Farm-to-Institution Strategies

Impact investing in health and economic development through the value chain of healthy regional food in the Puget Sound region

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Introduction

King County hospitals, schools and childcare facilities are currently spending an estimated $74 million on food purchases to serve their customers. These institutions are primarily purchasing outside of farm-to-institution (F2I) channels which represents a significant opportunity for regional farmers and food producers to capture market share.

As a provider of more than 43 million meals per year, these King County institutions feed hundreds of thousands of children, many of which are low-income. County hospitals represent a significant percentage of F2I purchases estimated at $30 million annually. King County schools provide over 27 million meals per year of which 67.5% are provided to low-income children. With 47,000 children enrolled in 2012, King County childcare facilities provide an opportunity to reach children at an early age when their eating habits can be strongly influenced.

With the goal of addressing childhood obesity, this project aims to: overcome challenges to increased consumption of healthy, Washington State food in King County hospitals, schools and childcare institutions; leveraging and scaling successful aspects of F2I initiatives; providing replicable models and fast-tracking efforts to allow programs to grow without hands-on assistance; evaluating and documenting successes and lessons learned; and developing a business plan that provides strategic investment recommendations.

F2I market analysis

The primary deliverables of this project include farm-to-institution case studies, market analysis, business development and investment strategic plans and pilot project implementation among project partners. This project builds on current F2I efforts that have achieved some success in serving affordable, healthy meals within the target market and creating economic development opportunities for farmers and food hubs by connecting them with new markets.

This report identifies market opportunities and investment strategies for the F2I market, focusing on those which increase access to healthy foods for vulnerable populations and builds on the evidence base to accelerate F2I efforts in the region.

Challenges

The solid growth of direct market channels for local and regional food (e.g. farmers markets) and the increasing demand for healthy and local food have led to strong growth in retail grocery, farmers market and community supported agriculture (CSA) purchases of locally and regionally grown and produced (processed) products over the last decade. However, this renewed and increasing interest in regional foods has led to limited gains in the F2I market with a number of factors presenting challenges to market growth.

The institutional market for food is not homogenous across the schools, hospitals and childcare facilities reviewed for this report. However, based on the partner institutions and industry interviews, we have identified specific traits that are generally shared by all institutional food service providers:

- Clear focus on low ingredient and labor costs;
- Need for consistent volumes, sizes, and delivery schedules;

- Need for advance planning of purchases for menus;
- Desire for simplified billing/invoicing systems;
- Requirements for nutrition standards and purchasing procedures;
- Limited flexibility in payment options, ingredient substitutions and choice of suppliers; and
- Limited and costly labor resources.

In addition to these needs, institutions must also respond to market forces and adapt to meet the demands of their customers and clients.

Research and interviews conducted for this project identified common challenges preventing institutions from accessing and utilizing local foods in their kitchens and are similar to findings from other surveys, most done at the national level. Prevailing challenges are shared across parts of the supply chain while others are unique to specific segments loosely defined as production, value-added, contractual and food service.

Table 1. Challenges

Production	Value-Added	Contractual	Food Service
Seasonality constraints	Processing	Pricing	Labor for coordinating procurement
Stable contracts	Distribution	Vendors familiar with formal bid procedures	Labor for preparing fresh product
Costs of production, inability to subsidize	Cold and dry storage	Larger businesses undercutting pricing through rebates and "loss leaders"	Final delivery
Affordable farmland	Uniform orders across institutions	National agreements inhibit local partnerships, contracts	Food allergy impacts on menu plans
Consistent volumes	Food safety	Sales and support staff for smaller businesses	Training for kitchen staff and teachers
Consistent sizing		Uniform purchasing procedures	Food safety
Limited knowledge about portion sizes		Additional account costs	Reluctance to change
Food safety		Rush delivery services	Evidence behind actual health or wellness impacts
			Cold and dry storage

One of the major challenges to growth in successful F2I market efforts is that they cannot be replicated or brought to scale without additional resources from leadership, support from stakeholders, investments, education, foundation support and government incentives. This F2I market does not yet have solid mechanisms to access regional foods and the market faces significant challenges that slow the process of production, processing, sourcing and preparation. In order to achieve scale, grants to fund education, staffing and subsidized purchasing will likely continue to be needed for several years if there is a stable global economy. Additionally, research has shown that processing, food safety, liability and distribution continue to be bottlenecks. In general, all parties in this values-based supply chain share challenges from providing consistent volumes, cost and availability of labor, food pricing, infrastructure to food safety, procurement policies and marketing.

Finally, a common need found across the spectrum of the institutional food buyers interviewed for this report is for timely, affordable, consistent and ready-prepared (minimally processed or frozen) fresh produce and fruits which also meet their institutional nutrition requirements. As part of the

overall challenges to sourcing locally and regionally, it is also important to mention that the types of foods ordered, quantities and sizing required for children and toddlers as well as the ordering and payment systems within the institutions vary widely. There is no one-size fits all solution.

Opportunities

Despite these difficulties, institutional purchasing efforts in the Puget Sound region have made strides to increase access to healthy foods in childcare, school and hospital settings with the help of innovative and bold leadership. For example, institutional purchases by schools have begun to open up since passage of the 2008 Local Farms Healthy Kids Act that created the WSDA Farm-to-School Program and revised bid procurement regulations[1]. Additionally, innovative hospitals and medical centers have been sourcing locally grown food for at least two years and have seen positive gains through educational programs and early purchasing efforts. Finally, childcare facilities are emerging as another expanding market for healthy and regional food since their smaller purchasing volumes match well with smaller farms and food producers exploring new institutional market opportunities. These facilities' direct connection to early childhood development and involvement of concerned parents show great promise for expansion of additional pilot projects. As the F2I market evolves and grows, farmers, ranchers and value-added food producers are seeing opportunities to expand and diversify their revenue by engaging in this emerging market.

Table 2. Opportunities

Production	Value-Added	Contractual	Food Service
Increased market demand for local	Demand outstrips supply	Cooperative purchasing entities	Increasing market demand
Increased market demand for healthy	Collaborative aggregation (infrastructure)	Off-contract purchases to test new products and suppliers	Interest in eliminating certain foods and ingredients
High quality farmland	Collaborative aggregation (services)	Stable contracts	Staff training in motivated institutions
Blended margin model	Processing		Marketing benefit
New farmers emerging	Blended margin model		Seasonal menu cycles for seasonal products
Cooperative production	Seconds for processing		Dirty Dozen/Clean Fifteen products for ordering
Dirty Dozen/Clean Fifteen products for growing			Seconds for purchase to reduce costs
Other specific products/needs already known			Summer meal programs

There are currently a number of projects underway designed to create system change. Local food hubs are one that provides an intriguing opportunity to create new aggregation and distribution models to serve F2I markets. Food hubs, typically centralized aggregation points that can provide marketing, delivery and other business services for local farms and their customers, have been an emerging category for supply chain development and many will be entering the critical proof-of-concept stage of deployment over the period 2013–2016.

The supply of healthy, Washington-produced foods into institutions is increasing due to ongoing advocacy efforts, market demand, key leadership and early successes from a few innovative institutions. Over 75% of schools surveyed last year reported increased consumption of fresh fruits and vegetables related to farm-to-school activities, with 80% currently serving Washington products and the other 20% interested.

Investment strategy

The program related investment strategy focuses on three types of businesses in the values-based supply chain from farm-to-institution. Primarily we focused on enterprises with the capability to serve more than one producer or institution, including "food hubs," processors and distributors. A second category of investment included value-added products which use Washington grown ingredients. Finally, we included prototype investments of a farm succession/preservation effort and a unique producer that is pioneering a local production model.

Appendices

Project research and interviews with key stakeholders emphasized the innovative nature of this F2I work which is characterized by both market forces and mission-based outcomes. Because of this, we have provided substantial supporting data and background information to augment the market analysis and investment strategies.

Project Goals and Scope

The Pilot Project's key priorities are to improve access to healthy regional foods for communities at highest risk for obesity and focusing investment priorities on hospital, school and childcare programs serving vulnerable populations. The underlying assumption is that improving access to fresh, local foods in institutions has an impact on childhood obesity because the identified institutions are primary or supplementary providers of meals and snacks to children (and their families). A broader benefit of expanding F2I is increased access to healthy, local food for all children in those institutions.

The main research questions of this project were:

1. Why aren't local institutions purchasing and serving more local fresh, prepared vegetables and fruits to their clients and/or customers?
2. What are the challenges to getting more fresh food into institutions and served to clients (e.g. regulations, processing, preparation, etc.)
3. What are the best opportunities for expanding this market?
4. Where would the application of creative/alternative funding and financing strategies catalyze market growth?

Answering these questions allowed us to create and implement an investment strategy to expand the F2I market by helping match market needs among participants, aligning metrics with goals between and across institutional sectors and developing implementable recommendations for institutions for processes and strategic investments that will speed things along. Specifically, the purpose of this pilot project is three-fold:

- Address childhood obesity among target populations by serving healthy regionally grown and produced food within childcare, schools and hospitals;
- Increase the supply of healthy regionally grown and produced food through a values-based supply chain; and
- Generate a catalytic investment strategy for the F2I sector.

These goals frame the project research to develop a market analysis and investment strategy that will increase access to and consumption of healthy foods by low-income children in King County through meals and snacks served in schools, hospitals and childcare institutions.

A number of key definitions were needed to scope the project and serve as a foundation for the analysis: healthy food, low-income populations, children within the region and values-based supply chain.

Healthy food was based on the Dietary Guidelines for Americans[2]. The Dietary Guidelines, intended for ages 2 years and over including those at increased risk of chronic disease, provide the basis for federal food and nutrition policy and education initiatives and encourage a focus on eating a healthful diet—one that focuses on foods and beverages that help achieve and maintain a healthy weight, promote health and prevent disease. The general principles are:

- Fresh minimally processed fruits and vegetables
- Lean protein including legumes (egg whites or any egg product with less than 95 mg of Cholesterol would be included here)
- Low fat dairy
- Whole grain rich (meaning it has at least 50% whole grain. This would include whole grain gluten free items)
- Healthy fats (oils and nuts)
- No or low added sugar or solid fats
- Low or reduced sodium

Low-income populations were based on eligibility requirements for federally-funded, free and reduced-price meal programs in public schools and childcare facilities. These require family income of less than 185% of the federal poverty level. This definition proved most relevant to this report and was most often recommended by experts.

Children were defined as those between the ages of 3 and 17.

A Values-Based Supply Chain is one in which personal relationships between supply chain players create equitable relationships between producers, middle position players (aggregators, wholesalers, processors) and institutions. These relationships create a more stable supply of product and a more stable supply of contracts and revenues. A values-based supply chain, or value chain, works to ensure the success of all partners and recognizes that in order to move product from farm-to-plate, all businesses need to cover their costs of production plus a reasonable rate of return.

Research Approach

Definition of research goals

Our research approach was designed with the following specific goals: ascertaining the current market size for F2I within King County; understanding successes and challenges to increased F2I in these institutions; and recognizing potential pilot projects which could provide immediate or near term benefits. Additionally, the above work needed to inform early stage strategy for potential investment in the F2I sector. With these goals in mind, the following research was conducted:

- Collection and analysis of publicly available data and research reports;
- Interviews with institutions;
- Interviews with food and farm businesses across the supply chain;
- Interviews with financial institutions;
- Interviews with project partners; and
- Interviews with governmental and non-profit agencies supporting F2I or working with the institutions being studied.

Interviews and data collection

To conduct an analysis of the existing F2I market, regional research reports were reviewed and publicly available data from the county, state and federal government were analyzed. In certain circumstances where data were not readily available, interviews were conducted with specific institutions (or organizations with intimate knowledge of an institutional sector) to access a sample size which could be scaled up to estimate the broader, countywide market.

Research to ascertain the current difficulties and successes in the F2I market as well as potential pilot projects were based largely on interviews with key stakeholders. Over 147 calls were placed to targeted food businesses and institutions, and 66 interviews were completed. The majority of the interviews involved farmers, ranchers, processors, wholesalers, distributors, schools, hospitals, childcare facilities, financial institutions and a few service providers.

The research team broke down the supply chain by size in order to understand the challenges faced throughout the industry. Companies were grouped by the relative scale of their business operations and categorized as small-, mid- and large-scale; then further broken down by their place in the supply chain: producers, processors, aggregators, distributors/wholesalers and institutions. The team was able to hold more than one interview in all but three of the fifteen segments.

Reporting research

This report begins with the market analysis section discussing the F2I market as it applies to each of the five major stakeholders: low-income children in King County, schools, hospitals, childcare and state food producers. These components are then aggregated for the ensuing sections.

This F2I project is geared towards an investment strategy for potential deployment of funds from RWJF, so the work was focused more on supply chain strategies that impact institutional cafeterias. The goal was to highlight investments strategies that may or may not require grant assistance. However, related grant-driven F2I projects without investment potential were still considered and are included in Appendix A.

Industry background

The Puget Sound farm-to-institution industry, as currently defined, is one of the oldest in the nation, with direct sales of sustainably-grown produce to institutions dating back to the 1970s. The majority of contemporary farm-to-institution work has occurred over the last ten years, with some of the project partners being key players in these earlier efforts. This decade of work, along with the combined 70 years of experience of the project team, allowed access to key stakeholders within regional supply chains.

Years of trust and relationship building allowed deeper conversations with private businesses. Due to the competitive nature of the wholesale food industry, some key companies declined to be interviewed, some of those interviewed would not share information deemed competitive and sensitive, while others shared information under conditions of anonymity to avoid aiding competition. Because of this, specific comments and data have been kept anonymous except those derived from project partners.

Key referenced reports

WSDA released three draft reports in late 2012 containing results from surveys of 216 state farmers, 373 processors and 61 schools (6 from King County)[3]. Funded by a USDA Specialty Crop Block Grant, the reports surveyed current markets, challenges, trends and opportunities for growth in institutional markets. These reports were directly relevant to this work and were determined to be of high value. Three other reports were also deemed to be of high value: The Puget Sound Food Project (2008) feasibility analysis of a multi-purpose agricultural processing center[4], and the University of Washington (2012)[5]and American Farmland Trust (2012)[6]complimentary reports focused on production and consumption of food in Western Washington.

Interviewee feedback

Of note, while collecting public data to support this research, a number of agencies mentioned our approach was different in scope than other researchers they had assisted. The market based approach to analysis as opposed to analyzing for a specific subsidy program drew great interest. The approach of analyzing food expenditures appeared novel as did a business-led approach in general. Often, existing data sets were not structured to look across the issues we were examining. While our questions were unfamiliar, there was interest on the part of agency representatives to discuss these directions further, suggesting we are engaging in new territory.

Introduction

National landscape

America is awakening to the reality that we are facing a complex world of concerns and that efforts focused only on one issue at a time are falling short of global, national and regional needs. A 2006 RWJF funded project, *Redefining Healthy Food: An Ecological Health Approach to Food Production, Distribution, and Procurement*[7], addressed some of the complexities and linkages across food, health, policy and the environment. This awakening creates a huge opportunity to address a series of interrelated issues by approaching change through a systems lens, where work at the intersection of multiple issues creates the opportunity for catalytic change. Within the realm of food and health, this crossroads involves doing a better job of feeding ourselves healthy food from close to home, and this F2I project lands squarely in the middle of this crossroads.

There are serious lifelong consequences associated with diet-related health concerns. Of pressing concern is the health of America's youth who are now facing rising rates of obesity and increasing risk of heart disease and diabetes at an ever earlier age. In 2010, the most recent year for available data, 9% of middle and high school youth were obese in King County with an additional 12% being overweight.[8] The direct medical costs associated with adult obesity in King County alone are estimated to be $500 million annually.[9] While there is no single solution to reverse youth obesity, increasing access to healthy food for vulnerable populations provides more opportunities to consume locally-produced fresh fruits and vegetables and other healthy food choices.

F2I market in King County

In particular, increasing attention has been focused on food service in institutional settings such as childcare, schools and hospitals due to the number of people and meals they serve. In King County, hospitals serve an estimated 12.5 million meals per year and total food spending is estimated at nearly $30 million annually (Table 3).[10] In K-12 public schools, the Office of the Superintendent of Public Instruction (OSPI) reported serving over 27 million meals in the 2011-2012 school year, 17 million of which were provided free or reduced-price, with total food spending of $34.8 million annually.[11] Additionally, childcare providers in King County have a capacity to serve close to 60,000 children.[12]

Table 3.

ESTIMATED F2I MARKET SIZE in KING COUNTY HOSPITALS, SCHOOLS and CHILDCARE	Meals served	Cost of Food
Hospitals	12,538,305	$29,857,733
Schools - School Year	27,253,036	$34,846,603
Schools - Summer	824,460	$1,178,266
Childcare*	2,710,994	$9,000,499
TOTALS	**43,326,795**	**$74,883,102**
* Only includes estimates for lunch		

Economic development opportunities

In addition to improved public health, increasing access to healthy, local food presents significant economic development opportunities for our rural communities, particularly local farm families, processors and others within the regional food system. The state's $46 billion food and agriculture industry currently employs approximately 160,000 people and contributes 13% to the state's economy.

