), revealing opportunities for growth in local impact through these special programs.

This work was hampered by the effect that spending changes during COVID-19 had on the 2019-2020 school year. Ultimately, more understanding of the shifts in spending and changes in economic impacts could be understood through inclusion of data from more years of BCSD's participation in the initiative that are not affected by COVID closures. This would yield better comparison than the 2019-2020 year, which was too deeply affected for meaningful comparison in our results. Additionally, future work evaluating the impact of this policy would be greatly improved by better accounting of local versus non-local spending on the part of SFAs. Particularly, ensuring there is proper incentive for SFAs to continue tracking local versus non-local spending after the 30% threshold is reached would provide a more accurate representation of the spending patterns. Further, although this work took a deeper look at

the impacts by way of types of spending (i.e., entitlement vs budget spending), industry, and category of product, there are additional ways to evaluate the total impacts (e.g., by product, vendor, or each entitlement program) that were not explored in this work.

Overall the results portray positive net economic impacts from BCSD's participation in the 30% NY Initiative. The results have important implications and insights for both FTS policy makers and SFAs surrounding this and other local food purchasing incentives. Our efforts also provide a needed pathway for other districts and interested parties to begin analyzing their impacts irrespective of location and the specific FTS program in question.



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APPENDIX I

2017-2018 Spending by Industry				
Rank	Industry	\$ Total	\$ Local	% Local
1	Fluid milk manufacturing	\$2,550,189.95	\$2,308,426.62	90.5%
2	Wholesale - Grocery and related products	\$3,687,704.19	\$2,127,010.20	57.7%
3	Fruit farming	\$611,026.21	\$154,471.50	25.3%
4	Truck transportation	\$191,651.47	\$128,628.30	67.1%
5	Vegetable and melon farming	\$349,649.45	\$32,583.96	9.3%
6	Canned fruits and vegetables manufacturing	\$707,921.28	\$2,637.54	0.4%
7	Frozen fruits, juices, and vegetables manufacturing	\$308,216.50	\$2,340.24	0.8%
8	All other food manufacturing	\$449,121.16	\$1,543.71	0.3%
9	Beef cattle ranching & farming	\$558.50	\$558.50	100.0%
10	Meat processed from carcasses	\$731,378.91	\$386.51	0.1%
11	Greenhouse, nursery, and floriculture	\$2,431.85	\$70.79	2.9%
12	Grain farming	\$22,467.87	\$0.00	0.0%
13	All other crop farming	\$238.13	\$0.00	0.0%
14	Poultry and egg production	\$282,657.78	\$0.00	0.0%
15	Flour milling	\$22.45	\$0.00	0.0%
16	Rice milling	\$545.00	\$0.00	0.0%
17	Fats and oil refinery and blending	\$5,430.08	\$0.00	0.0%
18	Breakfast cereal manufacturing	\$338,624.82	\$0.00	0.0%
19	Sugar cane mills and refining	\$1,436.82	\$0.00	0.0%
20	Nonchocolate confectionary manufacturing	\$75,411.18	\$0.00	0.0%
21	Chocolate and confectionary manufacturing	\$1,363.46	\$0.00	0.0%
22	Frozen specialties manufacturing	\$378,270.03	\$0.00	0.0%
23	Canned specialties	\$34,461.66	\$0.00	0.0%
24	Dehydrated food products manufacturing	\$8,308.71	\$0.00	0.0%
25	Cheese manufacturing	\$234,803.55	\$0.00	0.0%
26	Creamery butter manufacturing	\$309.85	\$0.00	0.0%
27	Ice cream and frozen dessert manufacturing	\$40,551.02	\$0.00	0.0%
28	Frozen cakes and other pastries manufacturing	\$72,203.10	\$0.00	0.0%
29	Poultry processing	\$913,303.05	\$0.00	0.0%
30	Seafood product preparation and packaging	\$13,505.06	\$0.00	0.0%
31	Bread and bakery product manufacturing	\$467,376.44	\$0.00	0.0%
32	Cookie and cracker manufacturing	\$138,112.50	\$0.00	0.0%
33	Dry pasta, mixes, and dough manufacturing	\$28,833.22	\$0.00	0.0%
34	Tortilla manufacturing	\$19,726.52	\$0.00	0.0%
35	Roasted nuts and peanut butter manufacturing	\$69,326.11	\$0.00	0.0%
36	Other snack food manufacturing	\$109,835.09	\$0.00	0.0%
37	Mayonnaise, dressing, and sauce manufacturing	\$78,240.40	\$0.00	0.0%
38	Spice and extract manufacturing	\$13,338.79	\$0.00	0.0%
39	Bottled and canned soft drinks & water	\$8,333.78	\$0.00	0.0%
40	Other basic organic chemical manufacturing	\$223.35	\$0.00	0.0%

