

Institutional Wholesale Markets for Local Produce in the Greater Lehigh Valley

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Abstract

Forty-one academic and healthcare institutions within Berks, Lehigh, and Northampton counties (Greater Lehigh Valley) are providing 56,000 meals per day, over half of which are served at ten colleges and universities. Between 3.2 and 3.9 million pounds of fresh produce could be sourced from growers in the Greater Lehigh Valley for these meals, depending on the use of season extension methods. This offers a potential wholesale market for fresh locally grown produce at these institutions of between \$2.2 and \$3 million. It was estimated that 102 acres of farmland would be required to meet this demand for local produce: 84 acres for vegetables and 18 acres for fruit and berries. Produce types purchased by the greatest number of food service providers and in the highest volumes were broccoli, peppers, onions, potatoes, apples, lettuce or salad mixes, carrots, tomatoes, and melons, while corn, nectarines, plums, and peaches were purchased by the fewest and in low volumes. Food service providers also indicated a preference for produce in whole form, rather than pre-cut or canned. Interviews with food service personnel about their purchasing habits highlighted recurring trends among study participants, including their enthusiasm for purchasing locally grown foods and the importance of building relationships with the local growers. Interviewees, however, also indicated that various challenges were hindering local sourcing, including the need to identify local farms of an appropriate scale, concerns over the price of locally grown foods, the lack of aggregation and distribution facilities in the Lehigh Valley, and the need for Good Agricultural Practices (GAP) certification. This study demonstrates that the market potential for wholesale local produce purchases is of significant size and presents an important opportunity to increase the economic viability of local farms and build the Lehigh Valley local food system. The study was limited to academic and healthcare institutions and 24 types of produce. If the market was expanded to include other wholesale buyers, additional produce types, and other foods, such as dairy, meat, poultry, eggs, grains, and processed foods, this potential could be considerably higher.

Introduction

In 2012, households in the Greater Lehigh Valley (Berks, Lehigh, and Northampton counties) spent \$2.7 billion on food.¹ Of this, 42 percent, or \$1.1 billion, was spent on food away from home, such as food eaten at restaurants, recreational places, schools and colleges, corporate cafeterias, and government agencies. In addition, of the \$1.6 billion spent on food to eat at home, only \$6.8 million (0.4 percent) was purchased directly from farmers.² In other words, the majority of food was purchased through wholesale channels.

There are a significant number of wholesale food buyers in the Greater Lehigh Valley, including grocery stores, colleges, hospitals, other healthcare facilities, school districts, retirement communities, prisons, and corporate dining services. These buyers could play an integral role in building the local

food system by replacing some of their food imports with locally grown foods and thus providing a large, stable market to local farmers year-round. A thriving local food system provides food security, improved fresh food access, support for family farms and sustainable agriculture, and the reinvestment of food dollars in the local community.

This report determines the potential wholesale market for fresh, locally grown produce by academic and healthcare institutions in the Greater Lehigh Valley. Additionally, it provides qualitative information about institutional buyers' perspectives on purchasing locally grown foods in order to work toward increasing wholesale local food purchases in the Greater Lehigh Valley.

¹ United States Department of Labor, Bureau of Labor Statistics. (2012). *Consumer Expenditure Survey Region of Residence* [Data file]. Available from <http://www.bls.gov/cex/#tables>; United States Census Bureau. (2012). *American Community Survey 1-Year Estimates* [Data file]. Retrieved from <http://factfinder2.census.gov/>

² United States Department of Agriculture (USDA), National Agricultural Statistics Service. (2012). *Census of Agriculture* [Data file]. Available from <http://www.agcensus.usda.gov/Publications/index.php>

Methods

In order to determine the potential institutional market for local produce in the Greater Lehigh Valley, academic institutions of higher learning (“academic institutions”) and healthcare facilities that serve meals within their facilities were identified. In fall 2013, healthcare facilities were determined from the Pennsylvania Department of Health’s *Health Care Facilities Provider Database*³ while academic institutions, such as colleges and universities, were identified from the Lehigh Valley Association of Independent Colleges⁴ (LVAIC) and the *Index to all Public & Private Colleges, Community Colleges, & Universities located in Pennsylvania*.⁵

Surveys were mailed to food service management at each of the 41 identified facilities. The survey (see Appendix 1: Fresh Fruit and Vegetable Survey), adapted from a 2012 report entitled *Institutional Healthcare Market for Local Produce*,⁶ was used to gather food purchasing data from various institutions, including the average number of meals served on a daily basis, the average amount of produce purchased weekly, and produce form preferences (locality of the food was not a factor in the produce surveys). In response, BFBL-GLV received 15 completed anonymous surveys.

Survey Results from 15 Respondents:

The types of specific produce being purchased by the 15 respondents were determined by analyzing responses to the part of Question 2 inquiring about the average amount of fresh fruits and vegetables purchased each week. Those that responded with a number of pounds or a package size were considered to have responded “yes,” whereas those that did not answer, wrote “no,” or responded saying they bought the specific produce as “canned” were considered to have responded “no.”

The total amount in pounds of each produce type purchased weekly by the 15 respondents was determined. Certain survey responses were not given in pounds as the survey requested, but in sizes such as “cases.” The weight associated

with a particular “case” was ascertained from the USDA’s *Fruit and Vegetable Market News User Guide*.⁷ To arrive at the amount of each type of produce purchased per 1,000 meals, the total amount purchased per week was divided by seven to convert to amount per day, divided by the total number of meals served per day by the 15 respondents, then multiplied by 1,000. As an example, the calculation for beans is as follows:

$$\begin{aligned} &970 \text{ lb beans/week} \times 1 \text{ week}/7 \text{ days} \\ &\times 1 \text{ day}/30,213 \text{ meals} \times 1000/1000 \\ &= 4.586 \text{ lb beans}/1000 \text{ meals} \end{aligned}$$

Market Potential for the Greater Lehigh Valley:

In order to determine the potential market for local produce for all academic and healthcare facilities in the Greater Lehigh Valley, the results from the 15 respondents were extrapolated to all 41 facilities.

The first step was to determine the total number of meals served daily by all 41 facilities. To do this, the institutions were contacted either by phone or email and asked how many meals they served daily. For those institutions that could not be reached, the number of meals served daily was estimated, assuming that facilities served a comparable number of meals per student, patient, or resident as similar facilities (colleges/universities, community colleges, hospitals, and long-term care/senior living facilities). From the institutions that were reached, it was determined that for academic institutions, the number of meals served per undergraduate student was 1.06 for colleges and universities and 0.93 for community colleges. For hospitals, the ratio was 0.3652 meals per total number of beds and employees. For long-term care and senior housing facilities, the number of patients/residents was multiplied by three (for breakfast, lunch, and dinner).

It was assumed that all 41 facilities would purchase the same relative amount of each type of produce per meal as the 15 respondents; thus, the total amount purchased per 1,000

³ Pennsylvania Department of Health. (n.d.). *Health Care Facilities* [Data file]. Retrieved from <http://app2.health.state.pa.us/commonpoc/content/publiccommon-poc/normalSearch.asp>

⁴ Lehigh Valley Research Consortium. (n.d.). *Lehigh Valley Association of Independent Colleges*. Retrieved from <http://www.lehighvalleyresearch.org/lvaic>.