In 2010, Slow Money Northwest undertook an analysis of the economic development potential of producing and processing more Washington State food for local consumption (i.e. within the state)[13]. The analysis, based on federal and state data, identified a $7 billion opportunity gap between all food and farm production and all food consumed in Washington State. Accounting for market substitution, the analysis further concluded that capturing an additional 2.5% of in-state market growth would generate an additional 3,784 direct jobs. Using Washington State's economic multipliers generated an additional 3,076 indirect jobs. The direct jobs would be disbursed among rural farms and rural and urban processing businesses. The indirect jobs would be represented mostly in farm supplies, logistics and retail sales businesses in both rural and urban communities. Data limitations did not allow for county-level estimates.

Developing successful F2I markets also has the potential to address an interesting paradox that currently exists. Five of the State's leading counties in agricultural production (farm gate value and number of farms) also rank in the top ten for poverty. Improved economic opportunities associated with production, processing, value-added and institutional sales could support new jobs, income and spending in these areas.

Strengthening values-based supply chains takes into consideration the health of rural farm workers, urban processing and cafeteria workers and the health of low-income urban consumers, as well as the children of each of these groups. Investments along these purposeful supply chains amplify/multiply the impact of investments to improve the health of low-income children. Expanding local and regional food systems supports jobs, incomes and output in both rural and urban communities while helping strengthen urban-rural linkages.

Values-based supply chain needs

As regional sourcing expands, so do the needs for information, resources and skills by farmers and others wanting to take advantage of the growing market. There is a significant gap between the purchasing requirements of institutional buyers and the ability of small- and mid-sized producers to meet those requirements. Education is needed on a broad range of subjects, such as product consistency, packaging, food safety certifications and appropriate and fair pricing.

On the production side, there are other fundamental needs. In order to meet institutional demand for local farm products, more farmers are needed to produce for local cafeterias. This includes a host of support for programs that preserve agricultural land and affordability; recruit, train and provide technical assistance to new and beginning farmers; and educate local farmers and food entrepreneurs about how to finance their enterprises.

Past and ongoing institutional purchasing efforts in King County and the Puget Sound region have made strides to increase access to healthy foods in childcare, school and hospital settings. The next essential step is to bring them to scale which requires additional resources. This F2I market does not yet have mechanisms to access regional foods and faces significant challenges that slow the process of production, processing, sourcing and preparation. All parties in this values-based supply chain share challenges, from consistent volumes, labor, pricing and infrastructure to food safety, procurement policies and marketing.

Project background

The project began in January 2013 by convening collaborative partners with the purpose of improving aspects of F2I purchasing, including: assessing demand at selected institutions; identifying production, value-added processing and distribution needs; developing recommendations for fast-tracking F2I efforts that are profitable and grow local business revenue and jobs; and identifying opportunities and strategic points of business development and investment that could catalyze success within the Puget Sound region over the next 3-5 years.

Data were gathered from previous and existing projects and key informant interviews with engaged supply chain partners to determine patterns, bottlenecks and opportunities. Financial intermediaries were identified that have capacity and experience to convert impact investment capital to grants, low-interest loans, equity and/or revenue-based financing.

Project goals and outcomes

Key outcomes of this project include: a market analysis, business development and investment strategic plans and pilot project implementation by partners. The market analysis identifies successful products and strategies that have been executed in the institutional market, focusing on those which increase access to healthy foods for those most in need, and builds on the evidence base to accelerate F2I efforts in the region. The strategic plan identifies key points for investments that will foster economic development and result in more fresh food in institutions.

Project deliverables

Project Market Analysis

Quantifies potential sales volumes to King County public schools, hospitals and childcare facilities and provides qualitative assessments of barriers to institutional purchasing of Washington-grown produce.

Investment Strategy

Assesses regional resources, addresses needs for various participants in the supply chain, identifies gaps in funding and key points along the supply chain – from production to consumption – where strategic investment could reduce barriers and leverage opportunities that speed up adoption of F2I efforts.

Case Studies

Examine project partners and others that produce and serve healthy, Washington-produced food and identify challenges and opportunities to expanding their efforts.

Pilot Project Plan

Documents efforts with pilot project partners in their efforts to implement local sourcing over the next 18 months and ramp up initial efforts. Identifies additional challenges to expanding local sourcing, preparation of meals and capacity needs as programs grow.

The Project Market Analysis and Investment Strategy are the first project deliverables due to RWJF in June 2013 and they build on the Case Studies. The Case Studies will continue to be refined as the Pilot Project is implemented and new opportunities/challenges are documented. The final Case Study report will be submitted by December 2013 and the Pilot Project Plan by November 2014.

The remainder of this report details these efforts and findings.

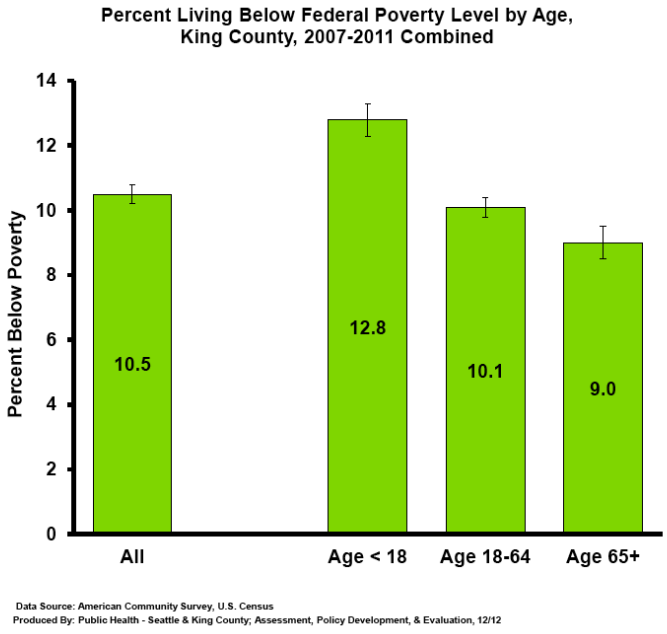
Market Analysis

Relevant King County Demographics

Total population: 1,908,379
Population of children 3 – 17 years old: 341,380
Estimated number of low-income children 3 – 17 years old: 115,543*
Food expenditures per capita: $4,229[14]
Total food market: $8,070,534,791*
*As calculated from published data.

According to the US Census, the population of King County in 2011 was 1,908,379. Of the total population, there were 402,891 children under the age of 18 of which 12.8% were below the federal poverty threshold.[15]

Figure 1.



Low-Income Children in King County

The explicit goal of this F2I project is to improve and increase access to healthy food for low-income children in King County served through institutional food providers. There are two ways to look at the size of the market: the number of low-income children that are potentially served through school, hospital and childcare meal services, or the number of total individuals being served by those three classes of institutions. While the first metric deals with the potential to benefit vulnerable populations, and is valuable in assessing the success of the program overall, the second measure determines the actual size of the institutional demand for food for the study.

For this report, low-income children are defined as those below 180% of the federal poverty level, the determinant for eligibility of free and reduced-price lunches under federal school meal programs. Using this definition, the number of low-income children between the ages of 3 and 4 is estimated to be over 16,000[a] while the number of low-income children between 5 and 17 years old is 99,330.[16] Thus, potential market size for F2I in the select King County institutions is approximately 115,000 youth (Table 4).

Table 4.

ESTIMATED LOW INCOME CHILDREN in KING COUNTY (Oct 2012)			Number of Students Eligible for F/R-Price Lunches in South King County School Districts (Oct 2012)	
K-12 kids up to 130% poverty	82,690		Seattle	20,583
K-12 kids 130 -180% poverty	16,640		Kent	14,595
3 - 4 year olds up to 185% poverty	16,213		Highline	13,017
TOTAL	**115,543**		Federal Way	12,233
Source: Computed from OSPI and US Census data.			Renton	8,983
			Auburn	7,789
			Tukwila	2,553
			South King County	**79,753**

Programs to promote healthy eating in childcare

In July 2010, project partners Northwest Agriculture Business Center (NABC) and the Washington State Department of Agriculture's (WSDA) Farm to School program joined a Center for Disease Control and Prevention (CDC)-funded Communities Putting Prevention to Work (CPPW) Farm to Table partnership led by Seattle Human Services. Access to affordable healthy food is a challenge for programs serving participants with limited incomes. Prior to participating in the project, childcare and senior meal programs reported that their food budgets limited the amount of fresh fruits and vegetables that they could purchase. Many programs relied on reheated institutional catered meals or frozen processed foods. In addition to cost, program administrators identified barriers such as limited storage capacity, staff training needs and the lack of staff time for menu planning and food preparation. The goal of the Farm to Table project was to bring fresh, local, affordable food to early learning and senior meal sites. There are seven main components to Farm to Table, including providing:

- Linkages to local farms in an effort to bring fresh, local, affordable foods to all. NABC facilitates those linkages primarily through increased food hub purchases for food service, the Good Food Bag program and community kitchens.
- Start-up and maintenance gardening support for childcare in an effort to grow food and provide therapeutic benefits of gardening.
- Nutrition education through Community Kitchens model which brings people together to cook, eat, share and learn in a supportive environment.
- Farm field trips to learn about local farms, origin of food and the goodness of local foods;
- Environments of well being where staff can be healthy and thrive;

[a]Data methodology: OSPI data provided a ratio of 5 – 17 year olds receiving free or reduced-price meals (i.e. <180% of the poverty level). This ratio was applied to the number of 3 -4 year olds per US Census data to derive the number of low-income 3 – 4 year olds in King County.

- Family support to inform, educate and inspire families to partner with programs to create healthy homes via dinners and the Good Food Bag program, which provides families with affordable access to fresh, local produce; and
- Physical activity support through Can-Fit which focuses on the principles of health at any size, community engagement and culturally relevant practices.

The Farm to Table partnership completed its initial 12 month grant-funded project in March 2012 through Public Health – Seattle & King County's CPPW program which helps connect senior and childcare programs with local arms to purchase fresh, affordable produce. The CDC recognized the project as a Health Champion for their efforts to make healthy living easier and prevent chronic disease.

Farm to Table was successful in improving access to affordable local produce for some of King County's most vulnerable citizens, providing them with the opportunity to increase their fruit and vegetable intake and improve their health. More than 50 sites incorporated farm fresh produce into meals – reaching 6,000 older adults and 600 children – and moved away from a reliance on catered or reheated processed foods. Commercial sales to 12 local farms increased by $35,000.

The Farm to Table partnership continues under a Community Transformation Grant (CTG) led by Public Health – Seattle & King County and Seattle Children's Hospital. The current reach estimates for childcare are 1,209 low income children in Seattle served; 620 low income match children in neighboring King County cities; and 116 low income families receiving Good Food Bags.

The City of Seattle has pledged ongoing support for programs like Farm to Table in its Food Action Plan. This is a very exciting opportunity for NABC and others to leverage food hub development and technical assistance to expand this sustainable market opportunity for local farmers and to feed people that need good food the most.

King County Hospitals

Based on publicly available data and interviews conducted with hospital staff [17] performed by project partner Kathy Pryor, Health Care Without Harm's Washington Healthy Food in Health Care Program Director, there are currently 25 hospitals in King County with 5,343 total beds. In order to understand and estimate the market size for F2I in King County hospitals, several of these institutions were asked to share annual meal service and purchasing expenditures.

Of the nine King County hospitals providing information, the average number of equivalent meals served annually per hospital was over 800,000 with total annual food purchase expenditures ranging from $340,000 to $3.7 million and food expenditures per equivalent meal ranging from $1.50 to $3.38 (Table 5). These data were used to project the wider F2I market for all 25 King County hospitals. These projections resulted in an estimated 12.5 million meals being served annually and total food expenditures of nearly $30 million.[b] (Note: Data were not available to ascertain food service to low-income children.)

[b]Data methodology: The data provided by each hospital was normalized to its number of beds and then averaged for a standard estimate for "meals served/bed" and "food expenditures/bed". With the number of beds known for each hospital, these standards were used to estimate the meals served and food expenditures for each hospital and aggregated to estimate the total F2I market size for King County hospitals.

Table 5.

KING COUNTY HOSPITAL SURVEY (per hospital per year)*	Avg. per Hospital*
Number of hospitals surveyed	9
Average number of beds	339
Average number of equivalent meals provided	801,603
Of which patient meals	30.7%
Of which café meals	69.3%
Avg. food cost per equivalent meal	**$2.38**
Total food cost surveyed hospitals	**$1,911,600**
* Data provided by nine King County hospitals	

Table 6.

ESTIMATED ANNUAL F2I MARKET SIZE King County Hospitals	Avg. per Hospital	Est. for All Hospitals
Number of Hospitals		25
Health Care Without Harm Pledge participants		14
Number of beds	214	5,343
Number of equivalent meals provided	501,532	12,538,305
Est. food cost per equivalent meal	**$2.38**	**$2.38**
Est. total cost of food	**$1,194,309**	**$29,857,733**

Programs to promote healthy eating in hospitals

Health Care Without Harm (HCWH) has been working directly with King County hospitals for years in efforts to promote healthy eating. In the spring of 2006, HCWH launched the Healthy Food in Health Care Pledge, a framework that outlines steps to be taken by the healthcare industry to improve the health of patients, communities and the environment. By signing the Healthy Food in Health Care Pledge (HFHC), facilities and food service contractors are demonstrating leadership and sending an important signal to the marketplace about their interest in local, nutritious, sustainable food and modeling healthy food practices for patients, staff and visitors.

In addition to the HFHC Pledge, HCWH is in collaboration with Seattle Children's Hospital and Public Health – Seattle & King County, working with Harborview Medical Center, Valley Medical Center and MultiCare Auburn Medical Center under a Community Transformation Grant (CTG) to change the retail food environments on these three hospital campuses. Participating hospitals choose their interventions from a "Menu of Opportunities" which includes increasing fruit and vegetable purchases, reducing meat purchasing, providing a minimum of one healthy meal option for breakfast, lunch and dinner, creating healthy vending programs, increasing purchasing of healthy beverages, promoting tap water, eliminating deep fryers and increasing purchasing of local and/or sustainable foods.

The King County hospitals that are the most engaged with HFHC and have the most momentum to move forward on farm-to-institution work include University of Washington Medical Center, Virginia Mason Medical Center, Harborview Medical Center, Swedish Medical Center and Overlake Medical Center. These hospitals have all signed the HFHC Pledge, and regularly attend monthly educational sessions on increasing local and sustainable purchasing. Additionally, the University of Washington Medical Center piloted a direct purchasing model through NABC's network of food hubs in 2012 and have continued purchasing regular but limited orders in 2013. They have presented information on their experience to the hospitals listed here. HCWH provides product expertise and technical assistance to hospitals interested in improving their cafeteria and patient

meals, as well as promoting innovative new ideas in healthcare foodservice via traditional media, webinars and presentations.

King County Schools

In October 2012, the OSPI reported that 99,330 students in King County were eligible to receive free or reduced-price meals through either the federally funded School Breakfast Program (SBP) or the National School Lunch Program (NSLP). This represented 37% of the total enrollment of 268,952 children[18].

According to OSPI, 27,253,036 "equivalent lunches"[19] were served to students in FY 2011-2012 generating $84,783,849 of revenue (Table 7).[c]Total expenditures per equivalent lunch of $3.66 outpaced revenues of $3.19 for an operating loss of $0.47 per meal or total loss of $1,928,344. Furthermore, detailed information on food expenditures was reported with King County school districts spending $34,846,603 on food, or $1.43 food costs per meal, in FY 2011-2012, accounting for 41.1% of revenues.[20]

Table 7.

FOOD SERVICE DATA FOR KING COUNTY SCHOOLS (FY 2011-2012)	Totals	Per Meal	% of Revenue
Equivalent Lunches	27,253,036		
Food Expenditures	**$34,846,603**	**$1.43**	**41.1%**
Total Expenditures	$86,712,193	$3.66	102.3%
Total Revenues	$84,783,849	$3.19	
Profit/(Loss)	$(1,928,344)	($0.47)	-2.3%
Source: All data provided by the OSPI			

Table 8.

ESTIMATED MARKET SIZE FOR F2I SCHOOLS in KING COUNTY - SUMMER PROGRAMS	Interview based data*	State based data**
Summer meals %	2.40%	0.70%
Est. # of summer meals	2,816,576	824,460
Est. Food costs to SD's for summer meals	**$4,025,275**	**$1,178,266**
* Source: Interviews with WA State Dept of Agriculture - Farm-to-school Program		
** Source: WA State Child Nutrition Programs 2012 report, OSPI		

Opportunity for impact in King County schools

The Federal Register provides income levels based on federal poverty guidelines for which students can qualify for SBP and NSLP meals which is 130% and 185% of the poverty guideline for free meals and reduced-price meals, respectively.[21] According to OSPI, in FY 2011-2012, King County school districts provided 14,481,918 free and 2,627,967 reduced price breakfasts and lunches representing 57.1% and 10.4% of all meals, respectively (Table 9). Therefore, free and reduced-price meals represented 67.5% of all meals served, a large proportion offering an opportunity to influence the eating habits of low-income children.