APPENDIX II

2018-2019 Spending by Industry				
Rank	Industry	\$ Total	\$ Local	% Local
1	Fluid milk manufacturing	\$2,745,378.48	\$2,538,804.86	92.5%
2	Wholesale - Grocery and related products	\$4,953,606.23	\$2,325,289.95	46.9%
3	Fruit farming	\$452,039.97	\$245,787.54	54.4%
4	Ice cream and frozen dessert manufacturing	\$232,706.40	\$204,224.90	87.8%
5	Truck transportation	\$229,310.95	\$160,760.45	70.1%
6	Cheese manufacturing	\$305,132.37	\$62,630.89	20.5%
7	Vegetable and melon farming	\$230,850.56	\$59,983.32	26.0%
8	Canned fruits and vegetables manufacturing	\$1,176,415.98	\$48,311.52	4.1%
9	Frozen specialties manufacturing	\$596,637.12	\$18,367.45	3.1%
10	Meat processed from carcasses	\$772,152.46	\$13,679.93	1.8%
11	Frozen fruits, juices, and vegetables manufacturing	\$530,281.10	\$12,020.22	2.3%
12	Other snack food manufacturing	\$232,915.60	\$10,550.27	4.5%
13	All other food manufacturing	\$696,154.70	\$4,402.27	0.6%
14	Beef cattle ranching & farming	\$3,510.54	\$3,510.54	100.0%
15	Grain farming	\$2,871.39	\$2,627.70	91.5%
16	All other crop farming	\$324.06	\$273.46	84.4%
17	Poultry and egg production	\$460,881.00	\$46.80	0.0%
18	Tree nut farming	\$24.31	\$0.00	0.0%
19	Greenhouse, nursery, and floriculture	\$1,847.64	\$0.00	0.0%
20	Flour milling	\$158.48	\$0.00	0.0%
21	Rice milling	\$12,503.69	\$0.00	0.0%
22	Fats and oil refinery and blending	\$12,445.85	\$0.00	0.0%
23	Breakfast cereal manufacturing	\$666,071.95	\$0.00	0.0%
24	Sugar cane mills and refining	\$3,167.78	\$0.00	0.0%
25	Nonchocolate confectionary manufacturing	\$103,101.91	\$0.00	0.0%
26	Chocolate and confectionary manufacturing	\$2,433.42	\$0.00	0.0%
27	Canned specialties	\$32,923.58	\$0.00	0.0%
28	Dehydrated food products manufacturing	\$17,183.16	\$0.00	0.0%
29	Creamery butter manufacturing	\$1,263.82	\$0.00	0.0%
30	Frozen cakes and other pastries manufacturing	\$179,761.12	\$0.00	0.0%
31	Poultry processing	\$1,180,613.17	\$0.00	0.0%
32	Seafood product preparation and packaging	\$48,698.00	\$0.00	0.0%
33	Bread and bakery product manufacturing	\$606,580.80	\$0.00	0.0%
34	Cookie and cracker manufacturing	\$193,590.25	\$0.00	0.0%
35	Dry pasta, mixes, and dough manufacturing	\$91,820.75	\$0.00	0.0%
36	Tortilla manufacturing	\$18,141.32	\$0.00	0.0%
37	Roasted nuts and peanut butter manufacturing	\$36,633.09	\$0.00	0.0%
38	Mayonnaise, dressing, and sauce manufacturing	\$169,160.72	\$0.00	0.0%
39	Spice and extract manufacturing	\$32,464.54	\$0.00	0.0%
40	Bottled and canned soft drinks & water	\$14,463.62	\$0.00	0.0%
41	Other basic organic chemical manufacturing	\$212.53	\$0.00	0.0%

