

**APPALACHIAN SUSTAINABLE AGRICULTURE PROJECT**

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| Appalachian Grown: Farm to School Project |
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| **Final Report** |

Appalachian Grown: Farm to School Project

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### INTRODUCTION

In a relatively short time span, the number of Farm to School programs has increased from fewer than ten (CA and FL) in 1997 to more than 2,000 programs in all 50 states. The now-annual national Farm to Cafeteria conference was first held in2002. Shortly after, in 2007, a National Farm to School Network was established; the network is now represented by five national staff and eight regional lead agencies. In other words, what was once an isolated project has now grown into a full-fledged movement. Farm to School purports benefits of improving children’s dietary habits, increasing access to fresh fruits and vegetables, offering positive nutrition education experiences, and providing markets for small, family farms.

For the purpose of this report, Farm to School is defined by four components: locally grown food served in school cafeterias, school gardens, farm field trips, and classroom cooking.

### PURPOSE

Appalachian Sustainable Agriculture Project’s (ASAP) purpose for conducting this project - Appalachian Grown: Farm to School Project - was to research the feasibility of developing local school systems as new markets for small family farmers in rural, tobacco-dependent counties and determine the impact educational programming could have on the potential for this market.

### CONTEXT

Family farming is facing the greatest decline of all occupations in the U.S. The farmer share of the food dollar has declined from 41 cents in 1950 to 20 cents in 1999. The survival of Western North Carolina family farms is challenged by market dynamics, pressures from sprawl, and dependence on centralized and consolidated food systems that drain economic resources from the region rather than build community wealth.

According to the 2002 Census of Agriculture, Western North Carolina has 12,212 farms (nearly 1/4 of NC farms) - over 90% of which are family farms. Many mountain counties have lost farms at rates approaching 20% in the last decade. Population is expected to continue to increase dramatically, increasing development pressure on farmland. Estimates range that between 50%-80% of tobacco farmers will exit farming altogether as a result of the recently passed buyout. Such losses could dramatically influence our region's appeal to tourists, our access to fresh healthy foods, our quality of life, and the rural economy. Most southern Appalachian communities are rural, and there are very few local markets for farm products. Competition from global markets has forced many growers nationwide to examine their marketing options and consider ways in which they might diversify. Simultaneously, a growing concern for healthful eating has mushroomed as news about the obesity epidemic and rapidly rising diet-related diseases has hit the front pages of media across the country.

PROGRAM HISTORY

In May of 2004, ASAP and the Community Food Security Coalition (CFSC) conducted a day-long Farm to School workshop. The response was overwhelmingly positive and the workshop participants – food service directors, farmers, agriculture professionals, health professionals, teachers, parents and others - identified the steps to move forward. This committee grew in number and strength by working together to promote Farm to School. In 2005, the committee sponsored a Farm Field Day – school cafeteria staff from three school systems went on farm field trips and then congregated together for a meal of locally grown food. Another key milestone was being named as the Southeast Regional Lead Agency for the National Farm to School Network (in 2007; we remain regional lead agency today). In 2008-09, ASAP expanded the Farm to School model to hospitals, colleges, and Head Start centers.

### PROJECT DESCRIPTION

Appalachian Grown: Farm to School Project was tasked with determining the viability of the Farm to School market for farmers in Western North Carolina; not only if there was a market, but how many farmers it could support and which crops would be most profitable within this market. The research required working closely with a group of farmers (Madison Farms) that, at project start, grew and sold their produce to two school systems and two local colleges. Drawing upon the expertise of the Child Nutrition Directors (and their staffs) of school systems that are currently engaged in Farm to School, the project gained the perspective and information from the schools. Working with farmers to prepare them for this institutional market and assist them with business planning, marketing and promotion was another goal of the project.  
  
Concurrently with the research, educational Farm to School programming for children was implement, to see the impact not only on the children themselves but the influence it could have on the market. Drawing from local and national experience, it is our theory that the combination of educational programs with the opening of markets for farmers significantly strengthens the relationship. We examined questions such as – if children are engaged, can that lead to engaging and educating families? What impact could an educated audience have on this market? Could this be extrapolated to other existing markets (CSAs, farmers' markets and other local food outlets)? Our solid foundation of implementing educational Farm to School programming relied upon having the necessary partners to insure success.  
  
Because Farm to School is a growing market phenomenon, it was very important that the information we gleaned be shared widely. By collaborating with the Community Food Security Coalition (CFSC), we will be able to share the results of our research throughout the region and country (via their website as well as their annual conference). CFSC provided consultation throughout the grant, which insured that we were on track with the work outlined in this proposal and that we were serving our priority constituency (farmers) in the best way possible.  
  
The work outlined in this proposal solidly fit within the mission statement of the Appalachian Sustainable Agriculture Project – to create and expand regional community-based and integrated food systems that are locally owned and controlled, environmentally sound, economically viable and health-promoting. We were committed to determining whether Farm to School is a viable market for farmers in Western North Carolina and if engaging children, parents, and community in Farm to School strengthened the market for farmers.

### PROJECT SIGNIFICANCE

Americans prefer local food. They recognize that it is fresher and supports their local economy and culture. A national survey conducted in 2003 by NC State University found that 71% of Americans say they would pay more for locally grown food. These findings are reflected locally. A survey conducted for ASAP of 500 people in three western NC (WNC) counties found that 75% of respondents expressed preferences for local food. Not only does the general population prefer locally grown food, school food service directors are also requesting it. ASAP surveyed school food service in western NC and found that more than 70% of districts not purchasing local produce scored their interest in doing so as "7" or higher on a scale from 1 to 10. A survey from the Michigan Department of Education and the C.S. Mott Group for Sustainable Food Systems at Michigan State University shows 73% of food service managers were interested in buying local and that 10 % were already doing so.

Fortunately, the Western North Carolina region is still blessed with numerous small family farms looking for new markets. Farmers are responding to a need to shift into different crops and markets by increasing production of horticultural crops, field crops, and fruits and vegetables. Direct sales also more than doubled during the decade between 1992 and 2002. The one potential market available to all rural Appalachian farmers is the local school system. Market diversification is essential for the survival of the Appalachian family farmer. Farmers selling to local schools may be one of the best hopes for rural communities to successfully rebuild local food systems that can sustain small, family owned farms. Sales to institutions can also increase opportunities in other local marketing outlets – grocery stores, restaurants, farmers' markets, CSAs or other institutions (hospitals, colleges).

### CONCLUSIONS

The impact and contributions benefitting farmers include:

* Increased understanding of the viability of Farm to School for farmers and schools
* Increased understanding about the possibilities of expanding current Farm to School buying practices
* The creation of outreach education and training activities based on research findings
* Additional farmers participating in Farm to School
* Identification of barriers and strategies to overcome these barriers
* Additional Child Nutrition Directors participating in Farm to School programs
* Increased visibility of Farm to School in local communities
* Increased facilitation of connections between farmers and school market outlets
* Increased awareness of food distribution networks in the project region

From the market research involving a three-county area (three school systems), the analysis indicates that current demand and use of produce is concentrated on a a small number of fresh fruits and vegetables. While it is unfortunate that school systems utilize more processed fruits and vegetables (frozen and canned) than fresh, it does indicate a potential for growth. It is also encouraging to local farmers to allocate their efforts on a few locally grown products that have the highest demand.

The results of student and parent surveys and teacher focus groups show that participation in Farm to School activities has increased awareness and knowledge of local food and farms across all three groups. Parents observed that children seemed more likely to try new food items, seemed eager to assist with cooking family meals, and had an overall increase in interest in the foods that they eat. Teachers indicated that Farm to School activities were valuable learning opportunities for their students, and some teachers continue to use Farm to School activities with their students.

### Section 1

**Existing and Potential Market Conditions for Farm to School Programs in Western North Carolina**

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**Existing and Potential Market Conditions for Farm to School (F2S)**

**in Western North Carolina**

Farm to School programs intend to connect schools with local farms with the objectives of improving student nutrition, providing health and nutrition education opportunities, and supporting local small farmers. Initially developed in the 1990s, the interest for Farm to School programs in the United States continues to grow. For example, in the last 6 years the number of schools serving food from local farms increased from 400 to 2,061. During the same period, the number of states with farm school programs has also gone from 22 to 41 states (CFJ, 2009; Vallianatos et al., 2004).

Over the past decade, a body of literature has also emerged on the Farm to School programs (Vogt and Kaiser, 2008; Joshi and Azuma, 2009). Three groups of studies are found within this literature. The first group corresponds to *ex-ante* studies assessing the feasibility and potential of Farm to School programs in a region. For example, several studies have surveyed schools’ child nutrition directors about their interest in implementing a Farm to School program (e.g., Izumi et al., 2006). The second group of studies deals with *ex-post* studies evaluating the performance of the programs (Joshi and Azuma, 2009). Finally, there are numerous publications dealing with practical aspects of implementing a Farm to School program (e.g., McKelvey et al., 2007).

Regarding the Farm to School evaluation literature, it should be noted that out of the more than two thousand Farm to School programs in the country, only a few have been assessed. A recent report reviewing the literature on Farm to School program evaluation found that only 23 of these programs had been evaluated (Joshi and Azuma, 2009). Moreover, even though Farm to School programs intend to benefit both farms and schools, Joshi and Azuma’s report show that most of the evaluation work has only focused on the impact of the programs on schools. A final conclusion of this report is that “concrete data on monetary and other benefits to farmers is scarce.”

This study takes the perspective of local farmers and explores the current situation and potential of a Farm to School program as a market for their products. Hence, the study can be seen as both an evaluation of currently active Farm to School programs and also as a feasibility study for the expansion of the programs. Three Farm to School programs located in Western North Carolina are analyzed. These Farm to School programs are county wide programs corresponding to Madison, Mitchell and Yancey counties.

For purposes of this study Farm to School programs are seen as market with both a supply and a demand component. Schools are considered as consumers demanding the products whereas than farmers are the suppliers of the goods. The first part of the study looks at the demand side of the Farm to School market using actual expenditure data for the academic year 2006-2007 from the three schools districts. Specifically, the amount and value of produce and processed fruits and vegetables purchased by these three schools districts is described and analyzed in order to assess the size of Farm to School programs as a market for regional farmers. The second part of the study focuses on the supply side of the Farm to School market and calculates the amount of land that is required to satisfy the demand for produce by the school districts. In addition, the second part of the study identifies crops with the highest potential of profitability in the region.

This report is organized as follows. The first part of the report presents a brief description of both the North Carolina and the Madison, Mitchell and Yancey counties school systems and also of the status of the Farm to School programs in the region. The second and third section presents and discusses the analysis of the demand and supply components of the Farm to School programs in the region. Finally, we present some general conclusions.

1. ***Background Information*** 
   1. *The North Carolina School System[[1]](#footnote-1)*

The state of North Carolina has 2,397 public schools, 1,766 are elementary schools (PK-8th), 428 are secondary schools (9th -12th), 110 are combined schools and 93 are charter schools. During the 2006-07 scholar year 1,405,455 students enrolled in North Carolina’s public school system, 70.35% in elementary schools and 29.65% in secondary schools.

The North Carolina public schools system spent more than $10.4 billion or $7,596 per pupil in the 2005-2006 school year. Total expenditures in child nutrition accounted for $ 578.5 million or an average of $424.11 per child (table 1). In the 2005-06 school year, North Carolina public schools served 282,683 breakfasts and 753,788 lunches with a average cost of $1.85 and $ 3.08, respectively (table 2).

Table 1. North Carolina School System Expenditures in Child Nutrition, 2005-06.

|  |  |  |
| --- | --- | --- |
| **Purpose** | **Total** | **%** |
| Salaries | 209,805,847 | 36.3 |
| Employee Benefits | 65,335,278 | 11.3 |
| Purchased Services | 16,926,323 | 2.9 |
| Supplies & Material | 267,717,613 | 46.3 |
| Instructional Equip. | 1,621,266 | 0.3 |
| Other Objects | 17,116,554 | 3.0 |
| Total | 578,522,881 |  |

*Source: NC Department of Public Instruction*

Table 2. Number and Average Cost of Breakfasts and Lunches Served in the NC School System 2005-06.

|  |  |  |
| --- | --- | --- |
|  | **Breakfast** | **Lunch** |
| Number of schools serving | 2170 | 2206 |
| Average number served daily | 282,683 | 753,788 |
| Average cost\* | 1.85 | 3.08 |

\* Includes indirect costs

*Source: NC Department of Public Instruction*

*Madison, Mitchell and Yancey County Public Schools*

With about two thousand students each, the size of the three school districts under study is very similar (table 3). During the 2005-06 school year, total expenditures per pupil in these three counties were above the state average (table 4). Out of the 115 counties, Madison, Mitchell and Yancey ranked 43, 44 and 39, respectively in terms of total expenditures per pupil (table 4). With regard to nutrition expenditures Madison County and Yancey County school systems were also above the state average, however Mitchell County was slightly below the state average (table 4).

Table 3. Madison, Mitchell and Yancey County Public Schools Average Daily Membership (ADM), 2006-07.

|  |  |  |
| --- | --- | --- |
| **County** | **ADM** |  |
| Madison | 2,610 |  |
| Mitchell | 2,192 |  |
| Yancey | 2,530 |  |

*Source: NC Department of Public Instruction*

Table 4. Madison, Mitchell and Yancey County Public Schools Expenditures per Pupil, 2005-06.

|  |  |  |  |
| --- | --- | --- | --- |
| **County** | **Total expenditures per Pupil (TEP)** | **TEP Rank**\* | **Nutrition expenditures per Pupil** |
| Madison | 8,269.70 | 43 | 525.55 |
| Mitchell | 8,250.15 | 44 | 421.17 |
| Yancey | 8,385.12 | 39 | 506.65 |
| State | 7,596.15 |  | 424.11 |
| \*Out of 115 Counties | | | |
| *Source: NC Department of Public Instruction* | | | |

* 1. *Farm to School Programs*

A comprehensive approach to linking small farms to the school meal programs began in the summer of 1997with the Small Farms/School Meals Initiative from the USDA (USDA, 1998). The main objective of the initiative was to encourage small farmers to sell fresh fruits and vegetables to schools and schools to buy these products from small farmers. The last two U.S. Farm Bills (2002 and 2008) have included language requiring the Secretary of Agriculture to encourage schools to purchase from local farmers. Moreover, the 2008 Farm Bill allows use of geographic preference in procurement of unprocessed agricultural products.

In Western North Carolina, Farm to School program efforts began in 2003 when a farmer located in Yancey County started selling lettuce to the county school system (ASAP, 2006). By 2005, Farm to School projects had expanded to at least 5 counties in the region including Madison, Mitchell and Yancey Counties which are the focus of this report. The growth of Farm to School programs in the region has been attributed to sustained collaborative efforts between the Appalachian Sustainable Agriculture Project (ASAP), Schools Child Nutrition Directors (CNDs), farmers, Cooperative Extension, County Health Departments and Blue Ridge Food Ventures (ASAP, 2006).

With respect to farmers participating in Farm to School programs in the region, most of the farms selling to schools are associated with Madison Farms, a non-profit organization that helps producers with their marketing efforts. During 2006, approximately 25 farmers sold their products to schools through Madison Farms. By 2009, 40 farmers are reported participating in the program (Raper, pers. comm., 2009).

In North Carolina there are also two state wide Farm to School initiatives. The first is the joint program between the USDA and the ***Department of Defense Farm to School Program*** (also called ***DoD Fresh***) which originated with the Small Farms/School Meals Initiative. The ***DoD Fresh*** gives schools the option of using commodity entitlement funds to purchase fresh fruits and vegetables grown within their state. The other intuitive is a state-sponsored Farm to School program (***NC Farm to School***) which facilitates delivery of produce grown by North Carolina farmers to North Carolina public schools (Kirby, 2006). However, these two programs have only had a minor impact on the Farm to Schools programs in Western North Carolina (Jackson and Raper, pers. comm., 2009).

1. ***Schools Demand for Locally Grown Products***

The assessment of the current and potential demand for locally grown fresh fruits and vegetables entailed the following:

1. Collection of expenditure data from Child Nutrition Directors (CDN’s) of the three school systems under study.[[2]](#footnote-2)
2. Analysis of the data in order to identify the fruits and vegetables with the highest demand by the schools.
3. Identification of crops that can be produced in the region and estimation of the total quantity demanded by the school districts.

*Expenditures on Fresh and Processed Fruits and Vegetables*

Nutrition expenditures figures in table 4 includes all the costs related with planning, preparing, and serving food and in the schools. However, in order to assess the market for locally grown foods, it is necessary to consider more specific and detailed information regarding these three school systems expenditures on fruits and vegetables.

Table 5 summarizes total expenditures on fruits and vegetables in Madison, Mitchell and Yancey by type of product (fresh and processed) and source (local provider and traditional foodservice provider). Out of the three school systems, Madison has the highest value of total expenditures on fruits and vegetables, both in absolute terms as well as in average expenditures per student. However, expenditures on fruits and vegetables only account for 7% of the total costs on nutrition in the case of Madison schools and 5% in the case of Mitchell and Yancey schools (tables 4 and 5).

Regarding the source of the fruits and vegetables products and the type of products being purchased, first it should be noted that most of these food products are purchased from traditional foodservice providers. Second, most of the expenditures on fruits and vegetables are on processed products. Finally, only fresh fruits and vegetables are being purchased from local sources.

Table 5. Madison, Mitchell and Yancey County Public Schools Expenditures (in dollars) on Fresh and Processed Fruits and Vegetables, 2006-07.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Product** | **Madison** | **%a** | **Mitchell** | **%** | **Yancey** | **%** |
| **Fresh Fruits and Veg.** | 38,441.25 | 40.7 | 12,119.78 | 28.3 | 17,276.96 | 28.9 |
| Traditional foodservice provider | 28,310.00 | 30.0 | 11,485.78 | 26.8 | 15,388.46 | 25.8 |
| Locally Grown | 10,131.25 | 10.7 | 634.00 | 1.5 | 1,888.50 | 3.2 |
| **Processed Fruits and Veg.** | 55,999.11 | 59.3 | 30,649.87 | 71.7 | 42,448.12 | 71.1 |
| **Total** | 94,440.36 | 100.0 | 42,769.65 | 100.0 | 59,725.08 | 100.0 |
| **Expenditure per student** | 36.18 |  | 19.51 |  | 23.60 |  |
| **Total nutrition expenditures per student** | 525.55 |  | 421.17 |  | 506.65 |  |

a Percentages do not add up to 100 because grocery supply and locally grown are part of produce.

Tables 6, 7 and 8 present detailed information regarding produce expenditures in each of the school systems under study. Table 6 presents total expenditures on fresh fruits and vegetables purchased from both local producers and traditional foodservice providers. Some of the produce categories in Table 5 include several varieties of the same product (see Appendix for a complete list of products).

Several patterns emerge from table 6. First, the Madison school system includes a more diversified set of fruits and vegetables than the other school systems. Out of the 40 produce categories included in table 6, the Madison school district reported using 38 product categories in their menus, compared with 12 categories used in Mitchell schools and 21 used in Yancey schools. However, in the three school districts, the top five produce categories (**in bold letters**) concentrate about 50% of total expenditures on fruits and vegetables.

Table 7 shows expenditures on locally grown produce by the three county school systems. During the 2006-07 school year, Madison had the highest share of expenditures on locally grown produce from total expenditures on produce (26.4%) compared with Mitchell (5.2%) and Yancey (10.9%). Madison also reported the highest number of fresh fruit and vegetables purchased from local sources (14) compared to Yancey (7) and Mitchell (1). Table 7 also indicates that most of the expenditures on locally grown products has been concentrated in a very few products. In fact, only four products: apples, bibb lettuce, tomatoes and potatoes concentrate approximately 73% of the expenditures on locally grown produce on the three counties.

Table 8 presents expenditures of processed food by the three school systems which as indicated previously were only purchased from traditional foodservice providers. The total number of product categories included in Table 8 is much higher that the product categories included in tables 5 and 6 (83 processed products versus 40 fresh products). Table 8 also indicates that processed fruits and vegetables expenditures are less concentrated than fresh produce expenditures.[[3]](#footnote-3)

To conclude this section, it is important to highlight the fact that the Farm to School program in Madison county was the most successful of the programs in the 2006- 2007 academic year. Hence, this program can be seen as a first benchmark for the other two programs in terms of potential expenditures and demand for locally grown fruits and vegetables. This school system spent during the school year 2006-2007 more than 25% of its budget on fresh fruits and vegetables on locally grown products which is significatively higher than the corresponding expenditure shares from the Mitchell and Yancey county Farm to School programs.

Differences in the structures of expenditures in these three counties suggest that the relatively higher share of expenditures on local products by the Madison County school district may have been due to:

1. The use of school menus adapted to the seasonal availability of products in the region which is reflected by the use of a more diverse group of fruits and vegetables, and
2. The substitution of fresh foods and vegetables for processed foods which is revealed by the expenditures shares on these two types of products.