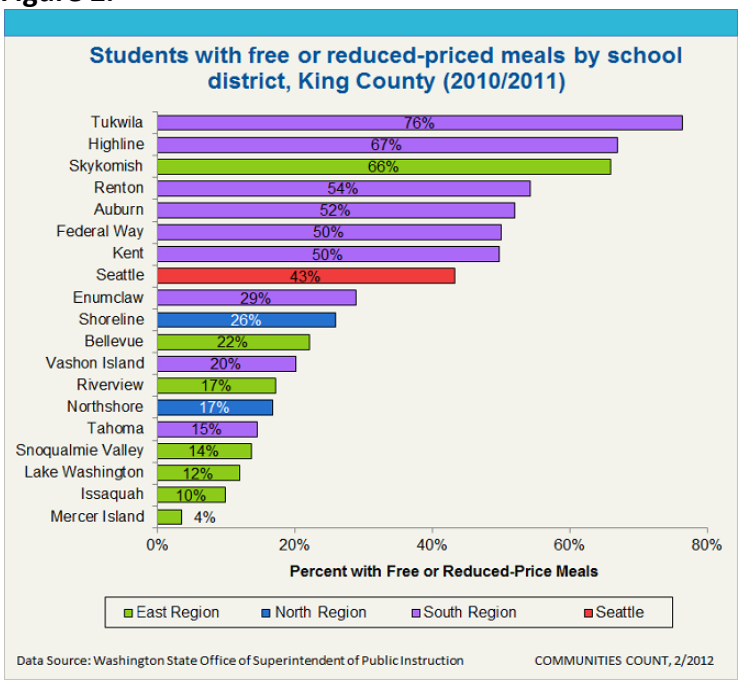
[c] Note: Adult lunches, adult breakfasts, snacks, and á la carte equivalent meals were excluded from the number of meal counts

Table 9.

MEALS SERVED IN KING COUNTY SCHOOLS (FY 2011-2012)	# of Meals	% of Total Meals
Total meals*	25,361,100	
Free breakfasts*	4,170,769	16.4%
Reduced-price breakfasts*	630,158	2.5%
Free lunches	10,311,149	40.7%
Reduced-price lunches	1,997,809	7.9%
Total Free meals	**14,481,918**	**57.1%**
Total Reduced-price meals	**2,627,967**	**10.4%**
TOTAL FREE & REDUCED MEALS	**17,109,885**	**67.5%**
Source: All data provided by the OSPI		
*OSPI does not include breakfast meals from Issaquah & Mercer Island SD's as they did not participate in the SBP; therefore these meal numbers are inconsistent with the previous figure which lists all 'equivalent lunches'		

More than 40% of students in King County public schools participate in free and reduced-price meal programs. Figure 2 breaks down the percentage of low-income children by county school district. With the exception of Skykomish, all districts with 50% or more students in the free and reduced-price meal program were located in South King County[22].

Figure 2.



Despite the current SBP and NSLP participation rates, OSPI data reveal there may be potential to reach even more children. The average daily participation in breakfast and lunch service is only 12.9% and 43.3%, respectively, of the total potential meals that could be served (Table 10). Healthier food options have the potential to increase these participation rates, representing an opportunity to reach a greater number of children regardless of their income status. Some rural

districts and other states have reported increased participation rates and no additional costs associated with farm-to-school activities. More research is needed to see if this holds true in larger urban centers.

Table 10.

STUDENT PARTICIPATION IN MEAL PROGRAMS IN KING COUNTY SCHOOLS (October 2011)	Potential Meal Service	Actual Meals Served	Participation (%)
Breakfast participation	4,806,912	620,225	12.9%
Lunch participation	5,233,922	2,267,324	43.3%
Source: All data provided by the OSPI			

Programs to promote healthy eating in schools

USDA administers a series of Child Nutrition Programs and all public schools in King County participate in at least one of these programs. According to their website, the National School Lunch Program (NSLP) is a federally assisted meal program operating in public and non-profit private schools and residential childcare institutions[23]. It provides nutritionally balanced, low-cost or free lunches to children each school day.

The School Breakfast Program (SBP) provides cash assistance to states to operate nonprofit breakfast programs in schools and residential childcare institutions. The Summer Food Service Program (SFSP) was established to ensure that low-income children continue to receive nutritious meals when school is not in session. Free meals that meet Federal nutrition guidelines are provided to all children 18 years old and under at approved SFSP sites in areas with significant concentrations of low-income children. The Fresh Fruits and Vegetables Program (FFVP) has been successful in introducing school children to a variety of produce that they otherwise might not have the opportunity to sample. FFVP is consistent with and supports the Institute of Medicine's recommendations to provide healthier snack choices in schools. FFVP provides funding to elementary schools with high levels of free/reduced-price meal eligibility with additional funds to provide fresh fruit and vegetable snacks for students.

The Special Milk Program (SMP) provides milk to children in schools and childcare institutions who do not participate in other federal meal service programs. The program reimburses schools for the milk they serve. Schools in the NSLP or SBP may also participate in the SMP to provide milk to children in half-day pre-kindergarten and kindergarten programs where children do not have access to the school meal programs.

USDA also has a Farm to School Program, established by the 2010 Healthy, Hunger-Free Kids Act. The USDA Farm to School Program, operated by the Food and Nutrition Service, conducts research, develops and provides training, provides technical assistance and manages the Farm to School planning and implementation grants to support farm to school and school gardens. The Farm to School Program surveyed 13,000 schools in 2013 for their first-ever Farm to School Census. In that survey, they found that in school year 2011-2012, schools participating in farm to school activities purchased and served over $350 million in local food, with more than half of participating schools planning to purchase even more local foods in future school years. In Washington State, nearly 80% of all public school districts completed the Farm to School Census. Of the 220 public school districts reporting, 104 districts representing approximately 1,144 individual schools with an estimated 523,917 children are engaged in farm to school activities, spending an estimated $43,498,189 on school food of which $10,527,555, or 24%, is local. 52% say this will buy more local foods in the future. Specific local items being purchased include apples, pears, berries, carrots, milk, bread/rolls, lettuce, potatoes, beef and vegetables.

USDA develops and conducts local food procurement workshops around the country and WSDA was a resource and reviewer in the development of those training materials and publications, and has co-presented with USDA for national webinars and conference presentations on school food procurement.

Washington State has had farm to school support from the WSDA since 2008, with education and outreach specialists providing training, outreach, technical assistance and publications to support farms and schools in making connections to improve school meals, build awareness and knowledge about Washington agriculture, and increase purchases of Washington-grown foods for school meals. The WSDA team leader participates in a number of coalitions, learning groups and research networks, including serving as the Washington State Lead for the National Farm to School Network and a leadership team member of the University of Washington's Nutrition and Obesity Policy Research and Evaluation Network. The WSDA farm to school team assists farms and schools to navigate the complex school food and agriculture regulatory environments, and works with partners to produce publications and guidance on local food procurement, food safety, and other technical aspects of farm to school, as well as providing general farm to school education and promotional support.

The South King County Farm to School Collaborative, made up of the Kent School District Farm to School Program and the more recent farm to school projects in Renton and Auburn School Districts, seeks to purchase and serve locally-grown foods through the NSLP, SFSP and FFVP. They may also serve local foods in the SBP next year. The Collaborative is a two-year partnership of the WSDA Farm to School education and outreach team with each of the three participating school districts, and with project and evaluation support from Public Health – Seattle & King County. The project is funded through a contract with Seattle Children's as part of their *Community Transformation Grant* package. In the Collaborative, Kent School District will be focusing farm-to-school efforts in their fruit and vegetable program (FFVP) which is currently operating in seven elementary schools and will serve some farm-to- school items in their lunch program (NSLP). Renton and Auburn School Districts will be developing a farm-to-school program in their lunch program (NSLP). All three districts will also be serving farm- to-school produce in their Summer Food Service Program (SFSP), will conduct training for food service employees to gain culinary skills to utilize locally grown fruits and vegetables and knowledge of farm-to-school program benefits to school nutrition and will include promotion of farm to school foods to their students.

King County Childcare

As of April 2013, there were 671 Child Care Centers (CCC) and 1,499 Family Child Care (FCC) businesses reported in King County.[24]According to studies performed by the Social & Economic Sciences Research Center at WSU for the Washington State Department of Early Learning (DEL), there were 18,145 preschool aged children enrolled full time in CCC's in King County in 2012 representing 38% of the 47,394 students in child care that year.[25]

Table 11.

CHILDCARE ENROLLMENT in KING COUNTY, 2012	Child Care Centers	Family Child Care (FCC)	Child Care & FCC
Full-Time			
Infant	1,391	315	1,706
Toddler	6,143	1,094	7,237
Preschooler	**18,145**	2,273	20,418
Kindergartener	1,896	218	2,114
School-Age	3,068	410	3,478
Total for Full-Time	**30,643**	**4,310**	**34,953**
Part-Time			
Infant	215	130	345
Toddler	1,260	316	1,576
Preschooler	5,370	723	6,093
Kindergartener	986	186	1,172
School-Age	2,516	740	3,256
Total for Part-Time	**10,347**	**2,094**	**12,441**
Total Preschoolers	23,515	2,996	26,511
Total King County	**40,990**	**6,404**	**47,394**

SOURCE: Washington State 2012 Child Care Survey, Child Care Rate and Resources in Washington State, Fall 2012, Social & Economic Sciences Research Center at WSU

While the table above gives an idea of market size based on the number of children enrolled, this data could not be used to directly calculate food expenditures. Because child care can be provided in so many different ways (e.g. year round vs. summer, part-time vs. full-time, toddler care vs. after school programs for school age kids, etc.), for this report food expenditure estimates have been limited to preschoolers enrolled in CCC which provide full-time service (i.e. children attend a minimum 5 hours a day, 5 days a week) either throughout the school year or year round. (Note: Toddlers and infants were not included as they are small consumers.)

This demographic was chosen because: (1) these children are most likely receiving at least one meal per day while in full-time service; and (2) these facilities represent those most likely to participate in subsequent pilot programs. The statistics published in this report relate to this demographic of childcare population and thus represent a subset of the larger F2I childcare market.

Using data from the WSU report combined with that from the 2012 Child Care Aware Report[26], the total number of preschool aged children meeting our study criteria was estimated to be approximately 10,900 students (Table 12).[d] If we assume one lunch is served to these students each day, there is a potential for approximately 2.7 million lunches served per year.

[d]Data methodology: The 2012 Child Care Aware report provides detailed data about the number of child care centers in King County categorized by hours of service and length of service as well as the capacity of child care facilities based upon age. Using this combined with vacancy rates aggregated through the WSU study for DEL, an estimate of the number of enrolled students was calculated.

Table 12.

ESTIMATED LUNCH FOOD COSTS FOR PRESCHOOL AGED CHILDREN IN FULL-TIME CHILDCARE CENTERS in KING COUNTY	
Est # of preschool age students enrolled in CCC in King Co (full year)*^	10,558
Est # of preschool age students enrolled in CCC in King Co (school year)*^	397
# of lunches per year per student (full year)	250
# of lunches per year per student (school year)	180
Total # of lunches per year (full year)	2,639,548
Total # of lunches per year (school year)	71,446
Total # of lunches per year	**2,710,994**
Fare Start average price for lunch to CCC**	**$3.32**
Est. food costs for lunch per year for Preschool age children in CCC's	**$9,000,499**
* SOURCE: ChildCare Aware of Washington, 2012 Child Care Data Report	
^ SOURCE: Washington State 2012 Child Care Survey, Child Care Rate and Resources in Washington State, Fall 2012, Social & Economic Sciences Research Center at WSU	
** SOURCE: Interviews w/ FareStart (price ranges of $2.88 to $4.50)	
NOTE: Enrollment figures were estimated based upon data provided in the referenced reports. For more information on the methodology for calculating enrollment please contact the authors directly.	

In order to understand the food dollars this would represent, we interviewed project partner FareStart. FareStart, a culinary job training and placement program for homeless and disadvantaged individuals, received a 3 year USDA Community Food Projects grant and has been able to increase the healthy and local food offerings to low-income childcare facilities. This mission related work was intended to increase their impact on hungry children and adults, homeless individuals and low-income children in the community, but also to change dietary patterns and reduce childhood obesity in schools.

According to FareStart, their lunch meal prices to CCC's ranged from $2.88 to $3.75, or an average of $3.31 per lunch meal. At the average meal price, this would represent food expenditures of approximately $9 million to CCC's per our defined market segment.

Washington State Food Production

Washington's food and agriculture industry is a key player in regional, domestic and international markets. The state's $46 billion food and agriculture industry contributes 13 percent to the state's economy and employs 160,000 people. The state ranks first in the U.S. for production of eleven commodities, including fresh apples, sweet cherries, pears and red raspberries and processed carrots, green peas and sweet corn.

Around 300 commodities are produced commercially in the state. This diversity creates very strong agriculture production and processing sectors that vary by county, product and market focus. The state's position on the Pacific Rim affords it a unique position in the global food market, with Washington being the third largest food exporting state in the country, with $15 billion of food and agriculture products travelling through its ports[27].

There were 39,500 farms and ranches producing crops and livestock valued at $9.2 billion in 2011, a 16% increase from $7.9 billion in 2010. Using USDA statistics and extrapolating for healthy food defined as fruits, nuts, vegetables and berry crops, the total value of healthy food production was

$2.8 billion, or roughly 36% of the state's total production value[28].Food processing is a $15 billion industry and employs over 39,000 people. Washington leads the U.S. in potatoes grown for processed foods such as french fries. Washington is the leading U.S. producer of apple juice and a leader of grape and berry juices. Fruits and vegetables, milk products, meat and seafood are also major product categories.

WSDA generates county-level maps based on USDA's Census of Agriculture. The maps, presented in Figures 3 and 4 below, detail farm revenue, number of farms, crops and jobs for farms and processing businesses.

Figure 3. Market Value of Crops and Livestock and Number of Farms by County from 2007 Census of Agriculture, USDA

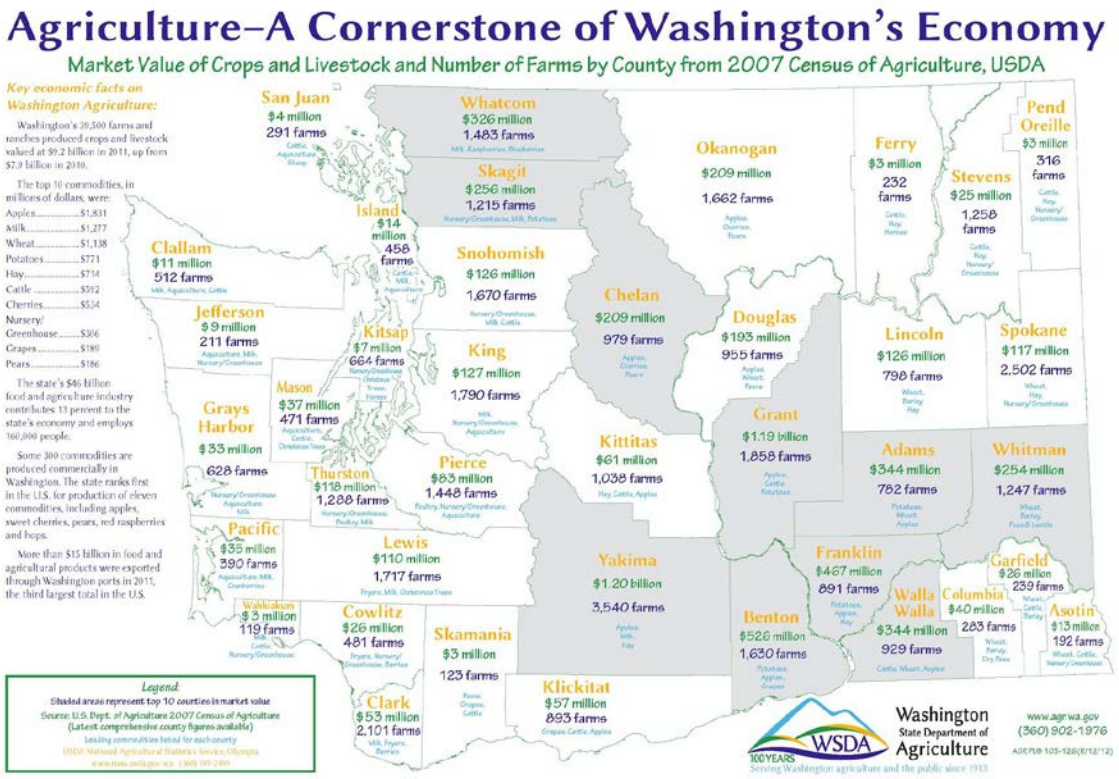
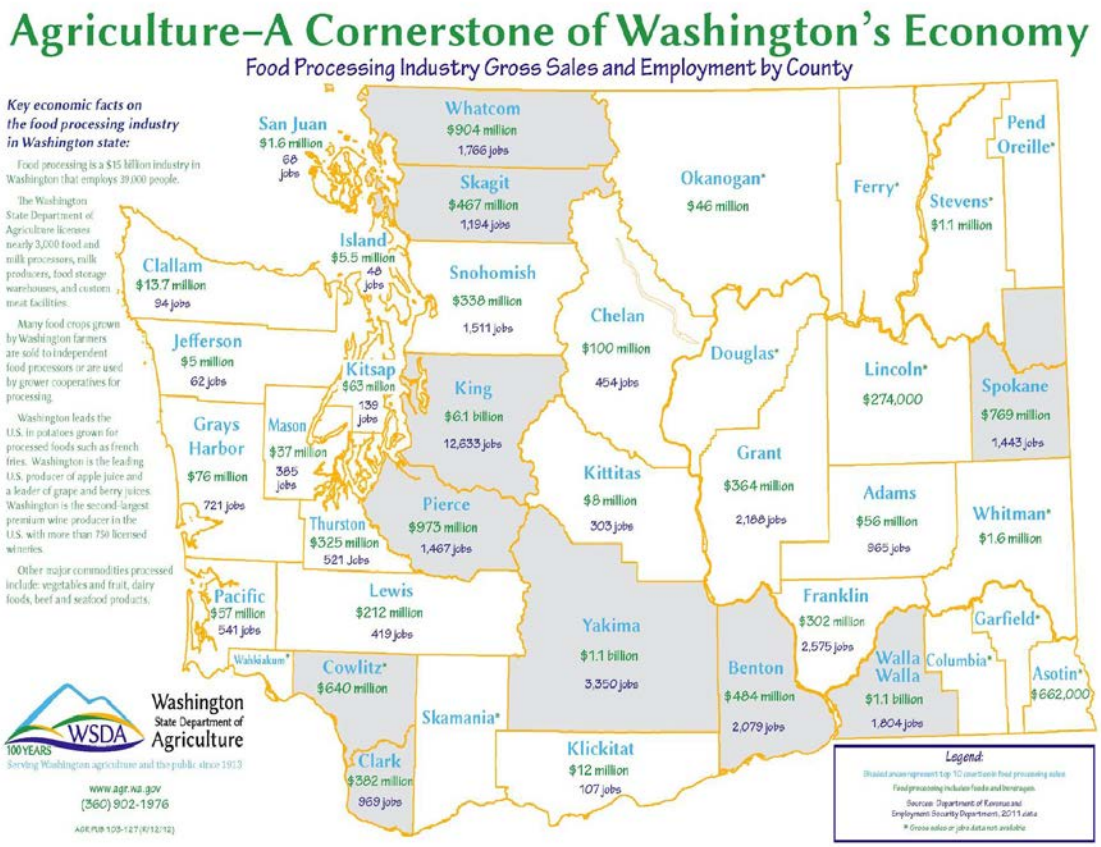


