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Local Food Market Analysis

AN ANALYSIS OF THE MARKET POTENTIAL FOR LOCAL FOODS IN THE UPPER MINNESOTA RIVER VALLEY RDC AREA

Authored by Ryan Pesch

PROGRAM SPONSORS: SOUTHWEST REGIONAL SUSTAINABLE DEVELOPMENT PARTNERSHIP, UPPER MN RIVER VALLEY RDC

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August 23, 2016

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SUMMARY OF RESULTS

For producers need to identify the size of each market channel in order for focus on its potential and begin building the necessary relationships to garner sales.

This information about the regional food market has been compiled to inform producers about market opportunities in the region. This report has focused on the largest market channels which would have most interest in sourcing local foods, including restaurants, institutions, and supermarkets. The report also highlights the demand for products most easily produced and market-ready in this region such as meats and fresh fruits and vegetables.

A summary of major findings follow:

- Residents of the five-county study area purchase approximately $69 million for food consumed at home and $25 for food away from home.
- Local farmers would take in $1.2 million in sales if residents purchased five percent of their meats and fresh fruits and vegetables direct. This five percent capture of fruits and vegetables would require between 27 and 40 acres of production. The return on this production would vary depending on the outlet used for sales.
- The market for food consumed at home is a significantly larger market than for food consumed away from home. The region retains nearly 80% of its grocery and liquor sales, but less than 50% of its food service sales. Coupled with the lower margin on sales to restaurants, food sales direct to consumer or though outlets like groceries are better potential markets for local farm producers than food service.
- The 39 healthcare facilities which serve meals in the region are a larger market for products growers can raise in the region than schools. The total market potential at healthcare institutions is $277,000 compared to $159,000 at schools during a standard West Central farm season.

BACKGROUND

The past decade has witnessed significant interest and effort in developing local food systems. The increasing consumer demands for farm products are driven by the beliefs that local food production systems are more sustainable, healthy, and supportive of local economies. Sales of local food through direct markets have grown tremendously—annual direct-market sales increased from $511 million in 1997 to $1.2 billion in 2007 (Martinez et al., 2010)—and the number of farmers markets has increased 67 percent since 2008 (USDA AMS, 2013). Additionally, more than 3,800 school districts in the US source food from local farmers, ranchers, and food businesses (USDA Farm to School Census, 2013).

The five counties of the Upper Minnesota River Valley region also have a long history of engaging in local food development, and, in many respects, lead Minnesota well before the local food movement went mainstream. The development of the Pride of the Prairie collaborative in 2000 stands out as a visible and successful effort to collaboratively market local foods regionally. These organizing efforts or farmers and organizations are all the more noteworthy, considering the rural nature of the region (see Appendix XX for a complete listing of local foods efforts in the region).

Considering these past efforts and general conversation about “what’s next” for local foods in the region, the Upper Minnesota River Valley Regional Development Commission (UMRVRDC) partnered

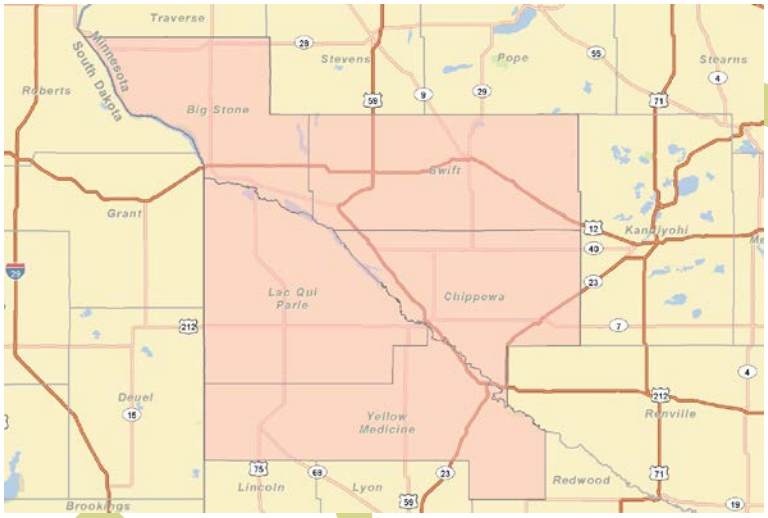
with the Southwest Regional Sustainable Development Partnership and University of Minnesota Extension to explore opportunities and next steps. Kristi Fernholz and David Fluegel assembled a project team to organize the effort, including representatives of the Statewide Health Improvement Program (SHIP) and Extension.

Process and timeline here

METHODOLOGY

This analysis primarily employed secondary data to estimate the size the food market in the region. The three primary datasets informing this analysis included sales tax statistics from the Minnesota Department of Revenue, Consumer Expenditure (CEX) survey data from the US Bureau of Labor Statistics, and population estimates from the US Census Bureau. Extension obtained the CEX and Census figures through ESRI's Business Analyst software, a GIS mapping program to retrieve demographic and business data for specific geographic areas (see Appendix XX for full reports from ESRI for the region). Extension also made use of the food expenditures dataset from USDA's Economic Research Service (ERS), which provides a breakdown of food spending by outlet, and the Food Disappearance dataset, also from ERS (see Appendix xx for full report).

Figure 1: Five-county study area



Extension combined and analyzed these data to estimate a reasonable spending on food for the five counties of the RDC region (see Figure xx) across a series of market outlets. For example, Extension used sales tax data to measure the level of out-shopping in the region and used those figures to adjust the consumer expenditure estimates of spending to reflect only purchases made in the region. This report provides sources and explainations throughout on how Extension came to its market estimates.

FOOD SOLD DIRECT TO CONSUMERS

Census of Agriculture data from the National Agricultural Statistical Services (NASS) provides reliable and detailed information about the state of agriculture in the United States. Census of Agriculture statistics are created from surveys sent to all American farm operators (identified as selling over $1,000 in ag-related production), much like the US decennial census. For our purposes of examining the market for local food, the figures on sales direct to consumers are an important indicator of current supply or activity in the region. Both the value of goods sold and the number of farms selling direct to consumer has grown between 2007 and 2012, the two most recent Census of Agriculture datasets (see Figure xx). The reader should understand that, although these are sales by farms within the region, not all of these sales are from residents of the region, that is, this is measure of current supply instead of demand. For example, Easy Bean Farm operates a CSA in the

study area, yet many of its customers live in the Twin Cities or nearby communities outside the region such as Morris.

Table 1: Food sold direct to consumers, value and number of farms (Census of Ag, 2012 and 2007)

	2012		2007	
Counties	***No. of Farms***	***Value***	***No. of Farms***	***Value***
Big Stone County	15	$97,000	9	$40,000
Chippewa County	20	$302,000	17	$81,000
Lac qui Parle County	23	$81,000	13	$47,000
Swift County	13	$59,000	23	$78,000
Yellow Medicine County	21	$115,000	19	$61,000
Total Region	**92**	**$654,000**	**81**	**$307,000**

The Pride of the Prairie local foods guide is a fairly comprehensive director of farms which sell food direct to consumers in West Central Minnesota and list only 19 of these 92 farms. From research in Renville County, however, we know that a large portion of sales direct to consumer are purchased directly off the farm (Pesch, 2012). These sales can be from the same producers who sell at public venues such as farmers markets or CSA and would be most likely to list themselves in the local foods guide, however, the remainder of these operations do not formally advertise that they sell products to consumers.