⁵ UnivSource. (n.d.). *Colleges, Community Colleges, & Universities in Pennsylvania, USA* (PA, USA). Retrieved from <http://www.univsource.com/pa.htm>

⁶ Pesch, Ryan. (2012). *Institutional Healthcare Market for Local Produce*. Minnesota: University of Minnesota Extension.13.

⁷ USDA, Agricultural Marketing Service. (2012) *Fruit and Vegetable Market News User Guide*. Retrieved from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5048679>

meals by the 15 respondents was multiplied by 56.603 (the total number of 1,000 meals served per day by the 41 facilities) in order to estimate the total amount of produce purchased daily by all 41 facilities. This was then multiplied by 30.4 to calculate the total amount purchased per month for each produce type. As an example, the calculation for beans is as follows:

$$\begin{aligned} &4.586 \text{ lb beans}/1000 \text{ meals} \times 56.603 \text{ } 1000 \text{ meals}/\text{day} \\ &\times 30.4 \text{ days}/\text{month} \\ &= 7892 \text{ lb beans}/\text{month} \end{aligned}$$

Once the total amount of produce purchased per month was determined for each type of produce, it was multiplied by the number of months the particular item was available for harvest in the Greater Lehigh Valley to determine the potential annual demand that could be met with locally grown produce. Calculations were made using both standard and extended growing seasons based on BFBL-GLV's Harvest Calendar (see Appendix 2). The Calendar indicates when fruits and vegetables are generally available in the region, either freshly harvested from the field/orchard or high tunnel, or available as a storage crop. Numerous farmers in the Greater Lehigh Valley supplied data to create the Calendar. In our scenarios, "field crops" and "storage crops" were considered part of the standard growing season, whereas "high tunnel crops" were considered a season-extension technology. It is important to note that the extended season numbers do not account for additional production costs.

A large percentage of the meals were provided by academic institutions that do not operate at full capacity throughout the whole year. Typically, colleges and universities have a limited number of students between mid-May and mid-August. For this reason, when calculating the annual demand, the number of months for which a particular type of produce could be purchased locally sometimes varied between academic institutions and healthcare facilities. For example, according to the Harvest Calendar, beans are available in the Lehigh Valley from July through October (four months); however, because students are not at the academic institutions for July and half of August, the number of months was reduced to 2.5 for those meals dedicated to academic institutions. Because 69 percent of meals were served by academic

institutions, the calculations for the potential annual demand that could be met with locally grown produce took the shorter academic year into account. As an example, the potential annual demand for beans during the standard growing season was calculated as follows:

$$\begin{aligned} &7892 \text{ lb beans}/\text{month} \\ &\times [(0.31 \times 4 \text{ months}) + (0.69 \times 2.5 \text{ months})] \\ &= 23,400 \text{ lb} \end{aligned}$$

The potential annual demand was then multiplied by a wholesale price paid to farmers for each type of produce to determine the market potential for local growers (see Table 4). Wholesale prices were obtained from an anonymous distributor in the Mid-Atlantic Region. These prices were on average 43 percent higher than those derived from the USDA Wholesale Market Price Reports,⁸ partly due to the fact that the USDA report was last updated in 2010.

Estimating Number of Acres Needed to Meet Institutional Demand:

In order to estimate the number of acres needed to meet the potential institutional demand, the calculated annual demand by weight for each type of produce during the regular growing season was divided by the yield (100-weight (cwt) = 100 pounds) per acre for each produce type according to national statistics.⁹

Interviews

BFBL-GLV sought out academic and healthcare facility management for interviews to garner qualitative accounts of local and non-local purchasing habits. A total of 16 food service management personnel participated in the interviews. This research was used to understand the benefits and challenges of local wholesale accounts, to pursue detailed institutional preferences, and to determine different institutions' definitions of "local." Two food service providers were asked to supply the prices that their current distributors were charging for select items, as well as the prices they would be willing to pay for locally grown produce.

In addition, several Lehigh Valley farmers were interviewed to determine their wholesale prices for the same select items.

⁸ USDA, Agricultural Marketing Service. (2010). Wholesale Market Price Reports. Retrieved September 4, 2014 from <http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateO&rightNav1=ViewU.S.TerminalMarketPriceReports&topNav=&leftNav=&page=FVMarketNewsTerminalMarketReportsMore>

⁹ USDA, National Agriculture Statistics Service. *Quick Stats Tools*. Retrieved from http://www.nass.usda.gov/Statistics_by_Subject/index.php.

Results

41 academic institutions and healthcare facilities were identified in the Greater Lehigh Valley as serving meals within their facilities (see Appendix 3 for list). These facilities included 13 academic institutions (10 colleges or universities and three community colleges), eight hospitals, and 20 long-term care and senior housing facilities.

Survey Results from 15 Respondents:

Of the 41 identified facilities, 15 completed and returned the Fresh Fruit and Vegetable Survey. Surveys indicated that the 15 respondents served a total of 30,213 meals per day.

Demand for Different Types of Produce:

The list of specific types of fresh produce currently purchased by the respondents is presented in Figure 1, formulated as a percentage of total “yes” responses out of the 15 total responses received. One respondent indicated that they purchased only frozen produce and did not purchase any fresh produce for their facility. Produce types were identified as low, medium, or high-demand

based on the number of “yes” responses received from survey participants: low-demand crops 0-33% responded yes; medium-demand crops 34-66% responded yes; and high-demand crops 67-100% responded yes. Types of produce that were highest in demand included lettuce or salad mixes, carrots, tomatoes, and melons. Corn, nectarines, plums, and peaches were purchased by the fewest number of food service providers.

Demand by Volume:

In total, 72,000 pounds of produce were purchased weekly by the 15 survey respondents (see Table 1). Potatoes, lettuce, tomatoes, onions, and apples were highest in volume demand, while beans, mushrooms, winter squash, beets, and radishes were lowest (see Figure 2).

Produce Form:

The form of fruits and vegetables preferred by respondents is presented in Table 2. Not all respondents indicated a preferred form for each produce type; those who did are referred to as “Answerers.” All types of produce were preferred in whole form by at least 69 percent of the Answerers.