Figure 4. Food Processing Industry Gross Sales and Employment by County



Washington's northern location creates a production barrier involving the seasonality of certain products, and the reality that some high demand produce is imported from other states or countries. WSDA has generated seasonality charts for vegetables, fruits, legumes and herbs that highlight what products grow well and when (Appendix B). Advanced storage allows certain products like apples, beans, carrots, beets and turnips to be harvested and placed in climate-controlled storage year round.

Some of the counties with the highest rates of poverty are also the counties that generate the highest value of food production. Whitman, Adams, Franklin, Yakima and Grant counties are ranked in the top 10 for both agriculture production value and poverty rates (as a percentage of population). Yakima County produces over 13% of the state's total production ($1.2 billion), with agriculture and forestry representing almost 25% of county jobs[29]. Yakima is also the fourth most impoverished county in the state with a poverty rate of 23%.

Challenges

The Farm-to-institution market distinguishes itself from other farm-to-market/retail/table/fork efforts mainly because the food is usually sold in prepared meals. This means that most food served is processed to some extent and ready for immediate consumption. This creates additional challenges to production, processing, contracts, food safety and cafeteria employees.

The table below represents a general ranking and summary of challenges revealed through all of the research and interviews. The challenges are stacked into columns that loosely represent the supply chain for food. The "Contractual" column represents the sales, marketing and purchasing negotiations between various businesses moving food from farm-to-cafeterias. The order of the descriptions that follow are loosely organized to follow these columns and the supply chain.

Table 13. Challenges Overview

Production	Value-Added	Contractual	Food Service
Seasonality constraints	Processing	Pricing	Labor for coordinating procurement
Stable contracts	Distribution	Vendors familiar with formal bid procedures	Labor for preparing fresh product
Costs of production, inability to subsidize	Cold and dry storage	Larger businesses undercutting pricing through rebates and "loss leaders"	Final delivery
Affordable farmland	Uniform orders across institutions	National agreements inhibit local partnerships, contracts	Food allergy impacts on menu plans
Consistent volumes	Food safety	Sales and support staff for regional businesses	Training for kitchen staff and teachers
Consistent sizing		Uniform purchasing procedures	Food safety
Limited knowledge about portion sizes		Additional account costs	Reluctance to change
Food safety		Rush delivery services	Evidence behind actual health or wellness impacts
			Cold and dry storage

Imperfect information

One of the primary challenges facing all participants along these emerging values-based supply chains is imperfect access to information and lack of clear communication. Participants simply do not know what sets of constraints or requirements face producers, aggregators or end buyers. For example, farmers face seasonality and other production and supply constraints that buyers may be unaware of; farmers may be unaware of how to access institutional contracts, understand their demand fluctuations or particular food safety requirements. Improved access to information and good communication are required for values-based supply chains to be effective.

Interviews conducted as part of this project underscore this lack of information and miscommunication. Depending on who you talk to within a traditional supply chain, there can

either be enough product when requested or not enough to meet current demand. Wholesale farmers will say they can get you anything as long as the contract is stable. The distributor will say the market is asking for healthy local product but they can't get enough at the right price, in the right form or in consistent volumes to fulfill contracts. The buyers who are trying to receive healthier regional produce are saying that they are trying but cannot get the product to match their budget especially if they have to process the product.

In one string of interviews, a mid-sized distributor said "whoever can get me tomatoes in May will make a killing" and referred the interviewer to a large farmer. When interviewed, that farmer said the problem is that people are not asking for the products enough, and when he was told about the distributor's comment he was surprised and wanted to know more about what the distributor was saying - as though he never had those conversations. This lack of communication inhibits growth of a values-based supply chain where suppliers are treated as strategic partners and solid relationships form a foundation of trust. This trust across partners can reduce the risk to try something new and can allow innovative ideas and products to be tested, ideas such as local tomatoes in May.

Aging farmers

According to the USDA Census of Agriculture, the average age of principal farm operators in Washington State is over 57 years old and the fastest growing segment is those 65 years and older which increased 22% between 2002 and 2007. Over the same period, farm operators younger than 45 years old decreased 14% but increased for those under 25[30]. The aging farm population creates a number of challenges to maintaining a viable, regional food system. The primary challenge is the risk to overall food supply: who will grow our food? Attracting new farmers requires providing access to training, markets, infrastructure and financing to be successful.

Secondly, how will we maintain our farmland base? Despite the importance of agriculture to the State's economy and increasing demand for locally produced food, if Washington follows national trends, 70 percent of our farmland will change hands in the next 20 years. Most current farmers do not have plans for transitioning their farmland to the next generation and many will end up selling their land for non-farming uses. Without effective ways of bringing in new farmers, this farmland and the value of crops it produces could be lost.

Managing risk

There are a number of challenges or risks inherent in moving beyond conventional production into new marketing, processing, distribution and/or other channels. This includes, for example, farmers seeking new and more direct marketing opportunities, marketing cooperatively with others, producing value-added products for the first time or seeking third-party food safety certifications. Without sufficient information on how to manage the risks associated with these endeavors or what the expected economic return would be, many producers may avoid new market opportunities. The emerging F2I market and the need for innovative business models that produce large volumes of food suggest that additional technical assistance and financial resources will be needed to attract established farmers.

Similarly, the initial effort for institutional buyers to participate in local purchasing and changing their operations is daunting, and many institutions are averse to risks that accompany this effort. In order to succeed at farm to institution, most will need to invest significant staff time into assessing current operations, working with technical assistance providers to do strategic planning, take the time to build relationships and buying and distribution systems with vendors who can supply locally-grown food, and invest time and money into staff training and likely some equipment to support their farm to institution goals. In schools, the required competitive purchasing systems necessary to increase purchases of Washington-grown food, such as applying a geographic

preference or using an informal quote system, must be carefully tested and used in order to avoid unintentionally committing to costs too high for existing food budgets. To date, this work has been assisted by WSDA, NABC, HCWH and other regional partners able to provide training and technical assistance and support pilot projects with direct engagement and participation in the assessment, planning and implementation phases. This work is largely funded through 2-3 year grants, mostly from federal health and agriculture agencies.

Land prices

Price of land and labor can have significant impacts on the price of food and where it can be grown. Generally speaking land becomes more expensive as you approach any metropolitan center. Table 14, below, shows a quick comparison of farmland costs, distance to King County and market value of crops per farm and value per acre in three different counties across Washington.

Table 14. Farmland Costs and Market Values[31]

County	Avg farm size (acres)	Farmland value ($/acre)	Farmland value (for average farm)	Total Market value of crops (average)	Value/acre
King (0 miles from King)	28	$17,788	$498,767	$71,100	$2,539
Skagit (50 miles)	89	$6,746	$602,607	$210,904	$2,370
Yakima (140 miles)	466	$1,530	$712,980	$340,058	$730

Aggregation

The need for product aggregation represents both a challenge and an opportunity in the emerging F2I market. The lack of economically-accessible and scale-appropriate aggregation facilities or services is an issue. Fresh fruits and vegetables frequently need to be aggregated to fulfill orders and ensure cost-effective delivery. Historically, packing houses used to be more common in farming communities across the country; however, competition, costs and scale of operations have shuttered many, resulting in consolidation to larger operations. This consolidation in turn removed jobs and revenue from these rural communities and increased the distance between farmer and buyer.

Today these critical supply chain roles are being serviced by distributors and wholesalers who, for the same reasons, have been pressured by the economics and competitiveness to reduce their costs wherever they can. The profit margins in the wholesale industry are extremely thin, with one large distributor mentioning operating on less than a 2% margin. This forces businesses to make up their revenue on volume by getting product as cheaply as possible from anywhere, pressures growers to drop their prices and to move product as fast as possible. This model accommodates only a handful of statewide growers who have to be able to both operate larger operations but also compete with product from California, Florida, Mexico, Chile and elsewhere. Today, a truck picks up local product from a few farms that can still compete in this market, moves that fresh product to either the Seattle area or even farther south to Oregon or California where it is aggregated with other product before returning for final delivery.

While there is a strong interest in developing appropriate-scale aggregation, with USDA creating a 'developers' market' by incentivizing the development of food hubs with large grants, there is concern around the viability of some of these efforts as many are entering the competitive arena described above and are operating without full feasibility, business plans, or have just not been around long enough to generate a viable revenue stream. A 2012 USDA food hub report highlights

that food hubs that are not yet economically viable have annual gross sales from $102,000-$5.5 million with median sales of $500,000, while those that are economically viable have gross sales from $1-$40 million with a median of $6 million[32].

The new food hubs currently appear to need continued long-term grant support to cover aggregation and distribution costs which is not surprising given the competitive climate, but also due to the fact that their collective mission is to address larger social and health issues which internalize some costs (e.g. fair prices, fair wages) not currently accounted for in the dominant economic model. The USDA findings suggest that there is an appropriate scale where an investment could succeed; the challenge is finding enough interest through collaboration, planning and product flow to achieve economic viability.

Processing

Processing presents both the largest challenge and opportunity for institutions to purchase more local food. Institutions may not have the space, labor or time to receive raw product. Some of the early-adopter institutions want more staff and/or equipment to increase in-house processing, but absent budgetary shifts needed to make that a possibility, they need more local products pre-washed, chopped and bagged.

The lack of economically accessible and appropriate-scale processing hinders the ability for both producers to enter this market and for buyers to be able to purchase more products. Currently many schools are not fully equipped, staffed or trained to handle raw product or to process (clean, cut, dice, measure, cook, etc.) fresh product into the forms needed to meet portion sizes and nutrition requirements.

Pilot project partner Kent School District revealed the conundrum of trying to get product in the right form while developing their farm-to-school purchasing program. The District has a hard time receiving product directly from one producer because the inconsistency in product size creates challenges for portion sizing and in-house processing. However, they can get that same producer's product through a processor/distributor who delivers the appropriate volumes in the right form ready to serve.

Final delivery

Distribution and delivery to the final institutional consumer can pose a number of challenges in terms of time, frequency and size of delivery that may not be cost-effective for some producers, aggregators and/or distributors. New delivery/distribution systems, especially those aggregating small lots of products from many farmers, have to compete with larger systems that can deliver product next or same day if needed. This flexibility is helpful for many buyers with limited time or other variables that force them to order product late. Smaller delivery systems are usually delivering only a set number of days/week and have cutoff times for ordering, usually one to two days before delivery.

The delivery window, usually a couple of hours in the morning, represents another challenge. Many businesses may have the same delivery window which is hard on single-truck delivery services, which is usually the case with producer-direct delivery systems.

Early adopters, those buyers motivated to try to source more locally, are making some gains by trying out alternative approaches. This may mean changing delivery windows around to accommodate the alternative delivery model or taking more time to plan ahead and not place last-minute orders.

Another challenge, voiced from a distributor, was in regards to a school district that wanted final delivery of product to between 15-20 schools, with each stop being small orders. As the distributor said "One drop may only be 60 lbs. We lose money on this. We want to service the schools but we need to cover the cost of our truck and driver." Final delivery to individual schools is either provided by the school itself which can be the case when there is a central commissary/kitchen, but is often undertaken by the distributor. If the schools undertake final delivery, it adds additional costs including vehicles, driver time, fuel and potentially additional refrigeration costs to store food at the central site until delivery.

Seasonality/consistent supply

Seasonality, or when products are available in our growing climate, and the ability of producers to provide a consistent supply of product over a growing period are challenges in the emerging F2I market. Consumer preferences, institutional menus and food marketing have evolved to such an extent that consumers expect the same products to be available year round. A winter salad bar is expected to have tomatoes, cucumbers and peppers. A global supply chain of food and advanced greenhouse operations have created this expectation and can deliver seasonal goods every day of the year if the buyer is not concerned with distance traveled, fuel/carbon emissions and in some cases growing practices.

Advanced cold storage allows some Washington fresh fruits, particularly apples, to be refrigerated and available all year. Washington State is also fortunate in that Western Washington has mild winters and quite a long growing season, allowing for some products, particularly dark leafy greens and storage crops like winter squash, potatoes and carrots, to be available through January or February. However, these are limited products, and menus would need to be adjusted to provide for increased use of these types of products. Most local fresh fruits and vegetables are seasonally constrained and only available in quantity during peak summer months, which unfortunately is when schools are out of session. Value-added and finished goods such as breads, pastas and canned goods do not have this seasonal constraint; however, foods with this level of processing cannot be purchased using a geographic preference, which may at times limit schools' ability to pay prices required by local, smaller scale processors.

Product consistency

The ability of producers to provide consistent size of products can also be challenging as product and serving size needs vary across institutional buyers. For example, smaller items like grapes and 'baby' carrots raise choking concerns for childcare facilities but are perfect for schools and hospitals. Childcare nutritional requirements call for smaller portion sizes than schools which means different case counts.

Some buyers have problems with varying sizes of product that constrain efficient hand or machine processing or serving as single servings, as is common practice for many fresh fruits. This is less of a concern when the product is sent to a processor for preparation as they are more accustomed to dealing with varying sizes.

Transaction costs

There are a number of added costs to producing and sourcing locally grown products that pose challenges to many participating in F2I efforts. Farms, distributors and institutional buyers all recognized the challenges of transaction and account costs. Staff for coordinating procurement is a hidden cost as it just takes more time to deal with multiple accounts, from ordering to billing to receiving orders. As one school buyer said, "When I move from one to two suppliers I have doubled my account costs." A hospital added that labor time has to be spent to make sure vendors are compliant with different food safety and third party certifications.

Minimum delivery charges are standard for companies, sometimes in pounds of product but usually by price and range from $250 to $500. This transaction goal is directly related to transaction costs and the challenges discussed under final delivery, above.

Pricing

Price is one of the primary market drivers in wholesale food channels. As location becomes a market consideration, the emphasis on lowest price is being challenged, with some buyers willing to spend more for regional products that have added value and marketing benefits. Some buyers who are trying to make the healthier, regional choice are paying more for products or are currently receiving local products through a grant-subsidized pilot period. One hospital is paying about 30% more for local meat. Another calculated that the cost of purchasing local, organic milk would increase their expenditures by an additional $120,000 per year. In some cases, these are costs institutions are willing to pay either during a trial period or because they see other values and benefits from serving local food. In other cases, the difference is cost prohibitive.

FareStart services many of the childcare centers who match our target criteria as well as those who receive subsidies from the Child and Adult Care Food Program (CACFP). The CACFP provides federal reimbursement to childcare providers for the meals they serve low-income children in their care[33]. FareStart's experience shows that the CACFP subsidies are insufficient to allow for the use of fresh, locally-produced fruits and vegetables in low-income childcare centers.

For producers, the price offered by many buyers makes it cost prohibitive to engage, regardless of interest. One certified organic producer described how they would still lose money even when a school was willing to pay 10% more for geographically-preferenced products. This may be a condition of that specific farm, however organic production practices have internalized some costs not calculated in the costs of conventional products, including synthetic and/or genetically modified fertilizers and pesticides that some studies have shown can impact individual health as well as increasing nutrient runoff from fields and groundwater and soil contamination.