APPENDIX III

2019-2020 Spending by Industry				
Rank	Industry	\$ Total	\$ Local	% Local
1	Wholesale - Grocery and related products	\$3,557,019.26	\$1,430,432.29	40.2%
2	Fluid milk manufacturing	\$1,082,205.07	\$1,025,388.43	94.7%
3	Truck transportation	\$186,818.03	\$125,575.15	67.2%
4	Fruit farming	\$396,654.06	\$106,351.96	26.8%
5	Canned fruits and vegetables manufacturing	\$1,002,878.34	\$105,928.32	10.6%
6	Meat processed from carcasses	\$888,207.79	\$100,647.76	11.3%
7	Vegetable and melon farming	\$282,673.47	\$95,703.43	33.9%
8	Ice cream and frozen dessert manufacturing	\$95,448.86	\$87,485.42	91.7%
9	Cheese manufacturing	\$548,764.83	\$72,977.92	13.3%
10	Other snack food manufacturing	\$192,937.90	\$57,009.50	29.5%
11	Beef cattle ranching & farming	\$35,072.37	\$35,072.37	100.0%
12	Frozen specialties manufacturing	\$830,719.61	\$33,403.44	4.0%
13	Grain farming	\$22,963.74	\$21,455.41	93.4%
14	Frozen fruits, juices, and vegetables manufacturing	\$344,974.18	\$20,109.38	5.8%
15	All other food manufacturing	\$694,376.65	\$4,414.70	0.6%
16	Greenhouse, nursery, and floriculture	\$3,018.51	\$0.00	0.0%
17	Poultry and egg production	\$558,136.48	\$0.00	0.0%
18	Flour milling	\$61.96	\$0.00	0.0%
19	Rice milling	\$11,764.05	\$0.00	0.0%
20	Wet corn milling	\$11.47	\$0.00	0.0%
21	Fats and oil refinery and blending	\$8,645.72	\$0.00	0.0%
22	Breakfast cereal manufacturing	\$653,284.31	\$0.00	0.0%
23	Sugar cane mills and refining	\$2,275.31	\$0.00	0.0%
24	Nonchocolate confectionary manufacturing	\$168,843.86	\$0.00	0.0%
25	Chocolate and confectionary manufacturing	\$2,600.70	\$0.00	0.0%
26	Canned specialties	\$41,924.12	\$0.00	0.0%
27	Dehydrated food products manufacturing	\$97,581.46	\$0.00	0.0%
28	Creamery butter manufacturing	\$1,269.25	\$0.00	0.0%
29	Frozen cakes and other pastries manufacturing	\$140,351.98	\$0.00	0.0%
30	Poultry processing	\$1,254,763.89	\$0.00	0.0%
31	Seafood product preparation and packaging	\$11,397.37	\$0.00	0.0%
32	Bread and bakery product manufacturing	\$537,589.17	\$0.00	0.0%
33	Cookie and cracker manufacturing	\$214,000.87	\$0.00	0.0%
34	Dry pasta, mixes, and dough manufacturing	\$17,357.65	\$0.00	0.0%
35	Tortilla manufacturing	\$5,427.41	\$0.00	0.0%
36	Roasted nuts and peanut butter manufacturing	\$99,898.07	\$0.00	0.0%
37	Mayonnaise, dressing, and sauce manufacturing	\$97,256.60	\$0.00	0.0%
38	Spice and extract manufacturing	\$28,336.25	\$0.00	0.0%
39	Bottled and canned soft drinks & water	\$7,801.51	\$0.00	0.0%
40	Other basic organic chemical manufacturing	\$181.50	\$0.00	0.0%

APPENDIX IV

Examples of products purchased by BCSD assigned to manufacturing industry codes

Industry Code	Description	Examples
65	Flour milling	All-purpose wheat flour, all flours, pancake mix, dough mix, biscuit mix
66	Rice milling	Rice, parboiled rice
68	Wet corn milling	Corn starch
70	Fats and oils refining and blending	Margarine, olive oil, vegetable oils
71	Breakfast cereal manufacturing	All breakfast cereals, granola
73	Sugar cane mills and refining	Refined sugar, cane sugar
74	Nonchocolate confectionery manufacturing	Non-chocolate covered breakfast bars, marshmallow, granola bars, jelly candies, snack bars
75	Chocolate and confectionery manufacturing from cacao beans	Chocolate chips, hot cocoa mix, chocolate spread
77	Frozen fruits, juices, and vegetables manufacturing	Frozen mixed berries, frozen vegetables, frozen French fries
78	Frozen specialties manufacturing	Frozen meatless patties, frozen cheese sticks, frozen breadsticks stuffed with cheese, frozen chili, frozen egg rolls, frozen entrees (e.g., macaroni and cheese, lasagna tray), onion rings, frozen pizzas, frozen soups, frozen waffles, falafel nuggets, frozen pancakes
79	Canned fruits and vegetables manufacturing	Canned vegetables, canned beets, canned beans (plain), canned cherry carbatrol, maraschino cherries, mixed fruit in juice, jelly and jam, juice boxes, fruit juice, ketchup, olives, banana peppers tub, pickles, relishes, tomato based sauces, barbecue sauce, sauerkraut, fruit pie fillings, chili sauce/hot sauce, salsa, pico de gallo
80	Canned specialties	Baked beans, shelf stable gravy, soups, broth, canned stuffed grape leaves
81	Dehydrated food products manufacturing	Dried fruits, raisins, bouillon powder/paste
82	Cheese manufacturing	Sliced cheese, shredded cheese, crumbled cheese, processed