FOOD AT HOME PURCHASES

To figure out how much local residents in the RDC region spend on food prepared at home, Extension adjusted consumer expenditure survey data by the portion of sales retained in the region.

Sales tax analysis of grocery and liquor store sales

Sales in the grocery and liquor category remain stable in the region

Counties	2013 Gross Sales (721)	No. of firms	2013 Population	Sales per capita	Pull Factor
Big Stone	$9,426,940	9	5,114	$1,843	0.74
Chippewa	$23,350,560	15	12,099	$1,930	1.20
Lac qui Parle	$8,223,542	10	7,006	$1,174	0.54
Swift	$13,758,841	9	9,543	$1,442	0.80
Yellow Medicine	$15,354,172	13	10,115	$1,518	0.51
Region Total	**$70,114,055**	**56**	**43,877**	**$1,598**	**0.79**

Table 2: Grocery and liquor store sales tax statistics (Source: MN Dept. of Rev.)

Sales tax statistics give us one of our most complete and accurate indications of food supply and demand in the region. Based on these data from 2003 to 2013, we observe that the total sales in the grocery category (which also includes liquor stores and specialty food stores like bakeries and meat lockers) remained relatively stable over the past ten years (see Figure XX). The exception to this stability Chippewa County which saw a significant increase in sales from 2007 to 2010 and a commensurate increase in the number of stores.

Figure 2: Number of firms in grocery and liquor store category, 2003–13 (MN Dept of Rev.)

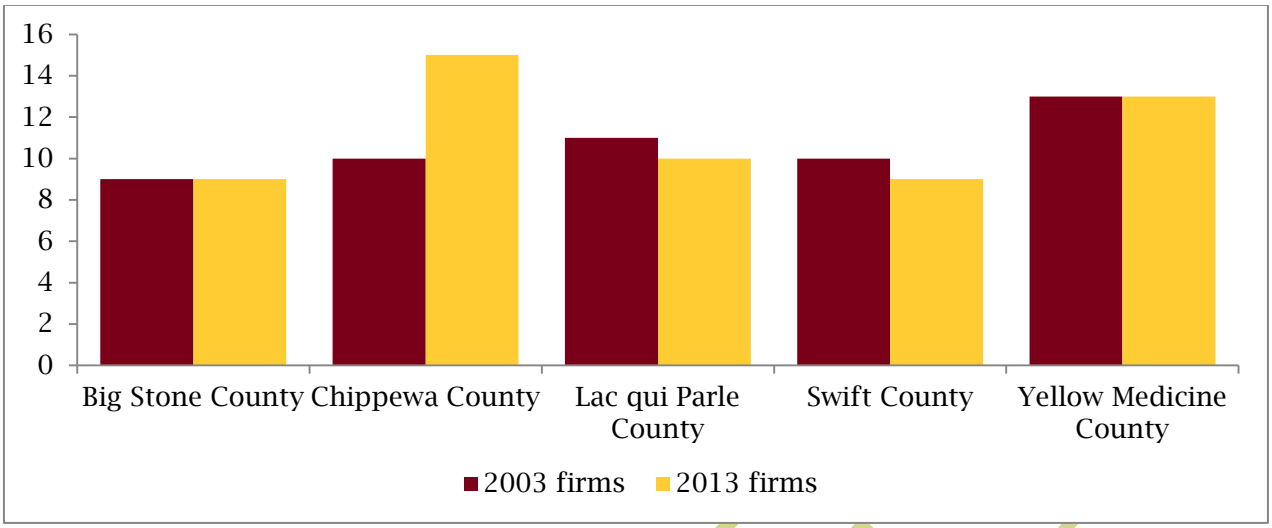
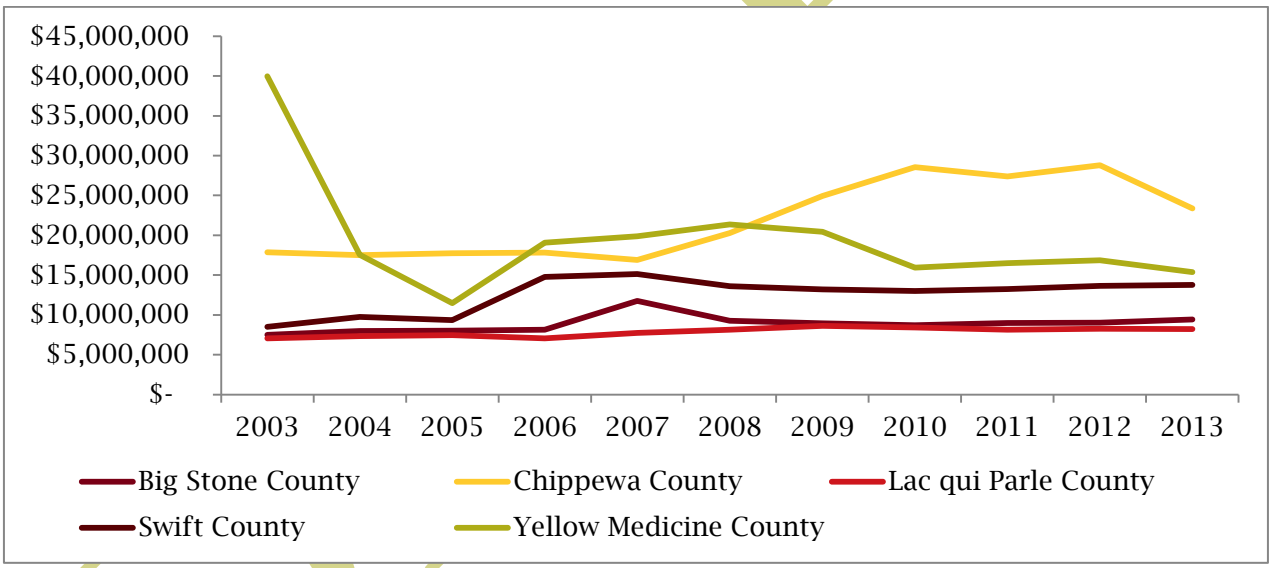


Figure 3: Grocery and liquor store sales (445 NAICS) change in gross sales, 2003-13 (MN Dept. of Rev.)