Table 6. Madison, Mitchell and Yancey County Public Schools Expenditures (in dollars) on Fresh Fruits and Vegetables, by Category, 2006-07.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Madison** | | **Mitchell** | | **Yancey** | |
| **Produce Category** | **Expenditures value** | **%** | **Expenditures** | **%** | **Expenditures value** | **%** |
| Apples | **6324.4** | **16.5** | **1723.4** | **14.2** | **3189.1** | **18.5** |
| Bananas | 1743.4 | 4.5 | 482.0 | 4.0 | **1385.1** | **8.0** |
| Bell Peppers | 120.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Blueberries | 360.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Broccoli | **2400.6** | **6.2** | 0.0 | 0.0 | 155.2 | 0.9 |
| Cabbage | 720.5 | 1.9 | 823.7 | 6.8 | 430.2 | 2.5 |
| Cantaloupe | 1521.3 | 4.0 | 0.0 | 0.0 | 522.3 | 3.0 |
| Carrots | 293.8 | 0.8 | **1780.5** | **14.7** | 123.6 | 0.7 |
| Carrots Baby | 0.0 | 0.0 | 0.0 | 0.0 | 541.3 | 3.1 |
| Cauliflower | 467.1 | 1.2 | 0.0 | 0.0 | 699.8 | 4.1 |
| Celery | 198.7 | 0.5 | 470.0 | 3.9 | 153.5 | 0.9 |
| Cherries | 260.2 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Corn on the Cob | 1790.0 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Corn Whole Kernel | **3113.4** | **8.1** | 0.0 | 0.0 | 0.0 | 0.0 |
| Cucumbers | 539.5 | 1.4 | 0.0 | 0.0 | 589.8 | 3.4 |
| Frozen Broccoli | 480.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Green Beans | 1427.8 | 3.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Honeydew Melon | 39.7 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Green Leaf Wash/Trim | 92.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine Wash/Trim | 116.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Bibb | 1863.0 | 4.8 | 0.0 | 0.0 | 888.0 | 5.1 |
| Lettuce Iceberg | 1057.6 | 2.8 | **2225.6** | **18.4** | **1965.8** | **11.4** |
| Lettuce Iceberg Clean/Trim | 1906.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine Wash/Trim | 68.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine | 45.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Onions | 310.1 | 0.8 | 260.9 | 2.2 | 154.6 | 0.9 |
| Oranges | 1138.2 | 3.0 | **1563.5** | **12.9** | **1623.5** | **9.4** |
| Peppers, Green | 210.5 | 0.5 | 0.0 | 0.0 | 336.6 | 1.9 |
| Peppers, Jalapeno | 102.2 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Potatoes | **3312.4** | **8.6** | 976.1 | 8.1 | **2300.1** | **13.3** |
| Radishes | 48.9 | 0.1 | 364.5 | 3.0 | 14.5 | 0.1 |
| Red Grapes Seedless | 232.3 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Romaine Iceberg Blend | 73.9 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Salad Mix | 0.0 | 0.0 | 0.0 | 0.0 | 911.5 | 5.3 |
| Spinach Baby | 285.8 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Squash Yellow | 120.8 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweet Potatoes | 462.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tomatoes Cherry | 433.2 | 1.1 | 0.0 | 0.0 | 18.7 | 0.1 |
| Tomatoes | **4046.9** | **10.5** | **1208.4** | **10.0** | 1252.9 | 7.3 |
| Watermelons | 715.4 | 1.9 | 241.1 | 2.0 | 21.0 | 0.1 |
| Total | 38441.3 | 100.0 | 12119.8 | 100.0 | 17277.0 | 100.0 |

Table 7. Madison, Mitchell and Yancey County Public Schools Expenditures (in dollars) in Locally Grown Produce, 2006-07.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Madison** | | **Mitchell** | | **Yancey** | |
| **Produce Category** | **Expenditures** | **%a** | **Expenditures** | **%** | **Expenditures** | **%** |
| **Apples** | **2866.0** | **45.3** | **634.0** | **36.8** | 0.0 | 0.0 |
| Bananas | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Bell Peppers | 120.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Blueberries | 360.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Broccoli | 0.0 | 0.0 | 0.0 | 0.0 | 31.0 | 20.0 |
| Cabbage | 322.0 | 44.7 | 0.0 | 0.0 | 7.0 | 1.6 |
| Cantaloupe | 470.3 | 30.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Carrots | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Carrots Baby | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cauliflower | 0.0 | 0.0 | 0.0 | 0.0 | 17.0 | 2.4 |
| Celery | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cherries | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Corn on the Cob | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Corn Whole Kernel | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cucumbers | 175.0 | 32.4 | 0.0 | 0.0 | 134.5 | 22.8 |
| Frozen Broccoli | 480.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Green Beans | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Honeydew Melon | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Green Leaf Wash/Trim | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine Wash/Trim | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Lettuce Bibb** | **1863.0** | **100.0** | 0.0 | 0.0 | **888.0** | **100.0** |
| Lettuce Iceberg | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Iceberg Clean/Trim | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine Wash/Trim | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lettuce Romaine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Onions | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Oranges | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Peppers, Green | 0.0 | 0.0 | 0.0 | 0.0 | 81.0 | 24.1 |
| Peppers, Jalapeno | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Potatoes** | **1475.0** | **44.5** | 0.0 | 0.0 | 0.0 | 0.0 |
| Radishes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Red Grapes Seedless | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Romaine Iceberg Blend | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Salad Mix | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Spinach Baby | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Squash Yellow | 72.0 | 59.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweet Potatoes | 462.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tomatoes Cherry | 380.0 | 87.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Tomatoes** | **762.0** | **18.8** | 0.0 | 0.0 | **709.0** | **56.6** |
| Watermelons | 324.0 | 45.3 | 0.0 | 0.0 | 21.0 | 100.0 |
| Total | 10131.3 | 26.4 | 634.0 | 5.2 | 1888.5 | 10.9 |

a Percentage in relation with total purchases of that product category from local producers and the grocery supply company

Table 8. Madison, Mitchell and Yancey County Public Schools Expenditures (in dollars) in Processed Fruits and Vegetables Products, 2006-07.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Madison** | | | **Mitchell** | | | | **Yancey** | | | |
| **Produce Category** | **Expenditures** | | **%** | | **Expenditures** | **%** | | | **Expenditures** | **%** | |
| Apple Juice | | 2098.3 | 3.7 | | 1549.4 | | 5.1 | | 2390.2 | | 5.6 |
| Apple Sauce | | 1675.8 | 3.0 | | 1035.6 | | 3.4 | | 1465.5 | | 3.5 |
| Apple Slices | | 667.1 | 1.2 | | 4232.3 | | 13.8 | | 461.2 | | 1.1 |
| Banana Peppers (4 gallon) | | 127.8 | 0.2 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| BBQ Sauce | | 769.9 | 1.4 | | 335.7 | | 1.1 | | 852.1 | | 2.0 |
| Beans Baked | | 1920.2 | 3.4 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Beans Pinto | | 801.9 | 1.4 | | 528.2 | | 1.7 | | 528.2 | | 1.2 |
| Beans Refried | | 0.0 | 0.0 | | 0.0 | | 0.0 | | 494.0 | | 1.2 |
| Beans w/ Pork | | 208.9 | 0.4 | | 521.8 | | 1.7 | | 495.1 | | 1.2 |
| Beans, Kidney | | 0.0 | 0.0 | | 92.7 | | 0.3 | | 0.0 | | 0.0 |
| Broccoli Florets Frozen | | 0.0 | 0.0 | | 1635.0 | | 5.3 | | 427.9 | | 1.0 |
| California Blend Frozen | | 0.0 | 0.0 | | 505.0 | | 1.6 | | 252.5 | | 0.6 |
| California Veg. | | 1921.0 | 3.4 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Carroteenies 200 pkgs. | | 611.3 | 1.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Carrots Shredded (5 lbs.) | | 9.6 | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Carrots Sliced (24 lbs.) | | 62.1 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Catsup | | 4435.2 | 7.9 | | 2303.9 | | 7.5 | | 2224.7 | | 5.2 |
| Citrus Punch Florida | | 67.2 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Corn Cut (30 lbs.) | | 248.7 | 0.4 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Corn Frozen | | 0.0 | 0.0 | | 1771.6 | | 5.8 | | 3946.5 | | 9.3 |
| Corn on the Cob | | 0.0 | 0.0 | | 593.4 | | 1.9 | | 1049.1 | | 2.5 |
| Cranberry Sauce | | 66.6 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Cut Sweet Potatoes | | 626.2 | 1.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Fruit Cocktail | | 368.6 | 0.7 | | 803.2 | | 2.6 | | 2229.9 | | 5.3 |
| Fruit Mix | | 30.7 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Fruit Punch Juice | | 67.2 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Grape Juice | | 830.9 | 1.5 | | 1279.9 | | 4.2 | | 1667.1 | | 3.9 |
| Green Beans | | 0.0 | 0.0 | | 505.8 | | 1.7 | | 871.1 | | 2.1 |
| Ground Beef (lbs) | | 2238.9 | 4.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Hashbrown Potatoes | | 23.2 | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Juice Fruit Punch | | 52.6 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Kidney Beans | | 64.0 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Kiwi Fruit | | 105.8 | 0.2 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Lettuce Reg. Chopped | | 51.6 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Lettuce shredded (20 lbs.) | | 191.4 | 0.3 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Mixed Salad Blend | | 1100.5 | 2.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Mixed Vegetables Frozen | | 0.0 | 0.0 | | 585.6 | | 1.9 | | 1489.4 | | 3.5 |
| Onions Dehydrated Chopped | | 77.1 | 0.1 | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Orange Juice | | 2567.0 | 4.6 | | 1051.5 | | 3.4 | | 2799.4 | | 6.6 |
| Orange-Pineapple Juice | | 153.8 | 0.3 | | 202.3 | | 0.7 | | 160.2 | | 0.4 |
| Oven Fries | | 2267.0 | 4.0 | | 0.0 | | 0.0 | | 1017.5 | | 2.4 |
| Oven Fries Crinkle Cut | | 0.0 | 0.0 | | 2149.0 | | 7.0 | | 98.2 | | 0.2 |
| Oven Fries Shoestring | | 0.0 | 0.0 | | 2420.0 | | 7.9 | | 0.0 | | 0.0 |

Table 8 (Continue). Madison, Mitchell and Yancey County Public Schools Expenditures (in dollars) in Processed Fruits and vegetables Products, 2006-07.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | |  |  | |  |  |
|  | **Madison** | | | **Mitchell** | | | **Yancey** | |
| **Produce Category** | **Expenditures** | | **%** | **Expenditures** | | **%** | **Expendituress** | **%** |
| Oven Fries Spicy | 0.0 | | 0.0 | 0.0 | | 0.0 | 422.5 | 1.0 |
| Peaches Diced | 404.0 | | 0.7 | 0.0 | | 0.0 | 895.7 | 2.1 |
| Peaches Sliced | 1411.1 | | 2.5 | 357.0 | | 1.2 | 2632.3 | 6.2 |
| Pear Halves | 421.7 | | 0.8 | 0.0 | | 0.0 | 451.1 | 1.1 |
| Pears Diced | 419.1 | | 0.7 | 0.0 | | 0.0 | 596.0 | 1.4 |
| Pears Sliced | 481.6 | | 0.9 | 612.8 | | 2.0 | 848.5 | 2.0 |
| Peas & Carrots Frozen | 0.0 | | 0.0 | 100.8 | | 0.3 | 0.0 | 0.0 |
| Peas and Carrots | 566.6 | | 1.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Peas Frozen | 470.3 | | 0.8 | 581.8 | | 1.9 | 1569.0 | 3.7 |
| Pickle Dill Chips | 1927.6 | | 3.4 | 61.2 | | 0.2 | 305.8 | 0.7 |
| Pickle Spears | 492.5 | | 0.9 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Pickles, Dill Spears | 0.0 | | 0.0 | 0.0 | | 0.0 | 22.6 | 0.1 |
| Pickles, Dill Whole | 0.0 | | 0.0 | 331.9 | | 1.1 | 0.0 | 0.0 |
| Pickles, Sweet Relish | 0.0 | | 0.0 | 147.0 | | 0.5 | 91.9 | 0.2 |
| Pickles, Whole | 23.7 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Pineapple Juice 4oz. | 153.8 | | 0.3 | 31.4 | | 0.1 | 0.0 | 0.0 |
| Pineapple Tidbits | 771.8 | | 1.4 | 634.6 | | 2.1 | 2266.2 | 5.3 |
| Potato Pearls | 0.0 | | 0.0 | 2213.7 | | 7.2 | 4689.9 | 11.0 |
| Potato Rounds | 0.0 | | 0.0 | 0.0 | | 0.0 | 105.9 | 0.2 |
| Potato Wedges | 1240.8 | | 2.2 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Potatoes Canned Sliced | 0.0 | | 0.0 | 537.3 | | 1.8 | 38.4 | 0.1 |
| Potatoes Canned Whole | 0.0 | | 0.0 | 64.0 | | 0.2 | 64.0 | 0.2 |
| Potatoes Dehydrated Pearl | 3320.0 | | 5.9 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Potatoes Diced Canned | 0.0 | | 0.0 | 354.5 | | 1.2 | 0.0 | 0.0 |
| Potatoes Irish Diced | 535.6 | | 1.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Salsa | 814.8 | | 1.5 | 0.0 | | 0.0 | 1624.0 | 3.8 |
| Seasoned Oven French Fries (27 lbs.) | 7027.7 | | 12.5 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Shoestring Oven Fry | 5166.6 | | 9.2 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Sliced Strawberries | 0.0 | | 0.0 | 171.8 | | 0.6 | 0.0 | 0.0 |
| Spaghetti Sauce | 0.0 | | 0.0 | 191.2 | | 0.6 | 0.0 | 0.0 |
| Strawberry Slices | 30.2 | | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Sunflower Kernels (25 lbs) | 167.6 | | 0.3 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Tater Tots | 2411.8 | | 4.3 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Three Bean Salad | 50.4 | | 0.1 | 0.0 | | 0.0 | 25.5 | 0.1 |
| Tomato Paste | 192.0 | | 0.3 | 22.2 | | 0.1 | 377.7 | 0.9 |
| Tomato Sauce | 0.0 | | 0.0 | 27.9 | | 0.1 | 223.2 | 0.5 |
| Tomato Puree | 186.6 | | 0.3 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Tomatoes Crushed | 0.0 | | 0.0 | 45.7 | | 0.1 | 91.3 | 0.2 |
| Tomatoes Diced | 483.3 | | 0.9 | 16.9 | | 0.1 | 169.1 | 0.4 |
| Vegetable Mix (20 lbs.) | 320.3 | | 0.6 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Vinegar | 0.0 | | 0.0 | 44.7 | | 0.1 | 17.9 | 0.0 |
| Total | 55999.1 | | 100.0 | 30649.9 | | 100.0 | 42448.1 | 100.0 |

*Current and Potential Demand for Locally Grown Products*

The expenditure data presented in the previous section was used to estimate current and potential demand for local grown products by the three school districts. A total of 17 crops were selected (table 9). The 17 crops include 15 crops that were already purchased from local farmers during the 2006-2007 school period and 2 crops that were not purchased that season but that could be produced in the region. Some crops that can be produced in the region but whose level of demand by the school districts is very low were not included in the list.

Table 9. Expenditures and Quantity Demanded of Locally Grown Products Purchased by the Madison, Mitchell and Yancey School Districts during the Period 2006-2007.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Commodity** | **Expenditure (in dollars)** | | | **Quantity demanded (cwt)** | | |
| **Locally Grown** | **Traditional Foodservice Provider** | **Total** | **Locally Grown** | **Traditional Foodservice Provider** | **Total** |
| Apples | 3,500 | 7,737 | 11,237 | 58.80 | 97.20 | 156.00 |
| Bell Peppers | 201 | 466 | 667 | 1.60 | 2.40 | 4.00 |
| Blueberries | 360 | 0 | 360 | 1.95 | 0.00 | 1.95 |
| Broccoli | 511 | 2,525 | 3,036 | 2.80 | 27.04 | 29.84 |
| Cabbage | 329 | 1,645 | 1,974 | 11.80 | 76.40 | 88.20 |
| Cantaloupe | 470 | 1,573 | 2,044 | 4.18 | 23.45 | 27.63 |
| Cauliflower | 17 | 1,150 | 1,167 | 0.18 | 8.22 | 8.40 |
| Cherry Tomatoes | 380 | 72 | 452 | 3.04 | 0.64 | 3.68 |
| Cucumbers | 310 | 820 | 1,129 | 2.60 | 5.60 | 8.20 |
| Green beans | 0 | 1,428 | 1,428 | 0.00 | 18.20 | 18.20 |
| Lettuce Bibb | 2,751 | 0 | 2,751 | 9.30 | 0.00 | 9.30 |
| Lettuce Iceberg | 0 | 7,229 | 7,229 | 0.00 | 65.60 | 65.60 |
| Potatoes | 1,475 | 5,114 | 6,589 | 42.00 | 143.00 | 185.00 |
| Sweet Potatoes | 462 | 0 | 462 | 10.50 | 0.00 | 10.50 |
| Tomatoes | 1,471 | 5,037 | 6,508 | 20.97 | 49.66 | 70.63 |
| Watermelons | 345 | 632 | 977 | 16.80 | 20.00 | 36.80 |
| Yellow Squash | 72 | 49 | 121 | 0.90 | 0.60 | 1.50 |
| **Total** | **12,654** | **35,477** | **48,130** | **187** | **538** | **725** |
| **Percentage in relation to total expenditures** | **100%** | **64%** | **71%** |  |  |  |  |
| \* NCSU Horticulture Extension  \*\* USDA, NC average from 2000-2007  \*\*\* University of California Cooperative Extension, 2005 | | | | | | | |

The products included in table 9 represent 100% of the total expenditures on local products and about 65% of expenditures on produce from traditional foodservice providers. Both the total expenditures on locally grown products and the total quantity demanded represent measures of the current demand for locally grown products. On the other hand, total expenditures on these products (regardless of the source of origin) and their corresponding total quantities can be seen as measures of the potential demand for locally grown products.

The implicit assumption for the calculation of the potential demand for locally grown products is that there is only substitution across vendors but not across type of fruits and vegetable products. In other words, we do not account for the possibility of substituting processed products with produce or replacing tropical fruits (e.g., bananas) with regional fruits (e.g., apples). Hence, we assume that since the 17 fruits and vegetables listed in table 9 can be produced in the region, they can all be purchased from local vendors. Given this assumptions, it is estimated that expenditures on local fruits and vegetables could account for up to 71% of the current expenditures in fresh produce, well above the current 18% level in the region. In practice, seasonality of production and the need to provide students with a more diverse selection of fruits and vegetables throughout the year constrain a complete substitution of out of state products with locally grown products (Appendix 2).

If the Madison school district is used a benchmark, given its relatively successful Farm to School program, the 71% number is also well above this district current expenditures on locally grown products which account for 26% of their fresh produce expenditures.

1. **Supply of Locally Grown Foods**

The previous section analyzed the aspects related with the current and potential demand of locally grown products by public schools in Madison, Mitchell and Yancey counties in North Carolina. This part of the report explores the supply side of the Farm to School program in Western North Carolina and focuses on two main objectives. The first objective is to calculate the amount of land that is required to satisfy the demand for produce by the school districts. The second objective is to identify the crops with the highest potential of profitability in the region.

* 1. **Land Required to Satisfy the Demand for Produce in the Three School Districts**

The assessment of the total amount of land required to satisfy the current and potential demand of fresh fruits and vegetables entailed the following:

1. Identification of crops that can be produced in the region and estimation of the total quantity demanded by the school districts (from section 2).
2. Collection of data on yields per acre for the selected crops (table 10). This information was obtained from the NC State University Extension Service, the National Agricultural Statistical Service (NASS) of the United States Department of Agriculture.
3. Finally, using information from steps 1 and 2 we calculated the total amount required to satisfy the demand for produce by the three schools districts.

Table 10 shows the estimated land areas. According to these estimates, the amount of land required to grow the products that were purchased locally by the three school districts in the Appalachian region is approximately 1.2 acres. Some additional 3.8 acres will be needed to produce the fruits and vegetables that are currently purchased from the traditional foodservice providers. Therefore, the total land area required to satisfy the current demand for locally grown fruits and vegetables by the Madison, Mitchell and Yancey school districts is approximately 5 acres. Table 2 also shows that the land requirements are highly concentrated on a few crops. In fact, only four crops: potatoes, apples, cabbages and iceberg lettuce account for 62% of the total area needed.

Table 10. Yield per Acre and Land Area Needed to Meet the Demand for Fruits and Vegetables from the Madison, Mitchell and Yancey Scholar Districts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **Yield**  **(cwt/acre)** | **Area (acres)** | | |
| **Locally Grown** | **Traditional Foodservice Provider** | **Total** |
| Apples | 177.7\*\* | 0.33 | 0.55 | 0.88 |
| Bell Peppers | 118.1\*\* | 0.01 | 0.02 | 0.03 |
| Blueberries | 48.4\*\* | 0.04 | 0.00 | 0.04 |
| Broccoli | 84.0\* | 0.03 | 0.32 | 0.36 |
| Cabbage | 209.4\*\* | 0.06 | 0.36 | 0.42 |
| Cantaloupe | 120.0\* | 0.03 | 0.20 | 0.23 |
| Cauliflower | 140.0\* | 0.00 | 0.06 | 0.06 |
| Cherry Tomatoes | 660.0\*\*\* | 0.005 | 0.001 | 0.01 |
| Cucumbers | 112.5\*\* | 0.02 | 0.05 | 0.07 |
| Green beans | 49.4\*\* | 0.00 | 0.37 | 0.37 |
| Bibb Lettuce | 40.0\* | 0.23 | 0.00 | 0.23 |
| Iceberg Lettuce | 80.0\* | 0.00 | 0.82 | 0.82 |
| Potatoes | 190.1\*\* | 0.22 | 0.75 | 0.97 |
| Sweet Potatoes | 155.0\*\* | 0.07 | 0.00 | 0.07 |
| Tomatoes | 315.0\*\* | 0.07 | 0.16 | 0.22 |
| Watermelons | 166.3\*\* | 0.10 | 0.12 | 0.22 |
| Yellow Squash | 97.5\*\* | 0.01 | 0.01 | 0.02 |
| Total |  | 1.24 | 3.78 | 5.02 |
| Land area/pupil (ft2) |  | 7.27 | 22.24 | 29.51 |

\* NCSU Horticulture Extension

\*\*USDA, NC average from 2000-2007

\*\*\*University of California Cooperative Extension, 2005

The last row in table 10 shows the amount of land required to grow locally grown fruits and vegetables for each student in the Appalachian school districts under study. According to our calculations, about 7 ft2 were required to produce the local fresh and fruits and vegetables used to feed each student in the Madison, Mitchell and Yancey school districts during the school period 2006-2007. If all the fruits and vegetables that can be produced in the region were procured locally, a total of almost 30 ft2 per student will be required to satisfy this demand.

