

FARM-TO-SCHOOL PRODUCT PURCHASING FREQUENCIES REPORTED BY SCHOOL FOOD SERVICE EMPLOYEES

Nathan Stokes, PhD and Susan W. Arendt, PhD, RD, FAND, CHE

ABSTRACT

Purpose/Objectives

The purpose of the study was to determine types and frequency of local food products purchased by schools as part of FTS programs and to identify whether differences in purchasing exist relative to school size (number of lunches served).

Methods

A valid and reliable questionnaire was developed from qualitative interviews with hourly school nutrition staff and previous literature. Hourly school nutrition staff with hands-on experience processing local produce as part of Farm to School (FTS) programs, from across the United States, completed the questionnaire.

Results

Of the 369 questionnaires sent to hourly school nutrition staff at participating schools, 239 usable questionnaires were returned (65%). Results indicated that fresh fruits and vegetables were the most commonly and most frequently purchased local food items. However, dairy products was the local food item most commonly purchased on a daily basis. Large schools more frequently purchased local food items daily than small or medium sized schools while small schools purchased local food items more frequently on a weekly basis than both medium and large schools.

Application To Child Nutrition Professionals

Results of this study can be useful to school nutrition professionals involved with FTS with information that can guide development of relationships between prospective local food sources. This research will also provide school nutrition professionals and their partners with a better understanding of the variety and frequency of local products being purchased for schools of different sizes as part of FTS programs. Utilizing this information, school nutrition professionals can more effectively work with food producers in efforts to establish regional food systems and support local economies.

Keywords: food service, local food, purchases, school nutrition

INTRODUCTION

In 1998, the National Commission on Small Farms highlighted the need to develop local food systems to stop the decline of small farms across the United States (U.S. Department of Agriculture [USDA] Commission on Small Farms, 1998). Since then, Farm Bills have been passed encouraging development of local food systems (USDA, 2014; USDA Economic Research Service [ERS], 2008; USDA ERS, 2009). The success of these local food systems is evidenced by projections of approximately \$20 billion annual local food sales by 2019 (Packaged Fact, 2015).

With this increase in local food sales, researchers have sought to identify benefits of selling and buying locally. Local producers and school nutrition professionals have identified helping the local economy, having fresh high-quality food, creating good public relations, and shortening the distance food travels as benefits (Gregoire, Arendt, & Strohbeh, 2005; Gregoire & Strohbeh, 2002; Motta & Sharma, 2016; Smith, Wleklinski, Roth, & Tragoudas, 2013). Similar benefits have also been noted by other institutions and food service industries (Knight & Chopra, 2013).

Farm-to-school (FTS) programs have developed into a nationwide local food movement involving more than 42,000 schools in all 50 states (National Farm to School Network [NFTSN], 2016b; USDA Food and Nutrition Service [FNS], 2015). FTS programs usually involve purchasing local foods for use in the school meal program with some schools spending a significant portion of their overall food budget on local food purchases (Beery & Joshi, 2007, NFTSN, 2016a, Wiemerslage, 2016). Benefits of purchasing local products as part of FTS programs are similar to those identified by other local purchasers and include: access to fresher foods, potential to increase fruit and vegetable consumption, shorter supply chains, and in some cases, cost savings (Izumi, Alaimo, & Hamm, 2010; Izumi, Rostant, Moss, & Hamm, 2006; Joshi, Azuma, & Feenstra, 2008).

Challenges to purchasing local foods for use in school meal programs have also been identified. These challenges include: availability of local produce; lack of knowledge about local products and producers; lack of product consistency; food safety concerns; and school nutrition staff lack of time, skills, and equipment needed for processing local fruits and vegetables (Gregoire & Strohbeh, 2002; Izumi et al., 2006; Oberholtzer, Hanson, Brust, Dimitri, & Richman, 2012; Strohbeh, Sharma, & Kelley, 2016; USDA FTS Team, 2011).

School districts present a potential market for local food producers (Wiemerslage, 2016) given the volume of breakfasts and lunches served daily (USDA FNS, 2017a). Yet, the literature is scant regarding types of local foods purchased and frequency of purchases relative to school meal programs (Motta & Sharma 2016; USDA FNS, 2015). For districts with FTS programs, procurement of local foods may involve hourly school nutrition staff or other school personnel buying directly from growers rather than centralized purchasing done by the district's nutrition director. Hourly school nutrition staff are on the "front lines" of the FTS program and work directly with local products served in the meal program. There are federal, state, and local procurement requirements districts must follow. However, if purchases are less than the established district threshold, micro purchasing may be used by school nutrition programs at the building level (USDA FNS, 2017b).