Figure 1: Produce Demand by Number of Respondents

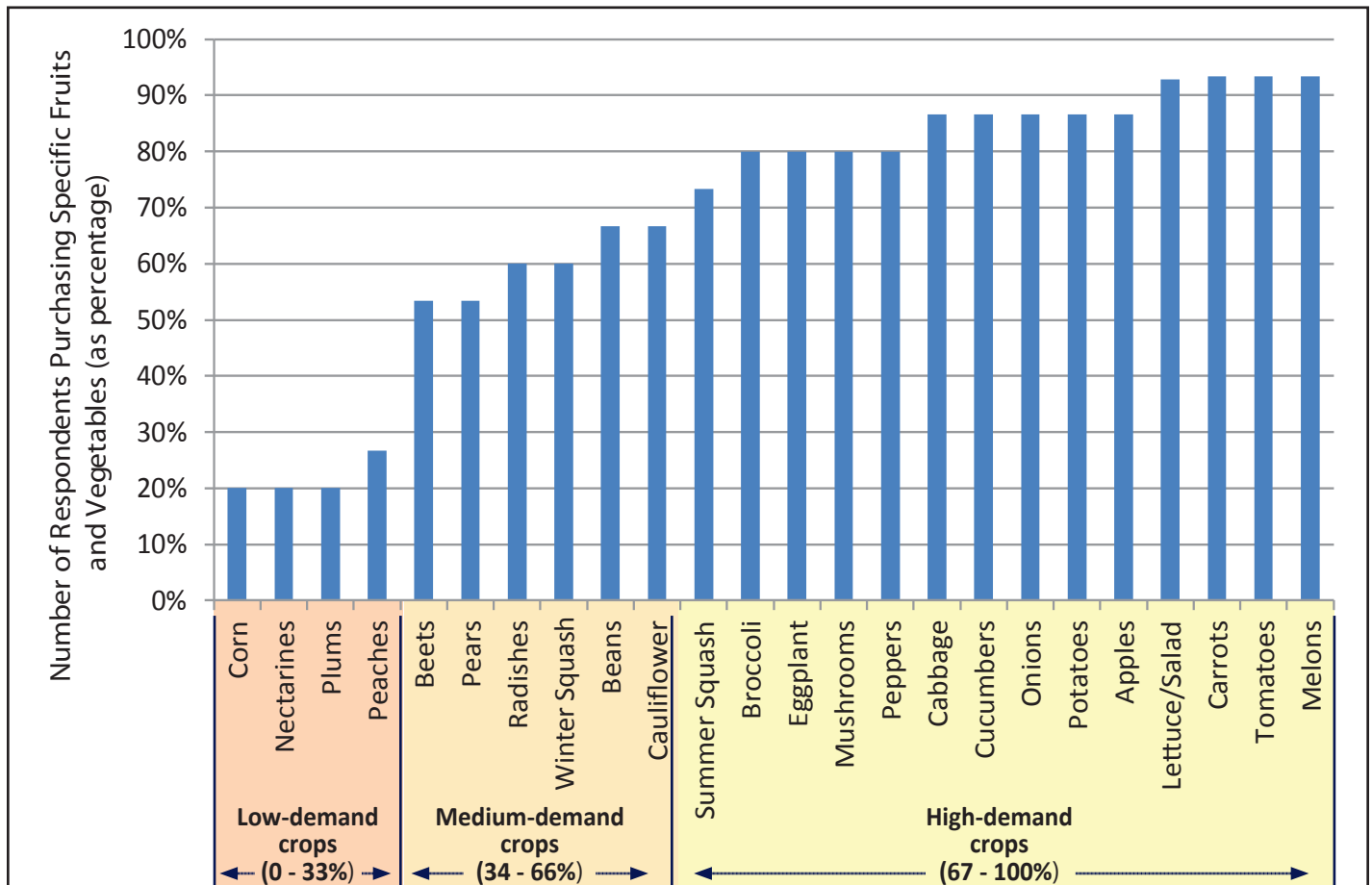


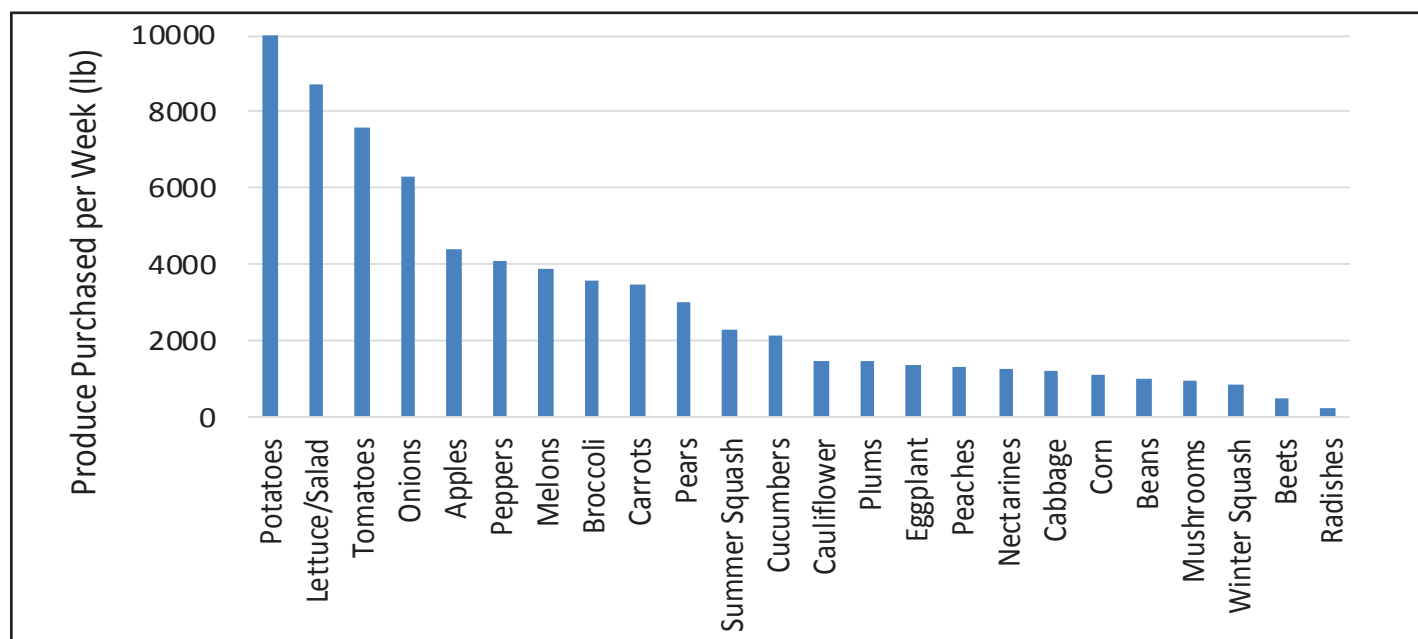
Table 1:
Purchasing Profile by Product of 15 Survey Respondents

Produce Type	Total Amount Purchased per Week by 15 Respondents (lbs)	Amount Purchased per 1,000 Meals Served (lbs)
Beans	970	4.6
Beets	496	2.3
Broccoli	3,588	17.0
Cabbage	1,176	5.6
Carrots	3,480	16.5
Cauliflower	1,452	6.9
Corn	1,100	5.2
Cucumbers	2,130	10.1
Eggplant	1,360	6.4
Salad/Lettuce	8,732	41.3
Mushrooms	950	4.5
Onions	6,290	29.7
Peppers	4,061	19.2
Potatoes	10,014	47.3
Radishes	228	1.1
Summer Squash	2,276	10.8
Tomatoes	7,592	35.9
Winter Squash	848	4.0
Apples	4,406	20.8
Melons	3,869	18.3
Nectarines	1,270	6.0
Peaches	1,290	6.1
Pears	3,005	14.2
Plums	1,430	6.8
Total Purchased	72,013	