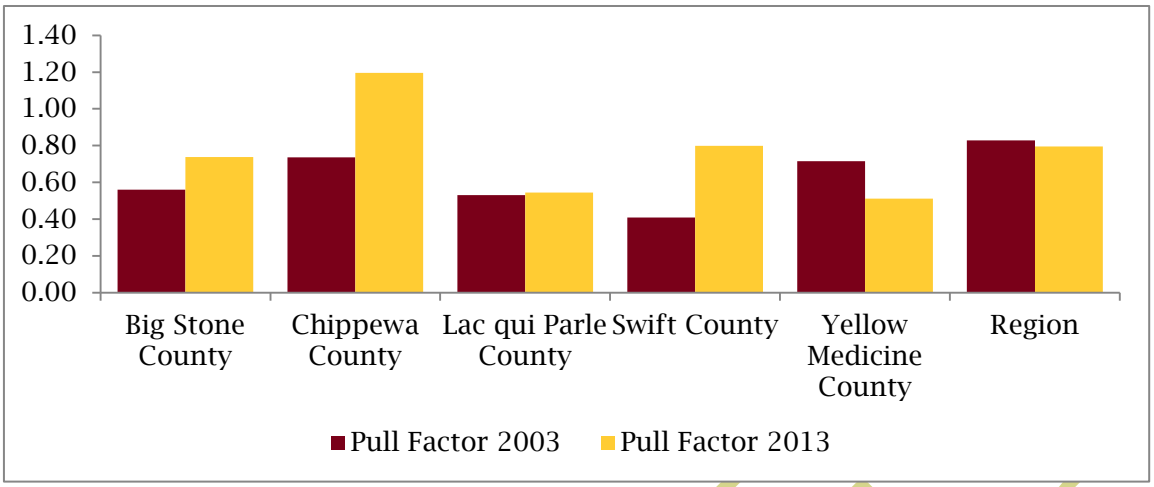


Nearly 80% of sales in the grocery category remain in the region

We know with some confidence the portion of sales retained in the region through pull factors by sales category. A pull factor is a measurement of a community's retail pulling strength or the portion of local sales retained. Extension calculated pull factors in this report by dividing the taxable sales per capita for a country or region by the taxable sales per capita in Minnesota based on sales tax statistics reported by the Minnesota Department of Revenue. A pull factor larger than 1.0 indicates that a community is pulling in sales or traffic from outside its community and one less than 1.0 signals sales leaving the community.

The five county study area has a pull factor of 0.79, so about one-fifth of sales in the grocery category are leaving the region. Pull factors range from 0.51 in Yellow Medicine Country to 1.20 in Chippewa (see Figure xx). Overall, pull factors have increased from 2003 to 2013.

Figure 4: Pull factors in grocery and liquor store category (MN Dept. of Rev.)



Food at Home by Outlet

One of our best measures of American household spending is the Consumer Expenditure Survey (CEX). This long-running survey by the Bureau of Labor Statistics details household spending across many categories and subcategories from motor oil to gifts (see Appendix XX for a full CEX report). . Since our purpose is to identify the size of the food market in the region, Extension combined CEX spending data with similar USDA dataset to breakdown of household spending by outlet or where they food purchase happened.

Over $20 million in food at home sales leave the region

Simply based on the demographics of consumers in the region, ESRI calculated that $88 million is spent on food at home based on the Consumer Expenditure Survey. To tailor this measure, Extension broke this down according to the spending by outlet (ERS Citation) and adjusted the figures down based on our knowledge of spending patterns from sales tax data. For example, supermarkets account form 65% of sales of food at home ($57 million for the region), but, since the region has a grocery pull factor of 0.79, Extension adjusted this sales estimate lower (down to $45 million). Working across all food at home outlets in this manner, Extension estimates that about $20 million in food at home sales are purchased outside the region.

Table 3: Purchases of food away from home by outlet based on CEX figures (Source: ESRI)

Food at home by outlet	*Percent of sales*	*Estimates of sales at outlet*	*Pull factor adjustments*	*Adjusted estimate*	*Assumption for Adjustment*
Supermarkets	64.9	$57,336,170	0.79	$45,295,575	Grocery pull factor
Convenience stores	2.3	$2,031,944	0.96	$1,950,667	Gasoline station pull factor
Other grocery	0.2	$176,691	0.79	$139,586	Grocery pull factor
Specialty food stores	2.3	$2,031,944	0.79	$1,605,236	Grocery pull factor

Warehouse clubs and supercenters	16.5	$14,576,992	0.64	$9,329,275	Retail pull factor
Mass merchandisers	0.5	$441,727	0.64	$282,705	Retail pull factor
Other stores	4.9	$4,328,925	0.64	$2,770,512	Retail pull factor
Home delivered, mail order	2.4	$2,120,290	1.00	$2,120,290	No adjustment
Farmers, processors, wholesalers, and other	5.9	$5,212,379	1.00	$5,212,379	No adjustment
Farmers only (2.6% of subcategory)			1.00	$135,522	No adjustment
Total		**$88,257,064**		**$68,706,225**	

Current purchasing patterns provide few sales to farmers

Farmers made only 2.6% of sales in the category "Farmers, processors, wholesalers, and others" category. According to USDS's ERS statistics direct-to-consumer sales were $1.31 billion in 2012 (the most recent Census of Agriculture), but the expanded figure including farmers, processors, wholesalers, and others came in at $49.7 billion that same year (ERS, https://www.ers.usda.gov/webdocs/publications/ap068/51173_ap068.pdf?v=42083).

Food at Home by Select Products

Since our primary concern is the market for foods which can be both raised and sold in this region, Extension broke down the figures about food at home from CEX by product categories most likely to garner farms sales, namely meats and fresh fruits and vegetables. Many of the other product categories need greater processing and a local supply chain such as processed vegetables and cereals. Approximately $15.5 million is spent in the region on meats and nearly $9 million on fresh fruits and vegetables across all outlets.

Table 4: Detailed CEX data based on Midwest spending pattern (Source: ERS, Table 1800)

Product	Average Spending Midwest	Percent of Food at Home Spending	Adjusted RDC Food at Home Spending	5% of sales to local growers
Meats, poultry, fish, and eggs	$946	22.8%	$15,654,164	$782,708
Beef	$302	7.3%	$4,997,418	$249,871
Pork	$173	4.2%	$2,862,759	$143,138
Other meats	$134	3.2%	$2,217,397	$110,870
Poultry	$166	4.0%	$2,746,925	$137,346
Fish and seafood	$113	2.7%	$1,869,895	$93,495
Eggs	$58	1.4%	$959,769	$47,988

Fresh F+V				
Fresh fruits	$286	6.9%	$4,732,654	$236,633
Fresh vegetables	$237	5.7%	$3,921,815	$196,091

See Appendix XX for calculations of all products

Local farmers would take in $1.2 million in sales if residents purchased five percent of their meats and fresh fruits and vegetables direct

The purchasing power of households in the region is significant and even a minor transition of their food purchases towards local sources would greatly increase sales to local food operators. If residents transferred five percent of their purchases directly to local operators, it would at least double the current sales (see Table 1), resulting in $433,000 in fresh fruit and vegetable sales and $783,000 meat sales. To give perspective of scale, $433,000 in mixed vegetable sales translates to 44 acres of production at a benchmark $9,900 sales per acre from recent Extension research on mixed vegetable operations (Pesch et al, 2015). Management practices and product mix grown would greatly affects the production and potential sales per acre.