Hourly school nutrition staff often have contact with the producer when produce is delivered; therefore, understanding their perceptions regarding purchasing frequency of local products is important. Thus, the purpose of this research was two-fold: (1) to explore the frequencies with

which various types of local foods are purchased as part of school districts' FTS programs and (2) investigate whether differences in purchasing exist relative to school size.

METHODOLOGY

Sample

The sample for this study was comprised of hourly school nutrition staff with hands-on experience processing local produce as part of their districts' FTS programs. Hourly school nutrition staff were recruited from the state with the most FTS programs (according to 2013 NFTSN data) in each of the eight NFTSN regions. The states were California, Connecticut, Maryland, Minnesota, New Mexico, North Carolina, Oklahoma, and Texas. Child nutrition directors from schools with FTS programs in each state were contacted via email and asked to distribute questionnaires to their hourly school nutrition staff. Directors who agreed were sent hard copies of questionnaires that they then distributed to staff. This study was part of a larger study that explored barriers and keys to success for implementing FTS programs (Stokes & Arendt, 2016; Stokes, Arendt, & Strohbehn, 2015). Approval from the Iowa State University Institutional Review Board was received prior to recruitment and data collection.

Questionnaire

A valid and reliable questionnaire was developed using data gathered from qualitative interviews with hourly school nutrition staff (Stokes & Arendt, 2016) and previous literature (Colasanti, Matts, & Hamm, 2012; DeBlicek, Strohbehn, Clapp, & Levandowski, 2010). The questionnaire contained items regarding perceived barriers and keys to success in implementing FTS programs, purchasing frequencies for various local food products, districts' FTS programs and activities, and demographics. Given there is no consistent definition for "local food products" and each school or district is allowed to define local however they prefer, a definition for local products was not provided. After questionnaire development, we conducted a two-phase pilot test. Five experts in school nutrition management reviewed the questionnaire; then 12 hourly school nutrition employees provided feedback. The questionnaire was revised according to reviewers' comments after each phase of pilot testing. This article focuses solely on the questions regarding purchasing frequencies for local foods. Other results are reported elsewhere (Kang, Arendt, & Stokes, 2016; Stokes & Arendt, 2016; Stokes, Arendt, & Strohbehn, 2015).

Data Analysis

Returned questionnaires were coded and data entered into an Excel spreadsheet. Descriptive statistics (frequencies and percentages) were calculated for responses to questionnaire items regarding purchasing frequencies for local foods. School size was identified by the average number of lunches served using categorization by Smith et al. (2013): small—0 to 200, medium—201 to 400, and large—more than 401.

RESULTS AND DISCUSSION

Participant and School Meal Program Demographics

A total of 369 questionnaires was sent to hourly school nutrition staff at participating schools and 239 usable questionnaires were returned, for a response rate of 64.8%. Respondents represented 23 districts and all eight NFTSN regions. The majority of participants (64.4%) had more than five years' experience working in school food service and two or more years working with a FTS program (62.6%). Nearly half (48.2%) of participants indicated that their schools had participated in FTS for two to three years (21.9%), or for more than three years (26.3%), and more than a third (38.2%) indicated that they did not know how long their schools had been involved with FTS. The majority (57.1%) of participants worked at medium size schools (those

serving an average of 201 to 400 lunches daily), 12.6 % worked at small schools (those serving 0 to 200 lunches daily), and 30.3% worked at large schools (those serving more than 401 lunches daily). See Table 1 for detailed demographic characteristics.

Table 1: Demographic Characteristics of Participants and School Meal Programs
(N=206-238)^a

Characteristics	N	% ^b
Sex		
Female	227	96.2
Male	9	3.8
Number of years working in school food service		
1 to 5	83	35.6
6 to 10	56	24.0
11 to 15	40	17.2
16 to 20	26	11.2
More than 20 years	28	12.0
Number of years involved with farm-to-school program		
1 Year or Less	43	20.9
1 to 2 years	34	16.5
2 to 3 years	48	23.3
More than 3 years	81	39.3
Food service management type		
Self-operated	169	79.0
Contract-managed	45	21.0
Length of farm-to-school program		
1 year or less	9	3.9
1 to 2 years	22	9.6
2 to 3 years	50	21.9
More than 3 years	60	26.3
I don't know	87	38.2
Average number of school meals served ^c		
0 to 200 (small)	30	12.6
201 to 400 (medium)	136	57.1
More than 401 (large)	72	30.3