Table 2:
Preferred Form of Produce by Number of Answerees

Produce Type	Number of Answerees Preferring a Specific Form			Answerees Preferring Whole Form (%)
	Whole	Shredded/ Sliced/Diced	Other	
Beans	8		2 (Snipped)	80
Beets	8	1 (Diced)	1 (Canned)	80
Broccoli	8		3 (Florets)	73
Cabbage	9	3 (Shredded)		75
Carrots	9	1 (Shredded/Diced) 1 (Shredded)	2 (Baby)	69
Cauliflower	8		1 (Florets)	89
Corn	3			100
Cucumbers	9			100
Eggplant	10			100
Salad/Lettuce Mix	8	1 (Shredded/Diced)	1 (Chopped)	80
Mushrooms	8	2 (Diced)		80
Onions	9	1 (Diced) 1 (Sliced/Diced)		82
Peppers	10			100
Potatoes	10	1 (Diced) 1 (Sliced/Diced)		83
Radishes	8	1 (Sliced/Diced/Whl.)		89
Summer Squash	10			100
Tomatoes	10	2 (Diced)		83
Winter Squash	8			100
Apples	10			100
Melons	8	1 (Diced)		89
Nectarines	3			100
Peaches	4			100
Pears	8			100
Plums	3			100

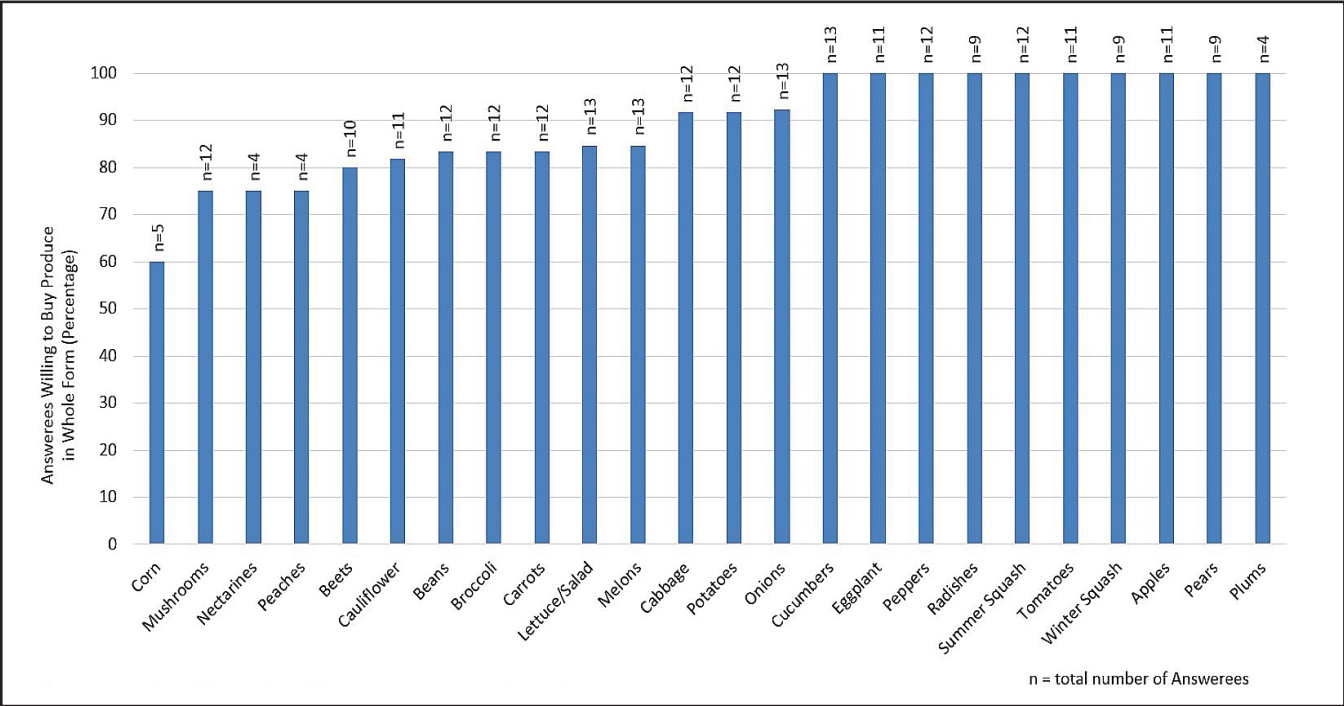
Figure 2. Produce Demand by Volume



Although respondents preferred the forms shown in Table 2, they also indicated that they would consider buying produce in whole form (see Figure 3). The total number of survey respondents who answered the question of whether they would consider purchasing a particular type of produce in whole form is indicated by n= x (shown at the top of the bars). Out of the total n, the percentage of respondents who indicated

that they would consider buying a produce type in whole form is indicated by the height of the bar. All respondents who answered the question pertaining to cucumbers, eggplant, peppers, radishes, summer squash, tomatoes, winter squash, apples, pears, and plums indicated that they would consider buying these items in whole form.

Figure 3: Produce Types Respondents Would Consider Buying in Whole Form

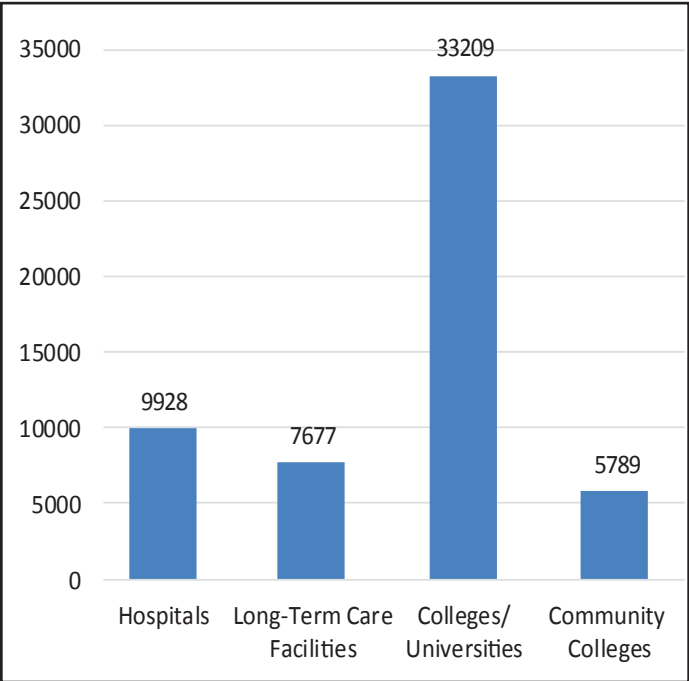


Market Potential for the Greater Lehigh Valley

In order to expand the results obtained for the 15 survey respondents to the 41 academic institutions and healthcare facilities in the Greater Lehigh Valley, the total number of meals served in all of these facilities was determined. Using both actual numbers and estimates, it was determined that a total of 56,603 meals were served each day by these facilities (see Figure 4): academic institutions served 38,998 of these meals (69 percent), while healthcare facilities served 17,605 meals (31 percent).