Focus: Supermarkets (NAICS 445)

The businesses in the region which sell food for home consumption include some subcategories, an important distinction when considering the size of the local food market. Four subcategories are present in the region:

(1) 17 Supermarkets (NAICS 4451)

(2) 6 Meat markets or lockers (NAICS 4452)

(3) 17 Liquor stores (NAICS 4453)

(4) 1 Supercenter or warehouse store (NAICS 45291)

Removing the liquor stores from these subcategories is important since fresh product is not sold there. Assuming that the distribution of sales in the grocery category in the region is the same as the state, where supermarkets account for 54.7% of sales in the 445 NAICS category, specialty foods are 5.8% of sales, and liquor is 39.5%. Doing these calculations, the food-selling establishments in the grocery and specialty food categories garnered over $42 million in sales in 2013, according to state sales tax data (see Figure xx).

Table 5: Estimates of food sales in the grocery category based on sales tax data (source: MN Dept of Revenue, 2013)

Counties	*2013 Gross Sales (NAICS 445)*	*Grocery Sales Estimate*	*Specialty Food Estimate*	*Liquor Sales Estimate*
Big Stone County	$9,426,940.00	$5,156,480	$543,813	$3,726,646
Chippewa County	$23,350,560.00	$12,772,618	$1,347,028	$9,230,915
Lac qui Parle County	$8,223,542.00	$4,498,229	$474,393	$3,250,921
Swift County	$13,758,841.00	$7,526,004	$793,709	$5,439,128
Yellow Medicine	$15,354,172.00	$8,398,641	$885,739	$6,069,792

County				
Region Total	**$70,114,055.00**	**$38,351,972**	**$4,044,681**	**$27,717,402**

According to USDA statistics, a significant amount of grocery sales are also purchased at warehouse stores or supercenters. According to state sales tax statistics, the region overall retains 64% of its total retail spending, we use this as an assumption of how much the region retains in the general merchandise category. Based on this assumption, we estimate that the region's one supercenter brings in approximately $9.3 million in grocery sales. This is reasonable or even conservative measure considering the size and average sales per square foot of the average Wal-mart store: the Montevideo store is approximately 135,000 square feet and the average sales per square foot at a Wal-mart supercenter is $423 (Bowman, Fool, 2015).

Parsing grocery sales even more, one way would be to delve into each product category. The National Grocer's Association published a study of its members in 2014 which gave average benchmarks per department. Applying these figures to estimated sales at supermarkets and superstores in the region provides a general total spending in the region:

Table 6: Supermarket Sales by Department – Percent of Total Supermarket Sales (FMI, 2015)

Departments	****2014 Percent of Total Sales***	***Estimated Sales for Region***
Grocery	**34.60**	$13,269,782
Alcoholic Beverages	4.4	$1,687,487
Dry Grocery (Food)	24.26	$9,304,188
Dry Grocery (Non Food)	6.00	$2,301,118
General Merchandise	4.36	$1,672,146
Health and Beauty Care	3.04	$1,165,900
Pharmacy	3.08	$1,181,241
Perishables	53.67	$20,583,503
Meat/Fish/Poultry	***14.08***	**$5,399,958**
Service Deli	3.69	$1,415,188
Deli/Self Service	1.31	$502,411
Floral	0.17	$65,198
Produce	***11.55***	**$4,429,653**
Baked Goods	3.00	$1,150,559
In-Store Bakery	2.08	$797,721
Dairy	9.08	$3,482,359
Frozen Foods	6.21	$2,381,657
Packaged Meats	2.52	$966,470
Grand Total		**$38,351,972**
Source: Progressive Grocer's Annual Consumer Expenditures Study (CES): 63rd Annual CES, September 2011, pp. 36-42;		
68th Annual CES, July 2015, pp. 62-64.		
* Note: percentages derived by FMI from category sales figures and grand total figure published by		

Progressive Grocer. Percentages may not justify due to rounding.
Key Industry Facts – Prepared by FMI Information Service, September 2015

Zeroing in on the types of foods which regional producers could sell to food retailers, the areas of most interest are fresh produce and meats. Over $12.5 million are sold in these two categories and a goal of 5% of local food sales would translate to $628,000 total local sales. At an average 26% gross margin for groceries (citation to National Grocers Presentation, 2014), regional producers would realize $464,000 in sales.

FOOD AWAY FROM HOME PURCHASES

Food purchases for consumption away from home have grown as a percentage of total food sales over the past generation (citation, ERS) and deserve attention of those interested in food sales in the study area. In an analysis similar to food at home purchases in the region, Extension examined food away from home sales through a couple of datasets, including sales tax and CEX data.

Sales tax analysis of food service sales

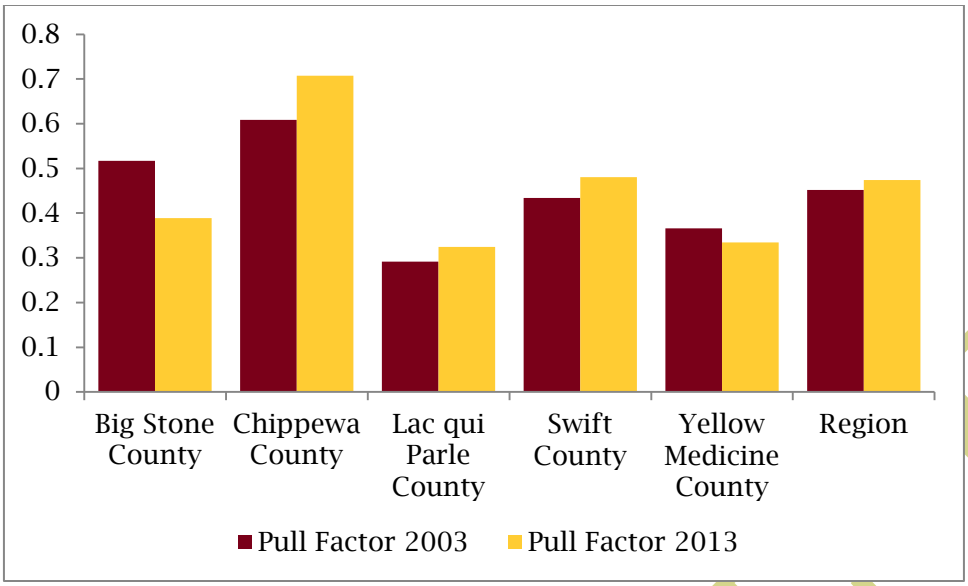
About half of food service sales leave the region

Extension calculated the pull factors for the food service category in the same way as with the grocery category, using taxable sales figures from the MN Department of Revenue. This category of food service includes restaurants (both full-service and limited service) as well as caterers and bars or drinking establishments.

