The Lasting Success of Farm to School in Oregon

Updated Economic Analysis Building upon *The Impact of Seven Cents*

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I. Executive Summary

This report provides a series of updated estimates of the economic impact of locally sourced food purchases by Oregon school districts, using data available from a study conducted by Ecotrust in 2008-9 and from the USDA Farm to School Census for 2011-12. It provides additional evidence that on a per-dollar or per-project basis, local sourcing of food for school lunches has a significant positive impact on the Oregon agricultural economy. Our data shows that for each $1.00 spent on local school food purchases excluding fluid milk and butter, a total of $2.00 of economic activity is generated in the Oregon state economy; and for each job created directly from local school food purchases, a total of 2.61 jobs are created throughout the Oregon state economy. We estimate that in 2011-12, $21.1 million in total economic activity was generated through Farm to School-related school food purchases, and 120 total jobs were created.

II. Introduction and Data

This brief report updates the assessment of the economic impacts of investing an additional $.07 per meal in locally sourced school lunches in the Ecotrust report *The Impact of Seven Cents* (Kane, et al. 2011). The original assessment analyzed purchasing by the Portland Public Schools and Gervais school districts. The assessment authors collected data from both districts on all local food purchases made during the 2008-2009 school year, including data from 91 schools serving approximately 22,000 lunches per day. For each food purchase, the school districts recorded the vendor/brand, item description, purchase unit (e.g., flat, package, loaf, etc.), price per purchase unit, total units purchased, and total amount spent (Kane, et al. 2011). Table 1 below lists the total dollar purchases made by industry category, by location, across the two school districts, as reported in the original analysis (Kane, et al. 2011). Industry categories follow the 440-sector classification scheme used by the IMPLAN economic analysis software, as described further below in section 0.

Table 1. Local (Oregon) purchases by Portland Public Schools and Gervais (2008–2009)

Industry	PPS local purchases	Gervais local purchases	Total local purchases	% of total	% of total (w/o milk & butter)
Vegetable and melon farming	$24,040	$1,371	$25,411	1.3%	2.3%
Fruit farming	$117,934	$2,486	$120,420	6.1%	10.7%
Cattle ranching and farming	$628		$628	0.0%	0.1%
Poultry and egg production	$106		$106	0.0%	0.0%
Animal production, except cattle and poultry	$62		$62	0.0%	0.0%
Fats and oils refining and blending	$5,503		$5,503	0.3%	0.5%
Breakfast cereal manufacturing	$5,337		$5,337	0.3%	0.5%
Frozen food manufacturing	$13,473		$13,473	0.7%	1.2%
Fruit and vegetable canning	$34,757		$34,757	1.8%	3.1%
Fluid milk and butter manufacturing	$842,135	$6,246	$848,381	42.9%	n/a
Cheese manufacturing	$30,318		$30,318	1.5%	2.7%

Animal processing, except poultry and seafood	$18,371		$18,371	0.9%	1.6%
Poultry processing	$55,450		$55,450	2.8%	4.9%
Bread and bakery product manufacturing	$303,321	$195	$303,516	15.4%	26.9%
Tortilla manufacturing	$14,144		$14,144	0.7%	1.3%
Flavoring syrup and concentrate manufacturing	$113		$113	0.0%	0.0%
Seasoning and dressing manufacturing	$7,756		$7,756	0.4%	0.7%
All other food manufacturing	$492,953		$492,953	24.9%	43.7%
TOTAL	**$1,966,400**	**$10,298**	**$1,976,698**		
TOTAL (without fluid milk and butter manufacturing sector)	**$1,124,265**	**$4,052**	**$1,128,317**		

Source: Kane et al (2011).

III. Price Adjustments

We update these numbers for the current year (2014-2015) by adjusting the dollar values of purchases given above in Table 1 to reflect current prices. We use the U.S. Consumer Price Index (CPI) for food to reflect changes in food prices between the base year (2008-9) and current year (2014-15). CPI data for food are collected annually and by food product category from the U.S. Department of Agriculture (USDA). The prices of different food products change at different rates in different years, based on changing conditions of supply and demand. Weather patterns, changes in input prices, and changing consumer tastes are just some of the factors that affect the constantly shifting pattern of food prices.

From the annual CPI data for food, we calculate the cumulative percentage changes in the average prices of major food product categories between 2008-9 and 2014-15. We estimate the price adjustments from one school year to the next by averaging the cumulative percentage changes from the years in which the first and second semesters of each school year occurred. Thus, the **school year price adjustment** between the 2008-9 and 2014-15 school years is approximated by averaging the cumulative percentage changes between 2008 and 2014 with the cumulative percentage changes between 2009 and 2015. The price changes for 2015 are based on the USDA forecast (2015).