The 15 participating institutions that provided complete responses to the produce survey account for 30,213 (53%) of the estimated 56,603 meals served daily by the 41 academic institutions and healthcare facilities in the Greater Lehigh Valley. Their reported fresh fruit and vegetable purchases were used to estimate the market potential for all 41 institutions in the region. This was done for two different scenarios: a standard Lehigh Valley growing season and an

Figure 4. Number of Meals Served Daily by Institution Type



extended growing season. Both scenarios were based on the BFBL-GLV Harvest Calendar (see Appendix 2). In particular, season-extension techniques, such as high tunnels and hoop houses, have lengthened the growing seasons for broccoli, carrots, lettuce, peppers, radishes, and tomatoes.

The amount of fresh produce purchased each month by the 41 facilities was extrapolated from the results of the 15 respondents based on the number of meals served (see Methods). The extent to which these purchases could be

made from local growers during both a standard and extended growing season in the Greater Lehigh Valley region is presented in Table 3. The number of months in which produce is available to academic institutions was reduced by the months for which classes were not in session. The annual demand for fresh produce that could be sourced from growers in the Greater Lehigh Valley is 3.2 million pounds, although this could be as high as 3.9 million pounds if season extension techniques are used (see Table 3).

Table 3: Potential Annual Demand for Local Produce by Institutions

Produce Type	Amount Purchased per Month (lbs)	Number of Months Available				Annual Demand (lb)	
		Standard Growing Season		Extended Growing Season		Standard Growing Season	Extended Growing Season
		Healthcare	Academic	Healthcare	Academic		
Vegetables:							
Beans	7,892	4	2.5	4	2.5	23,400	23,400
Beets	4,036	10	7	10	7	32,002	32,002
Broccoli	29,193	4	3	8	7	96,628	213,398
Cabbage	9,568	9	6.5	9	6.5	69,608	69,608
Carrots	28,314	9	7.5	11	8	225,521	252,844
Cauliflower	11,814	3	2	3	2	27,290	27,290
Corn	8,950	3.5	2	3.5	2	22,061	22,061
Cucumbers	17,330	2.5	1	2.5	1	25,389	25,389
Eggplant	11,065	3.5	2	3.5	2	27,276	27,276
Lettuce/Greens	71,045	7	4	12	9	350,252	705,477
Mushrooms	7,729	12	9	12	9	76,753	76,753
Onions	51,177	11	8	11	8	457,007	457,007
Peppers	33,041	4	3.5	6	3.5	120,765	141,251
Potatoes	81,476	12	9	12	9	809,055	809,055
Radishes	1,855	11	8.5	12	9	17,206	18,421
Summer Squash	18,518	5	2.5	5	2.5	60,646	60,646
Tomatoes	61,770	4.5	2.5	8	5	192,722	366,296
Winter Squash	6,895	7	7	7	7	48,268	48,268
Total Annual Demand for Vegetables:						2,681,848	3,376,441
Fruits:							
Apples	35,850	8	7.5	8	7.5	274,432	274,432
Melons	31,479	2	1.5	2	1.5	52,098	52,098
Nectarines	10,333	3	1.5	3	1.5	20,304	20,304
Peaches	10,496	3	1.5	3	1.5	20,624	20,624
Pears	24,449	8	1.5	8	1.5	85,939	85,939
Plums	11,635	3	1.5	3	1.5	22,862	22,862
Total Annual Demand for Fruit:						476,260	476,260
Total Annual Demand for Produce:						3,158,108	3,852,701

The market potential for local purchases of these particular crops is estimated at \$2.2 million for the standard growing season and \$3.0 million for an extended growing season (see Table 4).

Estimation of Acres Needed:

In order to meet the potential market demand for vegetables, a total of 84 acres would need to be dedicated to growing vegetables for Lehigh Valley institutions. Similarly, growers in the Greater Lehigh Valley would need to dedicate a total of 18 acres to meet the potential market demand for fruit. The total acreage required would be 102 acres (see Table 4).

Table 4: Market Potential for Local Produce Purchases by Institutions and Number of Acres Required to Meet Demand

Produce Type	Annual Demand (lb)		Price (\$/lb)	Market Potential (\$)		Yield per Acre (cwt/acre)	Land Required to Meet Demand (Acres)
	Standard Growing Season	Extended Growing Season		Standard Growing Season	Extended Growing Season		
Vegetables:							
Beans	23,400	23,400	1.00	23,400	23,400	59	4.0
Beets	32,002	32,002	0.80	25,602	25,602	334	1.0
Broccoli	96,628	213,398	1.00	96,628	213,398	163	5.9
Cabbage	69,608	69,608	0.43	29,584	29,584	367	1.9
Carrots	225,521	252,844	0.75	169,140	189,633	322	7.0
Cauliflower	27,290	27,290	1.25	34,112	34,112	181	1.5
Corn	22,061	22,061	0.33	7,354	7,354	125	1.8
Cucumbers	25,389	25,389	0.50	12,694	12,694	198	1.3
Eggplant	27,276	27,276	0.45	12,398	12,398	291	0.9
Lettuce/Greens	350,252	705,477	1.20	420,302	846,572	350	10.0
Mushrooms	76,753	76,753	3.00	230,258	230,258	2,853	0.3
Onions	457,007	457,007	0.60	274,204	274,204	529	8.6
Peppers	120,765	141,251	0.54	64,696	75,670	301	4.0
Potatoes	809,055	809,055	0.36	291,260	291,260	414	19.5
Radishes	17,206	18,421	0.67	11,528	12,342	92	1.9
Summer Squash	60,646	60,646	0.57	34,655	34,655	153	4.0
Tomatoes	192,722	366,296	1.00	192,722	366,296	263	7.3
Winter Squash	48,268	48,268	0.40	19,307	19,307	153	3.2
Total Market Potential for Vegetables:				\$1,949,844	\$2,698,739		
Total Acreage Needed for Vegetables:							84
Fruits:							
Apples	274,432	274,432	0.48	103,355	130,355	318	8.6
Melons	52,098	52,098	0.47	24,132	24,132	277	1.9
Nectarines	20,304	20,304	1.00	20,304	20,304	165	1.2
Peaches	20,624	20,624	0.96	19,799	19,799	171	1.2
Pears	85,939	85,939	0.63	53,712	53,712	354	2.4
Plums	22,862	22,862	1.00	22,862	22,862	105	2.2
Total Market Potential for Fruits:				\$271,345	\$271,345		
Total Acreage Needed for Fruits:							18
Total Market Potential for Produce:				\$2,221,189	\$2,970,084		
Total Acreage Needed for Produce:							102

Interviews:

Many of the food service providers at the academic institutions and healthcare facilities were willing to purchase locally grown fruits and vegetables; in fact, several were quite excited about the concept. In general, the food service providers recognized that locally grown produce offers premium flavors and unique varieties of fruits and vegetables. They wanted to offer fresh, healthy food choices to their clients and saw the value in supporting the local food system.

There was significant variation in the definition of the term “local” as used by the institutions, ranging from food grown within the counties to as far as 200 miles away. Several buyers did not distinguish between local Lehigh Valley growers and regional growers from places such as Lancaster or New Jersey. Often, regional distributors were the primary source of fresh produce, and buyers commented that it would be very convenient if these distributors provided source-identified Lehigh Valley produce.