^a Totals do not equal 239 due to missing data and percentages may not equal 100% due to rounding

^b Percentages were calculated using the total number of respondents for each question

^c Numbers indicate meals served per school building not district

Product Purchasing Frequencies

Participants identified frequencies with which certain locally produced food items were purchased (see Table 2). Participants indicated that fresh fruit was purchased from local producers weekly (58.5 %), daily (16.1%), and monthly (7.1%). A similar pattern was identified for the purchase of locally grown fresh vegetables: weekly (60.2%), daily (16.1%), and monthly (6.2%). The most common local purchasing frequency for both dairy products and meat/poultry was also weekly, at 34.3% and 28.7%, respectively. The local item that was purchased most

frequently on a daily basis was dairy products at 22.9%. This is likely due to the fact that National School Lunch and Breakfast Program guidelines require that fluid milk be offered to students each day at both breakfast and lunch (USDA FNS, 2012). Because dairy plants are typically regionally based, respondents' interpretations of "local" could reflect a large dairy and not necessarily a small farm-based operation.

By contrast, only 9.1% of participants indicated that meat/poultry was purchased locally on a daily basis. However, there were still 37.8% who indicated that meat/poultry was purchased from local sources on a daily or weekly basis. Eggs were most commonly locally purchased weekly (16.8%), but more than one-third (34.9%) of participants indicated never purchasing eggs locally, and another 34.8% indicated they did not know how often local eggs were bought. This could be explained by the popularity of egg products (e.g. frozen and liquid eggs) in school meals for both labor savings and potential reduction in food safety risks. Only 6.5% of respondents indicated that fish and seafood products were locally purchased weekly, while nearly half (43.5%) reported that fish and seafood products were never locally purchased or that they did not know whether they were purchased locally (41.3%). This circumstance could partly be due to a lack of hourly school nutrition staff knowledge of and involvement in purchasing activities, and/or the limited amount of fresh fish/seafood on school menus, especially in different regions of the country. Also, less processing is needed with other protein foods such as meats and eggs, and alternate procurement forms, such as convenience forms seen commonly with ready to eat fruits and vegetables, are not widely available. Meat/poultry, eggs, and seafood are considered temperature controlled for safety foods (TCS) which have more rigorous purchasing regulations than whole, unprocessed fruits and vegetables, possibly making it more difficult for schools to understand whether vendors are approved. There are also state specific regulatory requirements for producers of fresh shell eggs selling to retail food services like a school nutrition program (Minnesota Department of Agriculture, n.d.). These requirements may present challenges to schools when attempting to purchase local eggs. Researchers have previously identified food safety concerns and lack of processed and convenience forms of products as barriers to using local foods (Oberholtzer et al., 2012; USDA FTS Team, 2011). See Table 2 for additional details regarding purchasing frequencies for local foods.

Table 2: Purchasing Frequencies for Local Foods

Local food item	Daily		Weekly		Monthly		Occasionally		Never		Don't Know	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Fresh fruit (f=217) ^a	35	16.1	127	58.5	17	7.1	12	5.5	1	0.5	25	11.5
Fresh vegetables (f=211) ^a	34	16.1	127	60.2	13	6.2	9	4.3	1	0.5	27	12.8
Dairy products (f=175) ^a	40	22.9	60	34.3	1	0.6	3	1.7	30	17.1	41	23.4
Meat/Poultry (f=164) ^a	15	9.1	47	28.7	6	3.7	5	3.0	37	22.6	54	32.9
Eggs (fresh shell) (f=155) ^a	9	5.8	26	16.8	8	5.2	4	2.6	54	34.9	54	34.8
Fish/Seafood (f=138) ^a	1	0.7	9	6.5	6	4.3	5	3.6	60	43.5	57	41.3
Herbs (f=152) ^a	3	2.0	23	15.1	5	3.3	8	5.3	39	25.7	74	48.7

^a Percentages were calculated using the total number of responses for each question