Table 2 below reports the average annual changes in food prices by USDA food product category between 2008 and 2014, with price changes forecast for 2015 (USDA 2015). For instance, the average price of beef and veal rose 4.5% nationwide in 2008 relative to 2007, and fell by 1.0% in 2009 relative to 2008.

Table 2. Average Annual Price Changes by USDA Food Product Category, 2008-2015

USDA Category	2008	2009	2010	2011	2012	2013	2014	*2015 (forecast)*
Beef and veal	4.5%	-1.0%	2.9%	10.2%	6.4%	2.0%	12.1%	5.5%
Pork	2.3%	-2.0%	4.7%	8.5%	0.3%	0.9%	9.1%	0.5%
Other meats	3.1%	2.3%	-0.1%	6.4%	1.7%	-0.1%	3.9%	3.0%
Poultry	5.0%	1.7%	-0.1%	2.9%	5.5%	4.7%	2.0%	3.0%
Fish and seafood	5.9%	3.6%	1.1%	7.1%	2.4%	2.5%	5.8%	3.0%
Eggs	14.0%	-14.7%	1.5%	9.2%	3.2%	3.3%	8.4%	3.0%
Dairy products	8.0%	-6.4%	1.1%	6.8%	2.1%	0.1%	3.6%	2.5%
Fats and oils	13.8%	2.3%	-0.3%	9.3%	6.1%	-1.4%	0.1%	0.5%
Fresh fruits	4.8%	-6.1%	-0.6%	3.3%	1.0%	2.0%	4.8%	3.0%
Fresh vegetables	5.6%	-3.4%	2.0%	5.6%	-5.1%	4.7%	-1.3%	2.5%
Processed fruits & vegetables	9.5%	6.6%	-1.3%	2.9%	3.8%	0.3%	0.1%	2.5%
Sugar and sweets	5.5%	5.6%	2.2%	3.3%	3.3%	-1.7%	-0.8%	2.0%
Cereals and bakery products	10.2%	3.2%	-0.8%	3.9%	2.8%	1.0%	0.2%	1.0%
Nonalcoholic beverages	4.3%	1.9%	-0.9%	3.2%	1.1%	-1.0%	-0.5%	2.5%
Other foods	5.2%	3.7%	-0.5%	2.3%	3.5%	0.5%	1.0%	2.0%

Source: (USDA 2015, USDA 2015)

Table 3 below summarizes the cumulative price changes between the two school years 2008-2009 and 2014-2015, by product category, using the figures from Table 2. The first two columns summarize the cumulative price changes between 2008-2014, and 2009-2015, respectively. For instance, between 2008 and 2014 the average price of beef and veal increased by 36.45%; the average price of pork increased by 22.98%; and so on. The figures in the last column of Table 3 (in italics) give the school year price adjustment between 2008-9 and 2014-15 for each food product category. For instance, between 2008-9 and 2014-15, the average price of beef and veal increased by 40.97%.

Table 3. Cumulative Price Changes by USDA Food Product Category, 2008-2015

	Cumulative Price Changes		
USDA Category	**2008-2014**	**2009-2015 (forecast)**	***2008-9 to 2014-15***
Beef and veal	36.45%	45.49%	***40.97%***
Pork	22.98%	26.10%	***24.54%***
Other meats	14.79%	15.62%	***15.20%***
Poultry	17.71%	19.27%	***18.49%***
Fish and seafood	24.62%	23.86%	***24.24%***
Eggs	9.26%	31.90%	***20.58%***
Dairy products	7.09%	17.22%	***12.15%***
Fats and oils	16.69%	14.67%	***15.68%***
Fresh fruits	4.07%	14.15%	***9.11%***
Fresh vegetables	2.11%	8.32%	***5.21%***
Processed fruits & vegetables	12.85%	8.49%	***10.67%***
Sugar and sweets	12.23%	8.46%	***10.35%***
Cereals and bakery products	10.56%	8.26%	***9.41%***
Nonalcoholic beverages	3.78%	4.42%	***4.10%***
Other foods	10.97%	9.12%	***10.05%***

Source: Author's calculations, based on (USDA 2015, USDA 2015).

The next step of the analysis is to prepare the data for use in the IMPLAN input-output modeling software, which we will use to conduct the economic impact analysis below in section 0. Unfortunately, the food product categorization schemes used by USDA and IMPLAN are not the same. In Table 4 below we map each of the USDA food product categories given in Table 3 above to one or more categories used by IMPLAN. Some USDA categories map to one or more IMPLAN categories; for instance, the "Dairy products" category in the USDA system maps to both the "Fluid milk and butter manufacturing" and "Cheese manufacturing" categories in IMPLAN. The IMPLAN category "Poultry and egg production" maps to two USDA food product categories, "Poultry" and "Eggs".