* 1. **Profitability of the Production of Locally Grown Crops**

The second objective of the supply analysis section was to identify which crops, among those that are produced in the region and have a market in the Farm to School Program, have the highest profit potential. The profitability assessment of the crops grown in the region required two pieces of information:

1. Costs of production and marketing
2. Revenues generated from selling the crops (based on prices received and yields obtained)

*Costs of production and marketing*

The costs of producing the seventeen crops selected for the analysis (table 9) were obtained from enterprise budgets generated by the Extension Services of several Universities. Since the NC State University Extension Service only had available enterprise budgets for very few of the crops under analysis, we searched for enterprise budgets from universities located in the southern region since agricultural practices and costs across the southern region are likely to be similar. However, given the unavailability of regional budgets for some products, we used budgets generated in other regions of the country. There were also several cases in which we could not find enterprise budgets for the year 2007 and we used budgets from previous years. To adjust the costs and revenues to 2007 price level, the costs of production were adjusted using the producer price index and the prices received were adjusted using the corresponding consumer price index. Both price indexes were taken from the Bureau of Labor Statistics website.

Two other adjustments to the cost estimates reported in the budgets were necessary. First, overhead costs (i.e., miscellaneous costs such as utilities, office expenses, etc.) reported in some of the budgets are calculated using different methodologies or because they are not always included as a cost, , they were estimated as 9% of total variables costs (Ferreira, 2008). Moreover since lLand and management costs are highly variable they are usually not reported in enterprise budgets, hence we did not include them in our total cost estimates.

Different selling costs were estimated for both traditional marketing outlets (i.e., traditional wholesalers) and also the Farm to School program. Costs of selling the products to traditional wholesale markets were calculated using the estimates from the original budgets. Only 8 of the 17 budgets used reported a separate selling cost item, ranging from 3.3% of gross revenues in the case of sweet potatoes to 6% of gross sales in the case of apples. The average value of 4.9% of gross sales was used in the cost calculations.

Regarding the costs of selling the products to schools, it is important reiterate that in Western North Carolina most of the sales of farmers to schools are canalized through a cooperative marketing system with the help of the non-profit Madison Farms. Madison Farms currently charges farmers 10% of gross receipts for their marketing services and hence this is the cost estimate that we used in our calculations (Madison farms manager, pers. comm., 2009).[[4]](#footnote-4)

*Revenues*

Estimation of the revenues obtained from marketing the crops requires data on the price received by the producer and the yield obtained, hence the final results depend upon the assumed prices and yields. Each of these components was collected from two sources. Prices were obtained from NASS, the enterprise budgets and the school records. Prices from NASS are the average prices received by producers in the state during the years 2006 and 2007. However, there were five crops for which NASS does not report prices; hence, we used the prices reported in the budgets (adjusted from inflation when required). Price reported by NASS or the budgets are assumed as represent the price received by producers when they sell their products to traditional wholesalers. Crop yields were collected from the enterprise budgets and NASS(table 11).

As shown in table 11, prices paid by the schools are in all cases, except for blueberries, higher than those obtained from traditional buyers (on average, 237% higher) However, this result should be interpreted with caution This result only corresponds to one year of analysis. More years of data will be required to compare the long term average prices received by farmers from traditional buyers and schools.[[5]](#footnote-5)

With respect to the yield estimates, in most cases the yields reported in the enterprise budgets are higher than those reported by the NCSU Extension Service or NASS (table 11). This is because enterprise budgets tend to reflect yields from optimal production conditions. For several crops, but especially for Cantaloupes, Iceberg Lettuce, and Watermelons the differences in yields between the two sources were quite large (more than double). For our revenue calculations we decided to use the yields reported by NASS since they better reflect the average growing conditions and an average producer.

*Difference in Profitability between Farm to School Program and Traditional Buyers*

Profitability results displayed in the budgets depend on several aspects including a farmer managing skills and experience, farm characteristics and many other factors. In this sense, extension budgets are only guides to help farmers estimate their own costs and profitability of production. Hence, we do not discuss our estimated costs and profit values but rather the estimated difference in profitability between the alternative markets (see Appendix for more information on the budget results). In other words, we only present information about the extra costs and benefits of marketing agricultural products to schools instead of selling then to the more traditional buyers.

The first profitability results that we present are those related to the production and marketing of produce for the traditional buyers (e.g., wholesalers) (table 12). As mentioned previously, these use the price assumptions shown in table 11 and labeled as “enterprise budgets.” Table 12 includes the costs of production, the revenues from marketing the products and the difference between costs and revenues which we call **net returns** since as explained previously we did not include land and management costs. In other words, the net returns represent the amount of money that is left to pay for land and management costs plus pure profits (if any).

As seen in table 12, according to the original enterprise budgets 11 crops have negative net returns and the remaining have positive net returns. Cherry tomatoes, tomatoes and apples are the crops with the highest estimated net returns.

Table 11. Yields and Prices Used for the Analysis of Profitability of Fresh Fruits and Vegetables Produced in the Appalachian Region

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **Yield (cwt/acre)** | | **Price ($/lb)** | |
| **Enterprise Budgets** | **NCSU Extension/NASS** | **NASS/Enterprise Budgets** | **Paid by School Districts to Local Producers** |
| Apples | 192 | 178 | 0.30 | 0.60 |
| Bell Peppers | 195 | 118 | 0.26 | 1.26 |
| Blueberries | 38 | 48 | 2.28 | 1.85 |
| Broccoli | 92 | 84 | 0.49 | 1.83 |
| Cabbage | 240 | 209 | 0.11 | 0.28 |
| Cantaloupe | 250 | 120 | 0.18 | 1.13 |
| Cauliflower | 115 | 140 | 0.44 | 0.94 |
| Cherry Tomatoes | 660 | 660 | 0.49 | 1.25 |
| Cucumbers | 158 | 113 | 0.18 | 1.19 |
| Green beans | 59 | 49 | 0.28 | 0.78 |
| Bibb Lettuce | 60 | 40 | 1.31 | 2.96 |
| Iceberg Lettuce | 250 | 80 | 0.16 | 1.10 |
| Potatoes | 200 | 190 | 0.09 | 0.35 |
| Sweet Potatoes | 264 | 155 | 0.18 | 0.44 |
| Tomatoes | 375 | 315 | 0.31 | 0.70 |
| Watermelons | 350 | 166 | 0.08 | 0.21 |
| Sweet Potatoes | 58 | 98 | 0.29 | 0.80 |
|  |  |  |  |  |

Table 12. Estimates Changes in Costs, Gross Revenues and Net Returns of Producing and Marketing Fresh Fruits and Vegetables for a Form to School Program versus Traditional Marketing Outlets in Western North Carolina, 2007.

|  |  |  |  |
| --- | --- | --- | --- |
| **Commodity** | **Cost** | **Receipts** | **Net Returns to Land**  **and Management** |
|  | **-------------------------- $/acre ----------------------** | | |
| Apples1 | 873 | 5,336 | 4,463 |
| Bell Peppers2 | 1,454 | 11,768 | 10,315 |
| Blueberries3 | 386 | -2,074 | -2,459 |
| Broccoli4 | 1,449 | 11,180 | 9,731 |
| Cabbages2 | 518 | 3,640 | 3,120 |
| Cantaloupe2 | 1,356 | 11,340 | 9,984 |
| Cauliflower5 | 1,111 | 7,048 | 5,937 |
| Cherry Tomatoes6 | 7,277 | 50,383 | 43,106 |
| Cucumbers2 | 1,355 | 11,423 | 10,069 |
| Green beans2 | 349 | 2,515 | 2,166 |
| Bibb Lettuce4 | 1,010 | 6,606 | 5,596 |
| Iceberg Lettuce5 | 893 | 7,536 | 6,643 |
| Potatoes7 | 637 | 4,966 | 4,329 |
| Sweet Potatoes2 | 594 | 4,030 | 3,436 |
| Tomatoes2 | 4,862 | 32,040 | 27,178 |
| Watermelons2 | 301 | 2,084 | 1,783 |
| Yellow Squash2 | 699 | 4,972 | 4,274 |
| 1University of California Cooperative Extension, 2005 | | | |
| 2University of Georgia Cooperative Extension, 2003 | | | |
| 3Clemson University Extension, 2007 | | | |
| 4Ohio State University Extension, 2000 | | | |
| 5University of California Cooperative Extension, 2003 | | | |
| 6North Carolina State University Extension, 2002 | | | |
| 7Virginia Tech, 2000 | | | |

Table 13 presents net returns calculated using: a) costs of production from the original enterprise budgets and costs of marketing through Madison Farms, and b) gross receipts calculated using the prices paid by school districts to local producers and the average state yields reported by the USDA. Except for blueberries, all the net returns figures are substantially higher than those obtained using the average prices assumed in the budgets generated by Extension Services. The higher costs of producing and selling to schools versus selling to traditional buyers (25% higher on average) are outweighed by the additional revenues (240% higher on average) generated due to the higher prices. We also found that even with marketing costs of about 50% of gross revenues, it would have been more profitable for the farmers to sell their products to schools than to sell them to traditional buyers. This is important for the long term sustainability of the Madison Farms Cooperative since it is estimated that to cover the true cost of the marketing services farmers would have to pay around 25% of gross receipts (Madison farms manager, pers. comm., 2009).

*Profitability at the Farm Level*

A problem with looking at the costs and net returns of the selected crops in acre basis is that it does not take into account the size of the Farm to School program market. Hence, using the data of the land requirements section and the profitability sections we calculated the total production costs, receipts and net returns for all farmers producing and marketing the products for the three school districts. Table 14 shows the results of the calculations. The total production costs and net returns of the farms in charge of supplying local fruits and vegetables to three school districts in the academic period 2006-2007 are estimated to be around $7,800 and $7,000, respectively. Total production costs would increase to $27,407 and net returns could increase to $55,000 if local farms were to increase their production to satisfy the schools’ potential demand for local produce.

Table 13. Estimates of Net Returns of Producing and Marketing Fresh Fruits and Vegetables for the Farm to School Program in Western North Carolina, 2007.

|  |  |  |  |
| --- | --- | --- | --- |
| **Commodity** | **Cost** | **Receipts** | **Net Returns to Land and Management** |
|  | **-------------------------- $/acre ----------------------** | | |
| Apples1 | 4,529 | 10,579 | 6,050 |
| Bell Peppers2 | 8,123 | 14,839 | 6,717 |
| Blueberries3 | 16,098 | 8,928 | -7,169 |
| Broccoli4 | 6,341 | 15,330 | 8,989 |
| Cabbages2 | 2,995 | 5,838 | 2,842 |
| Cantaloupe2 | 5,312 | 13,500 | 8,188 |
| Cauliflower5 | 6,041 | 13,222 | 7,181 |
| Cherry Tomatoes6 | 30,393 | 82,500 | 52,107 |
| Cucumbers2 | 3,320 | 13,392 | 10,072 |
| Green beans2 | 2,637 | 3,873 | 1,236 |
| Bibb Lettuce4 | 9,584 | 11,832 | 2,248 |
| Iceberg Lettuce5 | 6,333 | 8,816 | 2,483 |
| Potatoes7 | 3,820 | 6,677 | 2,857 |
| Sweet Potatoes2 | 4,671 | 6,820 | 2,149 |
| Tomatoes2 | 17,292 | 56,688 | 39,396 |
| Watermelons2 | 2,777 | 3,414 | 637 |
| Yellow Squash2 | 2,613 | 7,800 | 5,187 |
| 1University of California Cooperative Extension, 2005 | | | |
| 2University of Georgia Cooperative Extension, 2003 | | | |
| 3Clemson University Extension, 2007 | | | |
| 4Ohio State University Extension, 2000 | | | |
| 5University of California Cooperative Extension, 2003 | | | |
| 6North Carolina State University Extension, 2002 | | | |
| 7Virginia Tech, 2000 | | | |

Table 14. Costs and Net Returns of a Hypothetical Farm Satisfying the Current and Additional Potential Demand for Locally Grown Produce by the Madison, Mitchell and Yancey School Districts in North Carolina

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Commodity** | **Current Demand**  **(1.3 acres farm operation)** | | **Additional Potential Demand**  **(3.8 acres farm operation)** | |
| **Costs** | **Net Returns to Land and Management** | **Costs** | **Net Returns to Land and Management** |
|  | ---------------------------------dollars ---------------------------------- | | | |
| Apples | 1,442 | 2,333 | 2,384 | 3,856 |
| Bell Peppers | 86 | 246 | 129 | 369 |
| Blueberries | 400 | -115 | - | - |
| Broccoli | 167 | 395 | 1,612 | 3,816 |
| Cabbage | 133 | 245 | 860 | 1,587 |
| Cantaloupe | 123 | 857 | 691 | 4,805 |
| Cauliflower | 6 | 8 | 287 | 350 |
| Cherry Tomatoes | 101 | 279 | 21 | 59 |
| Cucumbers | 40 | 394 | 85 | 849 |
| Green beans | - | - | 806 | 907 |
| Bibb Lettuce | 2,051 | 2,075 | - | - |
| Iceberg Lettuce | - | - | 4,653 | 17,937 |
| Potatoes | 851 | 702 | 2,897 | 2,389 |
| Sweet Potatoes | 262 | 525 | - | - |
| Tomatoes | 722 | 1,029 | 1,710 | 2,438 |
| Watermelons | 225 | 503 | 267 | 599 |
| Yellow Squash | 16 | 26 | 11 | 18 |
| Total | 6,624 | 9,503 | 16,413 | 39,980 |

1. **Summary and Final Remarks**

This study analyzes the demand and supply of locally grown products for Farm to School programs in Madison, Mitchell and Yancey counties in North Carolina. The demand analysis is conducted using the amount and value of produce and processed fruits and vegetables purchased by these three schools districts. For the supply analysis, we calculate the amount of land that is required to satisfy the current and potential demand for produce by the three school districts and identify the crops with the highest potential of profitability in the region.

Results of the analysis indicate that current demand and use of produce in general, and locally grown products in particular, by the school districts is concentrated on a very few fresh fruits and vegetables. This finding is important for two reasons. First, because it reflects potential for growth but more importantly because it suggests that schools interested in supporting local farmers can allocate a relatively high share of total expenditures in fresh fruits and vegetables buying local products by focusing on those few products with the highest demand.

Out of the three school districts being analyzed, the Madison school district had in the academic year 2006-2007 the highest share of expenditures on fresh fruits and vegetables on locally grown products (26%) followed by the Yancey and Mitchell school districts whose share of expenditures on locally grown products was 11% and 5%, respectively. How do these figures compare with other experiences? Our review of the literature only identified one previous study that reports a similar figure. Feenstra and Jeri (2006) report that purchases from local farmers in a Farm to School program in Yolo County, California accounted, on average, for 51% of total salad purchases during the 2000 to 2005 period. The maximum and minimum total salad purchases from local farmers ranged from 31% to 100%.

Based on the expenditure data it is estimated that expenditures on local fruits and vegetables could increase to 71% (about $6.6/student per year and a total of $48,000 for the three school districts) of the current expenditures in fresh produce, well above the current 18% (about $1.7/student per year or a total of $13,000 for the three school districts) level in the region. Even though these figures are estimated using data from only three counties, they can be used to estimate the potential of Farm to School programs as a market for agricultural products at the state and national level.

Results of the supply analysis suggest that the amount of land required to grow local fruits and vegetables is relatively small. About 7 ft2 of farmland were required to produce the local fresh and fruits and vegetables used to feed each student in the Madison, Mitchell and Yancey school districts during the school period 2006-2007. If all the fruits and vegetables that can be produced in the region were procured locally, a total of almost 30 ft2 per student or a total of 5 acres will be required to satisfy this demand.

The profitability analysis indicates that the net returns that farmers obtained from marketing products to the school districts during the school period 2006-2007 were substantially higher than those that are usually obtained from selling their products to other venues. However, more work is needed to study the profitability of the Farm to School programs market in the long run. More research is also required to investigate the extra costs incurred by farmers to market their products to schools.