Many interviewees expressed the need for building a relationship with the grower as a successful factor in local sourcing. Farmers were viewed as valued business partners and a part of the dining service team rather than as interchangeable suppliers. By building a successful rapport with the farmer, both the grower and the buyer could benefit: the institutional buyers could gain knowledge about seasonality and various factors that affect the harvest; they could offer some flexibility in their purchases depending on the harvest; and they could benefit from excesses of harvested produce.

Depending on each relationship, various systems worked for different institutions and growers. One participant slowly eased into local sourcing by visiting a nearby farmers’ market to make small purchases and sample the product offerings. As time progressed and a relationship was formed with a particular grower, the institution purchased larger quantities, and the grower began regular deliveries to the institution. Another participant expressed interest in offering a community supported agriculture (CSA) or farm share program for employees at the institution. Most of the interviewees had built relationships with the farmers.

Many interviewees, however, indicated that various challenges were hindering local sourcing, a few of which appeared to be thematic for all participants. The challenges included:

1. Identification of local farms of an appropriate scale,
2. Concerns over the price of locally grown foods,
3. Lack of aggregation and distribution facilities in the Lehigh Valley, and
4. The need for GAP certification.

Identifying Local Farms:

Some participants did not know where to find local products and were eager to have assistance in sourcing locally. Academic and healthcare institutions ranged greatly in size, presenting the challenge of matching appropriately sized farms with the institutions.

There was concern from larger institutions as to whether local farms would be able to produce enough to meet demand. A few expressed reservations about whether they could rely on local growers for large scale orders, particularly in light of seasonal unpredictability. One participant acknowledged that they typically did not use locally grown produce as the main part of each meal, but instead used these items as an accent within the menu. This way, they were still able to serve the meal even if they ran out of the local product. For example, this participant had a local account for fresh basil. It had occurred that the participant ordered several bunches for a given week, but the grower provided less than was ordered. As long as the supply lasted, the basil enhanced the meal, yet consumers were still fed the same meal after the basil supply was depleted.

On the other end of the spectrum, smaller institutions often required such modest orders that it was not worth the growers’ time to make the deliveries.

Price:

Price was a major concern for institutional buyers. Several participants expressed that they faced tight budgets and were uncertain whether they could afford to purchase locally grown produce. There was a general perception that it would cost more to purchase locally grown fruits and vegetables. As an example, one buyer stated that if he were to buy a bag of golden potatoes, he might pay around \$20 for a 50-pound bag from a national retailer; in contrast, he expected to pay \$56 for organically grown potatoes from a local source.

The majority of interview participants indicated that they were aware of the concept of seasonality and that prices for locally grown foods were typically lowest at the peak of season. There was, however, a lack of knowledge about the specific crops grown in the Greater Lehigh Valley and when these items would be in season.

Although a few participants said that they looked for the cheapest fruits and vegetables available, the majority of institutions cared as much about the quality of the produce they served as the price. Several institutions were willing to pay somewhat more for local produce as long as the produce was of premium quality.

In order to determine whether institutional buyers could meet locally grown produce prices, the prices for a selection of produce items were compared depending on whether the item was purchased from a large distributor, a local farmer

using integrated pest management (IPM), or a local farmer using organic methods. In addition, the prices that one large institutional buyer was willing to pay for each item were examined (see Table 5).

Table 5: Comparison of Wholesale Prices

Product	Large Distributor Prices ^a	Price Buyer Willing to Pay ^b	Lehigh Valley Farmer Prices	
			Growers Using IPM ^c	Growers Using Organic Methods ^d
Apples (40 lb case)	\$34.85 (100 ct)	\$25	\$18 - \$30 (60-80 ct)	
Peaches (half bushel)	\$22.35	Market price	\$18 - \$32	
Onions (50 lb bag)	\$19.71	\$30	\$15 - \$20	\$32.50 - \$50
Kale (24 count)	\$19.35	\$20		\$15-20 (10 count)
Potatoes (red or white) (50 lb bag)	\$24.59	\$15	\$13/bag at farm \$15/bag delivered	\$40-75
Tomatoes (25 lb crate)	\$21.55	\$25	\$14 - \$25	\$43-75
Beets (25 lb crate)	\$21.30	\$17	\$15 - \$24	\$18.75-50
Peppers (24 lb bushel)	\$16.80	\$25	\$15 - \$18	\$50

^a These prices were provided by a large institutional buyer in the Lehigh Valley on September 4, 2014.

^b These prices were provided by a different large institutional buyer in the Lehigh Valley during the interview process.

^c These prices were provided by four Lehigh Valley farms during the week of September 1, 2014. The range in prices were due to different varieties (apples), seasonal variation (with the lowest prices during peak season), and discounts for pick-up at the farms.

^d These prices were provided by two Lehigh Valley farms on September 10, 2014.

The results show that the prices for produce grown locally using IPM were comparable to, if not better than, prices paid to large distributors. It should be noted that these prices are for buying directly from the farmer; prices from a local or regional distributor could be higher.

The prices for produce grown locally using organic methods are much higher. Many interviewees stated that they did not have sufficient customer demand for organic produce to justify the increased cost. Several of the local growers who use organic methods sell their produce on a quasi-wholesale basis to upscale restaurants.

Several institutions offered suggestions for countering any price increases due to purchasing locally grown foods, including:

- decreasing food waste by cooking from scratch in small batches made to order,
- removing trays from cafeterias,
- using all parts of the produce (ex. roasting squash seeds, using peelings for stock),
- managing portion size, and
- using seconds where appropriate, such as for tomato or apple sauce.

Aggregation and Distribution:

Interview participants discussed the lack of local food aggregation and distribution in the Lehigh Valley as a barrier to purchasing locally grown foods for their operations: buyers simply did not have the time to order and pick up produce from multiple farms. All of the 16 interview participants indicated that their institution relied on regional food distributors for their produce and that it would simplify their ordering procedure if locally grown foods were available from these distributors. Institutions typically received food orders three to four days a week, and even up to six days a week. Two of the larger distributors that were utilized by several of the institutions were contacted to determine whether they would be interested in providing Greater Lehigh Valley produce to institutions. Although there was interest, a requirement that the Greater Lehigh Valley produce maintain its farm identity and be available to Greater Lehigh Valley institutions (as opposed to being mixed with other produce from throughout Pennsylvania and New Jersey) discouraged further movement on this concept.

GAP Certification:

Some of the institutions required farms to have third party certification, such as GAP, and product liability insurance in order to be listed as direct vendors to the institution, while others did not. The trend, however, was that institutions were moving towards requiring GAP certification.

Several of the regional distributors did not require that farms be GAP certified; rather, the distributors held responsibility for the growers in terms of food safety and insurance, and qualified as a third-party audit for institutional requirements. The distributors did, however, state that certification would likely be required within the next few years.

Discussion

The results of this study demonstrate that there is a significant market opportunity for local farmers to sell fresh produce to academic institutions and healthcare facilities in the Lehigh Valley: these institutions could purchase \$2-3 million of local produce per year.