Based on sales tax analysis alone, the region retains less of its food service sales than sales in the grocery category with an overall pull factor of 0.47 (see Table xx and Figure xx). Pull factors range from 0.32 in Lac qui Parle to 0.70 in Chippewa County.

Table 7: Food service sales tax statistics and pull factors (Source: MN Dept. of Rev.)

Counties	2013 Gross Sales (722)	No. of Establishments	2013 Population	2013 Gross Sales per capita	Pull Factor
Big Stone	$2,924,256	15	5,114	$572	0.38
Chippewa	$12,587,669	37	12,099	$1,040	0.70
Lac qui Parle	$3,348,145	13	7,006	$478	0.32
Swift	$6,783,626	24	9,543	$711	0.48
Yellow Medicine	$5,277,597	20	10,115	$522	0.33
Region	$30,921,293	109	43,877	$705	0.47
Minnesota	$8,409,216,068	11,362	5,422,060	$1,551	1.00



Unlike the grocery category trends, food service in the region has grown weaker over the past ten years. There are fewer businesses in this category in all counties save Chippewa. Gross sales have increased in Chippewa, but remained flat in the other four counties. This lack of growth in the food service points to residents transitioning more of their sales in this category out of the region or a change in consumption tastes where residents of the region consume food services at a lower rate than Minnesota as a whole.

Figure 5: Change in food service firms, 2003-13 (Source: MN Dept. of Rev.)

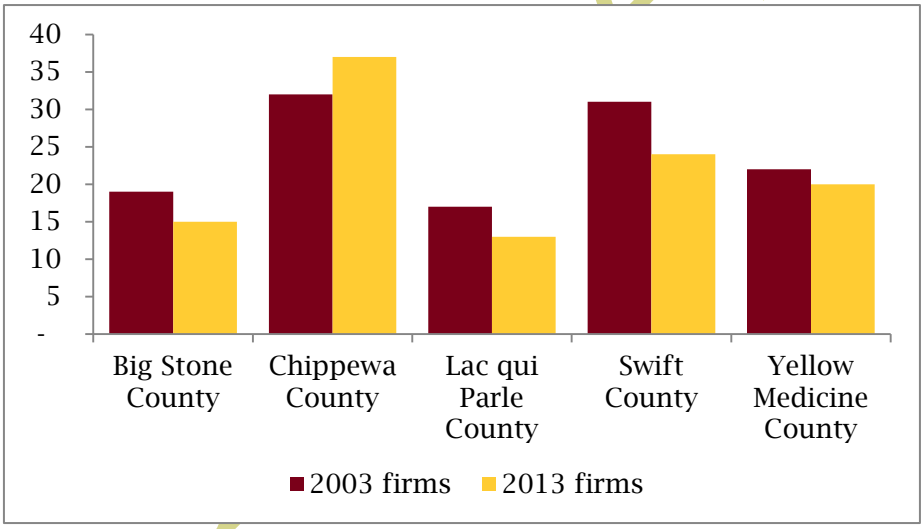
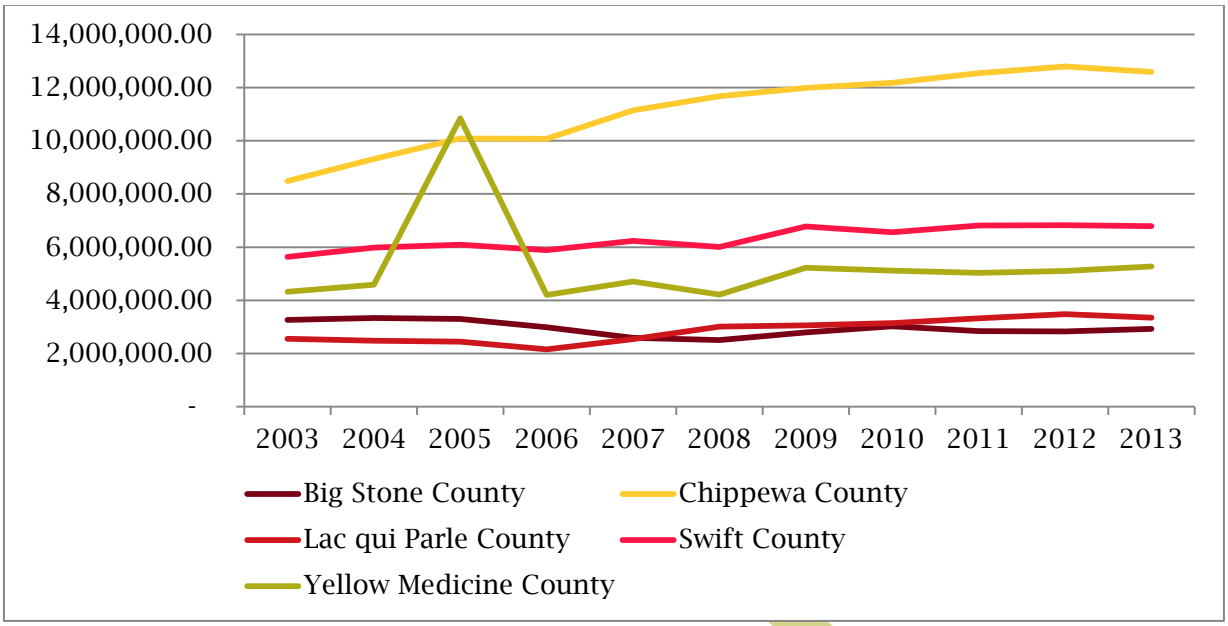


Figure 6: Food service gross sales by county (Source: MN Dept. of Rev.)



Focus: Full-service restaurants

The primary focus for producers interested in selling to food service would be restaurants, especially full-service since these operations typically have greater flexibility in purchasing than limited service restaurants such as fast food.

Table 8: Purchases of food away from home by outlet based on CEX figures (Source: ESRI)

Food away from home	*Percent (ERS data)*	*Estimate of sales (per CEX)*	*Food Service Pull Factor*	*Adjusted estimate*	*Assumption for Adjustment*
Full-service restaurants	54.2	$26,585,454	0.47	$12,495,163	Food service pull factor
Limited-service eating places	28.9	$14,175,639	0.47	$6,662,550	Food service pull factor
Hotels and motels	3	$1,471,520	0.19	$279,589	Accommodations pull factor
Schools and colleges	5.8	$2,844,938	1.00	$2,844,938	No adjustment
Stores, bars, and vending machines	3.4	$1,667,722	0.47	$783,829	Food service pull factor
Recreational places	3.2	$1,569,621	0.47	$737,722	Food service pull factor
Others, including military outlets	1.5	$735,760	1.00	$735,760	No adjustment
Total		**$49,050,653**		**$24,539,551**	

Adjusting Consumer Expenditure Survey data by the region's food service pull factor, Extension estimates that full-service restaurants account for $12.5 million in food sales (based on USDA statistics on sales by outlet), nearly twice the amount spent at limited-service restaurants.