		cheese, cream cheese, cheese spreads, cheese sauce, cheese curds
84	Fluid milk manufacturing	Milk, milk substitutes, whipped topping, whipped cream, buttermilk, Lactaid milk, cottage cheese, sour cream, yogurt, nondairy creamer (liquid), eggnog and milk-based beverages
85	Creamery butter manufacturing	butter
86	Ice cream and frozen dessert manufacturing	ice cream, flavored ices, flavored sherbets, ice pops, fruit pops
87	Frozen cakes and other pastries manufacturing	Pastries like cinnamon rolls where it says “Thaw & bake” or “frozen”, frozen danishes, frozen churros
88	Poultry processing	Turkey bologna stick, chicken tenders, buffalo chicken, chicken strips, breaded chicken, chicken wings, packaged chicken breasts
90	Meat processed from carcasses	Frozen beef crumbles, frozen beef patties, frozen Asian beef, bacon, corned meats, luncheon meats, ham slices, hot dogs, frozen meatballs, dried meats, pepperoni
92	Seafood product preparation and packaging	Breaded cod fillets, fish ready-to-serve frozen, seafood soups, clam chowder, canned seafood
93	Bread and bakery product, except frozen, manufacturing	Breads, frozen breads, frozen banana bread, zucchini bread, pita breads, breadstick plain, cakes that don’t explicitly say “frozen,” cheesecake, croissants, pastries, cream puffs, danishes (baked), doughnuts, French toast, muffins, pop tarts, rolls, frozen bread rolls or bagels, tray of brownies, croutons
94	Cookie and cracker manufacturing	Cookies, filled cookies, crackers, graham crackers
95	Dry pasta, mixes, and dough manufacturing	Pizza dough, biscuit dough, cookie dough (frozen and refrigerated), any dough refrigerated or frozen, dry pasta, cake mixes from purchased flour
96	Tortilla manufacturing	Tortillas and wraps

97	Roasted nuts and peanut butter manufacturing	Peanut butter, roasted seeds and nuts, roasted garbanzo snacks
98	Other snack food manufacturing	Chips, corn chips, popcorn, potato sticks, tortilla chips, cheese curls/puffs
101	Mayonnaise, dressing, and sauce manufacturing	Salad dressing, sandwich spreads, hummus, sauces, mayo, dips, guacamole, horseradish, mustard, alfredo sauce, reheat-able sauces, soy sauce, Worcestershire sauce
102	Spice and extract manufacturing	Vanilla extract, dry gravy mix
103	All other food manufacturing	Eggs processed, liquid eggs, honey, egg noodles, noodles, pizza “kit” unfrozen (e.g., Lunchables or Anytimers, prepared meals refrigerated, mashed potato in bag, puddings, sandwiches, pancake syrups, burritos, shredded coconut, breadcrumbs, powdered drink mixes, baking powder/soda, prepared cheeseburgers (cooked), cooked pasta, ravioli, imitation bacon bits, potato salad, pasta salad, fruit salad
104	Bottled and canned soft drinks and water	Bottled water, iced tea, fruit drinks (not juice), lemonade
163	Other basic organic chemical manufacturing	Sugar substitutes