The price gap between cost of production plus reasonable rate of return and what the market is willing to bear make it cost prohibitive for some producers to engage too deeply in segments of the institutional market, regardless of interest. There are many reasons for the price difference, including a global year round supply chain, externalized costs of production (e.g. health impacts, carbon emissions), scale of operations, access to capital to reach appropriate scale, access to affordable infrastructure including land, local labor costs and individual expertise in business and in producing food.

Labor

Labor availability is a challenge for many participants along the values-based supply chain and will affect the ability to expand F2I efforts. For farmers, the tightening labor pool, especially immigrant farm workers that have traditionally worked many farms, means that they must compete for a smaller work force. This drives up the price of labor, in some instances to the point where food prices increase to reflect higher input costs or some edible food is left in the fields un-harvested.

Turning raw product into prepared foods also requires labor to wash, cut, slice, dice, cook and/or preserve that food for shelf, refrigeration or freezing. Some fresh and minimally-processed products require more labor hours in the kitchen for final processing for salad bars, soups and other recipes. Cafeteria kitchens that are just beginning to convert to scratch cooking need additional funds for re-training staff, purchasing and upgrading equipment and for ongoing processing needs.

Food safety/regulations

Food safety requirements and regulations are a growing challenge, particularly for small- and mid-sized producers. Food safety and food recalls have been in the news extensively the last few years, with the USDA generating a new product recall about once a day[34]. The Food Safety Modernization Act (FSMA) of 2011 has already had an impact on food production in the region with many producers and processors preparing for or receiving a voluntary Good Agricultural Practices (GAP) or Good Handling Practices (GHP) audit.

Currently, very few producers have any third party food safety certifications with the primary driver being whether of not a certification is required by their buyers. Small- to mid-sized farms have expressed concerns about the costs for maintaining required food safety documentation and audits. These voluntary and mandatory third-party certifications and audits do not guarantee food becomes safe with most of the current recalls and foodborne disease outbreaks involving larger and more industrialized food production systems. While food safety is paramount, the large-scale recalls and responses place additional hardship and costs on smaller producers.

While hospitals represent the institutions with the best growth potential, they also have additional requirements that can be impediments to sourcing locally. One involves patient safety. For instance, two hospitals reported not serving grapefruit due to possible adverse interactions with different medications. Others require that anything processed or pre-cut have food safety documentation; however, some hospitals need products to arrive pre-cut. The same holds true for schools. The childcare sector, while less organized, would also benefit from such documentation.

Professional training and education

Lack of support for sourcing locally produced food and the capacity to handle local food are also challenges facing F2I projects. Many institutions seeking to increase the use of regionally-grown foods are doing so because a food service director or other decision-maker is enthusiastic and leading the change process. There is still great need for further outreach and education to share best practices, inspire additional food service leaders and empower kitchen and cafeteria staff to become positive leaders in the process.

Currently, much of this work is happening through government or non-profit organizations using public or private grant funds. Another important aspect of farm-to-institution is the promotion and education that supports acceptance of new menus and more seasonal options by consumers, builds understanding of agriculture and regional food systems and encourages healthy, local choices by families at home. These aspects are also important from an economic standpoint since participation rates increase revenues in schools, which can mean the difference between having enough funds to preference locally-grown foods or needing to rely on more affordable options that require less labor.

Opportunities

Despite substantial challenges to the growth of the F2I market, we have documented some of the successful innovations that can help overcome them. Through our interviews with various stakeholders, we have collected a set of opportunities to expand the regional F2I market. The chart below summarizes the results of interviews with strategic businesses engaged in the farm- to-

institution supply chain and forms the basis of our investment strategy. The descriptions are loosely ordered in terms of highest to lowest opportunity.

Table 15.Opportunities Overview

Production	Value-Added	Contractual	Food Service
Increased market demand for local	Demand outstrips supply	Cooperative purchasing entities	Increasing market demand
Increased market demand for healthy	Collaborative aggregation (infrastructure)	Off-contract purchases to test new products and suppliers	Interest in eliminating certain foods and ingredients
High quality farmland	Collaborative aggregation (services)	Stable contracts	Staff training in motivated institutions
Blended margin model	Processing		Marketing benefit
New farmers emerging	Blended margin model		Seasonal menu cycles for seasonal products
Cooperative production	Seconds for processing		Dirty Dozen/Clean Fifteen products for ordering
Dirty Dozen/Clean Fifteen products for growing			Seconds for purchase to reduce costs
Other specific products/ needs already known			Summer meal programs

Opportunities to Overcome Challenges

Increasing demand for local food through values-based supply chains

Underpinning most of this project is the perception that the market is changing and that consumer demand for healthy, local and sustainable food is growing. The institutional market reflects the overall market trend. The WSDA Specialty Crop Surveys revealed 66% of processors reporting that their customers desire, require or are willing to pay more for products with locally sourced ingredients[35].The Geographic Preference rule[36] permits school purchasing contracts to preference Washington-grown food and a recent report has helped clarify for schools how they use this preference to purchase fresh and minimally-processed Washington-grown food. One mid-sized producer interviewed for this project confirmed this recent shift in attitude towards local purchases from institutions he has worked with, including schools, hospitals and childcare facilities.

Beyond simply sourcing locally, customers are beginning to expect social responsibility through every stage in production, processing and delivery. In this new model, called a Values-Based Supply Chain (VBSC), personal relationships between supply chain players create equitable relationships between producers, middle position players (aggregators, wholesalers, processors) and institutions. The relationships across this values-based supply chain create a more stable supply of product and a more stable supply of contracts and revenues. Producers are treated as strategic partners with information such as true costs and market demands that is shared across the supply chain. A values-based supply chain works to ensure the success of all partners and recognizes that in order to move product from farm-to-plate all businesses need to cover their costs of production plus a reasonable rate of return. These relationships provide an advantage for regional companies entering a very competitive industry. Identifying businesses with strong relationships to their suppliers and customers shows promise as an investment strategy.

High quality farmland on the verge of succession

Washington is home to some of the world's most fertile farmland with a significant amount located near population centers in the Puget Sound region. Similar to national trends, this region has an

aging farming population (the average age of Washington farmers is 57 years old) and about 70 percent of our farmland is expected to change hands in the next 20 years. Most farmers do not have plans for transitioning their farmland to the next generation and many will end up selling their land for non-farming uses. This massive succession of ownership represents a threat to the stability of the food system if farmland is lost to non-farm development, but can also be seen as a tremendous opportunity to re-shape the food system to foster healthy communities and environments.

F2I project partners are engaged in dialogue with government agencies, land trusts and foundations involving how to effectively deploy capital to protect farmland from conversion and endow the region and its communities with access to healthy food using this once-in-a-generation opportunity. Agricultural conservation easements and purchase/transfer of development rights (PDR/TDR) can be less capital intensive than outright farmland acquisition and can have a similar effect.

Processing

Processing is both a barrier and an opportunity. Institutions need product in the right form and do not always have the labor to wash, cut and prepare raw product for a meal. A large majority of processors surveyed by WSDA want to sell to institutions and are reporting more requests for locally-sourced product; 24% of the respondent's customers are willing to pay more. Developing value-added products is a proven strategy to increase the profit margin for producers with many interested in finding an existing processor or incorporating processing into their own operations.

Some producers are beginning to respond to the call to provide value-added processed products as that can improve their bottom line. Access to technical assistance would benefit farmers in their ability to assess the profitability for them to do on-site processing.

73% of processors surveyed had a minimum order of less than 500 pounds, a manageable size for most farmers. This means that existing processing facilities can process fruits and vegetables from smaller farms. The trick to this is to find time for product to slot into the facility machinery. In other words, the minimum may be small but the preference will be to fill the machinery with fewer accounts and products, and therefore less down time between orders. More research is needed to determine which processors are truly interested and have the ability to position new product in to their schedules.

Aggregation

Aggregation is another challenge that also creates an opportunity in the emerging F2I market. There is a strong interest in developing appropriate-scale aggregation especially with USDA creating a 'developers' market' by incentivizing the development of food hubs with large grants.

Following the national trend, a handful of statewide efforts have since emerged and are now in the proof-of-concept phase. Regional efforts are focusing on marketing, aggregating and distributing product through farm-based community food hub sites and providing technical assistance for both buyers and sellers. Project partner NABC, for example, has created a web of connected food hub start-ups in the Puget Sound region. NABC, in partnership with the 21 Acres Center for Local Food and Sustainable Living and Bow Hill Blueberry Farm, created the North Sound Food Hub which provides marketing, aggregation and distribution services for local farms to market their products directly to commercial and institutional customers. This farmer-owned hub was created by NABC and partners to meet the growing market demand for local food sold in case-plus to pallet-sized orders. The food hub combines and online market, marketing, aggregation and distribution for up to 87 participating farmers and 160 commercial and institutional customers from Bellingham to Seattle. Of the customers receiving the weekly fresh sheet, 80 are institutions comprised of major

hospitals and low income pre-schools, senior and community centers involved with the Farm to Table partnership.

Now at the end of the grant period, NABC and partners are in the process of writing a business plan for a non-profit "community food hub". The purpose is to increase farm sales, reduce cost and waste and provide greater access to locally produced foods for all. While participation won't be free for farms in 2014, NABC is committed to keeping costs low while maintaining affordability and convenience for customers. In 2013, farms achieved over $100,000 in online farm sales (compared to $16,000 at the end of the 2012 pilot). While all food hub services in 2013 were free for farmers (funded through private and USDA grants), the food hub is projected to generate at least $2,000,000 in annual sales to break-even. This may take 3 to 5 years and grant funding will remain an integral part of food hub funding. However, margins applied in 2014 and beyond will help offset overhead costs to fund one full-time manager, online management system, aggregation (indoor cold and dry storage), two delivery drivers, two refrigerated trucks and the cost of reclaimed biodiesel, liability insurance and supplies. NABC also has the capacity to provide food safety training for food hub operators and farmers so that they may comply with pending FSMA food safety regulations in 2015 and beyond.

Stable contracts

Stable contracts between buyers and sellers create more certainty in the market and increase the likelihood of success. Project partners have heard for years that farmers can grow anything as long as the contract is stable and the WSDA surveys revealed that 75% of farmers would consider growing specifically for the institutional market, especially if there is a contract.

New markets have an inherent risk that keeps some key producers from engaging in the early stages of growth; however, some institutions have secured contracts with farmers to both secure a high demand product and to lock in price. Some really innovative food buyers have worked with farmers to determine what seeds to purchase in the fall for harvest the next summer. These values-based supply chain agreements and relationships reduce risk for many businesses, and the stability allows farmers to focus on developing a strong product. One farmer interviewed for this project called this 'coordinated' purchasing.

Purchasing, production and information sharing

Groups of buyers and institutions are collaborating on purchasing, production and sharing information in ways that can help drive down the cost and risk of innovations in the F2I market. Cooperatives for purchasing and production as well as nontraditional contracting strategies were all mentioned during many interviews as opportunities to shift the market.

Rather than competing on price for the same product, groups of producers have allocated demand and planting strategies among themselves in a cooperative manner, which allows them to match volumes with customers to ensure more consistent supply for the buyers and more consistent pricing for the producers. Sometimes these producers are organized through an actual co-op, sometimes through broker arrangements or through a specific "food hub" entity.

Information concerning long- term forward contracts between institutions (or their kitchen operators) and producers can mitigate the risk of smaller farmers entering into new markets. The certainty that the customer will purchase a given product for more than one season gives farmers and value-added producers the freedom to innovate new regional products. Uniform product requirements across multiple institutions can have a similar effect by encouraging standards for various producers submitting food procurement bids. Producers, processors and distributors can use the standards to plan production capacity to meet the demand.

Marketing campaigns

Any successful product push needs a good marketing program. Regional and national healthy food marketing and communication projects can be leveraged to help determine the next best products to enter cafeterias. Public Health - Seattle & King County created a series of ad campaigns and literature to support their recent Communities Putting Prevention to Work (CPPW) project[37]. Two interviewed institutions mentioned the national Dirty Dozen/Clean Fifteen Pesticides in Produce campaign as a list to prioritize their fresh food purchases[38]. Washington State produces large volumes of four products on the Dirty Dozen list - apples, grapes, potatoes and strawberries - and four products on the Clean Fifteen list - asparagus, sweet corn, onions and sweet peas. Market and finance support for organic or pesticide-free Dirty Dozen in-state crops and any variation of the Clean Fifteen in-state crops appear to be a strategic opportunity.

The recent focus on problematic ingredients - high fructose corn syrup, GMOs and transfats - adds additional opportunities to support specific produce and value-added products that either lack the harmful ingredients or focus on the beneficial ingredients. Local companies making products with these characteristics have already entered this local market, and three have already expressed interest in expansion and financing.

Statewide farm-to-school campaigns have helped create understanding about the importance and opportunities present in purchasing healthy food from close to home. The WSDA surveys revealed how school buyers recognize that school meals can support the local economy, buying locally results in good community relations and the fresh products are of high quality. Building on these successes by supporting expansion of existing work and products increases the likelihood of any next-stage work.

Off-contract space to expand markets and test product acceptance

Hospital purchasing is dominated by a few Group Purchasing Organizations (GPO's like Amerinet) that help improve efficiencies by aggregating purchasing into larger contracts[39]. Many schools operated by foodservice management companies also participate in GPOs. While this provides value in many ways, it can stifle innovation in the supply. Agreements often bind institutional buyers into contracts leaving little room for a smaller or more regionally-focused producer to break into this market.

Most hospitals have a set percentage of total purchasing, usually 10-20%, that can be used for off-contract purchases outside the majority GPO contract. Using off-contract purchasing to introduce new products can garner traction for new producers and allows institutions to test out new ideas and products before making large contract shifts. Once the product has proven successful, an institution can request the GPO add the producer to the main contract. Some hospitals, schools and other institutions have already used this strategy to bring in local produce.

Concurrently, a national strategy to have GPOs purchase more local product for local markets will make it easier for the work to move to the majority of food purchases. Due to market pressure, GPOs have already begun to market their local offerings when requested or by sheer competitive pressure. Additional opportunities exist when multiple hospitals utilizing the same GPO combine requests for local products as it increases sales while reducing transaction costs to some of the supply chain businesses.

Preference should be considered for those local products and businesses currently at the scale to service these contracts but are not currently part of the larger on-contract purchases.

Regional purchasing cooperatives

King County school districts are finding value in group purchasing to reduce purchasing costs and create more uniform product requirements (i.e. every school orders the same size milk or the same size bag and type of cut apples). The current CTG through Seattle Children's Hospital involves WSDA and Auburn, Renton and Kent School Districts working to form a purchasing group and pilot local produce procurement for school meals and snacks; conduct assessment of current food purchasing, preparation and meal service operations to identify the appropriate strategies to increase purchasing of local food products; and develop plans for purchasing, serving and promoting locally-grown foods in the districts. This project is being followed closely by other county school districts including Seattle School District and is due for completion in 2014.

The Puget Sound Joint Purchasing Cooperative is comprised of over 100 school districts throughout Washington to assist members in receiving competitive bid pricing for food, supplies and commodity processing[40].

Seasonal menu cycles

Most institutions work on menu cycles where menu items rotate through a regular cycle, usually 4 to 6 weeks, which means the same menu is seen about once a month. This cycle supports a variety of offerings on a daily basis while generating stability in purchasing and benefits greatly from a constant supply of globally-produced food and processed food. For local producers, though, the largest barrier to entry involves the seasonality constraints related to short growing seasons. FareStart is one institution that turned this problem into a solution by creating seasonal menus that rotate with the seasons. For buyers with more understanding of the diversity of healthy products, matching menu cycles to seasonal offerings can make room for more regionally-focused products, distinguish their food service in the market and introduce kids to a greater diversity of healthy food options. For FareStart, their menu cycles have kids see items like kohlrabi four times in one seasonally-based cycle, thereby turning a 'weird' food into a familiar food.

Another potential solution to year-round expectations of menu cycles is one used in some school districts. Instead of specifying the specific fruit or vegetable for use in every cycle, the base menu may include "seasonal produce" or similar description, allowing the district to substitute items based on seasonal availability and adjust to meet the nutrition standards requirements for certain types of produce to be served in specific amounts each week.

Marketing support

From a business development perspective, we need to consider cost and revenue centers. In business, marketing is a cost center focused on creating a new market for sales which in turn becomes a revenue center. Overlaying that with a non-profit perspective, we should consider grants as 'marketing' dollars that will generate sales opportunities for the enterprises/businesses supported by PRI dollars. We need to consider spending 'marketing' dollars to develop institutional buy-in. For example, FareStart has shown the need to engage and train childcare staff on how to prepare food and explain why it is important which makes it easier for them to explain or 'sell' it to children and parents.

Professional training and education

Ongoing training for educators, staff and food service personnel was mentioned repeatedly in interviews and is critical for peer-to-peer sharing and networking. Creating and marketing varied menus with healthy, locally-grown fruits and vegetables can pose challenges to institutional food service staff. Getting students and others to try and choose these options can also be challenging. Many programs have implemented successful public relation campaigns that showcase their new menus and local/healthy products; and marketing programs promoting healthy choices within

their schools or other institutions using signage, social media, newsletters, food sampling/taste tests and healthy food demonstrations.