Product Purchasing Frequencies by School Size

Differences in product purchasing frequencies relative to school size (average number of lunches served daily) were identified (see Table 3). Participants' responses indicated that daily purchasing of locally sourced fruit, vegetables, dairy, meat/poultry, eggs, and fish and seafood was more common at large schools than at medium and small schools. For example, 29% of participants from large schools purchased fresh fruit daily compared to 13.6% of participants from medium size schools and 0% of participants from small schools. Given that lack of availability and sufficient product amount have been identified in the literature as challenges to purchasing local food products (Gregoire & Strohbahn, 2002; Stokes & Arendt, 2016; USDA FTS Team, 2011), this may be an indication of ordering and delivery frequency rather than availability. Generally, larger food service operations receive deliveries more frequently and therefore, may also order more frequently as compared to smaller operations. However, weekly purchasing of certain locally sourced foods: fruits (73.3%), vegetables (69.0%), dairy (50.0%), meat/poultry (40.9%), eggs (33.3%), and fish and seafood (11.8%) was more common at small schools than at large or medium schools. Additionally, weekly purchasing of fruits (60.0%), vegetables (65.9%), dairy (37.1%), meat/poultry (33.3%), eggs (17.9%), and fish and seafood (7.4%) was more common at medium schools than at large schools. Therefore, it appears that daily purchasing of local food items is more common at large schools whereas weekly purchasing of local food items is more common at small and medium size schools. Table 3 contains detailed information regarding purchasing frequencies of local items based on school size.

Table 3: Local Food Purchasing Frequency by School Size

Small schools																
	Fruit		Vegetables		Dairy		Meat/ Poultry		Eggs		Fish/ Seafood		Herbs		Other ^a	
	n	(%)	n	(%)	N	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Daily	0	0.0	0	0.0	1	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Weekly	22	73.3	20	69.0	11	50.0	9	40.9	6	33.3	2	11.8	2	11.8	0	0.0
Monthly	3	10.0	5	17.2	0	0.0	2	9.1	0	0.0	0	0.0	1	5.9	0	0.0
Occasionally	2	6.7	1	3.4	2	9.1	1	4.5	0	0.0	0	0.0	1	5.9	0	0.0
Never	0	0.0	0	0.0	5	22.7	4	18.2	7	38.9	10	58.8	6	35.3	0	0.0
Don't know	3	10.0	3	10.3	3	13.6	6	27.3	5	27.8	5	29.4	7	41.2	2	100.0
Total responses	30		29		22		22		18		17		17		2	

Medium schools																
	Fruit		Vegetables		Dairy		Meat/ Poultry		Eggs		Fish/ Seafood		Herbs		Other ^a	
	n	(%)	n	(%)	N	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Daily	17	13.6	16	13.0	24	22.9	8	8.1	6	6.3	0	0.0	3	3.2	0	0.0
Weekly	75	60.0	81	65.9	39	37.1	33	33.3	17	17.9	6	7.4	15	16.1	0	0.0
Monthly	11	8.8	7	5.7	0	0.0	2	2.0	4	4.2	4	4.9	3	3.2	0	0.0
Occasionally	7	5.6	4	3.3	0	0.0	0	0.0	2	2.1	2	2.5	5	5.4	0	0.0
Never	1	0.8	1	0.8	18	17.1	26	26.3	35	36.8	38	46.9	25	26.9	2	18.2
Don't know	14	11.2	14	11.4	24	22.9	30	30.3	31	32.6	31	38.3	42	45.2	9	81.8
Total responses	125		123		105		99		95		81		93		11	

Large schools																
	Fruit		Vegetables		Dairy		Meat/ Poultry		Eggs		Fish/ Seafood		Herbs		Other ^a	
	n	(%)	n	(%)	N	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Daily	18	29.0	18	30.5	15	31.3	7	16.3	3	7.1	1	2.5	0	0.0	0	0.0
Weekly	30	48.4	26	44.1	10	20.8	5	11.6	3	7.1	1	2.5	6	14.3	0	0.0
Monthly	3	4.8	1	1.7	1	2.1	2	4.7	4	9.5	2	5.0	1	2.4	0	0.0
Occasionally	3	4.8	4	6.8	1	2.1	4	9.3	2	4.8	3	7.5	2	4.8	0	0.0
Never	0	0.0	0	0.0	7	14.6	7	16.3	12	28.6	12	30.0	8	19.0	1	8.3
Don't know	8	12.9	10	16.9	14	29.2	18	41.9	18	42.9	21	52.5	25	59.5	11	91.7
Total responses	62		59		48		43		42		40		42		12	

^a Other includes local foods not already identified in the category options.