Table 4. Mapping Between USDA and IMPLAN Food Product Categories

USDA Category	**IMPLAN Category 1**	**IMPLAN Category 2**	**IMPLAN Category 3**
Beef and veal	Cattle ranching and farming		
Other meats	Animal production except cattle and poultry	Animal processing, except poultry and seafood	
Poultry	Poultry and egg production	Poultry processing	
Eggs	Poultry and egg production		
Dairy products	Fluid milk and butter manufacturing	Cheese manufacturing	
Fats and oils	Fats and oils refining and blending		
Fresh fruits	Fruit farming		
Fresh vegetables	Vegetable and melon farming		

Processed fruits & vegetables	Fruit and vegetable canning		
Cereals and bakery products	Breakfast cereal manufacturing	Bread and bakery product manufacturing	Tortilla manufacturing
Other foods	Frozen food manufacturing	Flavoring syrup and concentrate manufacturing; Seasoning and dressing manufacturing	All other food manufacturing

Table 5 below reports the adjustment factors for each IMPLAN food product category for school year 2014-15, relative to school year 2008-9. These are the cumulative percentage increases in prices for each of the food products purchased by the Portland Public Schools and Gervais school districts between the period when the original data was collected and the present. For instance, on average, the products from the "Vegetable and melon farming" category, including all fresh vegetables and unprocessed melons, have gone up by 5.21% between 2008-9 and 2014-15. For the case of the "poultry and egg production" category that is double-listed above in Table 4, we simply average the two adjustment factors from the two USDA categories, "Poultry" and "Eggs".

We use these price adjustments to figure out how much it would cost for a school district to purchase an identical quantity of fresh vegetables in 2014-15 to those that it purchased in 2008-9. For instance, if the school bought $100 worth of fresh vegetables in 2008-9, that same quantity of vegetables would cost, on average, $105.21 in 2014-15. The cumulative price increase for fruit farming during this period was 9.11%. If the school had bought $100 worth of fresh fruit (excluding melons) in 2008-9, that quantity of fruit would cost, on average, $109.11 in 2014-15.

Table 5. Cumulative Price Increases between School Year 2008-9 and 2014-15 by IMPLAN Food Product Category

IMPLAN Category	Cumulative Price Increase (2008-9 to 2014-15)
Vegetable and melon farming	5.21%
Fruit farming	9.11%
Cattle ranching and farming	40.97%
Poultry and egg production	19.54%
Animal production, except cattle and poultry	15.20%
Fats and oils refining and blending	12.15%
Breakfast cereal manufacturing	9.41%
Frozen food manufacturing	10.05%
Fruit and vegetable canning	10.67%
Fluid milk and butter manufacturing	12.15%
Cheese manufacturing	12.15%
Animal processing, except poultry and seafood	15.20%
Poultry processing	18.49%
Bread and bakery product manufacturing	9.41%
Tortilla manufacturing	9.41%
Flavoring syrup and concentrate manufacturing	10.05%
Seasoning and dressing manufacturing	10.05%
All other food manufacturing	10.05%

Source: Author's calculations, modified from USDA (2015) *and USDA* (2015).

Table 6 below applies the adjustment factors for each product category by multiplying all of the original purchase data from Table 1 by that factor, and presents the updated values.

Table 6. Local (Oregon) purchases by Portland Public Schools and Gervais (2008–2009), in 2014-2015 USD

Industry	PPS local purchases (2014-2015$)	Gervais local purchases (2015$)	Total local purchases
Vegetable and melon farming	$25,294	$1,442	$26,736
Fruit farming	$128,682	$2,713	$131,394
Cattle ranching and farming	$885	$0	$885
Poultry and egg production	$127	$0	$127
Animal production, except cattle and poultry	$71	$0	$71
Fats and oils refining and blending	$6,172	$0	$6,172
Breakfast cereal manufacturing	$5,839	$0	$5,839
Frozen food manufacturing	$14,827	$0	$14,827
Fruit and vegetable canning	$38,465	$0	$38,465
Fluid milk and butter manufacturing	$944,494	$7,005	$951,499
Cheese manufacturing	$34,003	$0	$34,003
Animal processing, except poultry and seafood	$21,164	$0	$21,164
Poultry processing	$65,703	$0	$65,703
Bread and bakery product manufacturing	$331,866	$213	$332,080
Tortilla manufacturing	$15,475	$0	$15,475
Flavoring syrup and concentrate manufacturing	$124	$0	$124
Seasoning and dressing manufacturing	$8,535	$0	$8,535
All other food manufacturing	$542,478	$0	$542,478
TOTAL	**$2,184,205**	**$11,374**	**$2,195,579**
TOTAL (without fluid milk and butter manufacturing sector)	**$1,239,711**	**$4,368**	**$1,244,080**

Source: Author's calculations, modified from Kane et al (2011).