One of the most challenging issues for schools as they implement new USDA nutritional standards and incorporate more healthy food choices is getting the communication stream going with parents. The coordinator of one local school program likened it to constantly trying to figure out what works and what doesn't and described the process as a series of never ending changes[41].

Furthermore, menu planning and use of new, healthy ingredients can shift behaviors for families as well as the students at institutions. Pilot partner FareStart combines menu cycles, food and education to help change behavior and considers the three connected components as critical to their early successes. In one class on kale and quinoa at a Head Start learning center, a parent made kale chips with her 2-year old and commented, "It was strange to see him dive in without hesitation. . . I was impressed. It gave me the idea to try new things at home."

Given that the menu planning cycle drives the ultimate demand for ingredients in the F2I market, the opportunity for innovation lies with businesses like FareStart or other processors and service providers that build their menus from Washington-sourced food. Pilot partner WSDA has created an online menu planning tool[42]to help institutions adapt their practices to feature more local, healthy ingredients.

Summer meal programs

Summer meal programs provide valuable access to foods to students when they are out of school and they offer the greatest diversity and volume of fresh fruits and vegetables. USDA-funded Summer Food Programs are frequently operated by school districts, but may also be "sponsored" by other organizations (such as the Wal-Mart Foundation) or government entities as the City of Seattle does for the Seattle Public School District (SPSD). Some school district sponsors working on farm-to-school during the school year are interested in expanding it to their summer programs for a number of reasons. In 2011, NABC was funded by the City of Seattle, through a Wal-Mart Foundation grant, to coordinate with a local farm to produce supplemental mini-produce bags to accompany prepared meals for children enrolled in SPSD's summer feeding programs. The availability of a wide variety of produce options is a central reason, but smaller numbers of meals served may also make it more feasible to find adequate volumes of desired products locally. Summer Food Programs are frequently served as cold sack lunches, making raw produce items appealing side dishes. WSDA is piloting farm-to-school purchasing for summer meals in the Renton, Auburn and Kent School Districts.

Seconds for processing

Premium quality produce or firsts, primarily marketed to end consumers and retail stores, yields the highest margins for producers. Without a market for second grade (odd sized or blemished) produce, however, farmers often leave food in the field. The price point for seconds is lower than for firsts, but can still add to the farmer's bottom line. Using institutional need for processed vegetables combined with the availability of relatively low-cost local produce creates a market opportunity for producers, processors and food service buyers.

'Blended margin' business models

Many businesses diversify their customer base across different businesses to stabilize revenue. In the F2I market, this translates to producers selling some of their product in multiple markets. Innovative farm enterprises have deployed similar strategies: sell to high-margin farmers markets and mid-margin restaurants in order to service low-margin public schools and no-margin food banks. Project partner FareStart charges higher rates to 'market rate' schools that can afford higher

priced meals which helps cover the costs of selling to the low-margin market facilities. Basically, make money where you can to do the work that is needed. This proven strategy helps diversify revenue and reduce risk against the downturn of one market or revenue channel. As one farmer said, "If you have a hundred customers you have a business. If you have one they own you."

This model is very replicable and useful for any social enterprise, especially farms and other food producers trying to sell to low-income markets. We would recommend action towards identifying food producers and values-based supply chain partners with products desired by the low-income institutional markets and support efforts to engage them in market-rate institutions. For example, a value proposition to a corporate cafeteria can be made that purchasing from a specific producer is of higher value as it helps get that same food in to low-income schools and childcare facilities, which is a great employee benefit and public relations story.

Investment Strategies

We propose a series of investments that balance the social impact goals and the desired financial returns for the RWJF Impact Capital Initiative. The foundational premise of this project is that by shortening the supply chain between farmers and institutions, we can supply a larger quantity of healthy, locally-produced food to the institutions, providing myriad benefits to the communities they serve and supporting the local farm economy. The investment strategy, built upon that foundation, is that there are businesses in the shortened supply chain that can provide healthy food to the institutional market and can expand with the right type of capital. There are three types of investments identified. Primarily we focused on enterprises with the capability to serve more than one producer or institution, including "food hubs," processors and distributors. A second category of investment included value-added products which use Washington grown ingredients. Finally, we included prototype investments of a farm succession/preservation effort and a unique producer that is pioneering a local production model.

The bulk of our recommendations are enterprises that combine multiple links of the supply chain into one location or organization, such as 'food hubs' or processing/distribution facilities that are connected to a particular brand. For example, we interviewed a mid-sized processor that provides delivery services as well. They have the capability to convert farm-fresh produce into the form needed by the school districts. The company has been working with pilot project partner Kent School District and has seen its processing/delivery business grow enough that it needs more processing and storage area. This processor/distributor supports multiple farmers when products are in season and sources from outside the region as needed. Additionally, they work with the school district to plan menus that better reflect seasonal changes in local production.

In addition to businesses that provide physical infrastructure to move food from farm-to-institutions, there are businesses that provide virtual infrastructure such as North Sound Food Hub or Farm Raiser. The North Sound Food Hub online platform is used by pilot project partner NABC and UW Medical Center to consolidate multiple farm transactions into a single invoice and delivery to the institution[43]. Farm Raiser is a school fund raising platform that connects local farms with schools and trains student advocates while substituting healthy farm products for candy and cookie dough in school fundraisers[44].

Value-added products such as bread, cheese and preserved foods may include ingredients from the commodity food supply where origin, labor and environmental practices are unknown. An emerging class of premium-quality, differentiated brands has begun sourcing their ingredients from regional values-based supply chains[e]. During our research, we identified three candidate businesses that commit to sourcing their food from the region and are already delivering products to the institutional market. Expansion loans and business assistance support to these enterprises will increase support for their suppliers as well as creating healthier options for the institutions they serve. For example, Better Bean Company produces a refrigerated cooked bean product, sourced from a regional supply chain that meets many of the needs of the institutional market and is very popular with children. A facilities financing package would enable them to expand production, support a larger number of farmers and serve a greater number of institutions.

Generally, investing in a single producer is a higher-risk strategy, but in some cases, a pioneering producer can establish a new product or market and improve the food system. For example, one of the most widely eaten and popular products, lettuce, is not available locally for most of the school year. We found an innovative producer with a year-round greenhouse production model that is focused on expansion in King County; this type of grower could develop a new F2I product and therefore merits consideration. Strengthening the opportunity to connect this producer to a processor could provide institutions with washed, cut and bagged lettuce.

We included a single farmland loan as a way to take advantage of farm succession opportunities. While the risk of farmland loans is low, the scale of the opportunity is an order of magnitude larger than this PRI deployment. This type of investment should be treated as a proof-of-concept for a larger scale layered capital effort as discussed further in this report. In collaboration with the USDA Farm Service Agency and local land trusts, farmland could be acquired and leased to producers with lease terms and covenants to promote direct sales to institutions or value-based supply chain enterprises. This particular investment opportunity would then be leased to a grower who already serves the institutional market and is seeking to expand operations to adjacent land.

The sample investment portfolio on the following page is based on actual healthy food enterprises that we interviewed during our research. While some of these investments will still be viable by the time the funds are deployed, many are time sensitive and are meant to illustrate the type of opportunities that currently exist in the marketplace. Unless we had specific permission to include names in this report, we have omitted them for the sake of confidentiality.

Technical assistance co-grants

Note that each of the investments has a technical assistance/co-grant estimate ranging from $5,000 to $35,000 depending on the particular needs of each business, their stage of growth and internal capabilities. In some cases, the grants would pay for typical business development services such as financial modeling, sales support or strategic planning that a consultant would supply and in others they would act as credit enhancements or interest rate reductions. In all cases, the grants support the growth of the business and help achieve the desired social impact. Additionally, there are a series of non-profit initiatives in education and outreach which would support the overall growth of the farm-to-institution segment in conjunction with the PRI strategy. Some education and outreach projects, or 'marketing' dollars, would directly impact an investment, such as training kitchen staff in food and meal preparation, while some projects would inform the consumer by educating parents about home preparation for the healthier foods now available at schools or childcare facilities.

[e] For further discussion of Values-Based Supply Chains refer to page 9.

Project partners and others are providing the following technical assistance for farms and institutions, including:

- Facilitating marketing services that open new institutional marketing opportunities for local farmers and food producers;
- Conducting assessments of institutional facilities to identify the most appropriate models for local food procurement given barriers such as lack of kitchen infrastructure, staff capabilities, budgets and more;
- Identifying 'gateway solutions' (products or promotions) and communicating with farmers (acting as 'matchmakers') to grow and maintain direct sales relationships between farmers and buyers and creating food hub infrastructure to support them;
- Aiding in purchasing negotiations and logistics and participating in on-going communications with farmers and buyers;
- Assisting in nutrition education and events at community centers, senior meal service and clinics;
- Assisting with training and skill enhancement in meal preparation and planning to seniors, children, caregivers and patients; and
- Promoting importance of local food and direct purchasing through educational events at senior, childcare and community centers, health clinics and other community and regional events.

Non-financial returns

While it is hard to quantify the exact impact of any investment, we are confident that positive social and environmental returns would be generated with investments in this market. A review of the sample portfolio suggests non-financial returns from PRI investments including:

- More and consistent healthy food options for low-income children;
- More consumer education and development;
- Reduction of seasonality and volume constraints through year-round greenhouse operations;
- New market strategies for new and existing farmers;
- Stronger urban-rural partnerships;
- Stronger collaborations and relationships between value-based supply chain businesses;
- More fair and equitable wages for workers on farm, in processing and in cafeterias;
- Cleaner air, water and soil through organic production;
- Reduction of synthetic pesticides, fertilizers and GMO inputs;
- Creation of rural jobs and economic development through food hub development; and
- Creation of rural and urban jobs through urban processing infrastructure development.

Table 16. Sample Investment Portfolio

Project	Amount	TA needs estimate	Notes	Category
Food Hub Operating Loan	250,000	10,000	Revolving line of credit for startup phase of food hub operations	Food Hub
Facilities Bridge Loan	800,000	10,000	Construction loan for new facility, refinanced after 3-5 years	Food Hub
Fruit Company	150,000	1,500	On farm processing of fruits and vegetables for grower and surrounding farms	Food Hub
Farm Business	200,000	15,000	Business expansion planning assistance low interest loan	Food Hub
Food Hub Financing	850,000	35,000	Food hub would combine efforts of at least three different organizations working on direct-marketed produce. Co-grant for interest-rate reduction, TA	Food Hub
Project Finance	1,250,000	15,000	Project finance for farm-to-school fundraising and advocacy platform. Co-grant for marketing assistance and school and vendor engagement efforts	Infrastructure
Incubator Acquisition	1,500,000	21,000	Acquisition of ag accelerator facility for year-round local production	Infrastructure
Farm Business	200,000	7,000	Expansion of facility and marketing/technical assistance	Infrastructure
Value-Added Expansion	1,500,000	8,000	Processing and storage of local produce for institutional use. Co-grant for TA	Infrastructure
Fruit Company	250,000	10,000	Vertically integrated regional produce provider	Processing/Distribution
Produce Company	250,000	10,000	Minimally processed produce for institutional settings	Processing/Food Hub
Commodity Business	100,000	10,000	Vertical integration of producer's co-op	Producer/Distributor
Fruit Company	100,000	5,000	Business expansion loan/revolving line of credit, with credit enhancement	Producer/Distributor
Hydroponic Project Finance	450,000	20,000	Innovative hydroponic technology company seeks to expand production in Washington State	Producer/Distributor
Farmland Acquisition/Lease Project	1,200,000	12,000	Field/greenhouse grower serving F2I market seeks to expand. Funds used as part of land acquisition bridge financing	Producer/Infrastructure
Meat Producers Cooperative	350,000	12,000	Acquisition of mobile USDA certified slaughter facility by producers co-op Co-grant for organizational development	Producer/Processer
Bakery Business	125,000	5,000	Currently serves institutional market, can expand to displace current commodity products	Value Added Product
Value-Added Business	250,000	12,000	Expansion of manufacturing facility. Co-grant for TA and marketing to institutions	Value Added Product
Pasta Manufacturer	150,000	5,000	Business loan and TA would allow them to serve more food into institutional settings	Value Added Product
Farm Succession Planning		80,000	multi-year part time support for planning	Grant
Farm Business Training and Finance		175,000	multi-year support for farm business technical assistance	Grant
Institutional Kitchen and Purchasing Training		180,000	multi-year training support for staff at institutions	Grant
		248,125	Flexible capital reserves for loan portfolio	Grant
Total Loan Portfolio	9,925,000	906,625	Total grant portfolio	
		90,663	Grant-making overhead and documentation review process	
		997,288	Total co-grant amount	

Grant-based efforts

Many of the key challenges identified in this study cannot be overcome by PRI loans. Training of farmers and kitchen staff, access to equity and preserving farmland are a few of the examples where grants are needed to help support F2I participants. Other examples include:

- Increase access to farm training and farm incubator programs like Cultivating Success, Viva Farms, Greenbank Farm Agricultural Training Center, Seattle Tilth Farm Works and others.
- Increase support for North Sound Food Hub, a community food hub business that has opened up new marketing opportunities for smaller-scale farms while increasing access to locally produced food, including hospitals and childcare facilities in low income communities.
- Increase access to capital for land and equipment purchase, including expansion of the Seeds of Success IDA program.
- Provide technical assistance and education for alternative land tenure models, including shared ownership, venture capital financing and others.
- Increase capacity for programs like Washington FarmLink[45] that connect farmland owners with new farmers seeking to acquire land. Because there is underutilized agricultural land in the region, bringing farm owners into such programs is critical to the success of the next generation of producers and preserving our state's irreplaceable farmland resources.
- Support ongoing technical assistance programs that provide business development services, marketing, infrastructure creation and education.
- Provide training to institutional kitchen staff to plan seasonal menus, work with fresh produce and market local alternatives to imported products.
- Provide training/certification of mid-scale producers in GAP and HACCP to enable them to sell into institutional markets.
- Promote healthy foods through educational campaigns like Dirty Dozen/Clean Fifteen.
- Organize purchasing cooperatives and develop standards for F2I market participants.

Appendices

Appendix A. Grant-centric innovations and strategies

As the focus of this project was to develop an investment strategy for a potential PRI fund, there were some related projects and issues that fell just outside this scope. Advocacy, outreach and education programs compliment and support the F2I efforts and are a needed corollary to any investment, however they will most likely never earn direct revenue and could never repay an investment.

The primary funding mechanism for these efforts is grants and other donations; in other words, a financial investment with a non-financial return. However, the success of these programs is considered a crucial component of successful F2I efforts.

Business development needs

Regionally, one of the most successful ways of addressing technical assistance and information needs is through farmer-buyer trade meetings which have proven to be a cost- and time-effective method of connecting local producers and local buyers. Some of these programs include Cascade Harvest Coalition's Farm-to-Table program, Seattle Chef's Collaborative Farmer-Fisher-Chef Connection Conference and a variety of programs hosted by Sustainable Connections and others. WSDA also provides farm-to-school mobile workshops to bring together school buyers and local farms in regional events around the state.

Cultivating buyer interest is another key element of building successful farm-to-institution projects. For example, WSDA provides outreach and education to school buyers and foodservice staff through partnerships with the OSPI and the Washington School Nutrition Association. These programs have helped successfully build networks around the region and state supporting F2I efforts. Other organizations, like the Northwest Agriculture Business Center, provide fee-for service options for business and marketing plans and development of value-added products and WSU offers a variety of workshops in addition to their Cultivating Success curriculum. Slow Money Northwest also provides technical assistance supporting business growth and expansion.

Additionally, farmer training programs are critical to developing the next generation of farmers. WSU's Cultivating Success programs, including project partner Viva Farms, educate potential farmers about basic production and business skills.

Expand Taste Washington day to hospitals and childcare

The WSDA Farm-to-School Program and the Washington School Nutrition Association (WSNA) partner to sponsor Taste Washington Day, an annual celebration of Washington grown foods served in school meals. Schools connect with local farms to make the most of our bountiful fall harvest and use Taste Washington Day to launch into October—"Farm-to-School Month".

Participating schools around the state engage in all sorts of ways including:

- Serving a locally-sourced meal
- Providing education and activities to recognize the region's agricultural bounty

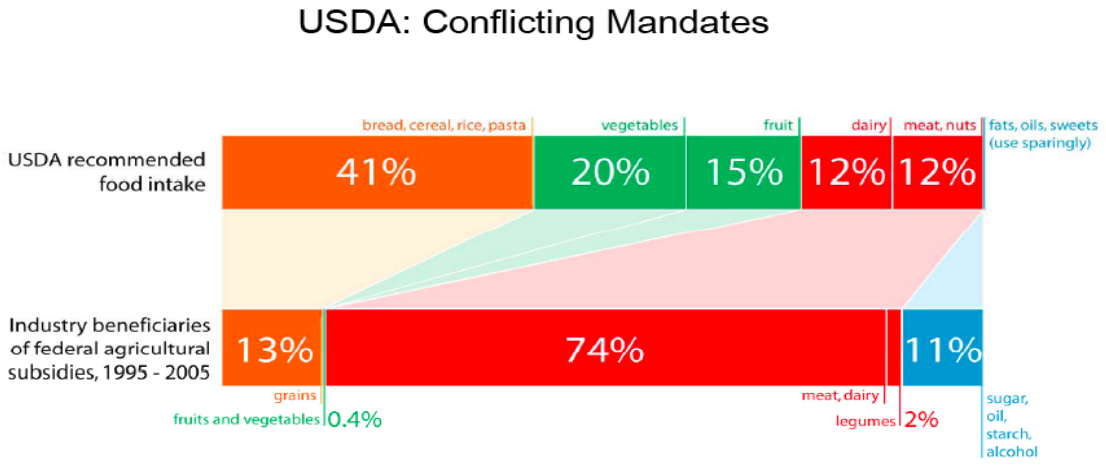
- Inviting farmers to lunch
- Arranging school visits to area farms
- Connecting Future Farmers of America high school students with elementary school students

The Kent School District has developed a number of educational flyers in association with Taste Washington Day[46]. Expanding Taste Washington Day to hospitals and childcare would provide great opportunities to connect local farms with institutional buyers, provide education and information on healthy local food options, and expand marketing opportunities for local producers.