Potential food sales of $3.7 million at full-service restaurants

Food purchases account for about 30% of total food sales in full-service restaurants (citation – consultants). Based on this benchmark, full-service restaurants purchase approximately $3.7 million in food sales. Extension was unable to identify suitable research to parse this spending figure into useful product categories such as fresh vegetables and meats. Obviously the types of food products purchase will vary significantly based on the type and management of the restaurant.

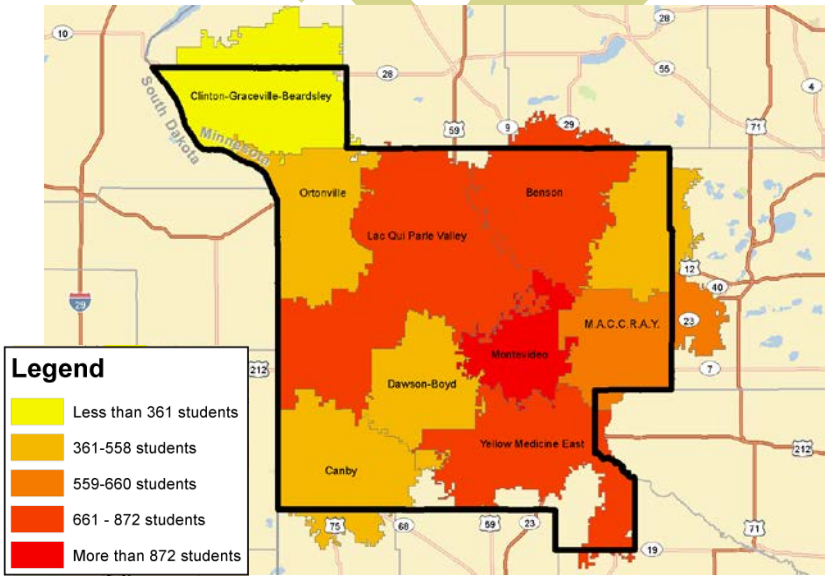
Focus: Farm-to-Institution

Extension estimated the market potential for locally-raised foods at educational and healthcare institutions by extrapolating product estimates from survey research we conducted in 2013-2014 with food service directors at both healthcare and educational institutions. The estimates are pro-rated according to the total number of meals served at these institutions throughout the region. From our survey research we have average lbs served per meal for a range of commonly-sourced fresh fruits, fresh vegetables, meats, and grains.

Schools in the region serve an estimated 7,306 meals daily

To obtain the number of meals served daily at educational institutions in the 5-county region, we started by identifying the institutions through Minnesota Department of Education's *Organization Reference Glossary,* or MDE-ORG. We then quantified meals served daily at the institutions (mostly schools) through numbers supplied by survey respondents and estimates of average daily attendance (membership) at the non-responding educational facilities.

Figure 7: School districts present in the region



Estimating meals based on average daily attendance

Extension estimated 7,306 meals served daily at 10 school districts by using average daily membership figures from MDE's *Data Reports and Analytics* page (see Reference list for website address). From previous survey research, Extension calculated that an average of 1.06 meals are served per enrolled student based on the attendance figures from MDE. Although schools serve breakfast and lunch, not all students participate and some elect to eat off campus or at home; therefore the average of 1.06 meals per enrolled student is not surprising.

Healthcare facilities in the region serve and estimated 3,783 meals daily across 39 facilities

Extension used a process to estimate the total number of meals served daily at healthcare facilities in the region similar to the one outlined above for educational facilities.

We started by using the Minnesota Department of Health's *Health Care Facility and Provider Database* (see Reference list for website address) to identify the full range of healthcare facilities in the 5-county region, including hospitals and long-term care facilities.

Extension researched healthcare facilities online to identify the size of their establishment by units and number of residents, as well as determine whether they serve meals. Our team used www.MinnesotaHelp.info, a listing of public information targeted to users of senior and social services, as the primary online information source. We created an estimate of meals served for each institution based on the assumption of three meals per day per resident, unless otherwise noted. We discovered many facilities that do not serve meals or have their meals prepared by a nearby healthcare facility – a common practice among small assisted living facilities. The total number of daily meals identified through this process was 3,783 at 39 facilities.

Estimating regional product demand

To estimate the amount of food purchased annually, we assumed that respondents bought a mix and amount of foods every month consistent with survey response in Northwest and West Central Minnesota as outlined (see text box to the right). This is a reasonable assumption because participating food service directors indicated anecdotally that their monthly fresh produce and other food purchases are fairly consistent across seasons.

CALCULATING product-buying estimates for educational and healthcare institutions:

1. Convert the number of pounds purchased by time period (weekly, bi-weekly, etc.) for each food into the amount purchased per meal on a monthly basis.
2. Calculate the average number of pounds per meal for those facilities that purchased a particular product. For example, eight of nine facilities that purchased fresh apples averaged less than one hundredth of a pound for all meals served monthly (0.0069 lb. per meal per month).
3. Apply average pounds per monthly meal count to total number of meals served in region.

When applying the purchasing profile to the region, we assumed our sample of survey respondents is representative of all institutional facilities in the 5-county region. In doing so, we assumed other facilities purchase foods in the same proportion; for example, we assumed 93 percent of all facilities purchase fresh lettuce, the same as the proportion of our survey respondents. We also assumed all facilities purchase the same volume of foods by meal as the average for our respondents.

Healthcare represents a larger potential market than schools

Estimating food purchases for an entire year greatly overemphasizes the size of the institutional market potential for local growers because of fruit and vegetable growing conditions in Northwest Minnesota. To account for this, we made estimates based on two scenarios for growing seasons. In our first scenario, we used a standard Northwest Minnesota growing season based on when a fruit or vegetable is typically available for sale, assuming production of a field-grown fruit or vegetable without any season-extending technology or methods. We assumed other food products are available year-round, such as meat and whole

grains. In our second scenario, we used an extended growing season that could reasonably be realized through readily available technologies and methods for growing fruits and vegetables over an extended season or for storing crops for later sale.

Scenario 1: Standard fruit and vegetable growing season

The standard growing season in Northwest Minnesota is relatively short compared with other parts of the nation – generally about 4-5 months from June to October. This is the time that field-grown produce is available, excluding produce grown hydroponically or through some other kind of non-soil-based growing technique.

Using retail pricing from USDA statistics for the range of produce listed (USDA Agricultural Marketing Services, 2012), we were able to estimate a market potential not only in volume of food products but also value in dollars. The average retail price data is derived from national supermarket price checks and represents reasonable benchmarks for an analysis such as this; certainly local market conditions may vary significantly between growers and buyers.

One major finding when comparing healthcare and school respondents is that healthcare facilities represent a larger potential market than educational institutions under both the standard- and extended-season scenarios. This is especially evident when comparing the total months available (see Tables 1, 2, 3 and 4 for details). Although K-12 schools serve more meals daily, healthcare facilities are open year-round and purchase a wider variety of fresh foods.