APPENDIX V

Figure 1. Total output effects, by food product category, 2017-2018

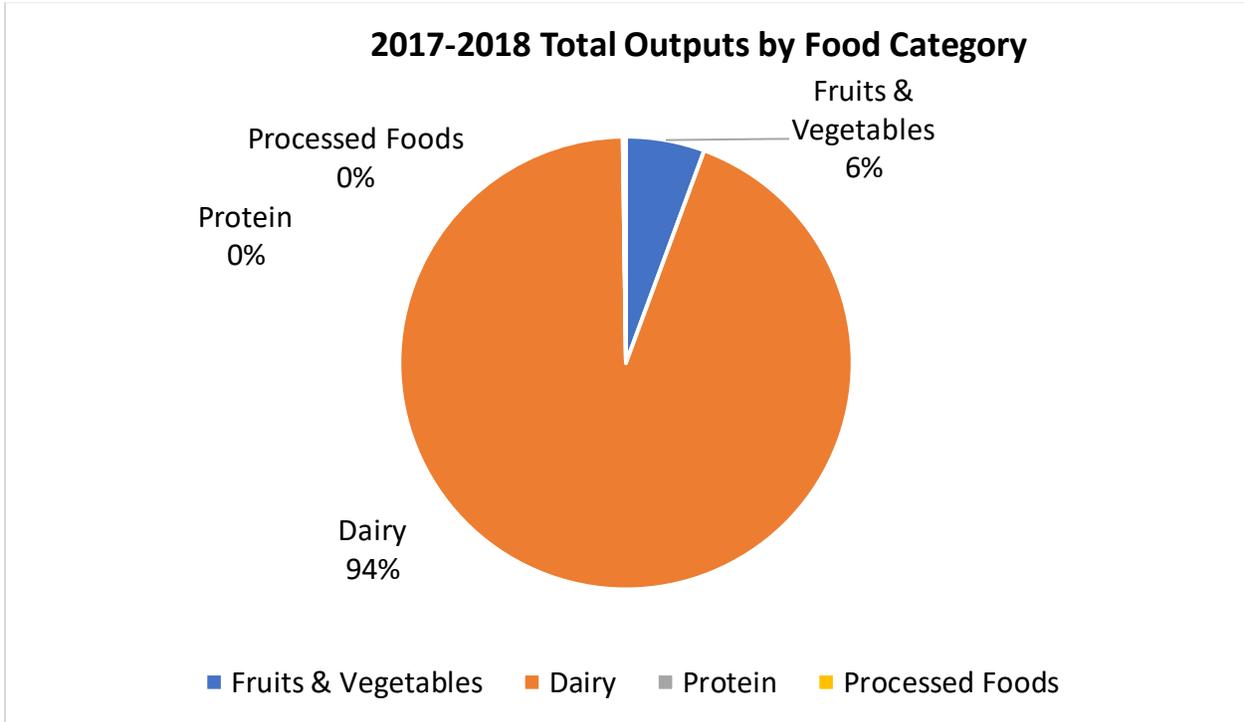


Figure 2. Total output effects, by food product category, 2018-2019

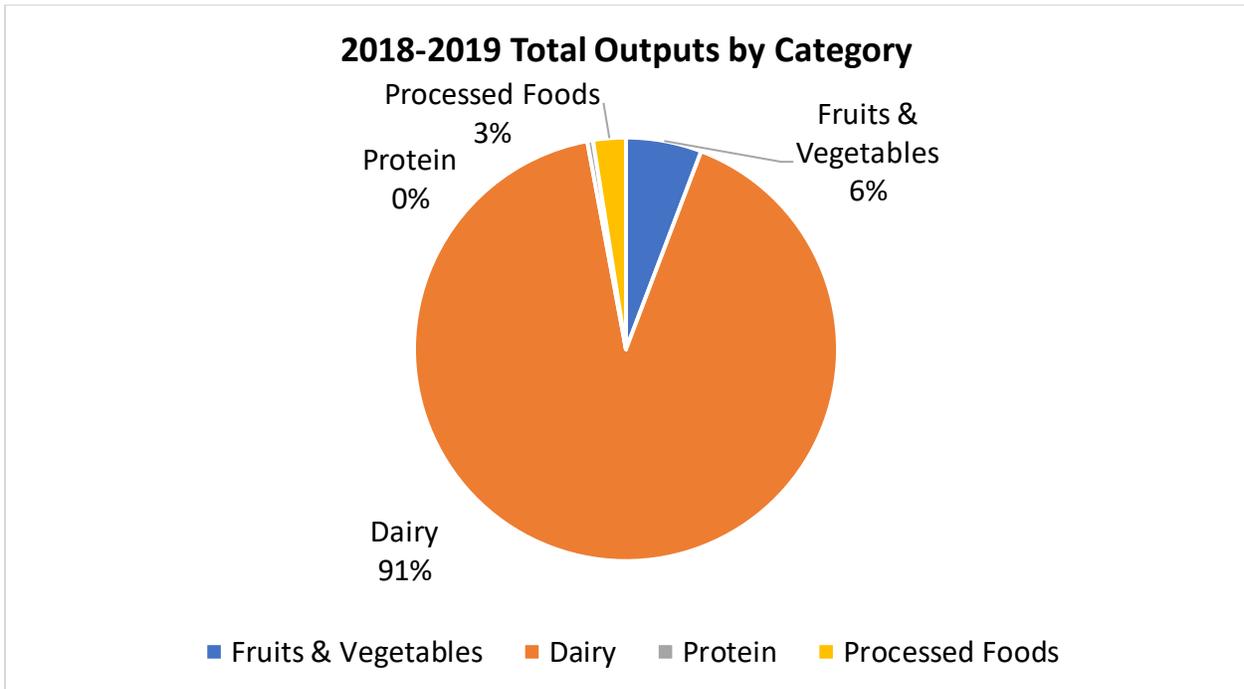
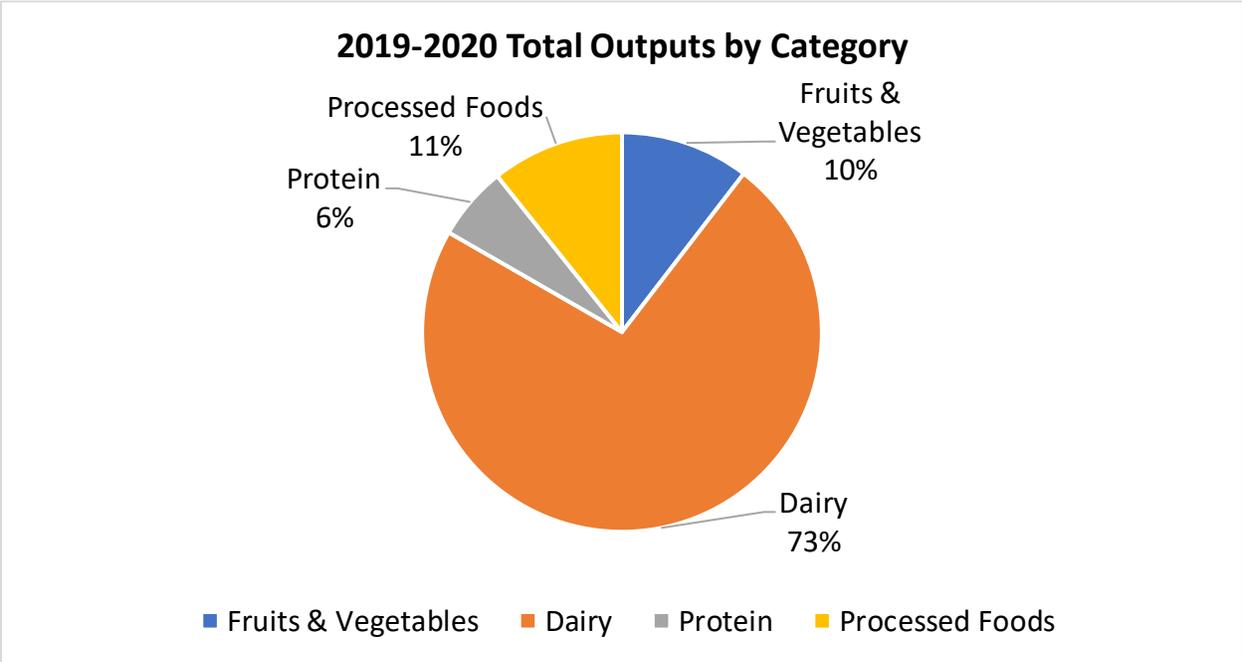