Even though we present some information regarding the demand of processed foods, the focus of this study is on the demand and supply of fresh fruits and vegetables. However, more work is required analyzing the demand and supply for processed food and vegetables. Processed fruits and vegetables require produce as one of the inputs in the production process and can have a positive effect not only the regional farms but also in other sectors of the local economy. Processed fruits and vegetables purchased by schools are also “value-added” opportunities that can be considered by farmers or local entrepreneurs. Looking into the future, the use of processed foods in schools can also be tied to the educational experiences for students, parents and teachers in the same way that agricultural production has been linked to the use of fresh fruits and vegetables.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Appendix 1. Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | **Yancey** | | | **Madison** | | |
| **Qty** | **Av. Price** | **Total** | **Qty** | **Av. Price** | **Total** | **Qty** | **Av. Price** | **Total** |
| **Grocery Supply Company** |  |  |  |  |  |  |  |  |  |
| Bananas (40 lbs.) | 26 | 18.54 | 482.04 | 70 | 19.79 | 1385.1 | 78 | 21.14 | 1648.57 |
| Cabbage (50 lbs.) | 96 | 8.58 | 823.68 | 31 | 9.85 | 305.29 | 20 | 11.62 | 232.42 |
| Carrots (25 lbs.) | 42 | 21.18 | 889.56 | 6 | 20.61 | 123.63 | 11 | 18.97 | 208.64 |
| Carrots (50 lbs.) | 28 | 31.82 | 890.96 |  |  |  | 1 | 17.84 | 17.84 |
| Celery (6 ct.) | 30 | 11.82 | 354.6 | 12 | 11.98 | 143.8 | 18 | 10.48 | 188.6 |
| Celery (36 ct.) | 4 | 28.86 | 115.44 |  |  |  |  |  |  |
| Apples Golden Delicious (100 ct.) | 20 | 29.19 | 583.8 |  |  |  | 5 | 44.23 | 221.15 |
| Lettuce Iceberg (24 ct.) | 104 | 21.4 | 2225.6 | 88 | 22.34 | 1965.8 | 49 | 21.58 | 1057.62 |
| Onions (5 lbs.) | 8 | 6.48 | 51.84 |  |  |  |  |  |  |
| Onions (10 lbs.) | 6 | 9.19 | 55.14 |  |  |  |  |  |  |
| Onions (50 lbs.) | 18 | 8.55 | 153.9 | 5 | 21.29 | 106.45 |  |  |  |
| Oranges (113ct.) | 56 | 27.92 | 1563.52 | 50 | 32.47 | 1623.5 |  |  |  |
| Potatoes (100 ct.) | 56 | 17.43 | 976.08 | 130 | 17.69 | 2300.1 |  |  |  |
| Radishes (14 lbs.) | 22 | 16.57 | 364.54 | 1 | 14.54 | 14.54 | 3 | 16.29 | 48.86 |
| Apples Red Delicious (125 ct.) | 16 | 31.6 | 505.6 |  |  |  | 49 | 30.35 | 1487.23 |
| Tomatoes (25 lbs.) | 68 | 17.77 | 1208.36 | 26 | 20.92 | 543.87 | 9 | 26.89 | 242.02 |
| Watermelons (each) | 44 | 5.48 | 241.12 |  |  |  | 56 | 6.99 | 391.37 |
| Apples (40 lbs case) |  |  |  | 102 | 31.27 | 3189.1 |  |  |  |
| Carrots Baby (20 lbs.) |  |  |  | 26 | 20.82 | 541.25 |  |  |  |
| Broccoli (14 ct.) |  |  |  | 7 | 17.74 | 124.17 | 13 | 21.35 | 277.51 |
| Cantaloupe (case) |  |  |  | 26 | 20.09 | 522.29 |  |  |  |
| Cauliflower (12 ct.) |  |  |  | 24 | 23.08 | 553.82 | 19 | 23.60 | 448.45 |
| Cauliflower Floret (6 lbs.) |  |  |  | 7 | 18.43 | 128.98 | 1 | 18.62 | 18.62 |
| Celery Sticks (3 lbs.) |  |  |  | 1 | 9.69 | 9.69 |  |  |  |
| Tomatoes Cherry (12 1 pts.) |  |  |  | 1 | 18.69 | 18.69 | 3 | 17.72 | 53.16 |
| Cucumbers (5 lbs.) |  |  |  | 65 | 7.01 | 455.34 | 43 | 7.99 | 343.64 |
| Pepper Green (5 lbs.) |  |  |  | 28 | 9.13 | 255.6 | 20 | 10.53 | 210.52 |
| Salad Mix (20 lbs.) |  |  |  | 63 | 14.47 | 911.51 |  |  |  |
| Cabbage Shredded (20 lbs.) |  |  |  | 7 | 16.84 | 117.87 |  |  |  |
| Onions Yellow (5 lbs.) |  |  |  | 7 | 6.87 | 48.12 | 3 | 5.25 | 15.76 |
| Spinach Baby |  |  |  |  |  |  | 15 | 19.05 | 285.77 |
| Bananas (10 lbs.) |  |  |  |  |  |  | 10 | 9.48 | 94.78 |
| Broccoli (12 lbs.) |  |  |  |  |  |  | 1 | 22.74 | 22.74 |
| Broccoli (24 lbs.) |  |  |  |  |  |  | 93 | 21.86 | 2032.96 |
| Broccoli Asian (20 lbs.) |  |  |  |  |  |  | 3 | 22.48 | 67.43 |
| Cabbage Shredded (20 lbs) |  |  |  |  |  |  | 4 | 17.75 | 70.98 |
| Cantaloupe (9 ct.) |  |  |  |  |  |  | 41 | 25.63 | 1051.01 |
| Carrot (5 lbs.) |  |  |  |  |  |  | 9 | 7.48 | 67.31 |
| Celery (5 lbs.) |  |  |  |  |  |  | 1 | 10.12 | 10.12 |
| Cherries (30 lbs.) |  |  |  |  |  |  | 7 | 37.17 | 260.21 |
| Corn on the Cob (96 ct.) |  |  |  |  |  |  | 120 | 14.92 | 1789.98 |
| Cucumbers (24ct.) |  |  |  |  |  |  | 2 | 10.42 | 20.83 |
| Apple Granny Smith (125ct) |  |  |  |  |  |  | 1 | 26.12 | 26.12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Appendix 1 (Continue). Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | | | **Yancey** | | | | | | **Madison** | | | | | | |
| **Qty** | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | | |
| Tomatoes Grape (10 lbs.) |  |  | |  | |  | |  | |  | | 28 | | 21.48 | | 601.47 | | |
| Tomatoes Grape (12/1pt.) |  |  | |  | |  | |  | |  | | 1 | | 19.98 | | 19.98 | | |
| Lettuce Green Leaf Wash/Trim (10 lbs) | |  | |  | |  | |  | |  | | 4 | | 23.04 | | 92.14 | | |
| Green Beans (bushel) |  |  | |  | |  | |  | |  | | 91 | | 15.69 | | 1427.79 | | |
| Honeydew Melon (6 ct.) |  |  | |  | |  | |  | |  | | 2 | | 19.83 | | 39.65 | | |
| Lettuce Iceberg Clean/Trim (24 ct.) |  |  | |  | |  | |  | |  | | 83 | | 22.96 | | 1905.97 | | |
| Potatoes Idaho (50 lbs.) |  |  | |  | |  | |  | |  | | 90 | | 17.80 | | 1601.95 | | |
| Peppers Jalapeno |  |  | |  | |  | |  | |  | | 2.75 | | 37.16 | | 102.19 | | |
| Oranges Mandarin |  |  | |  | |  | |  | |  | | 60 | | 18.97 | | 1138.2 | | |
| Onion Yellow (30 lbs.) |  |  | |  | |  | |  | |  | | 1 | | 20.40 | | 20.4 | | |
| Onions Yellow (50 lbs.) |  |  | |  | |  | |  | |  | | 2 | | 15.10 | | 30.19 | | |
| Red Cabbage (5 lbs.) |  |  | |  | |  | |  | |  | | 14 | | 6.79 | | 95.07 | | |
| Apples Red Del. 100-113 |  |  | |  | |  | |  | |  | | 49 | | 34.50 | | 1690.46 | | |
| Apples Red Del. 80-88 |  |  | |  | |  | |  | |  | | 1 | | 33.40 | | 33.4 | | |
| Red Grapes Seedless (18 lbs carton) | |  | |  | |  | |  | |  | | 8 | | 29.04 | | 232.34 | | |
| Onions Red (25 lbs.) |  |  | |  | |  | |  | |  | | 10 | | 14.14 | | 141.42 | | |
| Onions Red (5 lbs.) |  |  | |  | |  | |  | |  | | 1 | | 6.67 | | 6.67 | | |
| Potatoes Red (50 lbs.) |  |  | |  | |  | |  | |  | | 10 | | 23.54 | | 235.40 | | |
| Romaine Iceberg Blend (20 lbs.) |  |  | |  | |  | |  | |  | | 4 | | 18.48 | | 73.93 | | |
| Lettuce Romaine (10lbs.) Wash/Trim | |  | |  | |  | |  | |  | | 3 | | 22.81 | | 68.44 | | |
| Lettuce Romaine 24ct. |  |  | |  | |  | |  | |  | | 2 | | 22.60 | | 45.20 | | |
| Lettuce Romaine Wash/Trim (10lbs) | |  | |  | |  | |  | |  | | 5 | | 23.26 | | 116.31 | | |
| Tomato Jumbo 4x5 (20 lbs.) |  |  | |  | |  | |  | |  | | 8 | | 27.68 | | 221.43 | | |
| Tomatoes Large 6x6 (20 lbs.) |  |  | |  | |  | |  | |  | | 2 | | 17.95 | | 35.89 | | |
| Tomatoes 5x6 (25 lbs.) |  |  | |  | |  | |  | |  | | 71 | | 28.25 | | 2005.54 | | |
| Tomatoes (20 lbs.) 5x5 |  |  | |  | |  | |  | |  | | 4 | | 28.28 | | 113.11 | | |
| Tomatoes 6x6 (20 lbs.) |  |  | |  | |  | |  | |  | | 2 | | 22.72 | | 45.44 | | |
| Corn Whole Kernel |  |  | |  | |  | |  | |  | | 262 | | 11.88 | | 3113.37 | | |
| Onion Yellow (50 lbs.) |  |  | |  | |  | |  | |  | | 6 | | 15.94 | | 95.65 | | |
| Squash Yellow (20 lbs.) |  |  | |  | |  | |  | |  | | 3 | | 16.26 | | 48.78 | | |
| **Total grocery supply** |  |  | | 11485.78 | |  | |  | | 15388.00 | |  | |  | | 28310.00 | | |
|  |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| **Local Produce Supplier** |  |  | |  | |  | |  | |  | |  | |  | |  | | |
| Apples (case)(50 lbs) | 35 | 18.11 | | 634.00 | |  | |  | |  | |  | |  | |  | | |
| Lettuce Bibb (12 ct.) |  |  | |  | | 74 | | 12.00 | | 888.00 | |  | |  | |  | | |
| Pepper Green (5 lbs.) |  |  | |  | | 17 | | 4.76 | | 81.00 | |  | |  | |  | | |
| Cucumbers (5 lbs.) |  |  | |  | | 24 | | 5.60 | | 134.50 | |  | |  | |  | | |
| Broccoli (case)(20 pounds) |  |  | |  | | 2 | | 15.50 | | 31.00 | |  | |  | |  | | |
| Cauliflower (case) |  |  | |  | | 1 | | 17.00 | | 17.00 | |  | |  | |  | | |
| Cabbage (20 lbs.) |  |  | |  | | 1 | | 7.00 | | 7.00 | |  | |  | |  | | |
| Bell Peppers (5lbs) |  |  | |  | |  | |  | |  | | 15 | | 8 | | 120 | | |
| Lettuce Bibb (case) |  |  | |  | |  | |  | |  | | 81 | | 23 | | 1863 | | |
| Blueberries (gal) |  |  | |  | |  | |  | |  | | 30 | | 12 | | 360 | | |
| Cabbage (case)(50 lb) |  |  | |  | |  | |  | |  | | 5 | | 12 | | 60 | | |
| Appendix 1 (Continue). Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | | | | **Yancey** | | | | | **Madison** | | | | | |
| **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | **Qty** | | | **Av. Price** | | **Total** |
| Cantaloupe (each) |  | |  | |  | |  | |  | |  | 209 | | | 2.25 | | 470.25 |
| Tomatoes Cherry (12/ 1 pints) |  | |  | |  | |  | |  | |  | 18 | | | 20.00 | | 360.00 |
| Cucumbers (10lb) |  | |  | |  | |  | |  | |  | 14 | | | 12.50 | | 175.00 |
| Frozen Broccoli (4 lbs) |  | |  | |  | |  | |  | |  | 60 | | | 8.00 | | 480.00 |
| Fuji Apples (case)(50 lbs) |  | |  | |  | |  | |  | |  | 2 | | | 26.00 | | 52.00 |
| Gala Apples (case)(50 lbs) |  | |  | |  | |  | |  | |  | 27 | | | 26.00 | | 702.00 |
| Golden Apples (case)(50 lbs) |  | |  | |  | |  | |  | |  | 64 | | | 25.00 | | 1600.00 |
| Grape Tomatoes (12 1 pints) |  | |  | |  | | 3 | | 14.00 | | 42 | 3 | | | 20.00 | | 60.00 |
| Cabbage Green (case 50 lbs.) |  | |  | |  | |  | |  | |  | 18 | | | 14.00 | | 252.00 |
| Apples Jana Gold (case) |  | |  | |  | |  | |  | |  | 1 | | | 26.00 | | 26.00 |
| Cabbage Red (case 10 lbs.) |  | |  | |  | |  | |  | |  | 1 | | | 10.00 | | 10.00 |
| Apples Red Delicious(case) |  | |  | |  | |  | |  | |  | 18 | | | 27.00 | | 486.00 |
| Potatoes Red (case) |  | |  | |  | |  | |  | |  | 24 | | | 20.00 | | 480.00 |
| Sweet Potatoes (case) |  | |  | |  | |  | |  | |  | 21 | | | 22.00 | | 462.00 |
| Tomatoes (25 lbs.) |  | |  | |  | | 42 | | 15.88 | | 667 | 39 | | | 18.00 | | 702.00 |
| Watermelons (each) |  | |  | |  | | 3 | | 7.00 | | 21 | 81 | | | 4.00 | | 324.00 |
| Potatoes White (case) |  | |  | |  | |  | |  | |  | 37 | | | 15.00 | | 555.00 |
| Potatoes Kennebec (case) |  | |  | |  | |  | |  | |  | 19 | | | 20.00 | | 380.00 |
| Tomatoes Yellow Cherry (12 1 pint) | | |  | |  | |  | |  | |  | 1 | | | 20.00 | | 20.00 |
| Yellow Squash (10 lbs.) |  | |  | |  | |  | |  | |  | 9 | | | 8.00 | | 72.00 |
| Yukon Gold Potatoes (case) |  | |  | |  | |  | |  | |  | 4 | | | 15.00 | | 6.000 |
| **Total local produce** |  | |  | | 634.00 | |  | |  | | 1888.50 |  | | |  | | 10131.25 |
| **Total produce** |  | |  | | 12119.78 | |  | |  | | 17277.00 |  | | |  | | 38441.25 |
|  |  | |  | |  | |  | |  | |  |  | | |  | |  |
| **Processed Fruits and Vegetables** |  | |  | |  | |  | |  | |  |  | | |  | |  |
| 3-Bean Salad |  | |  | |  | | 1 | | 25.50 | | 25.50 |  | | |  | |  |
| Apple Juice 4 oz. carton | 214 | | 7.24 | | 1549.36 | | 330 | | 7.24 | | 2390.20 | 209 | | | 8.03 | | 1678.27 |
| Apple Sauce | 53 | | 19.54 | | 1035.62 | | 75 | | 19.54 | | 1465.50 |  | | |  | |  |
| BBQ Sauce | 13 | | 25.82 | | 335.66 | | 33 | | 25.82 | | 852.14 |  | | |  | |  |
| Beans w/ Pork | 39 | | 13.38 | | 521.82 | | 37 | | 13.38 | | 495.06 |  | | |  | |  |
| Broccoli Florets Frozen | 107 | | 15.28 | | 1634.96 | | 28 | | 15.28 | | 427.91 |  | | |  | |  |
| California Blend Frozen | 32 | | 15.78 | | 504.96 | | 16 | | 15.78 | | 252.48 |  | | |  | |  |
| Catsup |  | |  | |  | | 18 | | 15.20 | | 273.67 |  | | |  | |  |
| Catsup |  | |  | |  | | 161 | | 12.12 | | 1951.10 |  | | |  | |  |
| Corn Frozen | 149 | | 11.89 | | 1771.61 | | 332 | | 11.89 | | 3946.50 |  | | |  | |  |
| Corn on the Cob | 43 | | 13.8 | | 593.4 | | 76 | | 13.80 | | 1049.10 |  | | |  | |  |
| Peaches Diced |  | |  | |  | | 39 | | 22.97 | | 895.71 |  | | |  | |  |
| Pears Diced |  | |  | |  | | 25 | | 23.84 | | 596.00 |  | | |  | |  |
| Fruit Cocktail | 36 | | 22.31 | | 803.16 | | 93 | | 23.98 | | 2229.90 |  | | |  | |  |
| Grape Juice 4 oz. carton | 149 | | 8.59 | | 1279.91 | | 194 | | 8.59 | | 1667.10 | 75 | | | 9.00 | | 675 |
| Green Beans | 36 | | 14.05 | | 505.8 | | 62 | | 14.05 | | 871.10 |  | | |  | |  |
| Ground Beef (lbs) |  | |  | |  | |  | |  | |  | 892 | | | 2.51 | | 2238.92 |
| Mixed Vegetables Frozen | 23 | | 12.73 | | 292.79 | | 117 | | 12.73 | | 1489.40 |  | | |  | |  |
| Orange Juice 4 oz. carton | 121 | | 8.69 | | 1051.49 | | 322 | | 8.69 | | 2799.40 | 170 | | | 10.90 | | 1853 |
| Appendix 1 (Continue). Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | | | | **Yancey** | | | | | | **Madison** | | | | |
| **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** |
| Orange-Pineapple Juice 4 oz. carton | 24 | | 8.43 | | 202.32 | | 19 | | 8.43 | | 160.17 | | 15 | | 10.25 | | 153.75 |
| Oven Fries |  | |  | |  | | 80 | | 12.72 | | 1017.5 | |  | |  | |  |
| Oven Fries Crinkle Cut | 175 | | 12.28 | | 2149.00 | | 8 | | 12.28 | | 98.24 | |  | |  | |  |
| Oven Fries Spicy |  | |  | |  | | 23 | | 18.37 | | 422.51 | |  | |  | |  |
| Pear Halves |  | |  | |  | | 19 | | 23.74 | | 451.06 | |  | |  | |  |
| Peas Frozen | 43 | | 13.53 | | 581.79 | | 116 | | 13.53 | | 1569.00 | |  | |  | |  |
| Pickles, Dill Chips | 4 | | 15.29 | | 61.16 | | 20 | | 15.29 | | 305.80 | |  | |  | |  |
| Pickles, Dill Spears |  | |  | |  | | 1 | | 22.58 | | 22.58 | |  | |  | |  |
| Pickles, Sweet Relish | 8 | | 18.37 | | 146.96 | | 5 | | 18.37 | | 91.85 | |  | |  | |  |
| Pineapple Tidbits | 35 | | 18.13 | | 634.55 | | 125 | | 18.13 | | 2266.2 | |  | |  | |  |
| Pinto Beans | 35 | | 15.09 | | 528.15 | | 35 | | 15.09 | | 528.15 | |  | |  | |  |
| Potato Pearls | 59 | | 37.52 | | 2213.68 | | 125 | | 37.52 | | 4689.90 | |  | |  | |  |
| Potato Rounds |  | |  | |  | | 8 | | 13.24 | | 105.92 | |  | |  | |  |
| Beans Refried |  | |  | |  | | 25 | | 19.76 | | 494.00 | |  | |  | |  |
| Salsa |  | |  | |  | | 38 | | 42.74 | | 1624.00 | |  | |  | |  |
| Apples Sliced | 156 | | 27.13 | | 4232.28 | | 17 | | 27.13 | | 461.21 | |  | |  | |  |
| Peaches Sliced | 16 | | 22.31 | | 356.96 | | 118 | | 22.31 | | 2632.3 | |  | |  | |  |
| Pears Sliced | 26 | | 23.57 | | 612.82 | | 36 | | 23.57 | | 848.52 | |  | |  | |  |
| Potatoes Canned Sliced | 28 | | 19.19 | | 537.32 | | 2 | | 19.19 | | 38.38 | |  | |  | |  |
| Tomato Paste | 1 | | 22.22 | | 22.22 | | 17 | | 22.22 | | 377.74 | |  | |  | |  |
| Tomato Sauce | 2 | | 13.95 | | 27.90 | | 16 | | 13.95 | | 223.20 | |  | |  | |  |
| Tomatoes Crushed | 3 | | 15.22 | | 45.66 | | 6 | | 15.22 | | 91.32 | |  | |  | |  |
| Tomatoes Diced | 1 | | 16.91 | | 16.91 | | 10 | | 16.91 | | 169.12 | |  | |  | |  |
| Vinegar | 5 | | 8.93 | | 44.65 | | 2 | | 8.93 | | 17.86 | |  | |  | |  |
| Potatoes Canned Whole | 3 | | 21.33 | | 63.99 | | 3 | | 21.33 | | 63.99 | |  | |  | |  |
| Apple Juice 46oz. |  | |  | |  | |  | |  | |  | | 10 | | 16.32 | | 163.2 |
| Apple Juice 6oz. |  | |  | |  | |  | |  | |  | | 30 | | 8.56 | | 256.8 |
| Apple Slices |  | |  | |  | |  | |  | |  | | 31 | | 21.52 | | 667.12 |
| Applesauce |  | |  | |  | |  | |  | |  | | 96 | | 17.46 | | 1675.8 |
| Baked Beans |  | |  | |  | |  | |  | |  | | 85 | | 22.59 | | 1920.15 |
| Banana Peppers (4 gallon) |  | |  | |  | |  | |  | |  | | 4 | | 31.94 | | 127.76 |
| BBQ Sauce |  | |  | |  | |  | |  | |  | | 121 | | 6.36 | | 769.92 |
| Carrots Shredded (5 lbs.) |  | |  | |  | |  | |  | |  | | 1 | | 9.60 | | 9.60 |
| Cranberry Sauce |  | |  | |  | |  | |  | |  | | 2 | | 33.30 | | 66.60 |
| Corn Cut (30 lbs.) |  | |  | |  | |  | |  | |  | | 12 | | 20.73 | | 248.7 |
| Cut Sweet Potatoes |  | |  | |  | |  | |  | |  | | 8 | | 26.09 | | 208.72 |
| Dehydrated Chopped Onions (15 lbs.) | | |  | |  | |  | |  | |  | | 2 | | 38.55 | | 77.10 |
| Dehydrated Pearl Potatoes |  | |  | |  | |  | |  | |  | | 83 | | 40.00 | | 3320 |
| Tomatoes Diced in Juice |  | |  | |  | |  | |  | |  | | 17 | | 16.11 | | 273.87 |
| Dill Pickle Chips |  | |  | |  | |  | |  | |  | | 122 | | 15.80 | | 1927.60 |
| Florida Citrus Punch |  | |  | |  | |  | |  | |  | | 10 | | 6.72 | | 67.20 |
| Peas Frozen |  | |  | |  | |  | |  | |  | | 35 | | 13.44 | | 470.31 |
| Fruit Cocktail |  | |  | |  | |  | |  | |  | | 12 | | 30.72 | | 368.64 |
| Fruit Mix |  | |  | |  | |  | |  | |  | | 1 | | 30.72 | | 30.72 |
| Appendix 1 (Continue). Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | | | | **Yancey** | | | | | **Madison** | | | | | |
| **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | **Qty** | | | **Av. Price** | | **Total** |
| Fruit Punch Juice |  | |  | |  | |  | |  | |  | 8 | | | 8.40 | | 67.2 |
| Grape Juice 6oz. |  | |  | |  | |  | |  | |  | 17 | | | 9.17 | | 155.89 |
| Hashbrown Potatoes |  | |  | |  | |  | |  | |  | 2 | | | 11.62 | | 23.24 |
| Irish Diced Potatoes |  | |  | |  | |  | |  | |  | 29 | | | 18.47 | | 535.63 |
| Juice Fruit Punch |  | |  | |  | |  | |  | |  | 6 | | | 8.77 | | 52.62 |
| Juice Pineapple 4oz. |  | |  | |  | |  | |  | |  | 15 | | | 10.25 | | 153.75 |
| Carroteenies 200 pkgs. |  | |  | |  | |  | |  | |  | 23 | | | 26.58 | | 611.34 |
| Ketchup |  | |  | |  | |  | |  | |  | 392 | | | 11.31 | | 4435.19 |
| Kidney Beans |  | |  | |  | |  | |  | |  | 4 | | | 15.99 | | 63.96 |
| Kiwi Fruit |  | |  | |  | |  | |  | |  | 5 | | | 21.15 | | 105.75 |
| Lettuce shredded (20 lbs.) |  | |  | |  | |  | |  | |  | 12 | | | 15.95 | | 191.37 |
| Lettuce Reg. Chopped |  | |  | |  | |  | |  | |  | 3 | | | 17.20 | | 51.6 |
| Mixed Salad Blend |  | |  | |  | |  | |  | |  | 61 | | | 18.04 | | 1100.45 |
| Orange Juice 6 oz. |  | |  | |  | |  | |  | |  | 60 | | | 11.90 | | 714 |
| Oven French Fries (27 lbs.) |  | |  | |  | |  | |  | |  | 149 | | | 15.21 | | 2267.02 |
| Slices Peach |  | |  | |  | |  | |  | |  | 50 | | | 28.22 | | 1411.13 |
| Diced Peaches |  | |  | |  | |  | |  | |  | 14 | | | 28.86 | | 404.04 |
| Pear Halves |  | |  | |  | |  | |  | |  | 18 | | | 23.43 | | 421.74 |
| Pears Diced |  | |  | |  | |  | |  | |  | 17 | | | 24.65 | | 419.05 |
| Pears Slices |  | |  | |  | |  | |  | |  | 20 | | | 24.08 | | 481.6 |
| Peas and Carrots |  | |  | |  | |  | |  | |  | 45 | | | 12.59 | | 566.55 |
| Pickle Spears |  | |  | |  | |  | |  | |  | 21 | | | 23.45 | | 492.45 |
| Pineapple Tidbits |  | |  | |  | |  | |  | |  | 38 | | | 20.31 | | 771.78 |
| Pinto Beans |  | |  | |  | |  | |  | |  | 56 | | | 14.32 | | 801.92 |
| Pork and Beans |  | |  | |  | |  | |  | |  | 13 | | | 16.07 | | 208.9 |
| Potato Wedges |  | |  | |  | |  | |  | |  | 59 | | | 21.03 | | 1240.77 |
| Salsa |  | |  | |  | |  | |  | |  | 21 | | | 38.80 | | 814.8 |
| Seasoned Oven French Fries (27 lbs.) | | |  | |  | |  | |  | |  | 373 | | | 18.84 | | 7027.68 |
| Shoestring Oven Fry |  | |  | |  | |  | |  | |  | 347 | | | 14.89 | | 5166.56 |
| Carrots Sliced (24 lbs.) |  | |  | |  | |  | |  | |  | 3 | | | 14.79 | | 44.37 |
| Carrots Sliced (30 lbs.) |  | |  | |  | |  | |  | |  | 1 | | | 17.72 | | 17.72 |
| Strawberry Slices |  | |  | |  | |  | |  | |  | 1 | | | 30.17 | | 30.17 |
| Sunflower Kernels (25 lbs) |  | |  | |  | |  | |  | |  | 4 | | | 37.14 | | 148.56 |
| Sunflower Kernels (5 lbs.) |  | |  | |  | |  | |  | |  | 2 | | | 9.51 | | 19.02 |
| Sweet Potatoes Cut |  | |  | |  | |  | |  | |  | 16 | | | 26.09 | | 417.44 |
| Tater Tots |  | |  | |  | |  | |  | |  | 156 | | | 15.46 | | 2411.76 |
| Three Bean Salad |  | |  | |  | |  | |  | |  | 2 | | | 25.20 | | 50.4 |
| Tomato Paste |  | |  | |  | |  | |  | |  | 7 | | | 27.43 | | 192.01 |
| Tomato Puree |  | |  | |  | |  | |  | |  | 13 | | | 14.35 | | 186.55 |
| Tomatoes Diced |  | |  | |  | |  | |  | |  | 13 | | | 16.11 | | 209.43 |
| Vegetable Mix (20 lbs.) |  | |  | |  | |  | |  | |  | 26 | | | 12.32 | | 320.32 |
| Whole Pickles |  | |  | |  | |  | |  | |  | 1 | | | 23.67 | | 23.67 |
| California Veg. |  | |  | |  | |  | |  | |  | 87 | | | 22.08 | | 1920.96 |
| Appendix 1 (Continue). Mitchell, Yancey and Madison School Systems Price, Quantity and Total Expenditures  on Fresh and Processed Fruits and Vegetables | | | | | | | | | | | | | | | | | |
| **Products/Source** | **Mitchell** | | | | | | **Yancey** | | | | | **Madison** | | | | | |
| **Qty** | | **Av. Price** | | **Total** | | **Qty** | | **Av. Price** | | **Total** | **Qty** | | | **Av. Price** | | **Total** |
| Beans, Kidney | 6 | | 15.45 | | 92.7 | |  | |  | |  |  | | |  | |  |
| Catsup | 123 | | 12.12 | | 1490.76 | |  | |  | |  |  | | |  | |  |
| Catsup - Individual | 66 | | 12.32 | | 813.12 | |  | |  | |  |  | | |  | |  |
| Diced Potatoes Canned | 19 | | 18.66 | | 354.54 | |  | |  | |  |  | | |  | |  |
| Mixed Vegetables Frozen | 23 | | 12.73 | | 292.79 | |  | |  | |  |  | | |  | |  |
| Oven Fries Shoestring | 220 | | 11 | | 2420 | |  | |  | |  |  | | |  | |  |
| Peas & Carrots Frozen | 8 | | 12.6 | | 100.8 | |  | |  | |  |  | | |  | |  |
| Pickles, Dill Whole | 14 | | 23.71 | | 331.94 | |  | |  | |  |  | | |  | |  |
| Pineapple Juice 4 oz. carton | 4 | | 7.84 | | 31.36 | |  | |  | |  |  | | |  | |  |
| Sliced Strawberries | 5 | | 34.36 | | 171.8 | |  | |  | |  |  | | |  | |  |
| Spaghetti Sauce | 8 | | 23.9 | | 191.2 | |  | |  | |  |  | | |  | |  |
| **TOTAL Processed** |  | |  | | 30649.87 | |  | |  | | 42448 |  | | |  | | 55999.11 |
| **Total Fresh and Processed** |  | |  | | 42769.65 | |  | |  | | 59725 |  | | |  | | 94440.36 |