Table 9: Educational market potential scenario for standard West Central Minnesota growing season (n=10)

Product:	Total months available*	Lbs of food	Average retail price	Market potential
Beans	2.5	169	$1.47	$249
Broccoli	4	1,755	$1.55	$2,720
Cabbage	4	248	$0.81	$202
Carrots	4	3,372	$0.85	$2,866
Cauliflower	4	830	$1.10	$913
Cucumbers	2.5	419	$0.67	$280
Tomatoes	2.5	496	$1.30	$643
Peppers	2.5	112	$1.41	$157
Lettuce	4	2,642	$1.33	$3,501
Potatoes	3	919	$0.89	$819
Onions	3	172	$0.68	$117
Radishes	4.5	163	$1.00	$163
Summer Squash	2.5	4	$1.29	$6
Winter Squash	2	2	$0.94	$2
Apples	2	4,911	$1.35	$6,635
Melons	2	378	$0.56	$212
Strawberries	1	-	$2.36	$0
Wild Rice	9	14	$6.69	$91
Oatmeal	9	53	$2.72	$144
Dried Beans	9	11	$2.19	$25

Chicken	9	19,881	$1.48	$29,425
Ground Beef	9	29,281	$3.19	$93,407
Hot Dogs	9	5,153	$3.19	$16,437
Total Purchases		**70,986**		**$159,014**

Table 10: Healthcare market potential scenario for standard West Central Minnesota growing season (n=39_

Product:	Total months available	Lbs of food	Average retail price	Market potential
Beans	2.5	1,042	$1.47	$1,532
Broccoli	4	1,968	$1.55	$3,050
Cabbage	4	2,211	$0.81	$1,799
Carrots	4	3,855	$0.85	$3,277
Cauliflower	4	865	$1.10	$952
Cucumbers	2.5	1,526	$0.67	$1,023
Tomatoes	2.5	3,097	$1.30	$4,015
Peppers	2.5	792	$1.41	$1,116
Lettuce	4	5,674	$1.33	$7,518
Potatoes	3	14,013	$0.89	$12,495
Onions	3	2,656	$0.68	$1,806
Radishes	4.5	468	$1.00	$468
Summer Squash	2.5	688	$1.29	$884
Winter Squash	2	423	$0.94	$398
Apples	2	2,225	$1.35	$3,006
Melons	2	5,169	$0.56	$2,895
Strawberries	1	1,056	$2.36	$2,493
Wild Rice	12	1,040	$6.69	$6,960
Oatmeal	12	8,517	$2.72	$23,168
Dried Beans	12	2,700	$2.19	$5,914
Chicken	12	25,491	$1.48	$37,727
Ground Beef	12	38,590	$3.19	$123,103
Hot Dogs	12	9,691	$3.19	$30,914
Total Purchases		**133,759**		**$276,511**

Scenario 2: Extended fruit and vegetable season

Over the past decade, growers and researchers have concentrated significant effort on developing season-extension techniques and technologies as demand for local produce increases and growers work to maintain consistent supply (Coleman, 2009; Nennich, 2004). New and rediscovered technologies such as high and low tunnels, as well as cold frames and post-harvest storage facilities, are being deployed to lengthen the produce season, even in cold Minnesota.

For this study, University of Minnesota Extension based the length of the extended season on reasonable produce availability for growers using the aforementioned technologies and also based on information from correspondence with USDA resources and University of Minnesota faculty and researchers. Cindy Tong, a post-harvest handling specialist with the University's Department of

Horticulture, provided resources on storage capabilities, including USDA Handbook 66, "The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks,") and "Minnesota Foods in Season" on Extension's Farm to School website (see the Reference list for website addresses).). Steve Poppe, a horticulture scientist with the West Central (Minnesota) Research and Outreach Center, estimated strawberry availability based on first-year trials with day-neutral strawberry production near Morris, MN (day-neutral plants produce fruit throughout the growing season).

In the extended season scenario, both the amount of fruits and vegetables and their market potential in terms of dollars almost doubles when compared to the standard Northwest Minnesota growing season. Although most products – tomatoes, for example – increase their growing season by only a month under the extended scenario, the season for some high-volume products more than doubles, which has a significant impact on the total market potential and pounds of produce per season.

The significant impact applies to potatoes, onions, and strawberries. Each of these crops is in high demand among food service directors. In terms of availability under the extended scenario, onions and potatoes increase from three to nine months under ideal storage conditions. Strawberries are also in great demand, and day-neutral varieties grown in low tunnels for season extension promise a four-month picking season.

Table 11: Educational market potential scenario for extended season (n=10)

Product:	Total Months Available*	Lbs of Produce	Average Retail Price	Market Potential
Beans	4	339	$1.47	$498
Broccoli	6	2,632	$1.55	$4,080
Cabbage	7	497	$0.81	$404
Carrots	9	11,801	$0.85	$10,031
Cauliflower	6	1,246	$1.10	$1,370
Cucumbers	4	837	$0.67	$561
Tomatoes	4	991	$1.30	$1,286
Peppers	4	223	$1.41	$315
Lettuce	6	7,927	$1.33	$10,504
Potatoes	9	6,432	$0.89	$5,735
Onions	9	1,205	$0.68	$819
Radishes	8	544	$1.00	$544
Summer Squash	4	9	$1.29	$12
Winter Squash	5	6	$0.94	$5
Apples	5	19,645	$1.35	$26,541
Melons	3	756	$0.56	$424
Strawberries	4	727	$2.36	$1,717
Wild Rice	9	14	$6.69	$91
Oatmeal	9	53	$2.72	$144
Dried Beans	9	11	$2.19	$25
Chicken	9	19,881	$1.48	$29,425
Ground Beef	9	29,281	$3.19	$93,407
Hot Dogs	9	5,153	$3.19	$16,437
Total Purchases		110,211		$204,372

TABLE 3:

Table 12: Healthcare market potential scenario for extended West Central Minnesota growing season (n=39)

Product:	Total Months Available	Lbs of Produce	Average Retail Price	Market Potential
Beans	4	1,667	$1.47	$2,451
Broccoli	6	2,952	$1.55	$4,576
Cabbage	7	3,870	$0.81	$3,147
Carrots	9	8,675	$0.85	$7,374
Cauliflower	6	1,298	$1.10	$1,428
Cucumbers	4	2,442	$0.67	$1,636
Tomatoes	4	4,955	$1.30	$6,425
Peppers	4	1,266	$1.41	$1,786
Lettuce	6	8,511	$1.33	$11,277
Potatoes	9	42,040	$0.89	$37,486
Onions	9	7,968	$0.68	$5,418
Radishes	8	832	$1.00	$832
Summer Squash	4	1,100	$1.29	$1,414
Winter Squash	5	1,057	$0.94	$995
Apples	5	5,563	$1.35	$7,515
Melons	3	7,754	$0.56	$4,342
Strawberries	4	4,225	$2.36	$9,970
Wild Rice	12	1,040	$6.69	$6,960
Oatmeal	12	8,517	$2.72	$23,168
Dried Beans	12	2,700	$2.19	$5,914
Chicken	12	25,491	$1.48	$37,727
Ground Beef	12	38,590	$3.19	$123,103
Hot Dogs	12	9,691	$3.19	$30,914
Total Purchases		**192,204**		**$335,855**

MODELING MARKET POTENTIAL AT 5 PERCENT MARKET SHARE

With the value of local food sales at less than $650,000 (Figure xx) and spending on food in the region at over $90 million (Figures xx and xx) the current supply of local food sales sits safely at less than 0.5% of total household spending. In this environment, modeling the market potential as a five percent market share across outlets and products produces ambitious, yet obtainable goals. Calculating market potential at 20% or even 10% market share is both unreasonable and unrealistic.