Types of produce that were highest in demand both by the number of institutions and the volume of product ordered included broccoli, peppers, onions, potatoes, apples, lettuce or salad mixes, carrots, tomatoes, and melons; accordingly, growers seeking to sell to wholesale institutions might want to target these high-demand crops. Corn, nectarines, plums, and peaches were purchased by the fewest food service providers and in low volume, possibly due to the fact that these types of produce are predominantly available during the summer months when academic institutions are not in session.

A strong preference for produce in whole form by the majority of respondents is in accordance with purchasing locally grown produce.

It is noteworthy that of the various categories of institutions studied (colleges/universities, community colleges, hospitals, and long-term care/senior living facilities), the colleges and universities offer the largest meal service potential for local food sales: 69 percent of all meals served by the 41 institutions studied. This would suggest that colleges and universities would be a logical starting point for creating or expanding local wholesale markets.

The use of season extension techniques in this study expanded the wholesale market potential by 34 percent. By providing a longer harvest season, these techniques not only increase sales for growers but also allow for more continuity and relationship-building between farmers and buyers.

The study estimates that 102 acres of farmland would be required to meet this demand for local produce: 84 acres for vegetables and 18 acres for fruit and berries. Considering that there are 376,000 acres of farmland in the Greater Lehigh Valley, it seems that this small fraction of acreage could be set aside for local wholesale accounts.

Food service providers from only 16 of the 41 institutions agreed to be interviewed. Providers that participated in the interviews tended to be the ones that already had an interest in purchasing locally grown foods; thus, there was a positive bias in their willingness to support local farmers. Those that did not respond may not have been as eager to source ingredients locally. The qualitative data obtained is useful, nonetheless, because it sets out the challenges that food service providers face in obtaining locally grown foods even when they are enthusiastic about using these foods in their institutions.

The primary challenge facing the institutional purchasing of locally grown foods is a distribution system. A food distribution company willing to maintain farm identity would ideally connect local farms to the institutions.

The perceived notion that locally grown foods are more expensive is also a challenge. Food service providers facing tight budgets may not be interested in sourcing local ingredients if they believe that these items will cost considerably more than food imports. Efforts to build wholesale accounts for locally grown foods must therefore include an education component.

This study provides an estimate of the market for local produce in Lehigh Valley institutions; however, the accuracy of this number depends on a number of assumptions. It was assumed that the 41 institutions would purchase the same relative amounts of produce as that purchased by the 15 respondents; that produce would be available in the Lehigh Valley during the months indicated in the Harvest Calendar without regard to extenuating circumstances such as weather or disease events; and that the academic institutions would only purchase for nine months of the year. In addition, it is recognized that wholesale prices fluctuate throughout the season and from year to year. Furthermore, the total number of meals served by the 41 institutions contains estimates for some facilities. Despite these many factors that could change the final dollar figure in this study, it is likely that the market potential for wholesale local food purchases is still of significant size.

The 41 institutions included in the study offer a \$2-3 million market for local produce. Yet, if one also includes

restaurants, food hubs, grocery stores, food cooperatives, food distributors, and other large institutional buyers, such as schools, prisons, and corporate facilities, Lehigh Valley wholesale markets offer a much larger opportunity.

In addition, the study was limited to only 24 types of produce. If this were expanded to other produce types as well as to other foods, such as dairy, meat, poultry, eggs, grains, and processed foods, this market would be considerably higher yet.

The majority of food purchased in the Greater Lehigh Valley is purchased through wholesale channels; thus, there exists an important opportunity to build the Lehigh Valley local food system, improve the economic viability of local farms, and reinvest food dollars in the local economy. Gaps in infrastructure needed to move food from local farms to wholesale markets, however, make this a challenge.¹⁰ Farmers may need new equipment and facilities to harvest larger amounts; new food processing facilities, such as kitchen incubators or freezing facilities, could be established to create more value-added products and to expand the seasonality of local foods; delivery systems are needed to get the food from the farms to the institutions; and aggregators are needed to amass sufficient produce from small- and mid-sized farms to meet the demand of larger institutions. Education is also needed to teach farmers about food safety requirements, post-harvest handling, and packing specifications.

In order to take advantage of these wholesale markets and build a more vibrant local food system, coordinated efforts will be needed to provide farmer education and support, build necessary infrastructure, support food-based business development, bring about shifts in policy, and collectively market Greater Lehigh Valley products.

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¹⁰ Prior, Lynn, et al. (2013). Assessment Report: Lehigh Valley Local Food Economy. Retrieved from <http://www.buylocalgreaterlehighvalley.org>. 57.

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Appendix 1: Fresh Fruit and Vegetable Survey



Instructions: We do not need exact information, so please feel free to estimate or answer to the best of your knowledge. Once complete, please return in the stamped and self-addressed envelope included with the survey. We appreciate your participation.

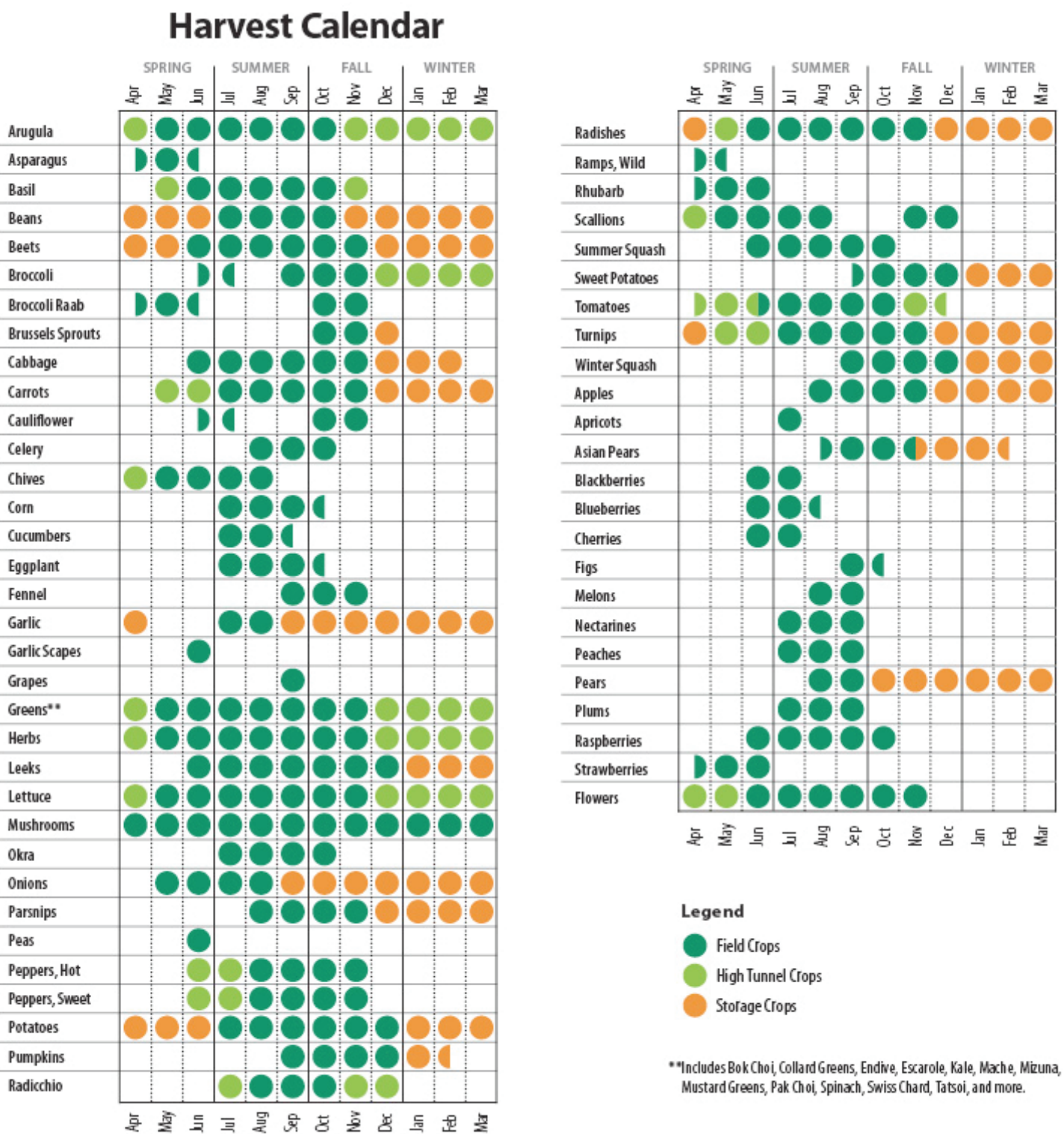
1. **How many meals on average do you serve daily?** *We understand that the number of guests can vary, but please make an estimate; for example, serving 50 guests 3 times a day would be 150 meals.*
_____ meals per day
2. **How much of the following fresh fruit and vegetables *on average* do you purchase each week?** *Please note that the list is focused on produce we commonly raise in the Greater Lehigh Valley. We are not interested in bananas or mangos, for example, since we cannot grow them.*