Figure 3. Total output effects, by food product category, 2019-2020



APPENDIX VI

Figure 4: Top 10 industries ranked by total output impacts in Full Impact Scenario, 2017-2018

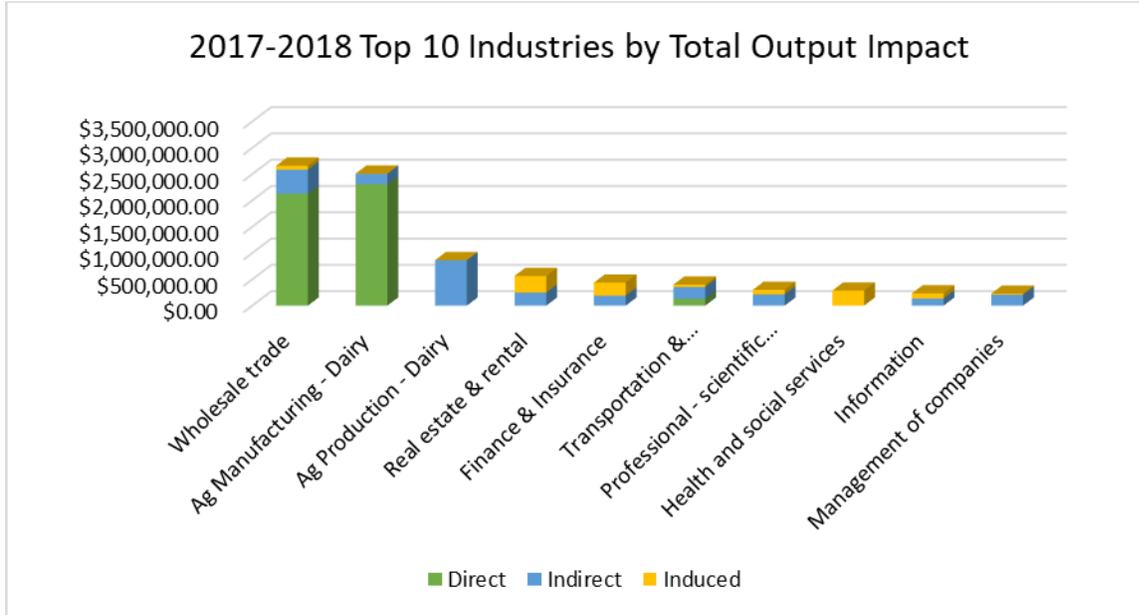


Figure 5: Top 10 industries ranked by total output impacts in Full Impact Scenario, 2018-2019