IV. Economic Impact Analysis

To analyze the impact of locally sourced school food purchases, we input the data given above in Table 6 into IMPLAN, an economic analysis software package developed by The Minnesota IMPLAN Group (MIG), Inc. IMPLAN provides an input-output model of the U.S. economy based on the merging of economic datasets from several federal agencies, including Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), U.S. Census Bureau, U.S. Department of Agriculture (USDA), and US Geological Survey (USGS). An input-output model estimates the relationships between the industries within an economy: the inputs used to produce outputs (e.g., grain used to produce bread), as well as wages paid to workers, incomes to business owners, and taxation to government, that occur in the production of goods and services. Input-output models can answer questions such as: how much total economic activity is generated by a project? How much value-added does that project generate? How many jobs are created?

Whenever money is spent or invested within an economy, it gives rise to additional rounds of spending in the form of consumption out of wages and resulting purchases of inputs to production. These rounds of spending give rise to impacts of two types: *indirect* and *induced*. The next two paragraphs define these terms.

Indirect impacts refer to the impacts of demands for inputs to production, equipment, supplies, and services necessary to produce the goods sold through the initial round of spending. For instance, suppose a school district buys bread from a local baker. The baker must then buy grain from a local mill,

milk from a local dairy, and eggs from a local poultry producer. It must also spend additional money to maintain its ovens and other machinery, kitchen supplies, and other equipment to keep the bakery running. All these additional purchases fall under the category of *indirect* impacts.

Induced impacts refer to the impacts of increased spending by those employed in sectors directly and indirectly affected by the project. For instance, in the example given above, the bakery employs workers, each of whom must purchase food, clothing, transportation services, health care services, and housing. The grain mill, dairy, and poultry producer that supply the baker also employ workers who purchase the same types of goods and services. All of this additional spending, most of which is related to workers' or business owners' consumption, is called the *induced* impact of the project.

The proportional impacts of additional rounds of spending, over and above the initial investment, are called *multipliers.* For instance, if an initial purchase of $1,000 worth of bread gives rise to an *additional* $1,000 in indirect and induced impacts in the form of grain, milk, eggs, and consumption out of wages and incomes, then the total amount of economic activity generated by the project is $2,000. The output multiplier on that purchase is equal to 2: for each $1 spent on fruits and vegetables, a total of $2 in economic activity is generated. [1]

The analysis in the next section asks the question: if the same quantity of local food purchases from the original analysis in 2008-2009, in the same proportions, were made during the 2014-2015 school year, how would the results change? Would the same, or similar, number/s of jobs be created? Would the amounts of total economic activity and value added change significantly? [2]

V. Results: Economic Impacts

Table 7 below presents the results of the input-output analysis using the data from Table 6. For this analysis, fluid milk, butter, and related dairy products are excluded since the school districts arguably would have purchased a comparable quantity of local dairy products even in the absence of the local school lunch program.

Table 7. Economic Impacts of Oregon purchases by Portland Public Schools and Gervais (2008-2009), in 2015 USD; IMPLAN 2010; Fluid milk and butter manufacturing excluded

Impact Type	Direct	Indirect	Induced	Total	Multiplier
Output/Economic Activity	$1,244,078	$791,577	$447,006	$2,482,662	2.00
Value Added	$364,159	$420,474	$278,238	$1,062,871	2.92
Employment/Jobs	6	6	4	16	2.61

Table 7 above lists three types of impacts: output/economic activity, value added, and employment/jobs. The table lists direct, indirect, induced, and total impacts corresponding to each impact type, and then reports the associated multiplier. The next three paragraphs explain each of the multipliers.

[1] Input-output models such as IMPLAN only calculate the *short-run* impacts of such projects in terms of the additional rounds of spending they trigger. *Long-run* impacts, which include the project's catalytic effects on scale of activity, economic growth, innovation, and technology diffusion, are not captured.

[2] This analysis uses 2010 as the IMPLAN Model Year, reflecting the version of the dataset currently owned by Ecotrust. The Event Year and Dollar Year are both 2015.

The *output* or *economic activity multiplier* answers the question: for each dollar of initial spending, how much total statewide output or economic activity is generated? Table 7 shows that the initial *direct* expenditure of $1,244,078 on locally sourced school lunches gave rise to an additional $791,577 in *indirect* output/economic activity, and an additional $447,006 in *induced* output/economic activity throughout the Oregon state economy. The resulting *total* additional output/economic activity resulting from the initial expenditure was $2,482,662 – very close to twice (1.996 times) the initial expenditure. Rounded to two digits, the output multiplier for local food purchases by Portland Public Schools and Gervais school district, in 2015 USD, is thus 2.00. This updated multiplier is higher than the output multiplier of 1.86 calculated by Kane *et al* (2011). The increased multiplier may reflect increases in the relative price of food items whose purchase gives rise to larger indirect and induced impacts per dollar.