Federal policies and incentives

We do not feel the necessity to provide much evidence that federal subsidies have a large impact on what food people eat and don't eat, and the impacts those choices have on individual health, the federal deficit and the environment. It is worth mentioning that changes at the federal level would have dramatic impact on scaling the successes of various F2I programs around the country. The hope is that successes on this project could help create the evidence that this type of market is real, in demand, and worth supporting with a shift in federal subsidies.

Two strategic policy intervention points involve conflicting mandates within USDA: subsidies and determining the hidden costs of food production. The Urban Design Lab at Columbia University generated a concise infographic to highlight the fact that the food USDA recommends we eat is not the food supported with federal subsidies[47]. Work to highlight this disparity and then shift the subsidies to support the food we are supposed to eat would dramatically change the pricing structure and market for healthier food options.



The second intervention point involves a proposal to determine the hidden costs of food production. The CDC, Institute of Medicine and the National Academy of Science held an initial workshop in the spring of 2012 that brought together foundations, industry, economists, research institutions and non-profits to explore the environmental and health costs of food[48]. The CDC seems intent on moving forward with the overall concept since diet-related diseases are a huge national health issue; however, it appears that more work needs to be done to create peer-reviewed evidence that documents the externalized costs of food production. If and when these costs can be internalized, there will be a fundamental shift in the market, who produces what, who profits and who pays the true costs of food.

Municipal or social impact bonds to preserve farmland for healthy food production

King County's Farmland Preservation Program, created in 1979, purchases and holds farmland development rights in perpetuity. County voters in that year passed a $50 million Farmlands and Open Space Bond Initiative that authorized the sale of municipal bonds to finance the purchase of development rights (PDR) on high quality farmlands. Since that time, municipal bonds have been used widely nationally to support farmland preservation efforts. However, the current climate of anti-tax initiatives limits the usefulness of this mechanism for protecting any significant amount of additional farmland. Preventing farmland loss through PDR will require alternative funding sources large enough to keep pace with farmland loss. Social Impact Bonds (basically performance-based investments in which repayment is contingent upon specified social outcomes being achieved) can be used to achieve similar ends but without using taxpayer dollars. They provide an opportunity for new private funding resources to be used to support public programs, like farmland preservation or public health, while reducing government costs. Discussions have already begun between public and private entities with the goal of pursuing a bond instrument. As of the close of this report, the City of Seattle, Slow Money Northwest, American Farmland Trust and PCC Farmland Trust have begun steps to organize more formal conversations to advance this issue.

Good food bag

NABC, one of our project partners, developed a community aggregation/food hub model that allows families, staff and employees to pick up and purchase produce from one of their childcare, senior or community center sites for home use. The distribution sites are formed around natural hubs – places where families and/or food buyers for those families gather. Each distribution site has a champion – a person in a position of authority and/or influence that has both vision and leadership. That individual leads the communication, process and volunteers and enables food distribution to families. Enough local produce is ordered to accommodate the committed participants. The program provides access to quality, local, organic food to community members who might not otherwise be able to afford it.

The Good Food Bag has now been expanded and includes Seattle Tilth as the aggregation hub and Tiny Tots as the childcare and family center that is the natural hub that serves 400 families at 5 centers in South Seattle. Tiny Tots now orders organic food for the cafeteria, developed education classes that connect 18-70 year olds in menu swapping and storytelling and is running a weight loss contest.

Gleaning and food recovery

Gleaning, picking a crop that might previously have gone to waste, has grown as a movement throughout our region in the last decade. As awareness has grown over America's substantial food waste issue. The Natural Resources Defense Council reports that 40% of food overall in the US goes uneaten[49] and its related production, transportation and disposal costs, gleaning and food recovery programs have grown.

Gleaning programs are a source of fresh, healthful foods that can be shared with families, food banks, shelters and other organizations seeking donations of fresh fruits and vegetables. In Seattle and other populated areas, urban fruit-tree gleaning programs, like City Fruit a local non-profit, organize volunteers to harvest trees when property owners can't. Farmers Markets also support successful gleaning programs where produce vendors supply fresh products at the end of the market day for distribution to those in need. One local program, run by the South King County Food Coalition, also maintains a cannery to produce value-added products from gleaned produce. Harvest Against Hunger, a program of Rotary First Harvest, is one of the state's largest efforts to build local and sustainable produce recovery efforts by connecting farmers, truckers, volunteers and food banks around the state.

Appendix B. WSDA Seasonality Charts

Washington Grown Fruits, Legume and Herbs Seasonality Chart

categories	produce	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vitamin A	Apricots												
	Cantaloupe												
	Nectarines												
	Peaches, yellow												
	Plums, purple												
Vitamin C	Blackberries												
	Blueberries												
	Cantaloupe												
	Honeydew melon												
	Raspberries												
	Strawberries												
Other	Apples									*	*	*	
	Asian pears												
	Cherries, Bings												
	Cherries, Rainiers												
	Currants												
	Grapes												
	Pears									*	*	*	
	Pluots												
	Quince												
	Watermelons												
	Frozen berries												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Legume	Black beans, dry												
	Cranberry beans, dry												
	Garbanzo/Chickpea, dry												
	Great Northern beans, dry												
	Kidney beans, dry												
	Lentils, dry												
	Navy beans, dry												
	Pink beans, dry												
	Pinto beans, dry												
Herbs	Basil												
	Chives												
	Cilantro/Coriander												
	Dill												
	Fennel												
	Lavender												
	Garlic												
	Mint												
	Oregano												
	Parsley												
	Rosemary												
	Sage												

* Peak harvest season for this product. However, this product is stored and available in other seasons from local sources.

Sources include: Washington State Department of Agriculture (WSDA); Washington Agricultural Commodity Commissions; WSDA From the Heart of Washington, Puget Sound Fresh, WSDA Farm-to-School survey resoponses; Full Circle Farm; Tonnemaker Family Orchard

Made possible by funding from the Department of Health and Human Services and Public Health - Seattle & King County

Washington State Department of Agriculture

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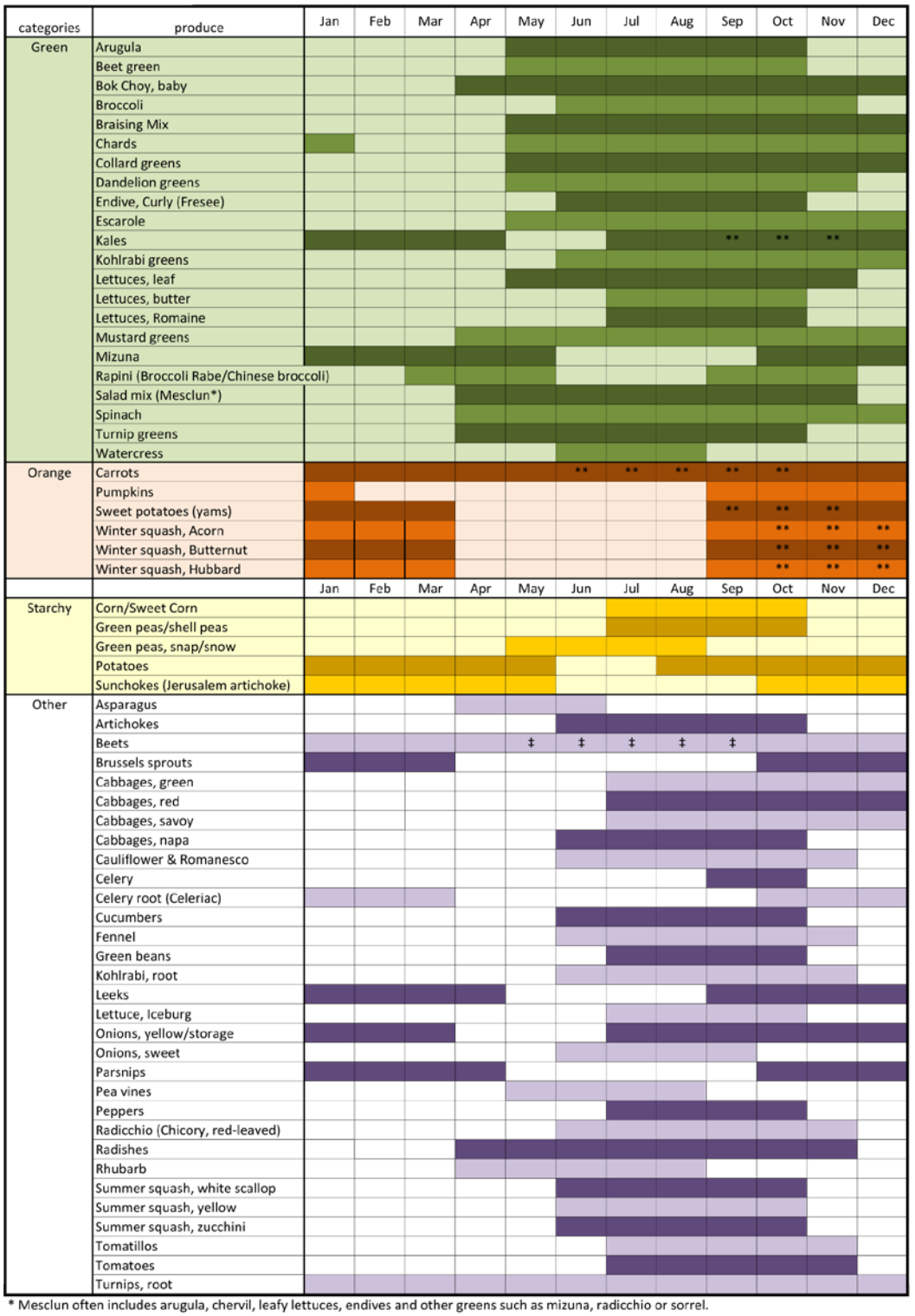
Washington Grown Vegetable Seasonality Chart

by Healthier US School Challenge Vegetable Group



categories	produce	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Green	Arugula												
	Beet green												
	Bok Choy, baby												
	Broccoli												
	Braising Mix												
	Chards												
	Collard greens												
	Dandelion greens												
	Endive, Curly (Fresee)												
	Escarole												
	Kales									**	**	**	
	Kohlrabi greens												
	Lettuces, leaf												
	Lettuces, butter												
	Lettuces, Romaine												
	Mustard greens												
	Mizuna												
	Rapini (Broccoli Rabe/Chinese broccoli)												
	Salad mix (Mesclun*)												
	Spinach												
	Turnip greens												
	Watercress												
Orange	Carrots						**	**	**	**	**		
	Pumpkins												
	Sweet potatoes (yams)									**	**	**	
	Winter squash, Acorn										**	**	**
	Winter squash, Butternut										**	**	**
	Winter squash, Hubbard										**	**	**
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Starchy	Corn/Sweet Corn												
	Green peas/shell peas												
	Green peas, snap/snow												
	Potatoes												
	Sunchokes (Jerusalem artichoke)												
Other	Asparagus												
	Artichokes												
	Beets					‡	‡	‡	‡	‡			
	Brussels sprouts												
	Cabbages, green												
	Cabbages, red												
	Cabbages, savoy												
	Cabbages, napa												
	Cauliflower & Romanesco												
	Celery												
	Celery root (Celeriac)												
	Cucumbers												
	Fennel												
	Green beans												
	Kohlrabi, root												
	Leeks												
	Lettuce, Iceburg												
	Onions, yellow/storage												
	Onions, sweet												
	Parsnips												
	Pea vines												
	Peppers												
	Radicchio (Chicory, red-leaved)												
	Radishes												
	Rhubarb												
	Summer squash, white scallop												
	Summer squash, yellow												
	Summer squash, zucchini												
	Tomatillos												
	Tomatoes												
	Turnips, root												

* Mesclun often includes arugula, chervil, leafy lettuces, endives and other greens such as mizuna, radicchio or sorrel.

** Peak harvest season for this product. However, this product is stored and available in other seasons from local sources.

‡ Peak harvest season for this product. However, this product is stored and available in other seasons from local sources.

Sources include: Washington Agricultural Commodity Commissions; WSDA From the Heart of Washington, Puget Sound Fresh, WSDA Farm-to-School survey resoponses; Full Circle Farm; Tonnemaker Family Orchard

Washington State Department of Agriculture

Made possible by funding from the Department of Health and Human Services and Public Health - Seattle King County

CPPW 2010-12

Appendix C. Production / Consumption Charts

	Food Item		W. Washington Production (pounds)		W. Washington Consumption Estimate (pounds)		Production as % of consumption
	Production category	Consumption category			Primary weight (before loss; closest to farm weight)	Loss adjusted availability (closest to what is actually eaten)	
GRAINS	barley	barley products	8,439,065	County Totals	3,563,475	1,881,443	237%
	organic barley		N/M	Producing Counties			
	corn	corn (does not include sweet corn, but does include corn products: corn flour and meal, hominy and grits, and starch)	N/A	Producing Counties	172,573,038	121,319,435	
	oats	oat products	468,427	County Totals	24,212,892	12,783,918	2%
	organic oats		N/M	Producing Counties			
		rice			110,761,275	77,972,956	0%
	rye	rye flour	N/A	Producing Counties	2,503,381	1,762,313	
	wheat	wheat flour (white, whole wheat, durum)	11,735,636	County Totals	703,888,816	495,337,955	2%
	organic wheat		N/M	Producing Counties			
		Grains Total	**20,643,128**		**1,017,502,877**	**711,058,019**	**2%**
DAIRY	milk	fluid milk only (all fat contents, flavored and unflavored)	727,913,841	County Totals	928,721,568	654,244,017	78%
	cheese	cheese	679,794,809	County Totals	158,599,851	129,701,712	429%
	butter and powdered milk	butter, fat share of eggnog, dry milk	696,137,122	County Totals	116,980,230	84,090,085	595%
	other dairy products	frozen dairy, evaporated and condensed milk, dairy share of eggnog	166,146,845	County Totals	255,506,507	204,524,248	65%
	organic milk		N/M	Producing Counties			
		Dairy Total	**2,269,992,617**		**1,459,808,156**	**1,072,560,061**	**155%**
PROTEIN	cattle	beef + veal, edible beef tallow	6,118,218	County Totals	460,314,996	200,284,190	1%
	organic cattle and calves		N/M	Producing Counties			
	chestnuts		N/D				
	chickens	chicken	162,194,443	County Totals	486,843,364	168,864,291	33%
	organic chicken		N/M	Producing Counties			
		coconut			3,090,223	2,614,329	0%
		dried peas and lentils			4,146,250	3,507,728	0%
	dry edible beans	beans[4]	15,876	County Totals	31,922,781	27,006,673	0%
	organic dry edible beans		N/M	Producing Counties			
	eggs	eggs, fat share of eggnog	6,923,603	County Totals	170,587,498	111,226,586	4%
	organic eggs		N/M	Producing Counties			
		fish (fresh and frozen fish, cured fish, canned tuna, canned salmon, canned sardines, other canned fish)			51,420,657	35,894,885	0%
	goats		N/D				
	hazelnuts	hazelnuts	5,280	County Totals	242,667	205,296	2%
	mollusks		31,875,000	County Totals			
		other tree nuts (almond, walnuts, pecans, pistachio, macadamia, other tree nuts, not including hazelnut/filbert)			19,271,836	16,303,974	0%
		peanuts			34,454,689	29,148,667	0%
	pork	pork, lard	2,121,155	County Totals	341,591,622	145,853,294	1%
	sheep	lamb	3,309,205	County Totals	5,743,013	2,121,033	58%
		shellfish (fresh and frozen shellfish, canned shellfish)			31,059,914	19,382,956.91	0%
	trout		1,754,000	County Totals			
	turkeys	turkeys	N/D		88,100,963	45,689,815	
	organic turkeys		N/M	Producing Counties			
	walnuts		N/D				
		Protein Total	**214,316,779**		**1,728,790,473**	**808,103,719**	**12%**