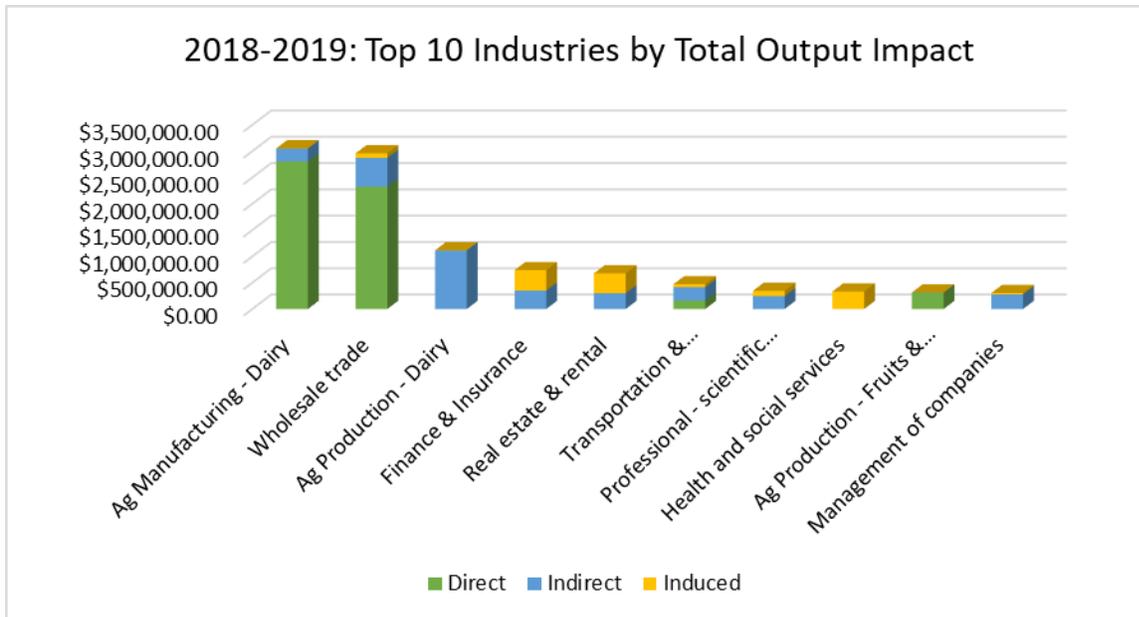


Figure 6: Top 10 industries ranked by total output impacts in Full Impact Scenario, 2019-2020

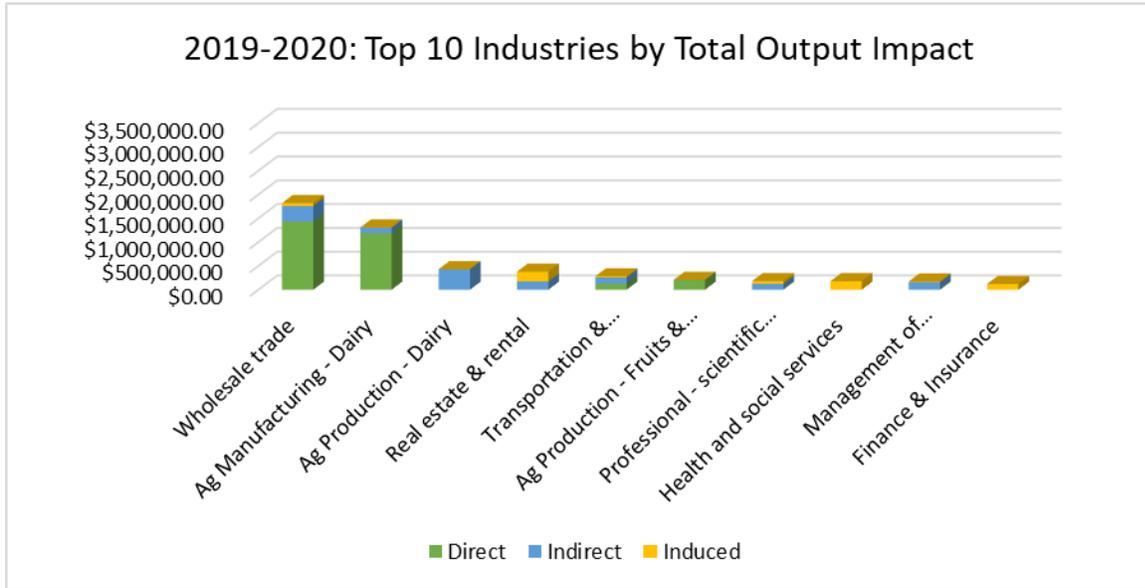


Figure 7: Top 10 industries ranked by total employment impacts in Full Impact Scenario, 2017-2018