Appendix 2. Seasonal Availability of Fruits and Vegetables in North Carolina

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| Apples |  |  |  |  |  |  |  |  |  |  |  |  |
| Bell peppers |  |  |  |  |  |  |  |  |  |  |  |  |
| Blueberries |  |  |  |  |  |  |  |  |  |  |  |  |
| Broccoli |  |  |  |  |  |  |  |  |  |  |  |  |
| Cabbage |  |  |  |  |  |  |  |  |  |  |  |  |
| Cantaloupe |  |  |  |  |  |  |  |  |  |  |  |  |
| Cauliflower |  |  |  |  |  |  |  |  |  |  |  |  |
| Cucumbers |  |  |  |  |  |  |  |  |  |  |  |  |
| Green beans |  |  |  |  |  |  |  |  |  |  |  |  |
| Lettuces |  |  |  |  |  |  |  |  |  |  |  |  |
| Potatoes |  |  |  |  |  |  |  |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |  |  |  |  |  |  |  |
| Watermelons |  |  |  |  |  |  |  |  |  |  |  |  |
| Yellow Squash |  |  |  |  |  |  |  |  |  |  |  |  |

*Source: NC Department of Agriculture and Consumer Services and NCSU Horticulture Extension Service*

Appendix 3. Estimated Costs of Selling Products to Traditional Markets (e.g., wholesalers) Estimates (as a Percentage of Gross Sales)

|  |  |
| --- | --- |
| **Commodity** | **% of Gross Sales** |
|  |  |
| Apples1 | 6.00 |
| Bell Peppers2 | 5.00 |
| Blueberries3 | 5.00 |
| Broccoli4 | n.a. |
| Cabbages2 | 5.83 |
| Cantaloupe2 | n.a. |
| Cauliflower5 | n.a. |
| Cherry Tomatoes6 | n.a. |
| Cucumbers2 | n.a. |
| Green beans2 | 4.29 |
| Bibb Lettuce4 | n.a. |
| Iceberg Lettuce5 | n.a. |
| Potatoes7 | n.a. |
| Sweet Potatoes2 | 3.31 |
| Tomatoes2 | 4.20 |
| Watermelons2 | n.a. |
| Yellow Squash2 | 5.26 |
| n.a. stands for not available | |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Table 12. Estimates of Costs, Gross Revenues and Net Returns of Producing and Marketing Fresh Fruits and Vegetables for Traditional Marketing Outlets in Western North Carolina, 2007.

|  |  |  |  |
| --- | --- | --- | --- |
| **Commodity** | **Cost** | **Receipts** | **Net Returns to Land**  **and Management** |
|  | **-------------------------- $/acre ----------------------** | | |
| Apples1 | 3,656 | 5,243 | 1,587 |
| Bell Peppers2 | 6,669 | 3,071 | -3,598 |
| Blueberries3 | 15,712 | 11,002 | -4,710 |
| Broccoli4 | 4,892 | 4,150 | -742 |
| Cabbages2 | 2,477 | 2,198 | -278 |
| Cantaloupe2 | 3,956 | 2,160 | -1,796 |
| Cauliflower5 | 4,930 | 6,174 | 1,244 |
| Cherry Tomatoes6 | 23,116 | 32,117 | 9,001 |
| Cucumbers2 | 1,965 | 1,969 | 3 |
| Green beans2 | 2,288 | 1,358 | -930 |
| Bibb Lettuce4 | 8,574 | 5,226 | -3,348 |
| Iceberg Lettuce5 | 5,440 | 1,280 | -4,160 |
| Potatoes7 | 3,183 | 1,711 | -1,472 |
| Sweet Potatoes2 | 4,077 | 2,790 | -1,287 |
| Tomatoes2 | 12,430 | 24,648 | 12,218 |
| Watermelons2 | 2,476 | 1,330 | -1,146 |
| Yellow Squash2 | 1,914 | 2,828 | 913 |
| 1University of California Cooperative Extension, 2005 | | | |
| 2University of Georgia Cooperative Extension, 2003 | | | |
| 3Clemson University Extension, 2007 | | | |
| 4Ohio State University Extension, 2000 | | | |
| 5University of California Cooperative Extension, 2003 | | | |
| 6North Carolina State University Extension, 2002 | | | |
| 7Virginia Tech, 2000 | | | |

Table 13. Estimates of Net Returns of Producing and Marketing Fresh Fruits and Vegetables for the Farm to School Program in Western North Carolina, 2007.

|  |  |  |  |
| --- | --- | --- | --- |
| **Commodity** | **Cost** | **Receipts** | **Net Returns to Land and Management** |
|  | **-------------------------- $/acre ----------------------** | | |
| Apples1 | 4,529 | 10,579 | 6,050 |
| Bell Peppers2 | 8,123 | 14,839 | 6,717 |
| Blueberries3 | 16,098 | 8,928 | -7,169 |
| Broccoli4 | 6,341 | 15,330 | 8,989 |
| Cabbages2 | 2,995 | 5,838 | 2,842 |
| Cantaloupe2 | 5,312 | 13,500 | 8,188 |
| Cauliflower5 | 6,041 | 13,222 | 7,181 |
| Cherry Tomatoes6 | 30,393 | 82,500 | 52,107 |
| Cucumbers2 | 3,320 | 13,392 | 10,072 |
| Green beans2 | 2,637 | 3,873 | 1,236 |
| Bibb Lettuce4 | 9,584 | 11,832 | 2,248 |
| Iceberg Lettuce5 | 6,333 | 8,816 | 2,483 |
| Potatoes7 | 3,820 | 6,677 | 2,857 |
| Sweet Potatoes2 | 4,671 | 6,820 | 2,149 |
| Tomatoes2 | 17,292 | 56,688 | 39,396 |
| Watermelons2 | 2,777 | 3,414 | 637 |
| Yellow Squash2 | 2,613 | 7,800 | 5,187 |
| 1University of California Cooperative Extension, 2005 | | | |
| 2University of Georgia Cooperative Extension, 2003 | | | |
| 3Clemson University Extension, 2007 | | | |
| 4Ohio State University Extension, 2000 | | | |
| 5University of California Cooperative Extension, 2003 | | | |
| 6North Carolina State University Extension, 2002 | | | |
| 7Virginia Tech, 2000 | | | |

### Section 2

**Dewain Mackey’s Farm to School Education – Case Study  
*Mackey Farms, Madison County, NC***

*Emily Jackson and Maggie Cramer, Appalachian Sustainable Agriculture Project*

Ask Dewain Mackey, a famer in Western North Carolina’s Madison County, how he got his lettuce on the menus at nearby schools and, surprisingly, he answers a bit more like an executive than a farmer.

“I had three-part invoices, I had a fax machine at home; I was ready to do business,” he says, adding, “That’s a lot for farmers, especially tobacco farmers who have never had to make out an invoice or make out a bill.”

But talk to him a bit more, and you’ll clearly see it also had a great deal to do with his passion for growing and sharing farm-fresh food.

Dewain started growing lettuce after visiting a fellow farmer’s, Harold Davis’, nearby greenhouse operation around the year 2000. “I came away from there on fire,” Dewain shares. Harold had already broken into the Farm to School market, and he made quite an impression on Dewain that day. “I thought that’s 2,000 kids eating five meals a week; that could be a lot of food!”

Over the next several years, he researched more on hydroponics, bit the bullet and borrowed money for his own greenhouse, and went into lettuce mode—changing his email to lettuceman2@yahoo.com and talking to the “powers that be” about getting his lettuce into Madison County cafeterias.

Toward the end of the 2004 school year, Dewain and his local agriculture extension agent put together a packet of everything they could find about local, fresh food and the Farm to School approach and mailed it to each school board member and the superintendent, Dr. Wilcox. “When I got the lettuce ready to plant, I called Dr. Wilcox and told him. Then, I called him again about six weeks before harvest, then three weeks before,” Dewain says. And he didn’t stop there. “About a week before it was really ready to market and cut, I cut samples and brought them to the county’s central office.” To his surprise, they served the samples on the high school’s salad bar that day. Not to his surprise, the students loved it.

ASAP held their very first Farm to School Workshop in Asheville around the same time in 2004 and Dewain attended, using the event to learn more and form some important partnerships.

Because of her interactions with Dewain, Madison County’s child nutrition director at the time, Brenda Spence, also attended. At the event, Dewain discovered Brenda was interested in buying potatoes as well as lettuce. So, he partnered with the county’s extension director, Ross Young, on what they called a “potato project.” Grant funds helped them buy the equipment necessary to wash and grade potatoes, and the project was off and running.

It wasn’t quite smooth-sailing. A flood in 2005 washed away their facilities. But, Dewain kept his head up. And from the rebuilding, and also in response to the Tobacco Buyout, Madison Farms was born—a collaboration between county farmers and Cooperative Extension. Madison Farms purchases product from farmers to disseminate to hospitals, grocery stores, schools, and beyond, as well as provides a facility for famers to create value-added products.

Around this time, Madison County schools bought anywhere from $1,500 and $1,800 worth of produce a week for their cafeterias—everything from tomatoes to cucumbers and watermelons to cantaloupes.

Just as he did in response to the flood, Dewain pushed ahead, even when getting some pushback from cafeteria workers. “The cafeteria ladies didn’t necessarily welcome raw product. They were used to ripping a bag open,” he shares. “So, in 2006, I brought them all out to my house, let them tour the greenhouse and facilities, and I fixed them a hamburger with the lettuce right out of the greenhouse. I was trying to make friends with them.”

His persistence has consistently paid off. Fast forward to 2008. Dewain contacted the North Carolina Department of Agriculture, and despite some initial resistance to their approach, was able to convince them to come and see Madison Farms in person. As a result, the NCDA has purchased tomatoes and potatoes from Madison Farms for their state-wide Farm to School program. According to Dewain, it looks like the relationship will continue. That means, students in Madison County and across the rest of the state will get to eat fresh ingredients from a nearby farmer. A business-minded one, at that.

*Just as he did in response to the flood, Dewain pushed ahead, even when getting some pushback from cafeteria workers. “The cafeteria ladies didn’t necessarily welcome raw product. They were used to ripping a bag open,” he shares.*

### Section 3

**Opportunities for WNC Schools to**

**Buy Local Value-Added Food Products**

*Mary Lou Surgi, Blue Ridge Food Ventures*

*Background*

Blue Ridge Food Ventures (BRFV), a shared-use value added food processing center in Asheville, has been working with the concept of getting more local produce into schools for several years. In 2006-07, it was the scene of collaboration between a local chef/entrepreneur, an organization of farmers known as Madison Farms, and the Madison County School system. The experiment was to take locally grown potatoes and find a way to process and freeze them for use in school lunches.

The results were not encouraging. Given the small scale of the processing facility, lack of specialized blanch/freeze equipment for potatoes, and the relatively higher cost of small scale production, it was found that we could not produce an acceptable product at a price fair to the farmers, the processor, and the school.

In the spring of 2009, BRFV launched a new program – Winter Sun Farms (WSF) – to provide winter shares of locally grown and processed fruits and vegetables. The program works with 13 farmers in the region who use sustainable practices (certified organic or naturally grown) and sell their produce to BRFV for a fair price. The produce is then minimally processed, packaged and frozen at BRFV, and available for subscribers to pick-up from December through March. In its first year, the program served 100 subscribers.

This report explores the feasibility of taking the lessons learned from the Winter Sun Farms program to see how they can be applied to the Farm to School program and provide WNC schools and/or institutions with local food in a frozen form. The report addresses the opportunities and the limitations of buying a larger quantity of produce from local farmers, as experienced by the WSF staff. It also discusses what locally grown foods do not have the potential to be processed and why, as well as provides information about what fruits and vegetables might be economically feasible to process and make available to schools.

*Opportunities and challenges faced by Winter Sun Farms -- buying local produce from farmers to add value through freezing*

The goal of the WSF program is twofold: to make healthy local food available in winter months when the supply of fresh produce is limited; and to support the local farming economy by creating an expanded market and guaranteed sales opportunities for farmers. From May until October 2009, the program purchased fresh produce in amounts ranging from 30 pounds of raspberries to 420 pounds of butternut squash. The program tries to work with as many farmers as possible to source 16 different fruits and vegetables to make 28 different frozen items. Although such goals of the program are not directly applicable to large institutional sales, the program staff can still offer invaluable insights into how the small size of WNC farms and diversified production practices determine what value a farmer attaches to his/her produce.

With many small farms each growing small amounts of a diverse array of vegetables to meet the demands of area tailgate markets, it is often hard to source large enough quantities of single items to meet the demand for fresh produce from schools and other large institutions. For example, Winter Sun Farms’ staff found it difficult to source larger amounts (100-200 lbs.) of certain products, like strawberries, broccoli, and bell peppers. They were able to overcome the challenge by buying more of a product that was available in larger quantities, like edamame, other small berries, and summer and winter squashes, to replace the produce items that were in short supply. For instance, a farmer who grows strawberries, blackberries, and blueberries might not have enough of any one berry to meet an order, but if an institutional buyer has flexibility, then a buyer could meet his/her needs with a combination of berries. We realize the institutional limitations to such substitutions, but having flexibility in what kind of produce to buy was a key component in meeting the WSF program’s goal. It will be a much needed tool for school and institutional buyers who want to work with farmers to provide local produce to their diners —whether fresh or frozen.

Buying only sustainably grown produce was also a limiting factor for the WSF program. This limitation might not exist for institutional buyers who would be sourcing all kinds of local food, regardless of growing practices. Yet another advantage for schools is their ability as an institutional buyer to offer a guaranteed purchase to farmers. This would enable them to work with growers on planning the growing season in terms of what crops are needed, in what amounts, and when. This is a working model developed by the Appalachian Sustainable Development (ASD) program in Abingdon, VA. ASD works with both farmers and institutional buyers, pooling produce from many small farmers and making it available in large quantities to institutions; they also plan with farmers what to grow and how much, based on the expressed needs of institutional buyers. This model could be applied in WNC as well.

In addition, due to the high demand for local and organic foods in the greater Asheville area, many small farmers know that they can get a premium price by selling directly to consumers. Since WSF’s goal was to pay a fair price, the program was paying a somewhat higher price than wholesale, despite buying a larger volume. WSF staff was sometimes able to negotiate a lower fair price, while other times a farmer did not choose to become a supplier because he/she was not willing to come down on the price. Such a model would not work for schools and institutions that want a frozen local product. Paying higher premiums for fresh food would mean that the price of a value added product, after processing costs are added, would be much above what schools would be able to pay. Fortunately, there are farmers who would prefer to grow less variety in larger amounts for a guaranteed institutional buyer. Such farmers usually express their desire early on and are willing to sell for wholesale prices.

*Locally grown foods that do not have the potential to be processed for school lunches at this time*

This section discusses produce that, according to the WSF staff experience, does not have the potential to be frozen for institutional purchase for the reasons given with each produce type.

**Bibb lettuce:** Although BRFV does not have specialized equipment to chop lettuce or package it for schools and institutions, there are many farms in the region that have green houses or hoop houses, or who grow lettuce hydroponically year round, so that there is plenty of fresh lettuce available to those institutions who will take head lettuce. WSF buys fresh lettuce heads from a farmer who grows it in hoop houses all winter long, for $1 head (1 head = about 1 lb). The program staff and the farmer plan the delivery date to be a day before the subscriber pick-up time, assuring the consumer gets the best quality lettuce. This example shows that a buyer and a farmer can work out a deal that will meet the goals of all parties involved.

**Potatoes**: As previously discussed, BRFV does not have the specialized equipment to peel, blanch, and freeze potatoes, which makes it impossible for farmers to supply schools with the tater tots, French fries, and hash browns that are a staple of many school menus. Some school lunch directors faced this situation by replacing the frozen prepared potatoes with whole unpeeled potatoes from local farmers and having the school kitchen staff peel and prepare them. Apart from this option, it should be possible to replace some potato items on the menu with another more nutritious, starchy vegetable that is grown locally and can be processed economically. For instance, WSF has processed butternut squash into both frozen cubes and frozen puree. The puree can easily be turned into a soup and served on a soup and salad bar, and the cubes can be the main ingredient of several simple dishes that could become new, healthier entries on the school menu. The BRFV Product Developer could develop recipes that include these ingredients and present it for evaluation to interested Child Nutrition Directors. Other alternatives to potatoes could include serving baked sweet potatoes or baked white potatoes on a potato buffet. Both of these crops could be grown locally in larger amounts, and using simple cooking methods like baking would not require much prep work for the kitchen staff.