The *value added multiplier* answers the question: for each dollar of initial income (or value added) generated, how much total income is created throughout the economy? Value added is defined as the sum of employee compensation, proprietor income, indirect business taxes and a final catch-all category called "other property type income" that includes rent, dividends, and royalties. Table 7 above indicates that the initial direct spending on the local school lunch program generated $364,159 worth of value added, indirect impacts of $420,474 in value added, and induced impacts of $278,238 in value added. The total value added created by the program is $1,062,871 – nearly three times the amount of initial value added. The *value added multiplier* is 2.92 – for each initial $1.00 of value added from the original food purchases, an additional $1.92 in value added is created in the Oregon state economy.

The *employment multiplier* (or *job multiplier*) answers the question: for each job created by the initial investment in the project, how many total jobs are created throughout the state economy? Table 7 above shows that the initial outlay on locally sourced school lunches created six (6) direct jobs, measured in person-years. Additional spending on inputs to production of those school lunches created an additional six (6) *indirect* jobs; additional consumption spending out of wages paid to workers associated with the direct and indirect jobs created an additional four (4) *induced* jobs. In total, out of an initial 6 direct jobs, the investment in local school lunches created a total of 16 jobs. The job or *employment multiplier* is thus 2.61, or 16 divided by 6. For each direct job created by the program, an additional 1.61 jobs are created throughout the Oregon state economy.

Table 8 below includes the dairy sector back into the model for comparison purposes. Including the dairy sector increases the total size of the program in terms of spending, and also increases all three multipliers, meaning that each dollar of direct spending has a larger total economic effect measured in output, value added, and jobs. For instance, the output multiplier rises from 2.00 to 2.03; the value added multiplier rises from 2.91 to 3.24; and the jobs multiplier rises from 2.61 to 3.34.

Table 8. Economic Impacts of Oregon purchases by Portland Public Schools and Gervais (2008-2009), in 2015 USD; IMPLAN 2010; Fluid milk and butter manufacturing included

	Direct	Indirect	Induced	Total	Multiplier
Output/Economic Activity	$2,195,577	$1,554,003	$706,710	$4,456,290	2.03
Value Added	$539,740	$769,496	$439,874	$1,749,110	3.24
Employment/Jobs	8	12	6	25	3.34

VI. Statewide Economic Impact Estimates

The analysis summarized in Table 6, Table 7, and Table 8 gives us an estimate of the economic impact of the locally sourced purchases made by Portland Public Schools and Gervais school district during the

2008-2009 school year, updated to reflect 2014-2015 prices. But what about the rest of the state? The USDA Farm to School Census collected local food purchase data from school districts across the state for the 2011-12 school year. Can we use these data to investigate what the statewide economic impact of statewide local food purchases by schools might be?

We estimate the statewide economic impact of locally sourced school food purchases, based on the key assumption that the local foods purchased statewide in 2011-2012 took the same proportions, by food product and industry, as those purchased by Portland Public Schools and Gervais in 2008-2009. While this assumption may not be entirely realistic, it does provide us with a benchmark to derive a rough estimate of the magnitude of economic impacts of locally sourced school food purchases. It is unlikely that the proportions of local foods purchased by school districts differ sharply from those purchased by Portland and Gervais, and small differences in the proportions will have only small effects on the results.

We use the annual CPI for food to derive the school year price adjustment between 2011-12 and 2014-15. The cumulative price increases are given below in Table 9.

Table 9. Cumulative Price Increases between School Year 2011-12 and 2014-15 by IMPLAN Food Product Category

IMPLAN Category	Cumulative Price Increase (2011-12 to 2014-15)
Vegetable and melon farming	2.04%
Fruit farming	11.37%
Cattle ranching and farming	31.21%
Poultry and egg production	19.30%
Animal production, except cattle and poultry	10.52%
Fats and oils refining and blending	10.80%
Breakfast cereal manufacturing	6.58%
Frozen food manufacturing	7.32%
Fruit and vegetable canning	7.03%
Fluid milk and butter manufacturing	10.80%
Cheese manufacturing	10.80%
Animal processing, except poultry and seafood	10.52%
Poultry processing	15.99%
Bread and bakery product manufacturing	6.58%
Tortilla manufacturing	6.58%
Flavoring syrup and concentrate manufacturing	7.32%
Seasoning and dressing manufacturing	7.32%
All other food manufacturing	7.32%

Source: Current study.

Table 10 below presents estimates of the total locally sourced school food purchases by industry category across the State of Oregon in the 2011-2012 school year. According to the U.S. Farm to School Census (USDA 2012), Oregon school districts spent $9,505,911 on locally sourced food during the 2011-2012 school year. We adjust the purchase prices for these food items using the school year price adjustment given above in Table 9. We then report the total dollar value of purchases by category in Table 10 below for both base year and current year. In 2014-2015 dollars, the value of statewide locally sourced school food purchases in 2011-2012 was $10,381,652. The proportional breakdown of these purchases is assumed identical to that of the Portland and Gervais analysis conducted above.