	Food Item		W. Washington Production (pounds)		W. Washington Consumption Estimate (pounds)		Production as % of consumption
	Production category	Consumption category			Primary weight (before loss; closest to farm weight)	Loss adjusted availability (closest to what is actually eaten)	
FRUITS	apples	apples (fresh, frozen, canned and applesauce, dried, juice)	21,794,880	County Totals	244,594,488	150,078,376	9%
	organic apples		N/M	Producing Counties			
	apricots	apricots (fresh, canned, frozen, dried)	N/A		8,728,209	4,450,091	
	organic apricots		N/M	Producing Counties			
		avocado			21,479,287	9,886,378	0%
		bananas			129,305,956	52,362,251	0%
	blackberries and other berries[1]	frozen blackberries	1,899,387	County Totals	477,846	404,257	397%
	organic blackberries and other organic berries*		N/M	Producing Counties			
	blueberries	blueberries (fresh and frozen)	15,360,920	County Totals	13,087,328	9,909,597	117%
	organic blueberries		N/M	Producing Counties			
	cantaloupe		44,000	County Totals	48,722,901	12,200,630	0%
	cherries	cherries (fresh, frozen tart and sweet, canned tart and sweet)	399,636	County Totals	12,780,406	8,669,410	3%
	organic cherries		N/M	Producing Counties			
	cranberries	cranberries (fresh, juice)	12,065,712	County Totals	11,895,345	9,686,583	101%
		dates			1,175,374	826,058	0%
		figs			1,117,116	321,456	0%
		grapefruit (fresh, juice)			34,323,388	15,544,117	0%
	grapes	grapes (and raisins)	2,276,520	County Totals	95,998,216	46,995,721	2%
	organic grapes		N/M	Producing Counties			
	honeydew		N/A		8,525,317	1,575,102	
	organic melons		N/M	Producing Counties			
	kiwifruit	kiwifruit	239,324	County Totals	2,629,472	1,379,398	9%
	organic kiwifruit		N/M	Producing Counties			
		lemon (fresh, juice)			38,246,038	11,053,016	0%
		lime (fresh, juice)			18,875,853	8,989,999	0%
		mango			10,554,880	4,202,580	0%
		olives			3,988,263	3,183,086	0%
		oranges (fresh, juice)			331,930,535	177,694,909	0%
		papaya			6,247,607	1,258,350	0%
	peaches	peaches (fresh, canned, frozen, dried)	464,760	County Totals	44,785,817	25,890,964	1%
	organic peaches		N/M	Producing Counties			
	pears	pears (fresh and canned)	6,300,696	County Totals	29,418,947	19,923,659	21%
	organic pears		N/M	Producing Counties			
		pineapple (fresh, canned, juice)			69,441,275	27,922,512	0%
	plums and prunes	plums (fresh, frozen, canned, dried and prunes, prune juice)	374,868	County Totals	10,369,882	4,992,807	4%
	organic plums and prunes		N/M	Producing Counties			
	raspberries	frozen raspberries	57,346,764	County Totals	2,842,360	2,290,130	2018%
	organic raspberries		N/M	Producing Counties			
	strawberries	strawberries (fresh and frozen)	6,289,140	County Totals	39,225,330	24,687,111	16%
	organic strawberries		N/M	Producing Counties			
		tangerines			16,463,932	6,719,831	0%
	tomatoes	tomatoes (canned and fresh)	2,280,000	County Totals	468,094,673	180,225,971	0%
	organic tomatoes		N/M	Producing Counties			
	watermelon	watermelon	67,200	County Totals	80,090,692	19,196,239	0%
		other frozen berries			306,272	227,286	0%
		other frozen fruit			8,094,606	5,827,481	0%
		Fruits Total	**127,203,807**		**1,813,817,610**	**842,520,590**	**7%**

	Food Item		W. Washington Production (pounds)		W. Washington Consumption Estimate (pounds)		Production as % of consumption
	Production category	Consumption category			Primary weight (before loss; closest to farm weight)	Loss adjusted availability (closest to what is actually eaten)	
VEGETABLES		artichokes			7,987,807	1,198,902	0%
	asparagus	asparagus (fresh, canned, frozen)	16,880	County Totals	7,960,366	2,541,782	0%
	organic asparagus		N/M	Producing Counties			
	beets		2,940,000	County Totals			
		broccoli (fresh, frozen)			44,994,350	18,363,677	0%
		brussels sprouts			1,511,158	790,650	0%
	carrots	carrots (fresh, frozen, canned)	4,350,080	County Totals	49,918,691	30,408,443	9%
	organic carrots		N/M	Producing Counties			
		cauliflower			9,790,847	2,207,989	0%
		celery			31,643,350	19,269,341	0%
		escarole and endive			1,145,071	355,844	0%
	cucumbers	fresh cucumbers + canned cucumbers (pickles)	49,668,702	County Totals	60,764,146	24,679,697	82%
	organic cucumbers		N/M	Producing Counties			
		eggplant			4,567,134	1,746,234	0%
	garlic	fresh garlic	722,400	County Totals	12,891,735	6,477,035	6%
	organic garlic		N/M	Producing Counties			
	green peas	green peas (frozen and canned)	55,108,620	County Totals	15,233,986	9,893,615	362%
	organic peas		N/M	Producing Counties			
	leafy greens[3]	lettuce, dark leafy greens (kale, collards, turnip greens, mustard greens), cabbage (including sauerkraut)	11,787,134	County Totals	195,244,315	97,145,620	6%
	organic leafy greens		N/M	Producing Counties			
		lima beans (fresh and frozen; not including dried)			1,505,073	858,866	0%
	mushrooms	mushrooms (fresh and canned)	36,639	County Totals	18,352,029	11,109,732	0%
	organic mushrooms		N/M	Producing Counties			
		okra			2,377,611	1,043,724	0%
	onions	onions (fresh and dehydrated)	3,076,182	County Totals	110,695,091	47,903,796	3%
	organic onions		N/M	Producing Counties			
		peppers (bell, chile)			83,488,691	47,076,622	0%
	potatoes	potatoes (fresh, frozen, dehydrated, canned, chips and shoestring)	763,902,000	County Totals	591,673,924	228,994,200	129%
	organic potatoes		N/M	Producing Counties			
	pumpkins	fresh pumpkin	29,797,600	County Totals	21,367,513	8,535,039	139%
	organic pumpkins		N/M	Producing Counties			
		radishes			2,611,817	1,400,627	0%
	rhubarb		10,072,043	County Totals			
	organic rhubarb		N/M	Producing Counties			
	snap beans	snap beans (fresh, frozen, canned)	35,297,249	County Totals	37,309,318	20,205,924	95%
		spinach (fresh, frozen)			13,448,126	5,684,402	0%
	squash	fresh squash	1,623,600	County Totals	23,080,612	11,454,832	7%
	organic squash			Producing Counties			
	sweet corn (fresh and processed)	sweet corn (fresh, frozen, canned)	93,308,345	County Totals	133,154,684	36,351,680	70%
	organic sweet corn		N/M	Producing Counties			
		sweet potatoes			27,511,480	8,712,176	0%
		miscellaneous frozen vegetables			17,472,975	8,431,297	0%
		other canned vegetables			12,262,980	7,884,605	0%
		Vegetables Total	**1,061,707,474**		**1,539,964,879**	**644,410,446**	**69%**

	Food Item		W. Washington Production (pounds)		W. Washington Consumption Estimate (pounds)		Production as % of consumption
	Production category	Consumption category			Primary weight (before loss; closest to farm weight)	Loss adjusted availability (closest to what is actually eaten)	
OTHER	canola		143,430				
		cane and beet sugar	-		332,298,749	236,596,709	
		corn sweeteners (high fructose corn sweetener, glucose, dextrose)			343,776,942	244,769,182	0%
		edible syrups			2,614,743	1,568,846	0%
	herbs		16,149	County Totals			
	honey	honey	481,479	County Totals	4,761,596	3,390,256	10%
		margarine			19,114,209	15,109,783	0%
		other edible fats and oils			8,795,705	8,355,920	0%
		salad and cooking oils			271,615,198	171,660,805	0%
		shortening			83,274,880	55,919,082	0%
	sugarbeets		N/A				
		Others Total	**641,058**		**1,066,252,021**	**737,370,583**	**0%**
		GRAND TOTALS	**3,694,504,863**		**8,626,136,017**	**4,816,023,418**	**43%**

[1] boysenberries, currants, dewberries and loganberries

[2] cantaloupe, watermelon (honeydew N/A)

[3] lettuce, cabbage, kale, collard and mustard greens

[4] dry pinto beans, dry navy beans, dry red kidney beans, dry black beans, dry great northern beans, dry lima beans, other dry beans

N/D - Not able to determine yield
N/A - Yield data not available
N/M - Yield not measured

Appendix D. Challenges and Opportunities from Regional Reports

There was a broad literature review completed including national and regional reports on the food system. Below are four reports determined to be directly related to this project and worth highlighting.

WSDA specialty crop surveys

In late 2012, WSDA released a series of reports that surveyed the challenges and opportunities for state farmers, processors and schools[50]. Funded by a USDA Specialty Crop block grant, the reports surveyed current markets, challenges, trends, and opportunities for growth in institutional markets. The survey respondents include 216 farms, 373 processors, and 61 schools (6 from King County).

Some key findings:

- 80% of responding schools currently serve Washington State products, with the other 20% interested
- 75% of school food service staff received 'positive' and very positive' feedback about their farm-to-school activities
- 77% of reporting schools report increased consumption of fresh fruits and vegetables related to farm-to-school activities
- 58% provide nutrition education
- 48% highlight Washington grown food
- 46% provide education about Washington grown food
- 34% compost cafeteria food waste
- 100% of schools work with distributors, while 62% have purchased directly from farms
    - 90% would do direct purchase again.
- 92% of schools need produce to be at least minimally processed
- The following processing needs were identified:
    - Post harvest handling
    - Drying/Dehydrating
    - Freezing
    - Central distribution/storage
    - Co-packing
    - Poultry processing
    - Livestock processing

WSDA Survey responses regarding the benefit of Farm-to-School activities.

Benefit of Farm to School?	# of "yes"	% of "yes"
School meal programs support the local economy	45	92%
Schools buying locally results in good community relations	43	88%
High quality, fresh product	41	84%
Increase consumption of fresh fruits and vegetables	37	77%
Schools know the source of the products - for education purposes	36	75%
Student nutrition will be improved	35	73%
Schools know the source of the products - for promotion purposes	35	71%
Schools know the source of the products - for food safety purposes	33	67%
It is better for the environment	31	66%
Farmland preservation	29	60%
Schools can purchase a diverse range of quantities	29	59%

n=48

Challenges to increasing farm-to-school purchases.

Barrier	# of schools - yes	% of schools - yes
Consistent availability of product	45	98%
Seasonality constraints	42	89%
Limited staff time - for coordinating procurement	39	85%
Limited staff time - for preparing fresh product	37	80%
Limited availability of WA grown minimally processed foods	36	80%
Distribution	35	80%
Finding growers in my region	34	77%
Farms' capacity to do minimal food processing	34	81%
Capacity to handle raw, whole produce	32	73%
Procurement process for geographic preferencing is complex	32	80%
Budget constraints	29	64%
Consistent quality of product	27	68%
Food safety and liability	23	58%
Learning what products are available	22	50%

n=47

Additional findings include:

- Consistent supply is driven by two main factors: seasonality of fresh products, and smaller producers not being able to consistently supply the volumes that large distributors can provide year round from national and global markets.

- Schools and farms identify processing and distribution as challenges to procuring more locally grown food. Washington food processors are interested in operations that may assist in meeting the processing and packing challenges identified by farms.

- 25% of farm respondents considered processing capacity a challenge in selling to schools, and 23% identified infrastructure for washing and packing as a challenge.

- While 61% of the reporting farms implement GAPs in their operations, only 13% are GAP certified. Only 3% are HACCP[51]certified.

- Small farms (less than $250,000 revenue) see more challenges than the mid-size farms (more than $250,000), particularly processing, volumes, storage, delivery, and certification requirements.

- Apples, berries and carrots - three of the state's top specialty crops - are already being purchased by schools.

- Price and seasonality are bigger processing challenges than volume and quality.

2012 WSDA Food Processor Survey highlights

- Low levels of sales to schools (8%) and other institutions (12%), but 66% of respondents expressed interest in starting or increasing sales to schools and 67% are interested in selling to other institutions. This suggests that the food is being processed either out of state or in large facilities that did not engage in the survey and are keeping their cards close so that competition does not try to outbid them for precious institutional contracts. Some distributors have their own processing lines or contracts with processors.
- 70% of processors are reporting more requests for locally-sourced products, with 24% of their customers willing to pay more.
- Only 14% of processors offer co-packing services, while 33% would consider offering these services.
- 50% of processors require liability insurance. 41% offer GAP certification. 41% require HACCP. Liability and certification are more prevalent in the institutional market than direct-to-consumer market.

In that same survey processors indicated interest in starting or increasing the following operations:

- Purchasing more Washington products directly from growers, then from in-state wholesalers, and then their own farms
- Receiving training on how to source directly from state farmers
- Providing co-packing services
- Provide processing for another business label
- Leasing space to other businesses
- Leasing equipment to other business
- Food Safety, GAP and GHP
- Selling directly to consumers

Farmers agree with some of the same opportunities and add a few of their own:

- Processing and co-packing services to engage in the institutional markets and are open to either finding an existing processor or incorporating processing into their own operations.
- Interest in marketing cooperatives for aggregation, marketing, sales and processing.
- Information and training about food safety: GAP, GHP, and HACCP.
- 75% of farmers would consider growing specifically for the institutional market, especially if there is a contract.

- School districts most commonly indicated potential benefits of engaging in farm-to-school (in order of highest response) to be:
- School meal programs supporting the local economy
- Schools buying locally results in good community relations
- High quality fresh product.

73% of processors have a minimum order of less than 500 lbs., a manageable size for most farmers. This indicates that existing processing facilities can process fruits and vegetables from smaller farms. The challenge is to find time for product to slot into the facility machinery. In other words, the minimum may be small but the preference will be to fill the machinery with fewer accounts and products, and therefore less down time between orders. More research is needed to determine which processors currently have excess capacity and that could potentially match with motivated producers.

Puget Sound food project report

Cascade Harvest Coalition and NABC managed a 2008 study regarding the feasibility of a multi-purpose agricultural production center in the Puget Sound region[52]. The report reached these conclusions:

- The vast majority of farmers in the region would increase food production if there were nearby processing available;
- With increasing public demand for locally produced food and with more than five million consumers in the Puget Sound region, there is a clear market for more local food;
- There is sufficient demand, both for co-pack processing facilities and commercial kitchen rental space, to support the creation and operation of additional facilities throughout the region;
- A regional, pasture-raised poultry business is feasible; and
- A regional processing facility is feasible on Port of Skagit property.

The economic downturn derailed a follow-up business plan for a processing center on property owned by the Port of Skagit. Since then Viva Farms, a project partner, has located their farmer incubator on the site. A new regional grain processing business is currently in discussions with the Port.

Western Washington production/consumption studies

The American Farmland Trust[53]and the University of Washington[54]co-developed two reports focused on the production and consumption of food in Western Washington. The focus of these complementary reports was to identify which local foods are over or under-produced, analyze strategies for closing the gap between production and consumption and examine land resources to increase production.

These reports, released in December 2012, used county-level data to determine the volumes of specific products produced in the region and national Loss-Adjusted Food Availability Data statistics for food consumption. The reports were not able to evaluate production and consumption for the whole state.

Relevant to this F2I research are a few key findings:

- Average per person consumption, after food loss adjustments: 932 pounds per year;
- For every 100 pounds of food consumed in Western Washington, 43 pounds of food are produced there; and
- Average rate of production: 3,623 pounds of food per person.

- If 10% of farmland lost since 1950 was brought back into production, it would result in about 124,000 acres of additional farmland. This acreage could generate an additional 450 million pounds of food that could feed 482,833 people per year, or 25% of King County's population.
- Reducing food waste by 10% suggests that 324 million pounds of food could be saved
    - Annual consumption of 932 pounds of food per person means that technically speaking 347,600 additional people could be fed.

The following table from the report highlights the foods most consumed in the region and their total consumption rate, useful for determining market preferences for healthy food.

American Farmland Trust

TABLE 3: TOP 5 ITEMS CONSUMED IN EACH FOOD GROUP BY W. WASHINGTON POPULATION (IN POUNDS)

Fruit		Vegetables	
Oranges	177,694,909	Potatoes	228,994,200
Apples	150,078,376	Tomatoes	180,225,971
Bananas	52,362,251	Lettuce	75,876,485
Grapes and raisins	46,995,721	Onions	47,903,796
Pineapple	27,922,512	Bell and chili peppers	47,076,622
Meat, beans, seafood, and nuts		**Grains**	
Beef and veal	198,484,776	Wheat flour	495,337,955
Chicken	168,864,291	Corn products (flour, meal, hominy, grits, starch)	121,319,435
Pork	142,045,876	Rice	77,972,956
Eggs	110,195,906	Oat products	12,783,918
Legumes and dried beans	84,713,962	Barley products	1,881,443
Dairy		**Fats and oils**	
Fluid milk	699,694,768	Salad and cooking oils	171,660,805
Cheese	129,701,712	Dairy fats	74,320,934
Cottage cheese	89,889,635	Shortening	55,919,082
Frozen dairy products	26,283,397	Margarine	15,109,783
Evaporated and condensed milk	22,575,691	Other edible fats and oils	8,355,920
Added sugars*			
Corn sweeteners	244,769,182		
Cane and beet sugar	236,596,709		
Honey	3,390,256		
Other edible syrups	1,568,846		

*Only has four total categories

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