**Tomatoes**: Despite their abundance on the local market, processing locally grown tomatoes cannot compete with canned tomato products available from traditional food service wholesalers. For instance, it costs $0.54 to produce 1 oz of tomato sauce at BRFV, whereas Buncombe County Schools pays $0.018 for 1 oz, purchased from a wholesale foods distributor. The most cost-efficient way for schools to put local tomatoes on their menu is by buying whole tomatoes and putting them on a salad bar. Cherry and grape tomatoes are especially plentiful and disease resistant. Again, seasonality is the big issue here. Perhaps schools could work with farmers with green house operations to get some early and late summer ripe tomatoes for late spring and early fall when schools are in session. Year-round food service operations, like hospitals and some colleges, would not face this problem of seasonality as they operate during tomato growing season.

**Apples** – Processing locally grown apples into apple sauce also cannot compete with the apple sauce provided by a commercial wholesaler. It costs $0.21 to produce 1 oz. of apple sauce at BRFV. One ounce of apple sauce purchased from a food service costs about $0.03. That being said, there are locally available ready-pack apple wedges that should be the first choice of schools seeking to serve processed apples.

*Processed products that are currently on the school menus and could be prepared at BRFV*

Based on the ease of processing and processing cost, WSF staff can suggest freezing the following fruits and vegetables for schools and institutions: broccoli, blueberries, blackberries, edamame, summer and winter squash, bell peppers, cauliflower, collards and kale. Only broccoli is currently purchased from local growers, on a very limited basis and by only one county school. Table 1 presents the items and prices per ounce of products schools currently buy from wholesalers that Winter Sun Farms has experience with.

**Table 1: Price comparison between food items produced at BRFV and those purchased by county schools**.

|  |  |  |
| --- | --- | --- |
| **Produce** | **BRFV processing cost**  **$/oz\*** | **Purchased from wholesaler**  **$/oz** |
| Refrigerated apple quarters | na | 0.28 |
| Frozen broccoli | 0.41 | 0.03 |
| Frozen corn on the cob | na | 0.03 |
| Frozen halved strawberries | 0.52 | 0.06 |
| \*Includes labor, kitchen time fee and packaging used by Winter Sun Farms |  |  |

It can be noted that production costs for frozen broccoli and halved strawberries produced at BRFV are significantly higher per unit than what schools are currently paying wholesalers. In the case of apples, BRFV has not peeled and quartered a sufficient amount of apples to be able to provide a competitive production cost. However, because locally packaged apple quarters are already available, BRFV would not be needed for this product. In the case of frozen corn on the cob, Winter Sun Farms program team decided that shucking corn to freeze required too much hand labor and is thus not feasible for their program. Similarly, this would not be feasible for schools.

Table 2 gives a list of products that were processed at BRFV and that are considered to be feasible to process for schools. None of these items are currently being procured by the schools, but a great potential exists to serve these locally grown fruits and vegetables in fresh and frozen form.

**Table 2: Products made at BRFV that are currently not on the school menus**.

|  |  |
| --- | --- |
|  | |
| **Produce** | **BRFV processing cost,**  **$/oz\*** |
| Frozen blueberries | 0.25 |
| Frozen blackberries | 0.21 |
| Frozen edamame | 0.25 |
| Frozen summer squash slices | 0.32 |
| Frozen bell pepper cubes or strips | 0.42 |
| Frozen kale | 0.44 |
| Frozen collards | 0.44 |
| Frozen cauliflower | 0.41 |
| Frozen winter squash puree or cubes | 0.47 |
|  |  |

It is noted that the three frozen items produced at BRFV with the lowest processing cost per oz are blueberries, blackberries and edamame, at 25, 21 and 25 cents/oz respectively. Blueberries and blackberries hold up well in processing to make them feasible to package for schools. Similarly, edamame only requires washing and the extra step of blanching before packaging, which makes it into another easy product to freeze and package. Since edamame is a relatively unknown menu item, the BRFV staff could work with Child Nutrition Directors to develop ways that the item could be introduced in the schools. Another potential value added product for schools is frozen summer squash slices, at 35 cents/oz. This is a great ingredient for healthy soups and mixed vegetable dishes, and of course, squash casserole. In the case of butternut squash, the WSF team believes that its processing cost could be lowered if it is all processed into a puree and used to make seasonal soups. Again, BRFV staff would be happy to work with CNDs, to find ways to put these local foods on the menu. Winter Sun Farms offers several other pureed vegetables that could easily be turned into quickly made and nutritious soups. BRFV could package butternut squash, broccoli, cauliflower and summer squash purees into larger sizes as needed for the various schools. Paying 44 cents/oz of frozen kale or collards might not be feasible for schools, but BRFV would continue to experiment with quicker ways of chopping the greens to reduce the processing cost.

*Conclusions and next steps*

Although some characteristics of Western North Carolina farms, such as their small size and high crop diversification, could be limiting factors when it comes to supplying institutional buyers with large volumes, there are working examples in the Appalachian region showing that it is possible to overcome these challenges. Models such as Madison Farms and Appalachian Sustainable Development are good for organizing small farms to aggregate planning and production based on the demands for fresh produce of institutional buyers. In the same way, Winter Sun Farms is aggregating production from many farms in order to satisfy the needs for frozen local produce.

Some locally grown fresh produce is already in limited use in some local schools, such as lettuce, potatoes, tomatoes, and apples. Other foods, like corn and processed apples that are found in abundance in the region, are not cost competitive with commodity wholesalers. Yet other foods, like blueberries, broccoli, cauliflower, kale, edamame, etc. are easy enough and cost-efficient to process, but are not currently purchased by schools. Such items could be put on the schools’ menu.

We recognize that Child Nutrition Directors and even institutional buyers from hospitals and universities might not have adequate flexibility to create menus that reflect the seasonality of local agriculture. However, this is the direction that we need to head toward if our aim is to have healthier, more sustainable local economies. BRFV would like to work with schools or institutions that are committed to getting a supply of frozen, local produce into their dining rooms and on their dinner plates.

### Section 4

**Feasibility of Freezing Local Produce for WNC Schools**

*Martha Vining, Blue Ridge Food Ventures*

Blue Ridge Food Ventures (BRFV) is an 11,000 sq. ft. shared-use food processing facility that offers support to farmers and food entrepreneurs in developing value-added products. Along with the physical facility, it provides guidance through the regulatory maze, advice on packaging and label design, business planning, and much more. In the spring of 2009, BRFV launched a new program, Winter Sun Farms (WSF), a Community Supported Agriculture program to provide winter shares of locally grown, prepped, and frozen produce to subscribers in the Asheville area. Since BRFV has been working with the Farm to School Program of the Appalachian Sustainable Agriculture Project, we decided to explore the possibility of providing locally grown produce in a frozen form to local schools.

To this end, staff from BRFV talked with or visited 10 Child Nutrition Directors (CND) across the region, bringing samples of frozen local fruits and vegetables (green beans, applesauce and butternut squash cubes and puree) that were processed for the Winter Sun Farms program at BRFV. A discussion was held with each CND to determine the opportunities and obstacles to accepting local produce in a frozen state.

The responses from the CND’s across the region to our questions were very similar.

Positive Aspects of a Farm to School Program featuring local foods:

* improved children’s eating habits,
* increased awareness of local agriculture,
* increased production/profit for local farmers,
* and often, better quality of food due to less distance produce needs to travel and less processing of fruits and vegetables.

Obviously, there is keen interest by CND’s, state and federal representatives, students and farmers to utilize local produce, assuming no other barriers.

Obstacles cited by CNDs that stand in the way of purchasing produce from small local farms include:

* a requirement, real or perceived, that all produce be from GAP (Good Agricultural Practices) Certified farms that have HACCP plans and liability insurance,
* seasonality of local production when schools are in session is not ideal. There is also the preference of schools and children to serve popular fruits such as bananas and grapes, neither of which are grown/sold locally,
* nutrient guidelines required by state/federal government in regards to school menus that has a direct influence on funding,
* a sometimes, once-yearly bidding system that favors large purveyors with multiple sources of produce,
* storage and distribution of produce. Available storage facilities (warehouse, freezer and refrigeration) are different for each WNC school district. Some counties such as Henderson and Yancey have ample refrigeration storage facilities while other counties do not. This is a consideration when determining what type of produce is being considered and the type of processing required,
* extra labor needed to prepare meals from fresh produce rather than canned or frozen,
* and Priority must be given when allotting time and resources to the 57% of students who are on reduced or free meals rather than promoting local foods such as ‘Chefs in Schools’ programs which consume valuable time and resources.

The elephant in the room is really the disturbing cost structure of school lunch programs. The actual cost of a typical school lunch plate, including food, labor and overhead, is $3.34. In addition, in many WNC counties over half of the student population is on federally subsidized lunch plans which only cover about 75% of the cost of the meal. The school lunch program has to make up that difference out of its own budget. Other school meal programs include breakfasts and snacks. Schools are allotted 0.79 for snacks. A snack is defined as a ½ cup serving of a raw fruit or vegetable, a carton of milk, crackers or juice.

Many of the fruits and vegetables being served on school menus could be purchased locally and processed at BRFV. Items such as frozen squash, peppers, broccoli, applesauce, tomato sauce, and vegetable soup bases could be processed and frozen. These items could be served as a vegetable at lunch, topping for pizza, salad bar items, or base for soup.

Sadly, the costs to grow and process these items locally, averages more than four times as much as the same products being purchased now by the school systems from large distributors such as Sysco, Carolina Produce, Foster Caviness, and JMJ Tomatoes.

It must be noted that production costs for all of these products is significantly higher per unit than what schools currently are paying their wholesale distributors. On average, the schools are paying just over 4 cents per ounce for canned and frozen vegetables and fruits such as applesauce and green beans. Those same items, grown locally, sold to BRFV then processed and frozen, cost, on average, 18 cents per ounce. Even with improved processing equipment and additional freezer capacity that we have put into place, BRFV is not able to achieve the economies of scale of large processors who process thousands of pounds of produce per day. Small, local farms in our region do not have the production capacity (or have other, more lucrative markets) to supply the produce at a price that makes it feasible to process and sell to the school systems.

**WNC Child Nutrition Directors Interviewed**

Christina Dodd, Henderson County, 828-891-6310

Lynn Deyton, Yancey County, 828-682-6101 ext.321

Lori Moore, Rutherford County, 828-288-2200

Allison Francis, Haywood County, 828-627-1150

Mary Butler, Polk County, 894-3051

Karen Kephart, Cherokee County, 828-837-2788, ext. 5

Barbara Wood, Clay County, 828-389-6332

Beth Palien, Asheville City Schools, 828-350-6171,

Lynette Vaughn Hensley, Buncombe County, 828-255-5932

Caroline Barton, Transylvania County, 828-884-6173 ext. 377 **Appalachian Grown:**

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### Section 5

**Farm to School in Rural Communities**

*Molly Nicholie*

You may not think children from Madison County, which has abundant farmland and a rich agricultural history, would need field trips to learn about farms in their community. The farmers hosting field trips as part of *ASAP’s Growing Minds Farm to School Pilot Project* didn’t think so either and didn’t know if they could offer anything new to these country kids. But they certainly did. “This kinda feels like farm’n,” a third grader from Brush Creek Elementary told a classmate as they pulled corn and stacked fodder at Double Tree Farm.

While these rural students see farms out their back doors and may even come from a family of farmers, they suffer from the same disconnect from food as many urban children. In rural counties of western North Carolina, children have been encouraged to move off the farm for generations because of the risk, hard work, and poverty associated with subsistence farming. Moving into factory or other off-farm jobs, young families today are losing many of the skills and connections with food and community that come with family farming. For students at Brush Creek Elementary, it is mostly Mamaw or Papaw who still grow and preserve food from the garden, and there are fewer families that have the skills to prepare fresh, healthy meals at home. For these same students, childhood obesity continues to rise, along with a disconnect from fresh food and farms in their community.

Appalachian Sustainable Agriculture Project’s (ASAP) Farm to School program strives to provide children with access to fresh local food, while creating positive experiences around fresh healthy food. Local food in schools in one component of this program that is complemented by educational experiences that reconnect children to fresh food and farms in their community. These experiences including farm field trips, cooking with local products, and school gardens.

Madison County Schools has been at the forefront of Farm to School purchasing in western North Carolina. With support from the superintendent and the infrastructure in place for farmers to expand, Madison County Schools began incorporate local fruits and vegetables into their school cafeteria menus in 2004. With 54% of students at Brush Creek Elementary eligible for a free or reduced lunch, this was seen as an opportunity to provide all students with access to fresh healthy products sourced from their own community. But they were unsure, would they eat it?

**Will They Eat It?**

“Will they eat it?” is a question that comes up repeatedly when there is talk of increasing access to fresh, healthy food. The experience of ASAP, educators, chefs, farmers and community members involved in Farm to School programs is yes. If children have had positive relationships with fresh local products, grow food themselves, visit farms and see food growing, cook themselves, or otherwise have positive experiences with these foods, they will “eat it.” But, like any nice idea, there is always the question of proof. As part of a Southern SARE Research and Education grant, ASAP wanted to examine how experiences such as farm field trips and cooking what students saw growing on the farms might impact attitudes and behaviors. Would positive experiences with local food and farms help change attitudes or even behaviors toward fresh foods?

Brush Creek Elementary is a kindergarten through 5th grade school and the second largest elementary school in the district with a population of approximately 450 students. This elementary school was selected to participate in this project because it seemed the most representative in terms of school district and state comparisons. The project began with the selection of seven teachers ranging from first to third grade in the spring of 2008. Teachers were selected based on interest to maximize involvement and therefore potential impact. Teacher’s interest in the project stemmed from personal experience and health promotion, but more so an interest in engaging students in experiential learning tied to their curriculum and community.

Beginning in the fall of 2009, classes visited a range of local farms within their county: from mixed produce to goat cheese producers. Hands-on experiences included milking goats, feeding animals, shelling and grinding corn, helping in the fields, and harvesting tomatoes, carrots, rhubarb, corn, beets, peas, squash, sorghum, and potatoes. Students were able to hear first hand from farmers in their community and observe cheese making, farm machinery, horse driven equipment, molasses making, bees, and authentic days on a working family farm. First graders learned about the life cycle and basic needs of animals visiting a goat dairy. Second graders read food- and farm- related books and wrote about their experiences. Third graders learned about the changes in farm technology through visiting a “horse powered” farm. Teachers used these field trips as opportunities to tie in math, art, science, social studies, and language arts. While offering real life context for learning, these field trips also offered connection to the county’s agricultural heritage. Saving seeds, grinding corn, keeping bees, and making molasses are all rich traditions in Madison County.

Following the field trips, each class had the opportunity to cook with what they saw growing on the local farm the next day. Area chefs and ASAP staff provided the opportunity for every child in the class to participate in preparing dishes from salsa and goat cheese tacos to carrot beet salads, featuring local ingredients. In addition to being positive experiences for participating children, parents and teachers also benefited. “*Goat cheese was such an awesome experience*,” first grade teacher Chastity Shelton shared. This was the first experience she had trying it herself.

In addition to classroom-based activities, there was an effort to connect educational components with the Brush Creek Cafeteria. Guidance counselor Jennifer Fore helped coordinate two school wide tastings with the support from ASAP staff and volunteers. Cherry tomatoes were the first taste test item, highlighting two types of local tomatoes that were being served as part of the lunch menu. Third grade students participating in field trips and cooking classes were brought in to help “administer” the taste test. Wearing clip on ties and brandishing foe silver trays, students offered schoolmates yellow pear and red grape tomatoes. After sampling one of each, another student “interviewed” participants about which they preferred. Connecting to social studies, students then voted for which tomato they liked best and received an “I voted” sticker donated from a local polling site.

**Evaluation**

In an attempt to measure changes in attitudes and behaviors, an outside evaluator developed a survey tool to measure awareness, attitude, and preference for a range of fresh fruits and vegetables. Pre-tests were given to participating students, as well as a control group of fourth grade students, before activities began in the fall 2008. ASAP staff then worked with teachers to develop and implement pre/post classroom activities related to a farm field trip, followed by a cooking class featuring what students saw growing on the farm. ASAP was disappointed with the student pre/post fruits and vegetables survey as a measurement tool. Not because it failed to show changes in awareness, attitudes, or preferences, but because it was not customized to the Farm to School experiences it was suppose to be measuring.

Teacher focus groups and parent surveys conducted in the spring of 2009 seemed to be a more beneficial measurement, but unfortunately not quantifiable. Teachers observed that students both tasted new foods and enriched their understanding of the local food system. Parents reported observing changes in their children as a result of the Farm to School activities, which included looking for tasted food at supermarkets and wanting to cook more. Teachers expressed their belief that the activities made a big impact on students, including their willingness to try new foods and awareness of how much work goes into farming. One student said, “I like spinach today,” reported 3rd grade teacher Kari Schubauer. “They’re learning where food comes from and taking pride in cooking.”

“My non-vegetable eating child came home saying he loved kale!” reported one parent. “My daughter bragged about eating fresh veggies at the farm and she tried more raw veggies at home after the farm trip,” reported another. Multiple families commented on their children being more willing to try new things and their new interest/excitement in cooking.

**Barriers and Support**

One of the components of this project that made it successful was ongoing support from ASAP staff, as well as a non-classroom teacher at the school. Jennifer Fore, a school guidance counselor was able to help coordinate classroom and school wide activities, providing support to teachers as well acting as a point person. Teachers are often so overwhelmed with schedules and requirements that it often takes outside encouragement and support to get them involved in these types of Farm to School activities. This was also true for the school wide tastings. While these were very popular among teachers, staff, and students, they are difficult to implement without outside input of time.

Coordinating local chefs to provide cooking classes was a more difficult component of this project than expected. This was made more difficult because the school was located in a rural area, a minimum of a half hour drive from most restaurants. ASAP has since developed a more formalized Chef to Schools program that matches area chefs and volunteers with teachers and schools interested in providing positive experiences preparing fresh local products?.

Teachers communicated that barriers for them continuing with farm field trips included cost and not knowing what farms were open and accessible for school field trips. Based on this feedback, ASAP has created a farm field trip mini-grant program for schools in the Southern Appalachian Region and “The Hayride,” a resource for educational farm field trips that includes practical planning information for teachers/schools and a county-by-county directory of farms that welcome school groups. The first edition of this guide was made available in print and online for the 2009-2010 school year.

**The Next Step**

In the fall of 2009, all participating teachers received funds to purchase classroom materials to advance Farm to School activities. Teachers used these funds on materials like food- and farm-related children’s books and garden supplies and worm bins. One teacher used her funds to go on another farm field trip. The hope is that participating teachers will continue to integrate Farm to School component into their classes as a result of these experiences and resources. While this study did not statistically prove that Farm to School activities impact children’s attitudes and behaviors toward fruit and vegetable consumption, children had positive experiences with fresh healthy food and successfully began to rebuild connections with fresh food and farms.



### Section 6

***Appalachian Grown*: Farm to School Project**

**2009 Education Evaluation Report**

Rita & John O’Sullivan

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919/414-9863

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This report summarizes the external evaluation of Appalachian Sustainable Agriculture Project (ASAP)’s*Appalachian Grown: Farm to School Project* funded by the Southern SARE Research and Education grant. This project has two primary programmatic objectives: (1) to research and assess existing and potential market conditions for Farm to School (F2S) in Western North Carolina and (2) to conduct outreach, education, and training to new farmers interested in accessing this market and to child nutrition directors interested in sourcing locally grown food for schools. As part of the external evaluation O’Sullivan & Associates evaluators met with ASAP project team members to review the project goals and revise the project’s logic model (see Appendix A).

A component of Objective 2 was to examine the impact of Farm to School related educational activities, including farm field trips and cooking classes, as part of ASAP Growing Minds Farm to School Pilot Program. O’Sullivan & Associates was tasked with helping to evaluate this activity, taking place between fall 2008 and spring 2009, to determine the extent to which activity outcomes (i.e., positive change in children’s & teachers’ perception about food & food systems) and impacts (i.e. improved children’s eating patterns and increased interest in eating local foods) were achieved.

Madison County was identified as the school district to participate in the study, because the School District Superintendent is supportive of Farm to School and the schools are currently using local foods in their cafeterias. Previous ASAP education activities in schools have focused on the elementary levels and so the decision was made to build from the curriculum already in place and conduct the activities at the elementary level. To intensify the impact of farm to school programming and increase the likelihood of achieving measurable outcomes, the decision was made to focus programming on one of the four elementary schools in Madison County- Brush Creek Elementary.

Brush Creek Elementary is a kindergarten through 5th grade school and the second largest elementary school in the district with a school population of approximately 450 students. The school seems the most representative of the four in terms of district and state comparisons. Brush Creek Elementary was also selected because is that it had the lowest teacher turnover rate, which will likely allow more continuity of teachers through the 2008-09 academic year.

The following evaluation questions were used to examine the impact of Farm to School related educational activities:

* To what extent did the program contribute to participating children’s improved eating patterns?
* In what ways, if any, did the program contribute to increased interest in eating local?