Table 10. Estimated Locally Sourced School Food Purchases by Category, State of Oregon, 2011-2012

Industry	Estimated $ local purchases (2011-2012)	Price Adjustment (2011-12 to 2014-15)	Estimated $ local purchases (2014-2015)
Vegetable and melon farming	$122,201	2.04%	$124,695
Fruit farming	$579,097	11.37%	$644,917
Cattle ranching and farming	$3,020	31.21%	$3,963
Poultry and egg production	$509	19.30%	$608
Animal production, except cattle and poultry	$298	10.52%	$330
Fats and oils refining and blending	$26,463	10.80%	$29,323
Breakfast cereal manufacturing	$25,665	6.58%	$27,356
Frozen food manufacturing	$64,791	7.32%	$69,532
Fruit and vegetable canning	$167,145	7.03%	$178,895
Fluid milk and butter manufacturing	$4,079,851	10.80%	$4,520,674
Cheese manufacturing	$145,798	10.80%	$161,552
Animal processing, except poultry and seafood	$88,345	10.52%	$97,642
Poultry processing	$266,658	15.99%	$309,301
Bread and bakery product manufacturing	$1,459,603	6.58%	$1,555,712
Tortilla manufacturing	$68,018	6.58%	$72,497
Flavoring syrup and concentrate manufacturing	$543	7.32%	$583
Seasoning and dressing manufacturing	$37,298	7.32%	$40,027
All other food manufacturing	$2,370,603	7.32%	$2,544,047
TOTAL	**$9,505,916**		**$10,381,652**
TOTAL (without fluid milk and butter manufacturing sector)	**$5,426,064**		**$5,860,978**

Source: Author's calculations based on Kane, et al. (2011), *USDA* (2015) *and USDA* (2015).

We then run these estimated figures, adjusted to 2014-2015 dollars, through IMPLAN once again, arriving at a new set of estimated impacts and multipliers. These impacts and multipliers are displayed below in Table 11, with fluid milk and butter manufacturing excluded, and then in Table 12, with fluid milk and butter manufacturing included.

Excluding fluid milk and butter manufacturing, if the State of Oregon's locally sourced school food purchases from 2011-2012 were made in 2015, the purchases would create 75 total jobs, $11.7 million in total economic activity, and over $5 million in value added. The multipliers remain the same as in the above analysis in Table 7.

Table 11. Estimated economic impacts of State of Oregon locally sourced school food purchases, 2011-2012, Fluid milk and butter manufacturing not included

Impact Type	Direct	Indirect	Induced	Total	Multiplier
Output / Economic Activity	$5,860,980	$3,725,505	$2,109,253	$11,695,738	2.00
Value Added	$1,724,444	$1,979,902	$1,312,904	$5,017,250	2.91
Employment/Jobs	29	29	18	75	2.60

Including fluid milk and butter manufacturing, the State of Oregon's locally sourced food purchases would create 120 total jobs, $21.1 million in total economic activity, and $8.27 million in total value added. The multipliers remain the same as in the above analysis in Table 8.

Table 12. Estimated economic impacts of State of Oregon locally sourced school food purchases, 2011-2012, Fluid milk and butter manufacturing included

Impact Type	Direct	Indirect	Induced	Total	Multiplier
Output/Economic Activity	$10,381,654	$7,347,870	$3,343,133	$21,072,657	2.03
Value Added	$2,558,649	$3,638,145	$2,080,852	$8,277,646	3.24
Employment/Jobs	36	56	28	120	3.34

VII. School District Level Economic Impacts

The above figures provide estimates of the total short-run economic impact of Oregon's local food purchases. How do those impacts break down by school district? This section uses data from the 2011-12 Farm to School Census to estimate the school district-level impact of local food purchases.

The Farm to School Census indicated each school district's expenditures on locally sourced foods during the 2011-12 school year. However, it did not indicate the precise breakdown of these expenditures. Thus, it was impossible to update the value of the purchases at the level of the food product category, as we did for the Portland and Gervais analyses in section III of this report. Instead, we used the broad-based U.S. CPI (urban consumers) between the 2011-12 and 2014-15 school years to estimate the price adjustment using the school year CPI averaging outlined in section III above.[3] We then apply the multipliers generated in section VI above to estimate the economic impacts according to the IMPLAN categories of total economic activity/output, value added, and job creation.

A total of 59 school districts in Oregon reported purchasing some food from local producers during the 2011-12 school year. The following two tables focus on the top ten districts by value of food purchased. Cumulatively, the top ten districts purchased 78.6% of all local food bought by schools in the state. Table 13 below summarizes the school district-level impact of the purchases of each of these ten districts. Of these, Salem-Keizer purchased the most food ($2.85 million in 2014-15 dollars), created the most total jobs (32.9 FTE), and generated the most total economic activity ($5.78 million) and value added ($2.27 million). The next largest local food purchaser was Portland school district ($2.1 million, 2014-15 USD), which created 24.3 total jobs, $4.27 million in economic activity, and $1.68 million in total value added.