CONCLUSIONS AND APPLICATION

When comparing purchasing frequency by school size, results indicated that large schools more frequently purchased local food items daily than small or medium sized schools (service of fewer than 400 lunches). In fact, there was only one participant from a small school (fewer than 200 meals served each day) who indicated purchasing any local food products on a daily basis. This is interesting given the fact that lack of availability and sufficient product amount have frequently been identified in the literature as challenges to purchasing local food products (Gregoire & Strohbehm, 2002; Stokes & Arendt, 2016; USDA FTS Team, 2011). However, participants from small schools purchased local food items on a weekly basis more frequently than both medium and large schools, and medium schools purchased on a weekly basis more frequently than large schools. Small and medium sized schools may not have the storage capacity to allow for less frequent purchasing. Daily purchasing also presents additional direct and indirect costs to both sellers and buyers as delivery costs associated with transportation and transactional costs would impact productivity (Motta & Sharma, 2016). Smaller and medium size schools do not have built in economies of scale; thus, minimum production inputs needed may preclude daily receiving of purchased foods.

Results of this study can be useful to school nutrition professionals involved with FTS by providing information to guide development of relationships between prospective local food sources and buyers for school meal programs as part of FTS programs. Nationally, over 31 million school lunches are served each day (USDA FNS, 2017a); this is a potential market that could benefit local food producers and communities. This research provides a snapshot of purchasing frequency of local products by districts of varying sizes.

This research will also provide school nutrition professionals and their partners with a better understanding of the variety and frequency of local products being purchased in schools of different sizes. This information will be helpful as they work with food producers and food buyers in efforts to establish regional food systems and improve local economies. Findings from this study also provide school nutrition professionals with information about market potential for specific food commodities or new products for use in FTS programs. Results indicate that local fruits, vegetables, and dairy are being frequently purchased by schools; therefore, school nutrition professionals should continue efforts to increase purchases of these products in addition to fostering efforts to increase purchases of meat and poultry. Further, potential market opportunities exist for adding value to products such as processing of fruits and vegetables into convenience forms thereby addressing identified challenges of lack of skill and equipment at schools. The capacity at local processing facilities may be sufficient to supply local produce to a small or medium size school.

Information from this study may also be useful in conducting environmental scans of the market and development of grower/producer business plans in identification of new market characteristics, such as school size. As school nutrition professionals work with community stakeholders to establish regional food systems, inclusion of locally produced foods in school meal programs will help educate children and the community about where and how food is grown.

Similar to most studies, there are limitations of this study. First, the respondents to the questionnaire were hourly school nutrition employees who may not be involved in the purchasing process. Because this was anticipated, the questionnaire was structured so respondents could select “don’t know” as an option; therefore, only those respondents who had

knowledge of purchasing provided frequency responses. Second, because the questionnaire asked participants to select only one option when indicating frequency of purchasing for each food item (i.e. “On average, how often does your school purchase?”), it is difficult to determine potential variability in purchase frequencies over the school year. Third, because the definition of “local” varies, participants may have interpreted the word differently based on their district’s definition.

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REFERENCES

- Beery, M., & Joshi, A. (2007). A growing movement: A decade of farm to school in California. *Center for Food & Justice, Urban and Environmental Policy Institute*. Retrieved from http://scholar.oxy.edu/cgi/viewcontent.cgi?article=1381&context=upep_faculty
- Colasanti, K. J. A., Matts, C., & Hamm, M. W. (2012). Results from the 2009 Michigan farm to school survey: Participation grows from 2004. *Journal of Nutrition Education and Behavior, 44*, 343-349. doi:10.1016/j.jneb.2011.12.003
- DeBlicek, S. Strohbeh, C.H., Clapp, T., & Levandowski, N. (2010). Building food service staff familiarity with local food. *Journal of Hunger and Environmental Nutrition 5(2)*, 191-201. doi: 10.1080/19320241003800318 Retrieved from: <https://www.tandfonline.com/doi/pdf/10.1080/19320241003800318?needAccess=true>
- Gregoire, M.B., & Strohbeh, C.H. (2002). Benefits and obstacles to purchasing from local growers/producers. *Journal of Child Nutrition and Management*. Retrieved from: https://schoolnutrition.org/uploadedFiles/5_News_and_Publications/4_The_Journal_of_Child_Nutrition_and_Management/Spring_2002/7-gregoire.pdf
- Gregoire, M. B., Arendt, S. W., & Strohbeh, C. H. (2005). Iowa producers’ perceived benefits and obstacles in marketing to local restaurants and institutional foodservice operations. *Journal of Extension* [online] 43 Article 1RIB1. Available at: <http://www.joe.org/joe/2005february/rb1.php>.
- Izumi, B. T., Rostant, O. S., Moss, M. J., & Hamm, M. W. (2006). Results from the 2004 Michigan farm-to-school survey. *Journal of School Health, 76(5)*, 169-174.
- Izumi, B. T., Alaimo, K., & Hamm, M. W. (2010). Farm-to-school programs: Perspectives of school food service professionals. *Journal of Nutrition Education and Behavior, 42(2)*, 83-91. doi:10.1016/j.jneb.2008.09.003
- Joshi, A., Azuma, A. M., & Feenstra, G. (2008). Do Farm-to-School Programs make a difference? Findings and future research needs. *Journal of Hunger & Environmental Nutrition, 3*, 229-246. doi: 10.1080/19320240802244025
- Kang, S., Arendt, S., & Stokes, N. (2016). School nutrition staff perceptions of Farm to School (FTS) activities differ based on management type and FTS participation length. *Journal of Child Nutrition Management 40(2)*. Retrieved from https://schoolnutrition.org/uploadedFiles/5_News_and_Publications/4_The_Journal_of_Child_Nutrition_and_Management/Fall_2016/SchoolNutritionEmployeesPerceptionsofFarmtoSchool2.pdf