Product	Average Amount Purchased per Week (lbs)	Preferred form (shredded, diced, etc.)	Would you consider buying in whole form (circle)?
<u>Fresh</u> Vegetables:			
Beans			Yes / No
Beets			Yes / No
Broccoli			Yes / No
Cabbage			Yes / No
Carrots			Yes / No
Cauliflower			Yes / No
Corn			Yes / No
Cucumbers			Yes / No
Eggplant			Yes / No
Lettuce/Salad Mix			Yes / No
Mushrooms			Yes / No
Onions			Yes / No
Peppers			Yes / No
Potatoes			Yes / No
Radishes			Yes / No
Summer Squash (zucchini, yellow)			Yes / No
Tomatoes			Yes / No
Winter Squash (acorn, buttercup)			Yes / No
Other vegetable(s)			Yes / No

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Fresh Fruits:			
Apples			Yes / No
Melons			Yes / No
Nectarines			Yes / No
Peaches			Yes / No
Pears			Yes / No
Plums			Yes / No
Other fruit(s):			Yes / No

Appendix 2: Greater Lehigh Valley Harvest Calendar¹¹



¹¹ Greater Lehigh Valley Chapter of Buy Fresh Buy Local. (2013). 2013-2014 Local Foods Guide. Retrieved from <http://www.buylocalgreaterlehighvalley.org> 6-7.

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Appendix 3: Academic Institutions and Healthcare Facilities in the Greater Lehigh Valley

Healthcare Facilities:

Hospitals:

1. Easton Hospital, 250 S 21st St, Easton, PA 18042
2. Lehigh Valley Health Network, 1200 S Cedar Crest Blvd, Allentown, PA 18103
3. The Reading Hospital and Medical Center, Sixth Ave and Spruce St, West Reading, PA 19611
4. Sacred Heart Hospital, 421 Chew St, Allentown, PA 18102
5. St. Joseph Regional Health Network, 2500 Bernville Rd, Reading, PA 19605
6. St. Luke's University Health Network, 801 Ostrum St, Bethlehem, PA 18015
7. Surgical Institute of Reading, 2752 Century Blvd, Wyomissing, PA 19610
8. Wernersville State Hospital, 422 Sportsman Rd, Wernersville, PA 19565

Long-term Care and Senior Housing Facilities:

1. Cedarbrook Nursing Home, 350 S. Cedarbrook Rd, Allentown, PA 18104
2. The Children's Home of Reading, 65 E. Elizabeth Ave, Bethlehem, PA 18018
3. Everyday Life, 2045 Westgate Dr, Ste 100, Bethlehem, PA 18017
4. Fellowship Community, 3000 Fellowship Dr, Whitehall, PA 18052
5. Good Shepherd Specialty Hospital, 2545 Schoenersville Rd, Bethlehem, PA 18017
6. Hamburg Center, 3560 Old US 22, Hamburg, PA 19526
7. Healthsouth Reading Rehabilitation Hospital, 1623 Morgantown Rd, Reading, PA 19607
8. Kidspeace National Centers, Inc Orchard Hills Campus, 4085 Independence Dr, Schnecksville, PA 18078-2574
9. Kirkland Village, 1 Kirkland Village Cir, Bethlehem, PA 18017
10. Luther Crest, 800 Hausman Rd, Allentown, PA 18104
11. Moravian Hall Square, 175 W North St, Nazareth, PA 18064
12. Moravian Village of Bethlehem, Inc, 526 Wood St, Bethlehem, PA 18018
13. SarahCare of the Lehigh Valley, 7010 Snowdrift Rd, Allentown, PA 18106
14. The Chandler Estate IV, 1569 Teels Rd, Pen Argyl, PA 18072
15. The Good Shepherd Rehabilitation Hospital, 850 S Fifth St, Allentown, PA 18103
16. The Heritage of Green Hills, 200 Tranquility Ln, Reading, PA 19607
17. The Highlands at Wyomissing, 2000 Cambridge Ave, Wyomissing, PA 19610
18. The Lutheran Home at Topton, 1 S Home Ave, Topton, PA 19562
19. The Terrace at Phoebe Allentown Home Care Services, 1940 Turner St, Allentown, PA 18104
20. Westminster Village, 803 N Wahneta St, Allentown, PA 18109

Academic Institutions:

Colleges & Universities:

1. Albright College, 1621 N 13th St, Reading, PA 19604
2. Alvernia University, 400 St Bernadine St, Reading, PA 19607
3. Cedar Crest College, 100 College Dr, Allentown, PA 18104
4. DeSales University, 2755 Station Ave, Center Valley, PA 18034
5. Kutztown University of Pennsylvania, 15200 Kutztown Rd, Kutztown, PA 19530
6. Lafayette College, 730 High St, Easton, PA 18042
7. Lehigh University, 27 Memorial Dr W, Bethlehem, PA 18015
8. Moravian College, 1200 Main St, Bethlehem, PA 18018
9. Muhlenberg College, 2400 W Chew St, Allentown, PA 18104
10. Penn State Berks, 2080 Tulpehocken Rd, Reading, PA 19610

Community Colleges:

1. Lehigh Carbon Community College, 4525 Education Park Dr, Schnecksville, PA 18078
2. Northampton Community College, 3835 Green Pond Rd, Bethlehem, PA 18020
3. Reading Area Community College, 10 S 2nd St, Reading, PA 19603