Table 13. Estimated Results by School District: Expenditure, Job Creation, Economic Activity, and Value Added from Local Food Purchases

Rank	School District	Dollars Spent on Local Food (2011-12)	Dollars Spent on Local Food (2014-15)	Total Jobs Created In-State	Total Economic Activity Generated In-State	Total Value Added Generated
1	SALEM-KEIZER	$2,600,000	$2,849,600	32.9	$5,784,111	$2,272,083
2	PORTLAND	$1,920,000	$2,104,320	24.3	$4,271,344	$1,677,846
3	DAVID DOUGLAS	$675,230	$740,052	8.6	$1,502,156	$590,069
4	REYNOLDS	$578,000	$633,488	7.3	$1,285,852	$505,102
5	EUGENE	$392,042	$429,678	5.0	$872,159	$342,597
6	SPRINGFIELD	$313,500	$343,596	4.0	$697,430	$273,961
7	LAKE OSWEGO	$291,208	$319,164	3.7	$647,838	$254,480

[3] The CPI for urban consumers is the broadest measure of the national CPI, covering the approximately 87% of the U.S. population that lives within either metropolitan statistical areas (MSAs), or smaller towns of 2,500 inhabitants or more. There is no corresponding CPI for rural consumers only. Since the majority of school districts purchasing local food fall under the purview of the urban CPI, this is the best single consumer price measure that we can use.

8	BETHEL	$241,804	$265,017	3.1	$537,931	$211,307
9	GLADSTONE	$225,000	$246,600	2.8	$500,548	$196,623
10	BEAVERTON	$222,796	$244,184	2.8	$495,645	$194,697
	TOTALS	**$7,459,580**	**$8,175,700**	**94.5**	**$16,595,016**	**$6,518,764**

Table 14 below breaks down these results by food product category, assuming that each district purchases food products in the same proportions as the statewide averages. Since the exact proportional breakdown of food purchases by category was not collected on the Census, the category-level spending figures below should be taken as rough estimates only.[4] The largest group of purchases fell under the catch-all category "All other food manufacturing" (IMPLAN category 69), totaling $2.59 million statewide, with the largest school district in this category, Salem-Keizer, purchasing $710,639 in this category. The second-largest was "Bread and bakery product manufacturing" (IMPLAN category 62), with $1.6 million in total statewide purchases and $437,547 purchased by Salem-Keizer. The third largest category was "Fruit farming" (IMPLAN category 4), with $633,807 in statewide purchases and $173,597 by Salem-Keizer.

Table 14. Estimated Results by School District: Top 5 Categories, excluding fluid milk and butter; Top 10 School districts

			Expenditures by Category				
Rank	**School District**	**Total Local Food Expenditures (2014-15)**	**All other food manufacturing**	**Bread and bakery product manufacturing**	**Fruit farming**	**Poultry processing**	**Fruit and vegetable canning**
1	SALEM-KEIZER	$2,849,600	$710,639	$437,547	$173,597	$79,937	$50,106
2	PORTLAND	$2,104,320	$524,780	$323,112	$128,195	$59,030	$37,001
3	DAVID DOUGLAS	$740,052	$184,556	$113,633	$45,084	$20,760	$13,013
4	REYNOLDS	$633,488	$157,981	$97,270	$38,592	$17,770	$11,139
5	EUGENE	$429,678	$107,154	$65,976	$26,176	$12,053	$7,555
6	SPRINGFIELD	$343,596	$85,687	$52,758	$20,932	$9,638	$6,042
7	LAKE OSWEGO	$319,164	$79,594	$49,007	$19,443	$8,953	$5,612
8	BETHEL	$265,017	$66,091	$40,693	$16,145	$7,434	$4,660
9	GLADSTONE	$246,600	$61,498	$37,865	$15,023	$6,918	$4,336
10	BEAVERTON	$244,184	$60,895	$37,494	$14,876	$6,850	$4,294
	STATEWIDE TOTALS[5]	**$10,403,959**	**$2,594,561**	**$1,597,496**	**$633,807**	**$291,850**	**$182,937**

VIII. Potential for Further Studies

This study has provided a series of estimates of the economic impact of locally sourced school food purchases in the Portland and Gervais public school districts combined, and in the State of Oregon as a

[4] School districts were asked to state whether or not they purchased any food from a set of specified categories. However, we chose not to use these binary (yes/no) data, since: 1) the data were incomplete, with some districts responding "Don't know" to some questions, and other districts not responding at all; 2) the categorization scheme used on the Farm to School Census in 2011-12 was somewhat different from the one used by the more in-depth study of Portland and Gervais school districts from 2008-9, and 3) calculating the breakdown of expenditures across the food product categories associated with "yes" responses only would have required making additional assumptions.