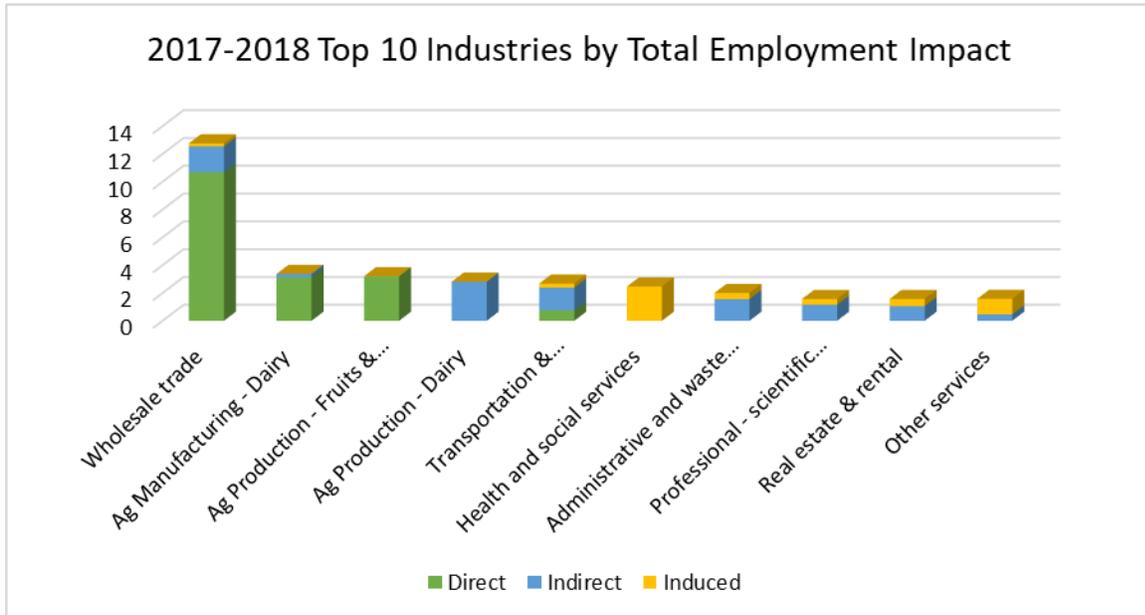


Figure 8: Top 10 industries ranked by total employment impacts in Full Impact Scenario, 2018-2019

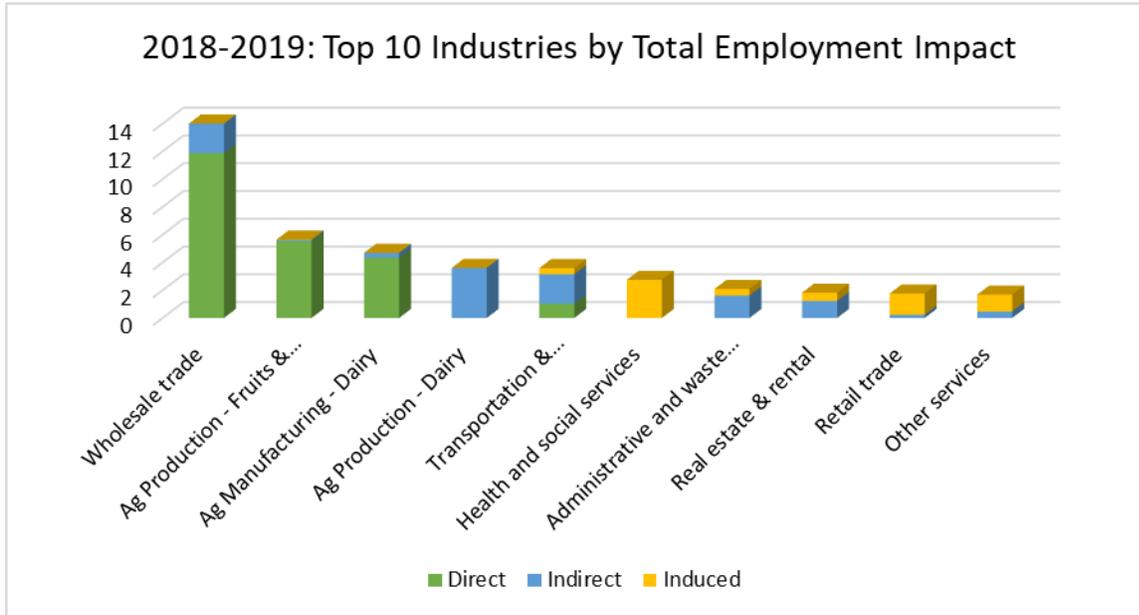


Figure : Top 10 industries ranked by total employment impacts for Full Impact Scenario, 2019-2020