To gather data to inform the answers to these questions, a Teacher Focus Group was conducted (see Appendix B for the protocol) and Parent Surveys were sent home (see Appendix D for a copy of the survey).

In addition a Student Pre/Post Fruits & Vegetables Surveys were administered (see Appendix C for a sample copy of the survey) as part of a cross-over randomized field trial, with half the teachers who volunteered to have their classes participate doing so in the fall and the remaining classes experiencing program activities during the spring semester. This design required that teachers survey their students’ food awareness and preferences at the beginning and end of each semester. In this manner it would be possible to compare immediate pre-post changes among the students as well as group comparisons.

**Overview of Findings for Growing Minds Farm to School Pilot Program**

While there was a quantifiable changes in student eating patterns, the ASAP Growing Minds Farm to School Pilot Program was viewed as a success by teachers, students, and parents. Key findings:

* To what extent did the program contribute to participating children’s improved eating patterns?
* In what ways, if any, did the program contribute to increased interest in eating local?

1. Teachers observed that students both tasted new foods and enriched their understanding of the local food system; they also easily found ways to integrate the Farm Visit and tasting into their lesson planning as part of their grade level standard course of study.
2. Parents were very aware of the Farm to School activities and were very positive about them; they reported observing changes in their children as a result of the activities which included looking for tasted food at supermarkets and wanting to cook.
3. While the Student Pre/Post Fruits & Vegetables Survey is a promising data collection instrument, no differences were found between pre and post testing.

The rest of this report summarizes each of the data collection activities, starting with the Teachers Focus group, followed by the Parent Survey results and Student Pre/Post Survey results. The extent to which these findings may impact the farm to school market or goals/objectives of the grant is difficult to determine. Certainly the connection between the school and participating farmers was strengthened by the visits, and activities led by local chefs created new enthusiasm about cooking fresh foods. The sustainability of the effort was questioned by teachers in the final spring focus group; they were not yet ready to assume responsibility for initiating or coordination the visits. It might be another year of exposure is necessary.

**TEACHER FOCUS GROUP SUMMARY, MAY 2009**

A focus group was conducted by external evaluators, Rita and John O’Sullivan (O’Sullivan & Associates) at Brush Creek Elementary School, Madison County North Carolina with teachers who participated in Farm to School activities that occurred during the 2008-09 academic year. Molly Nicholie from ASAP also was present. Educators participating in the focus group were: Chastity Shelton (1st grade teacher); Nicole Norton (2nd grade teacher); Kari Schubauer, Robin Bishop

and Susan Ball (3rd grade teachers), and Jennifer Fore (School Counselor). With permission of the participants, the conversation was taped. It lasted from about 3:15 pm until about 4:30 pm.

The conversation with the teachers began with a recollection that the original design for the first year of the program was to have focused exclusively on 3rd grade classrooms. Teachers’ interest in the program, however, broadened participation to include 1st, 2nd, and 4th grades in addition to 3rd grade. Complementing the farm visits was a school wide tasting activity. During lunch periods cherry tomatoes and apples from a local farm were brought to school and the children were asked to do a taste test, using stickers to vote for their favorites.

All teachers followed the program implementation sequence, which included a) a preparatory lesson before the Farm Visit, b) the Farm Visit, c) a Follow-Up Cooking Event, and d) a Follow-Up Lesson. As Farm Visits varied in terms of location and time of year, the nature of the program-related activities varies accordingly. For example, one 3rd grade class visited a farm, saw bees, and tasted honey. Another class visited a goat farm and tasted goat cheese. Another class visited an organic farm and dug potatoes, picked squash, ground corn meal.

Focus group questions are listed below with summaries of teachers’ comments by questions. Direct quotes are italicized.

1. Tell me about the activities you did with your students around Farm to School this year.  What classroom activities did you do?  How was the field trip? How did the survey go?

“*Goat cheese was such an awesome experience*.” shared first grade teacher Chastity Shelton. Some of the teachers themselves had never tried it before and found it to be wonderful. They had a first tasting at the farm and then even cooked with it the following day at school. One of the chefs brought aprons for all the kids and had them working on getting the food ready. They started out cautious but became actively involved. One of the kids had her parents looking for goat cheese in the supermarket because of her experience.

Nicole Norton, 2nd grade, built on the farm visit by using the 4-H egg embryology process and bringing it into the class. She had the students hatch eggs and feed the chicks. Another class had the children write stories about the visits and the tasting. Those stories were then displayed in the hallway.

One of the farms visited was organic vegetable producer, with a few animals. Students dug potatoes, picked squash, ground corn meal, and then baked corn bread from the ground corn meal.

Before their farm visits, two of the third grade teachers talked about draft animals as part of a social studies activity. One of the teachers had students predict what farmers would look like as a writing activity. During their visit they observed sorghum cane and winter squash; they talked about the need to use outhouses. Afterwards they made coleslaw from cabbage and sprouted seeds.

Another class integrated their Farm to School experiences into language arts by writing thank you notes for farmers and a beekeeper that visited the school.

“*It was easier to teach the first grade science “organism” after the visit*” commented teacher Chastity Shelton.

2 & 3. What do you think the students learned from the activities, including the taste test?

Teachers believed that the activities made a big change in children’s attitudes and behaviors towards local food and farming. They identified that students were encouraged to taste new foods. One student said, “I like spinach today.” Other students became more aware of where produce in grocery stores comes from. Another teacher offered that students became more aware of how much work goes into farming. Another teacher said that her students became aware of not killing “good” bugs.

1. How, if at all, would you improve the process for next time?

“A number of teacher comments addressed what and who should be included in the experiences. These suggestions included: expanding the school wide food tasting with a connection to the school cafeteria, adding in the cafeteria more, having something different in cafeteria on a special day. Teachers also talked about parents attending the farm visits. One observed that there is always a challenge with parents and wasn’t sure if fewer should come on the trips or more. Another teacher observed that smooth participation depended on parent preparation without that sometimes parents could make the trips more not less complicated. Another teacher commented that parents need to be part of it or it won’t happen.

Teachers also talked about how the program could be tied right in with the curriculum and wondered if there was time to do more. One suggestion was to do some soil samples at farms. Another suggestion pointed to doing some fractions and bar graphs with tasting. Yet another teacher said that knowing farms/opportunities was a big help in planning curriculum related activities.

In terms of logistics and facilities: “Not having kids on the ground eating lunch” was one observation. Some parents wanted picnic tables for lunch. Bathrooms were an issue at one site. One group went to two different places and neither one had bathroom facilities - a local gas station helped out but it was a long time for the children.

Another question raised was should the focus be on Madison County farms or better farms further out? Some teacher thought that Madison County was the best choice. Many students and parents hadn’t seen the farms in their county.

1. What support, if any, would you need to continue with these activities?

SUPPORT IS NEEDED. Help is needed in terms of a school-wide or other person to set up the details and follow up. The trips also cost something and need to be supported after grant funds run out. It might be possible to plug into some of the schools funds. Farmers currently receive $100 for their time and involvement (approximately $5.00 per kid) + mileage + driver. The chefs volunteered their time and food. Maybe the person coordinating could be part of the High School Cadet Ed program or a Mars Hill College Education student. They could establish a list of the farms that work in terms of the visit, establish a relationship with the farm and chefs; then take over the running of the program on a regular basis. The Coordinator would be the go-to person at school. This year it branched out of guidance because of the way it developed, and Jennifer (guidance counselor) was able to provide leadership of the school wide program.

1. How might the program be expanded?

Next year Molly Nicholie from ASAP can continue with the project. It won’t be possible to track students, as they will be all shifted around. The thought is to organize another 6-7 class field trips at $100/class. The School had started a garden and there was discussion about how that fit with the program. Support was needed- first to finish the garden beds- timbers were used for three beds and another one is needed. The garden also needed soil for the beds. Perhaps a master gardener with tools could be found.

1. Is there anything else you’d like to say?

*It important that local recipes be remembered, as people are not cooking as much.*

*Students are learning vocabulary from the experience.*

*Really great experience for the kids.*

*They’re learning where food comes from and taking pride in cooking.*

*There were many advantages for parents, bus drivers, and interest.*

### Section 7

**Farm to School Project**

**Parent Survey Summary – May 2009**

*Rita & John O’Sullivan, O’Sullivan & Associates*

During the Spring 2009 semester the parents of children who had participated in Appalachian Sustainable Agriculture Project’s (ASAP) *Appalachian Grown: Farm to School Project* were asked to complete a survey about their children’s participation. The purpose of the survey was to find out if parents had heard about the Farm to School activities of their children, and if they did, what they thought about them. A copy of the survey is appended to this report. Program developers were hoping to expand the program and want to hear from parents about this component. As an incentive, the class that had the greatest number of surveys returned received a $50 gift card to use for the future Farm to School activities.

Number of Parent Surveys Returned Per Class (n=54/XXX):

Ms. Ball: 18

Ms. Bishop: 16

Ms. Peterson: 9

Ms. Schubauer: 11

1. Which, if any, of the following activities did you child(ren) tell you about this semester (check all that apply):

Farm Visit 53/54

Cooking Class 40/54

Teacher-led Food Lessons 20/54

Food Tasting at School 42/54

2. If you’ve heard of these activities how would you rate them? (If not, go to question 3):

Excellent 35/53 Good 17/53 Fair 1/53 Poor

Rating Explanations for “Excellent” (27/35 commenting). The one parent who rated the activities as “Fair” did not provide an explanation.:

**Science Curriculum Enhancement (12 comments):**

* Instructor did a good job helping the kids understand the origins of our food and the many steps from seed to product
* My child was very excited to see how things were grown.
* They stimulated his thinking
* A lot of information
* My child enjoyed learning how different fruits and vegetables were grown
* My son enjoyed very much and explained in GREAT detail what he learned
* I think its wonderful for our children to learn where our foods come from and how to prepare foods.
* Its excellent because it expands the knowledge of the children
* Teaches kids how to live off the land. They need to know how to grow a garden. Vegetables would be part of their daily diet.
* Children often forget their food comes from.
* I think its great for children to learn where food comes from, especially since this county once produced a large number of crops and families grew their own food.
* I think it’s great for the kids to learn where their food comes from. Some of them don't have gardens at home.

**Tasting New Food (11 comments):**

* He tasted rhubarb for the first time. He also liked the tacos.
* He was very scared about trying new items he hadn't ate before - and surprised when they were good to eat.
* My non-vegetable eating child came home saying he loved kale!
* Taught to try new things
* He wasn't crazy about tasting the foods but it was a great activity.
* She also liked trying new fruits
* He tried new things that without having tasted them at school he probably wouldn't have had the opportunity
* She tried more raw veggies at home after the farm trip.
* My son was so excited about cooking and eating new things in class. Since then he tries more types of food.
* They also need opportunities to try different foods.
* Also, students don't know if they will like a food unless they taste it.

**Enhanced Student Excitement & Enjoyment (7 comments):**

* He came home excited about the activities.
* My child had only good and exciting things to say about all his experiences
* My son talks about what all he has got to make at school
* My son enjoyed very much and explained in GREAT detail what he learned
* My daughter enjoyed these projects and bragged about eating fresh veggies at the farm. She tried more raw veggies at home after the farm trip.
* My daughter enjoyed these projects
* My son was so excited about cooking and eating new things in class. Since then he tries more types of food.

**Farm Visit (5 comments):**

* My son enjoyed the farm experience.
* My son loved the farm and the horses, especially digging potatoes.
* Farm visit
* My daughter bragged about eating fresh veggies at the farm
* My daughter enjoyed learning about farm picking potatoes

**Hands-On Nature of the Activities (5 comments):**

* My son learns a lot from hands on type lessons
* My child has really enjoyed the hands on this year, and learned a lot.
* Hands on experience
* Allowed him to experience multi-instructional learning opportunities
* I think being able to experience new things in a hands on project is the key to everyday knowledge that is less likely to be forgotten.

**Cooking (2 comments):**

* He ask all the time if he can help cook now.
* Cooking class

**Special Needs Accommodation (1 comment)**

* My child has special needs and I was glad that the farm chosen was wheel chair accessible

**General Explanations about Activities (6 comments):**

* I think we should be given more activities like these.
* I can't say enough good things about his experience this year. Thank you.
* The food was awesome
* I went with the children to the farm and really enjoyed it.
* This is a great program and I love that our school participates in this!
* Great experience

3. Differences noticed by parents recently in how your children eat or thinks about food:

|  |  |
| --- | --- |
| **DIFFERENCES NOTICED** | **Number** |
| Wants to help cook more often | 37 |
| More likely to try new vegetables | 23 |
| Is more interested in where food is grown | 20 |
| More likely to try new fruits | 19 |
| Wants to help more with your garden | 18 |
| Asks more often to eat fruits | 16 |
| Wants to start a garden | 13 |
| Asks more often to eat vegetables | 12 |
| Asks more often to visit a Farm | 7 |
| Asks to visit a Farmers Market | 1 |

Other Comments about Differences Noticed

|  |
| --- |
| * Daughter has always loved helping with garden and cooking though |
| * No. He has always been intrigued by gardening, cooking and loves to eat all fruit. |
| * Already loves fruits and veggies and we already have a garden and my child helps with it |
| * Notices different kinds of fruits and vegetables in the grocery store. |

1. Children’s impacts on how families eat or think about food:

|  |  |
| --- | --- |
| **IMPACTS OF CHILDREN ON FAMILY** | **Number** |
| Eats fruit more often | 16 |
| Eats vegetables more often | 15 |
| Cooking more | 15 |
| More likely to try new fruits | 12 |
| More likely to try new vegetables | 11 |
| Interested in starting a garden | 11 |
| Is more interested in where food is grown | 7 |
| Visits a Farmers Market more often | 3 |

Other Impacts on Family

|  |
| --- |
| * Great experience thank you. |
| * No, we have always cooked garden items and went to produce stands. |
| * You have to understand that my child is, and always has been, very restricted in his preferences. However, he has made comments about how healthy we eat and started drinking milk more because of what he was told in class. In time, I think he will be more open to other changes and I appreciate he's hearing this from other sources than his parents. |
| * We try to eat vegetables every night. We grow our own garden every year. Maybe my child will be more interested in helping out. |
| * My son encourages his older brother to eat more veggies. |
| * We already instill local grown values and awareness of food. |

1. Other activities Parents suggested could be done to help your children learn about good food:

|  |
| --- |
| * + School garden (6) |
| * + Maybe offer a local "school farmers market day" where the children might be able to bring things their families have grown or made to sell - perhaps as a fundraiser for the school |
| * + Let them bring vegetables and farm our garden. |
| * + Try different recipes to help the children find ways that they like different fruits and vegetables |
| * + Visit a potato farm - the kids especially excited about finding food underground. Visit a chicken/egg farm where kids can learn about both local/good health issues and welfare of animals (as opposed to caged/factory raised chickens) |
| * + Do more taste test on foods. |
| * + Maybe explain more about non-local food. The costs of transport, differences in growing, the time involved of shipment, storage, etc. "vine ripe" vs. "truck ripe". |
| * + Visit farmers' market. |
| * + Other food projects at school and get more parents involved. The kids love it!!! |
| * + Keep serving local grown products for lunches. |
| * + More hands on |

**Thank yous:**

|  |
| --- |
| * I think the programs seem good enough |
| * I think his teacher has done an outstanding job. I feel sure if anything else could be thought of, she already has done it. Thanks again. |
| * I think you all are doing a great job and your ideas are good ones! |
| * My child comes home every day being able to tell me of the new things that he has learned. I think that his teachers are doing a great job in teaching him new things. |

**Growing Minds Farm to School Program Parent Survey**

Dear Parents,

This semester your child(ren) participated in the Growing Minds Farm to School Program (part of the Appalachian Sustainable Agriculture Project). We would like to find out if you heard about those activities and if you did, what you and your children thought about them. We’re hoping to expand the program and want to hear from you. Thanks in advance for your help. Please note that the class that has the greatest number of surveys returned will receive a $50 gift card to use for the future Farm to School activities. If you have any questions about the program please contact: Molly Nicholie at 828-236 or [molly@asapconnections.org](mailto:molly@asapconnections.org)

Your child(ren)’s Teacher(s) this year:

🞎 Ms. Ball

🞎 Ms. Bishop

🞎 Ms. Peterson

🞎 Ms. Schubauer

1. Which, if any, of the following activities did you child(ren) tell you about this semester (check all that apply):

🞎 Farm Visit

🞎 Cooking Class

🞎 Teacher-led food lessons

🞎 Food Tasting at school

2. If you’ve heard of these activities how would you rate them? (If not, go to question 3):

🞎 Excellent 🞎 Good 🞎 Fair 🞎 Poor

Please explain your rating:

3. Have you noticed any difference recently in how your child(ren) eats or thinks about food? (check all that apply)

🞎 More likely to try new fruits

🞎 More likely to try new vegetables

🞎 Asks more often to eat fruits

🞎 Asks more often to eat vegetables

🞎 Asks more often to visit a Farm

🞎 Asks to visit a Farmers Market

🞎 Is more interested in where food is grown

🞎 Wants to start a garden

🞎 Wants to help more with your garden

🞎 Wants to help cook more often

Other (please explain):

4. Has your child(ren) had an impacdt on how your family eats or thinks about food (check all that apply)

🞎 More likely to try new fruits

🞎 More likely to try new vegetables

🞎 Eats fruit more often

🞎 Eats vegetables more often

🞎 Visits a Farmers Market more often

🞎 Is more interested in where food is grown

🞎 Interested in starting a garden

🞎 Cooking more

Other (please explain):

5. What other activities do you think we could do to help your child learn about good food?

THANK YOU FOR YOUR TIME AND THOUGHTS!

STUDENT PRE/POST FRUITS & VEGETABLES SURVEY

As part of the evaluation, external evaluators consulted with program staff to develop an assessment that might capture three dimensions: changes in students’ food awareness, tastings, and likes. As the assessment was to be given to students in kindergarten through 5th grade, the decision was made to make the assessment as picture driven as possible. The U. S. Department of Agriculture website was consulted and the 25 most popular fruits and 25 most popular vegetables were identified. Some modifications to the lists were made based on local food availability. Next pictures were gathered to represent these foods (see Appendix D for a sample survey page). While it was the intention to print the survey with the pictures, cost of printing color pictures was an issue at the time, so teachers receive pictures of the foods and shortened surveys without pictures. Pre-assessment results were encouraging in that most common fruits and vegetables were echoes on the survey. Similarly, food awareness was higher than foods tasted, which was higher than food likes.

When pre-assessment were compared with post assessments (which are summarized in the following two pages), however, no appreciable differences were found. Part of this could be due to lack of matched pairs between pre and post assessments. This is to say that evaluators were not able to pair students who completed the pre assessment with their post assessments. Another possibility might be that the younger students’ results were less reliable than that of the older students. Finally, as students engaged in only one Farm visit with one follow-up cooking event, it’s possible that the assessment was not sensitive enough to pick up changes in students eating habits. Given the lack of pre-post differences for the treatments students, no other analyses were completed comparing students in the program to the 4th graders who did not.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Fruits: | I have seen this  cartoon eyes | | I have tasted this  kideatting fruit | | I like this  smiley | |
|  | Pre Post | | Pre Post | | Pre Post | |
| 1. Apple | .99 | 1.00 | .98 | .99 | .98 | .98 |
| 2. Banana | .98 | .98 | .97 | .98 | .95 | .89 |
| 3. Blackberry | .98 | .94 | .96 | .87 | .94 | .77 |
| 4. Blueberry | .98 | .97 | .92 | .92 | .89 | .81 |
| 5. Cantaloupe | .97 | .98 | .92 | .91 | .83 | .81 |
| 6. Cherry | .95 | .99 | .89 | .93 | .79 | .74 |
| 7. Concord Grapes | .91 | .87 | .86 | .84 | .83 | .77 |
| 8. Fig | .60 | .61 | .48 | .43 | .43 | .36 |
| 9. Grapefruit | .85 | .90 | .79 | .82 | .73 | .65 |
| 10. Green Grapes | .98 | .99 | .95 | .98 | .95 | .96 |
| 11. Honeydew | .69 | .67 | .56 | .55 | .53 | .47 |
| 12. Kiwi | .85 | .90 | .72 | .77 | .68 | .71 |
| 13. Mango | .80 | .77 | .66 | .62 | .62 | .56 |
| 14. Nectarine | .66 | .60 | .56 | .47 | .52 | .43 |
| 15. Orange | .98 | .99 | .96 | .98 | .93 | .95 |
| 16. Paw Paw | .50 | .35 | .43 | .20 | .38 | .18 |
| 17. Peach | .96 | .98 | .91 | .96 | .85 | .83 |
| 18. Pear | .96 | .98 | .88 | .92 | .74 | .79 |
| 19. Persimmon | .54 | .33 | .41 | .25 | .38 | .18 |
| 20. Pineapple | .95 | .98 | .85 | .90 | .76 | .87 |
| 21. Plum | .87 | .86 | .76 | .73 | .66 | .61 |
| 22. Raspberry | .93 | .96 | .85 | .90 | .81 | .82 |
| 23. Rhubarb | .55 | .50 | .40 | .38 | .37 | .27 |
| 24. Strawberry | .97 | .98 | .94 | .96 | .92 | .92 |
| 25. Watermelon | .99 | 1.00 | .98 | 1.00 | .95 | .95 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vegetables: | I have seen this  cartoon eyes | | I have tasted this  kideatting fruit | | I like this  smiley | |
|  | Pre Post | | Pre Post | | Pre Post | |
| 1. Asparagus | .76 | .70 | .53 | .38 | .43 | .17 |
| 2. Beets | .82 | .81 | .56 | .49 | .41 | .28 |
| 3. Green Bell Pepper | .94 | .92 | .73 | .73 | .62 | .52 |
| 4. Broccoli | .98 | .96 | .85 | .83 | .75 | .65 |
| 5. Cabbage | .98 | .98 | .85 | .85 | .74 | .71 |
| 6. Carrots | .98 | .98 | .94 | .95 | .89 | .87 |
| 7. Cauliflower | .92 | .89 | .79 | .68 | .59 | .48 |
| 8. Celery | .94 | .90 | .77 | .78 | .64 | .54 |
| 9. Collard Green | .69 | .65 | .54 | .41 | .43 | .27 |
| 10. Corn | .98 | .99 | .96 | .98 | .95 | .96 |
| 11. Cucumber | .93 | .95 | .82 | .86 | .76 | .74 |
| 12. Eggplant | .68 | .61 | .44 | .50 | .38 | .15 |
| 13. Green Beans | .97 | .98 | .90 | .91 | .83 | .77 |
| 14. Kale | .55 | .38 | .37 | .20 | .34 | .14 |
| 15. Lettuce | .97 | .95 | .88 | .91 | .83 | .86 |
| 16. Okra | .78 | .65 | .59 | .50 | .49 | .32 |
| 17. Peas | .95 | .94 | .82 | .83 | .65 | .59 |
| 18. Potato | .98 | .96 | .95 | .95 | .89 | .92 |
| 19. Pumpkin | .98 | .98 | .82 | .86 | .73 | .81 |
| 20. Red Bell Pepper | .91 | .89 | .61 | .68 | .46 | .46 |
| 21.SummerSquash | .90 | .86 | .73 | .71 | .56 | .45 |
| 22. Sweet Potato | .97 | .97 | .81 | .80 | .63 | .56 |
| 23. Tomato | .98 | .99 | .83 | .89 | .69 | .74 |
| 24. Winter Squash | .69 | .71 | .46 | .45 | .43 | .34 |

**Phone Survey**

**FARM TO SCHOOL PROGRAM SHORT SURVEY**

The Appalachian Sustainable Agriculture Project is conducting a survey of farmers in Western North Carolina. The survey is designed to collect information on prices received and costs of participation on Farm to School programs in the region. All individual information will remain confidential and only be used to arrive at survey totals.