[5] These totals reflect all school districts in the State of Oregon, not just the ones listed above.

whole. There are two important possible extensions to this study which should be mentioned before concluding.

1. **Deriving County-Level Impacts**

The analysis conducted in sections V and VI above examine the statewide impact of locally sourced food purchases by Portland Public Schools and Gervais school district, and estimate the statewide impact of locally sourced food purchases by all schools in the state. However, these analyses do not examine the economic impact of these purchases on the individual counties within Oregon. The farms and food processors from which school districts source their purchases are located within specific counties, which have economies and inter-industry relationships that may differ somewhat from the state as a whole. The IMPLAN input-output model, explained above in section 0, contains models for both the state as a whole and individual counties. With the right data inputs to the model, a county-level impact analysis could thus be conducted for locally sourced school food purchases.

Such a study would begin by identifying the county of origin for each farm and food processing company from which the school districts source food purchases. It would then analyze the economic impact of those purchases at the county level. For example, Portland Public Schools sources berries from Willamette Valley Fruit Company, which is located in Marion County. All purchases from Willamette Valley would thus be coded as located within Marion County and reflect the inter-industry relationships of that unique county.

Each county from which local schools source food purchases would be included in the input-output model separately. The study could then derive county-level impact estimates, including output/economic activity, value added, and jobs/employment data and multipliers, as given above in Table 7 and Table 8. Such a study could answer questions such as: how many jobs were created within Marion County alone from locally sourced school lunches from all counties in Oregon? How much economic activity was generated in Clackamas, Wheeler, or Jackson counties from statewide school lunch sourcing? These impact figures could then be aggregated to estimate the total statewide economic impact of the purchases across all counties.

2. **Unique Local Economic Relationships**

Even when taking into account the inter-industry relationships at the county level, an economic impact study of local food purchases may omit certain key features of the local food economy. For instance, farms oriented towards production for local sales often have different structures, and fit into the local, regional, and national economies in different ways, than do export-oriented farms. Farms oriented towards local or regional sales tend to be smaller, source inputs locally to a greater degree, purchase inputs (e.g., fertilizer, seeds, equipment) in different proportions, and grow a wider diversity of crops than farms oriented towards national or international trade. Also, locally oriented farms often sell crops at different prices than export-oriented farms; they may charge price premiums that reflect unique local crop varieties, organic and other certifications, or other concerns related to local food (Meter and Goldenberg 2015).

Input-output models such as IMPLAN cannot take these differences in farm structure, input purchasing, and output pricing into account. For instance, suppose a locally oriented farm purchases a larger proportion of its inputs locally than an export-oriented farm. Then the local economic impact of buying

from the locally oriented farm is greater than that of buying from the export-oriented farm. However, the IMPLAN study would base its impact estimates on the state- or county-wide *average* proportion of locally sourced input purchases. These differences from the average can add up to be significant when aggregated over many farms producing many products.

Further studies could also investigate the question of whether the local food *processors* sourced by the school districts purchase their ingredients from local farms, or farms within the state, at a higher rate than the statewide average. If so, then the IMPLAN results given above would underestimate the total statewide economic impact of the locally sourced food. On the other hand, if the locally sourced food processors purchase their ingredients locally/in-state at a *lower* rate than the statewide average, then the above results *overestimate* the statewide economic impact.

These under- or overestimates result from the fact that IMPLAN assumes that a purchase from a given industry in a state reflects the average sourcing pattern for that industry in that state. For instance, suppose that on average, 25% of the apples purchased by applesauce companies in Oregon are sourced from within the state. Then an IMPLAN study of the economic impact of applesauce purchases will assume that 25% of the apples sourced by that industry are from Oregon. However, suppose that the company/companies that supply applesauce to Oregon school districts source 50% of their apples from within the state. Then the IMPLAN study would underestimate the Oregon-wide impact of the applesauce purchase.

IX. Conclusion

This brief report has provided a series of updated estimates of the economic impact of locally sourced food purchases by Oregon school districts, using the data available from a study conducted by Ecotrust in 2008-9 and from the USDA Farm to School Census for 2011-12. It provides additional evidence that on a per-dollar or per-project basis, local sourcing of food for school lunches has a significant positive impact on the Oregon agricultural economy.

As the suggestions in section 0 above indicate, a number of potentially desirable refinements to this economic impact study are possible. However, making these refinements to the study may prove labor-intensive in data collection and analysis. Care should be taken not to allocate too many resources to modeling impacts that could be better used in fostering the development of the Farm to School network and the local food system on which it relies (Meter and Goldenberg 2015). Modeling should only be pursued to the extent it will improve the network's ability to demonstrate its benefits to the local and state economy.

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