Meats for home consumption nearly double market potential of fresh fruits and vegetables

To give a comparative sense of the size of all the market channels in the region, this section lays out all opportunities in one location. Extension consistently made calculations of market potential at five percent of market share.

Table 13: Total spending and market potential at five percent market share by outlet

	Total Spending	5 percent market share
Total food at home	$68,706,225	$3,435,311

Target Products:		
Meats	$15,654,164	$782,708
Fresh fruits and vegetables	$8,654,469	$432,723
Market Channels:		
Grocery stores @ 26% gross margin	$38,351,972	$1,419,023
Meats at grocery	$5,399,958	$199,798
Fresh F+V at grocery	$4,429,653	$163,897
Specialty Food Stores (butchers, bakeries) @ 26% gross margin	$1,605,236	$59,394
Institutions		
Schools (extended season)	$204,372	$10,219
Healthcare (extended season)	$335,855	$16,793
Total food away from home	$24,539,551	$1,226,978
Market Channels:		
Full-service restaurants @ 30% of total food sales	$3,748,549	$187,427

Examining table 13 we see that that food purchased for at home consumption would net local producers almost three times the sales as food purchased away from home. This is in part due to the amount of sales leaking outside the region and also the amount of the total dining sales which goes to food purchase (30%), whereas grocery stores spend on average 26% gross margin on cost of goods (Grocers Association, 2014), that is, 74 cents of every retail dollar goes to food purchases.

Region would need 27 acres of fruit and vegetable production to meet five percent of demand

The food disappearance database from USDA provides per capita consumption figures for a wide range of foods. This aggregate demand for foods is based on national consumption pattern and not limited to or broken out by outlet (whether food at home or away from home), although the fruits and vegetables are limited to a fresh market, that is, these figures do not include processed foods, only those purchased fresh. Since the database provides consumption for such a wide range of foods, these calculations are very helpful to create estimates of production by type or crop or livestock. Extension calculated the needed supply for our target products of meats and produce based on the population of the region and five percent market shares (see Table xx).

Table 14: Demand and potential supply by food at five percent market share (Source: Food Disappearance, USDA)

	Demand (lbs)	Supply Needed	Unit	Supply by Acres
Meat (carcass)				
Beef	143,086	313	Head	
Veal	871	7	Head	
Pork	110,659	2,470	Head	
Lamb	2,496	16	Head	
Chicken	187,855	60,593	Head	
Turkey	38,455	2,359	Head	
Eggs (shell)				
Shell Eggs (count per capita)	373,457	31,121	Dozen	
Vegetables				
Asparagus	2,518	84	Crates	0.63
Bell peppers	14,882	531	Bushels	0.74
Broccoli	13,266	577	Cases	1.11
Brussels sprouts	665	27	Cases	0.06
Cabbage	18,888	378	Crates	0.47
Carrots	19,714	394	Bushels	0.49
Cauliflower	3,820	153	Cases	0.25
Celery	14,039	234	Cases	0.23
Collard greens	1,250	69	Bushels	0.08
Cucumbers	13,888	253	Bushels	0.69
Eggplant	2,107	64	Bushels	0.14
Escarole/endive	504	20	Bushels	0.03
Garlic	6,501	217	Cases	0.43
Kale	845	34	Bushels	0.06
Lettuce: Head	44,573	1,114	Cases	1.49
Lettuce: Romaine and leaf	33,292	832	Cases	0.95
Lima beans	61	2	Bushels	0.03
Mushrooms (fresh)	5,680			
Mustard greens	975	54	Bushels	0.07
Onions	47,745	955	Sacks	0.95
Potatoes	86,318	863	Cases	2.16
Pumpkin	11,323			0.28
Radishes	1,151	96	Cases	0.16
Snap beans	4,812	160	Bushels	1.20
Spinach	4,484	179	Bushels	0.30
Squash	9,826	218	Bushels	0.33
Sweet corn	20,110	402	Bushels	2.01
Sweet-potatoes	11,457	286	Cases	1.15
Tomatoes	44,671	2,234	Flats	1.65
Turnip greens	947	53	Bushels	0.06
Fruits				
Apples	36,169	904	Bushels	1.81
Blueberries	1,259	466	Cases	0.16
Cantaloupe	21,678	723	Cases	1.08
Grapes	17,643	802	Flats	2.21
Honeydew	4,452	148	Cases	0.22

Raspberries	890	148	Flats	0.18
Strawberries	14,177	1,181	Flats	1.18
Watermelon	35,748	421	Cases	1.79

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APPENDIX XX: FULL CEX REPORT FROM ESRI

APPENDIX XX:

Detailed CEX data based on Midwest spending pattern (Table 1800):

Item	Average Midwest Spending	Percent of Food at Home	Adjusted RDC Food at Home Spending
Number of consumer units	27,674	19,015	
Food at home	$4,152		$68,706,225
Cereals and bakery products	$533	12.8%	$8,819,947
Cereals and cereal products	$175	4.2%	$2,895,855
Bakery products	$358	8.6%	$5,924,092
Meats, poultry, fish, and eggs	$946	22.8%	$15,654,164
Beef	$302	7.3%	$4,997,418
Pork	$173	4.2%	$2,862,759
Other meats	**$134**	**3.2%**	**$2,217,397**
Poultry	**$166**	**4.0%**	**$2,746,925**
Fish and seafood	$113	2.7%	$1,869,895

Eggs	**$58**	**1.4%**	**$959,769**
Dairy products	$439	10.6%	$7,264,459
Fresh milk and cream	$143	3.4%	$2,366,327
Other dairy products	$296	7.1%	$4,898,132
Fruits and vegetables	$757	18.2%	$12,526,641
Fresh fruits	**$286**	**6.9%**	**$4,732,654**
Fresh vegetables	**$237**	**5.7%**	**$3,921,815**
Processed fruits	$102	2.5%	$1,687,870
Processed vegetables	$131	3.2%	$2,167,754
Other food at home	$1,478	35.6%	$24,457,563
Sugar and other sweets	$155	3.7%	$2,564,900
Fats and oils	$108	2.6%	$1,787,156
Miscellaneous foods	$797	19.2%	$13,188,550
Nonalcoholic beverages	$367	8.8%	$6,073,021
Food prepared by consumer unit on out-of-town trips	$51	1.2%	$843,935