1. Where did you sell products in 2009? From the following table, indicate what percentages of your products volume were delivered to the following marketing channels:

|  |  |
| --- | --- |
| **Market channels** | **Percentage** |
| School districts through Madison Farms |  |
| Other institutional markets through Madison Farms (e.g., Community colleges, hospitals, etc.) |  |
| Conventional wholesale markets (e.g., conventional supermarket chain buyer, independent broker, etc.) |  |
| Other markets (e.g. direct on farm, farmers market) |  |

#1 100% of total sales are from Madison Farms. 50% of produce goes to the Mission Tailgate Market and 50% to the Madison County Farmers Market.

# 260% of total sales come from Madison Farms. Farmer is unaware of where the produce is sources once sold to Madison Farms. Of the remaining 40% of total sales, 20% is from on farm sales and 20% from roadside stand sales.

#3 100% of product is sold to Madison Farms, but farmer does not know where food is sourced once it sold.

#4 10% of total produce goes to Madison Farm – 100% of that goes to Mission Tailgate Market

#5 35% of total sales was from Madison Farms. Of that 35%, see Madison Farms numbers above. The remaining 65% of total sales were from tailgate market sales.

#6 10% of total produce going to Madison Farm – 25% to Madison County schools, 75% to other institutions. 90% of other produce going to Carolina Organic Growers

#7 50% to Madison Farms – of that, 100% goes to the school district (not in Madison County but in the eastern part of the state). 50% to conventional supermarket buyers (Ingles).

#8 100% of total sales are from Madison Farms. 90% goes to Mission Tailgate Market and 10% to Greenlife (he thinks).

#9 100% sold to Madison Farms. Does not know where food is sourced once it is sold to Madison Farms.

1. Are the average prices received from the school districts (through Madison Farms) higher or lower compared to conventional wholesale markets?

If higher, can you provide a percentage estimate? \_\_\_\_ %higher (or select response below)

If lower, can you provide a percentage estimate? \_\_\_\_ %lower (or select response below)

1. Less than half (lower than 50%)
2. 1%-49% lower
3. Equal price
4. 1%-49% higher
5. 50%-100% higher
6. More than double (higher than 100%).

#1 1%-49% higher

#2 Don’t know

#3 1%-49% higher

#4 10% higher

#5 15% lower

#6 Priced received are identical

#7 15% lower

#8 1%-49% higher

#9 1%-49% higher

Comments.......................

#4 Farmers like me could use help with pricing at market!!

1. Do the costs of selling your products through Madison Farms higher or lower compared to the costs of selling your products to conventional wholesale markets? (Select one response)

If higher, can you provide a percentage estimate? \_\_\_\_%higher (or select response below)

If lower, can you provide a percentage estimate? \_\_\_\_% lower (or select response below)

1. Less than half (lower than 50%)
2. 1%-50% lower
3. Costs are the same
4. 1%-49% higher
5. 50%-100% higher
6. More than double (higher than 100%).

#1 1%-50% lower

#2 1%-50% lower

#3 1%-50% lower

#4 10% lower

#5 10% lower

#6 Costs are the same

#7 Costs are the same

#8 1%-50% lower

#9 1%-50% lower

Comments..........................

#1 “Madison Farms is awesome but totally unsustainable. When the grant money is gone, I’m afraid the farmers will seriously loose the connection. They’re not being empowered or taking part in the bigger picture of running the organization. I love the program though; I would just hate to see it go.”

#2 No comment.

#3 You need to get in touch with Madison Farms for this information.

#4 No comment.

#5 No comment.

#6 No comment.

#7 No comment.

#8 Drawback To Madison Farms operation is quantity. They have a limited ability to move large quantities of a particular product.

#9 No comment.

### Section 8

**Analysis of School Food and Local Purchasing in Vermont Schools 2003—2004,** Vermont FEED: Food Education Every Day, December 2004

With the growth of Farm to School programs nationwide, there is a feeling that the economic and financial feasibility of such programs deserves further analysis. Questions arise such as: Can schools afford to buy local products? Are there other perceived or real barriers to local purchasing? Is selling to local schools economically viable for farmers and local producers? This economic analysis was conducted by Vermont Food Education Every Day (VT FEED)—a community-based approach to school food system change collaboratively developed in 1999 by three Vermont nonprofits: Food Works, Northeast Organic Farming Association of Vermont (NOFA-VT), and Shelburne Farms. VT FEED’s mission is to work with schools and communities to raise awareness about healthy food, the role of Vermont farms and farmers, and good nutrition. The VT FEED program has acknowledged the importance of answering critical questions listed above, and with this analysis, has embarked on an initial survey of current and potential school food purchasing practices in Vermont. <http://www.farmtoschool.org/files/publications_234.pdf>

**Bearing Fruit: Farm to School Program Evaluation Resources and Recommendations**, Anupama Joshi and Andrea Misako Azuma, Center for Food & Justice, Urban & Environmental Policy Institute, Occidental College, National Farm to School Network,

This publication provides guidance on how to evaluate the farmer impacts of a Farm to School program. Farmer impacts can include profitability, the number of farms participating in a program, and how participation in a Farm to School program impacts aspects of a farm’s production, processing, or marketing activities. It contains a summary of nine different reports that evaluated farmer impacts of Farm to School programs. Also included is an example of a survey of fruit, vegetable, and nut producers. <http://departments.oxy.edu/uepi/cfj/bearingfruit.htm>

**Crunch Lunch Manual: Farm-to-School Case Study**, Renata Brillinger, Jeri Ohmart and Gail Feenstra, UC Sustainable Agriculture Research and Education Program, March 2003

This publication provides brief information on the farmer financial viability of Farm to School programs, focused mostly on salad bar programs. An original goal of the Davis, CA school district program was to create a viable alternative direct marketing opportunity for small local farmers. However, the program has not yet proved to make a significant difference. Farmers stated that the extra income derived from the farm- to-school program was almost too insignificant to calculate. <http://www.sarep.ucdavis.edu/cdpp/farmtoschool/crunchlunch32003.pdf>

**Direct Marketing to Schools — A New Opportunity for Family Farmers**, Jeri L. Ohmart, UC Sustainable Agriculture Research and Education Program, July 2002

This case study—part of a larger study on direct marketing techniques used by small farmers—focuses on the experiences of six farmers in California who have participated in farm-to-school farmers market salad bar projects. The primary reasons farmers offered for their participation in the program are philosophical rather than practical ones. Interviewees felt it was crucially important that the general public become more aware of the origins of their food, how it is grown, how it is processed and the health benefits of fresh, organically and sustainably produced food. The Farm-to-School program is seen as an ideal avenue for making inroads in educating the general public by educating children. Another attraction to the program for farmers is its potential to significantly increase farmers' direct marketing opportunities if it were instituted in all schools in a district. Farmers were hopeful that the program could mean a reliable market for small, local, organic farmers and could prove to be a viable and regular source of income for them. Another essential component of the program is the link between schools and local farmers markets. The program was designed to enhance the schools' and community's awareness of and participation in the farmers market. <http://www.sarep.ucdavis.edu/CDPP/directmarketingtoschool.htm>

**Do Farm-to-School Programs Make a Difference? Findings and Future Research Needs**, Anupama Joshi, Andrea Misako Azuma, and Gail Feenstra, Journal of Hunger & Environmental Nutrition, Vol. 3(2/3) 2008

A section of this report looked at direct farm sales for four different Farm to School studies. Despite the fact that total and individual sales were modest, most participating farmers were initially enthusiastic about the program. Some also conducted farm tours or classroom educational activities. They tended to see these efforts as a way to create synergy between the educational institutions, agriculture, and community, with the added potential benefit of additional sales through other venues. <http://www.cahpf.org/GoDocUserFiles/504.Farm_to_School_Programs.pdf>

**Farm to School in the Northeast: Making the Connection for Healthy Kids and Healthy Farms. A Toolkit for Extension Educators and other Community Leaders**. Cornell Farm to School Program, NY Farms!, and the New York School Nutrition Association. A project funded by the Northeast Sustainable Agriculture Research and Education Program. May 2007.

This extensive report includes information on the economic potential for farmers marketing to the 21,000 K-12 schools and over 550 colleges in the northeastern states. It discusses the positive economic and social benefits of Farm to School programs. There is an outline of considerations for farmers in selling to schools and colleges and examples provided of systems for keeping track of local purchases and its impact on the local economy. <http://farmtoschool.cce.cornell.edu/files/all/fts_toolkit_oct07_print_version_new_1.pdf>

**Oklahoma Farm-to-School Report**, Oklahoma Food Policy Council (joint project of the Kerr Center for Sustainable Agriculture, the Oklahoma Department of Agriculture, Food and Forestry, and Drake University), January 2004

The content of this report focuses on the results of a survey sent to foodservice buyers at 638 public institutions in Oklahoma (such as public elementary, middle and secondary schools, colleges, universities and correctional facilities) to ascertain their level of interest in purchasing locally-produced foods. Survey questions examined the contractual arrangements most typically used to procure foods at Oklahoma’s public institutions, and the types of food commodities (produce, meat and dairy) most commonly purchased from both local and non-local sources. Researchers also sought to identify the primary issues that either encouraged or discouraged procurement of locally-produced foods by this foodservice segment, and analyzed differences in purchasing behavior and preferences between larger and smaller institutions. Aside from containing an analysis of survey results, the report also contains background information on several successful farm-to-school marketing models, a nutritional profile of Oklahoma residents/households compared to the U.S. average, and a list of food items produced in Oklahoma. <http://www.kerrcenter.com/ofpc/farmtoschool.htm>

**Rethinking School Lunch**, Center for Ecoliteracy, Berkeley, CA, 2004, 165 pages (includes 10 chapters, introductory sections, concluding section, and downloadable financial calculator tool).

This comprehensive web-based guide to enhancing school nutrition in school districts is the culmination of five years of research by the Center for Ecoliteracy and their project partners aimed at identifying the elements necessary to create integrated farm-to-school programs that incorporate nutritional, educational, community development, and environmental goals. One of the unique tools found in the guide’s Finances module is a downloadable financial calculator, which is designed to help food service directors obtain a clearer understanding of their expenses and revenue sources, and more accurately evaluate the financial impacts of incorporating fresh food and onsite meal preparation into school foodservice. The guide may be accessed electronically for free from the Center for Ecoliteracy website at <http://www.ecoliteracy.org/downloads/rethinking-school-lunch-guide>

**The Burlington School Food Project, Final Evaluation Report**, Michele Cranwell Schmidt, Jane Kolodinsky, and Catherine Symans, Center for Rural Studies, December 2006

This report outlines dollar values of fresh produce purchased by the Burlington School District for the academic school years of 2003 to 2006 and the amount purchased from each source (i.e farmer, distributor) as well as the type of produce purchased. All farmers in the program stated that they enjoyed having the opportunity to educate students about their farms, and that the school field trips provided them some direct marketing opportunities. <http://www.uvm.edu/crs/reports/2006/BSFP_finaleval06.pdf>

**FOOD SAFETY RESOURCES FOR FARMERS**

**1) National Good Food Network:** <http://ngfn.org/resources/food-safety>

Why is there so much concern about produce and control of bacteria on produce?

Over the last 10 years Center for Disease Control ( CDC) has reported a doubling of incidents of illness related to food borne bacteria.  [Figures reported in 1999](http://www.cdc.gov/enterics/publications/213-PMead1999.pdf) reflected that 76 million Americans become ill as a result of food borne illness each year, with 325,000 hospitalizations, and 5,000 deaths.  Several major outbreaks in the last few years have been [traced to “ready to eat” bagged, fresh produce](http://www.cfse.purdue.edu/foodprotect/packets/2008Packet/issues/print/III_022_with_attachments.pdf). Media attention to the outbreaks, the scope of illness and human suffering, and FDA’s inability to respond and contain the problem are contributing to concern for the safety of the U.S. food system in general and several fresh produce items in particular.  This situation has also had direct consequences for producers of products which have been implicated in food borne illness outbreaks.

### Good Agricultural Practices (GAPs)

What are GAPs?

Good Agricultural Practices (GAPs) in the United States were developed in the early 1990s originally by Cornell University Extension as a voluntary set of guidelines designed to improve food safety.  GAPs is a system of developing plans, training, and documentation of best practices on the farm to minimize the risk of health problems from products leaving the farm.   In the mid 1990s USDA in cooperation with State Departments of Agriculture began training and certifying producers and packers under GAPs and Good Handling Practices (GHPs).  In 1998 FDA established a single set of federally recognized GAPs and GHPs by issuing a guidance document: “[Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064574.htm).” (<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064458.htm#ch1>)

What is a “guidance document”?

GAPs and GHPs are considered to be “guidance documents”.  Unlike a regulation, a guidance document is not mandatory.  It is a set of recommendations to industry and/or regulators delineating practices which, if followed, ensure those practices are in compliance with regulations.  A guidance document reflects the Agency’s current thinking. The process by which a guidance document is developed is not as lengthy or rigorous as the process of developing a regulation. [FDA’s 1998 guidance document](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ProduceandPlanProducts/ucm064574.htm) has been under review as of its tenth anniversary.

How are GAPs used in the marketplace? Aren’t they being used as a de facto form of regulation by private food purchasers? What is meant by “supermetrics”?

In addition to FDA GAPs, some private parties, including buyers and producer groups, have added requirements onto FDA GAPs.  These additional requirements are often referred to as supermetrics, and are generally audited by private firms.  These supermetrics are required by some buyers to demonstrate that they are so committed to food safety that their requirements go beyond approved guidance documents.  These requirements often place producers at the nexus of conflicting mandates because food safety supermetrics can conflict with conservation and habitat improvement goals that are increasingly important to farms and to the general public.  There is no scientific evidence that the additional requirements of buyer supermetrics increase food safety.  Rather supermetrics seem to make food safety into a marketing issue by allowing buyers to claim that because of their stringent requirements, the food they sell is safer.  As a result of these additional GAPs definitions, and the many different scenarios in which supermetrics can be required by some buyers, producers are often faced with conflicting requirements and the need for multiple audits.  This situation has led to the coining of the term “audit fatigue”.

How do GAPs relate to organic certification?

Organic certification is not equivalent to GAPs certification.  Although the practices of organic agriculture assure that food safety standards are being met on some key areas, the fundamental risk factors addressed in GAPs to minimize introduction of illness pathogens (sanitation, hygiene and water quality) are not addressed by the organic certification process or its supported production practices.  For a detailed description of food safety requirements that are intrinsic to the National Organic Program.

What is the California Leafy Greens Marketing Agreement (LGMA)?

In response to the proliferation of GAPs supermetrics (required by buyers), and in an attempt to reach a single standard for buyer approval for fresh cut greens for fresh consumption, the Western Growers Association has developed the “[LGMA](http://www.caleafygreens.ca.gov/about/lgma.asp)” and promoted it in California and Arizona as an alternative to GAPs.  It is a voluntary agreement, implemented by the California Department of Agriculture.    
There are concerns about the LGMA among many groups as well as by small and mid-size producers. Critics argue that in n the rush to address buyer concerns, and to develop a single solution acceptable to all buyers, this agreement was developed with little involvement of small and medium scale producers, or environmental or consumer groups.  As a result, the current proposal has not identified common ground on requirements related to wildlife habitat management, and conflicts with federally mandated clean water and soil erosion practices. Further, there are no provisions to modify costs or requirements for farms which operate at different scales of production, nor those farms which produce a diversity of crops or include livestock in crop rotations. As a result these groups feel that the LGMA will not support increased sustainability in the food system and will put limits or barriers on small- and mid-size producers.

**USDA inspection under Food Safety Inspection Services (FSIS)**

What is HACCP?

Hazard analysis critical control point (HACCP) is a tool for the evaluation of food processing methods. A HACCP plan looks for specific points in production that can ELMINATE or REDUCE a risk to an acceptable level. Examples of risk reductions steps include heating or cooking to control microbial contamination or interventions to control chemical or physical risk. HACCP is mandated in meat, poultry, seafood, low acid canned food (LACF) and juice and therefore is a regulated system. The HACCP system is verified through a third party audit or  a USDA or FDA food safety officer.  USDA FSIS requires a HACCP plan for each product manufactured in a meat processing plant.  (Definition adapted from Nancy C. Flores, Ph.D. Associate Professor, Extension Food Technology Specialist, New Mexico State University)

**Pending legislation and other regulatory initiatives**

National Leafy Greens Marketing Agreement (NLGMA)

Beginning in 2007, major produce industry groups requested that USDA AMS investigate the creation of a National Leafy Greens Marketing Agreement (NLGMA) along the lines of the California LGMA (see the [proponents web page](http://www.nlgma.org/)). The national effort is being touted as stakeholder based, although smaller industry groups have again (as in the California process) noticed that they have been left out of the process of developing the proposal (see testimony at Monterey LGMA hearings:  [Dave Runsten, CAFF](http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5079853) and [Joanne Baumgartner, Wildfarm Alliance](http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5079741)).  There is reason to believe that the USDA hearing and review process, which will take approximately 2 years, will result in a clear recognition that the Marketing Agreement approach to food safety is not appropriate.  Minimally, the lessons learned in the California agreement will likely be applied to a national version.

**2) Cornell University resources**

Cornell University has developed some very practical resources for farmers on GAP & GHP issues; these are listed on their website: <http://www.gaps.cornell.edu/educationalmaterials.html>

Cornell brochure that provides a simple outline of ‘good agricultural practices’ for farmers in order to prevent food safety issues. <http://www.gaps.cornell.edu/Educationalmaterials/Samples/PamphletEng.pdf>

**3) National Sustainable Agriculture Coalition (NSAC)**

For farmers interested in staying up to date with pending food safety legislation, this website would prove beneficial to visit on a regular basis: <http://sustainableagriculture.net/>

1. This background information was obtained from the North Carolina Public Schools Statistical Profile, 2007 which is available online. [↑](#footnote-ref-1)
2. The data collection efforts were coordinated by staff members of the Appalachian Sustainable Agriculture Project (ASAP). [↑](#footnote-ref-2)
3. Several of the products included in table 8 were also reported as fresh fruits and vegetables (e.g., frozen broccoli and salad mix). The US 2008 Farm Bill allows schools to use geographic preference for the procurement of unprocessed agricultural products (USDA, 2009). The Join Explanatory Statement accompanying the Farm Bill states that the use of the term “unprocessed” intends to preclude the use of geographic preference for agricultural products that have “significant” value added components. Minimum handling and preparation of agricultural products is allowed (<http://budget.house.gov/congressional_budgets/fy2009/explanatory-statement.pdf>). [↑](#footnote-ref-3)
4. This fee does not reflect the true cost of their services since Madison farms uses facilities provided by the NC Extension Service and is funded through several grants. It is estimated that to cover the true cost of the marketing services farmers would have to pay around 25% of gross receipts (Madison farms manager, pers. comm., 2009). [↑](#footnote-ref-4)
5. According to Raper (pers. comm.., 2009) during the period 2006 to 2009 there has been little variability on the prices paid by schools to farmers participating in the Farm to School program in Western North Carolina. [↑](#footnote-ref-5)