- Knight, A., & Chopra, H. (2013). Perceived benefits and barriers to local food procurement in publicly funded institutions. *Journal of Extension* [online], 51(1) Article 5FEA4. Retrieved from <https://www.joe.org/joe/2013october/a4.php>
- Minnesota Department of Agriculture, the Minnesota Department of Health, and University of Minnesota Extension. (n.d.). *Sale of locally raised eggs to food facilities*. Retrieved from <https://www.mda.state.mn.us/licensing/inspections/~media/Files/food/foodsafety/eggssales.ashx>
- Motta, V. & Sharma, A. (2016). Benefits and transaction costs of purchasing local foods in school districts. *International Journal of Hospitality Management*, 55, 81-87.
- National Farm to School Network. (2016a). *About farm to school: What is farm to school, and how does it contribute to vibrant communities?* Retrieved from <http://www.farmtoschool.org/learn>
- National Farm to School Network. (2016b). *About national farm to school network*. Retrieved from <http://www.farmtoschool.org/about>
- Oberholtzer, L., Hanson, J., Brust, G., Dimitri, C., & Richman, N. (2012). Local foods in Maryland schools and implications for Extension: Findings from Schools and Farmers. *Journal of Extension*, [online], 50(2) Article 2RIB4. Retrieved from <https://www.joe.org/joe/2012april/rb4.php>
- Packaged Facts. (2015). *Packaged facts: Sales of local foods reaches \$12 billion*. Retrieved from: <https://www.prnewswire.com/news-releases/packaged-facts-sales-of-local-foods-reaches-12-billion-300027082.html>
- Smith, S., Wleklinski, D., Roth, S. L., & Tragoudas, U. (2013). Does school size affect interest for purchasing local foods in the Midwest? *Childhood Obesity*, 9, 150-156. doi: 10.1089/chi2012.0055
- Stokes, N. & Arendt, S. W. (2016). Identifying farm to school barriers and keys to success: Perceptions of hourly employees. *Journal of Hunger and Environmental Nutrition*, 3, 1-21. doi:10.1080/19320248.2016.1157544
- Stokes, N., Arendt, S. W., & Strohbehn, C. H. (2015). Hourly employees' perceptions about farm to school program barriers and keys to success: Differences by state and number of meals served. *Journal of Foodservice Management & Education*, 9, 1-11. Retrieved from <http://fsmec.org/wp-content/uploads/2015/08/9-1-Stokes.pdf>
- Strohbehn, C.H. Sharma, A., & Kelley, K. (2016) Views of Iowa and Pennsylvania School Foodservice Directors on Local Food Purchasing. (Poster). School Nutrition Association Annual Conference, San Antonio, TX. July, 2016. Retrieved from http://schoolnutrition.org/uploadedFiles/5_News_and_Publications/4_The_Journal_of_Child_Nutrition_and_Management/Fall_2016/2016ChildNutritionShowcase.pdf
- United States Department of Agriculture. (2014). *2014 Farm bill highlights*. Retrieved from <https://www.usda.gov/sites/default/files/documents/usda-2014-farm-bill-highlights.pdf>
- United States Department of Agriculture Commission on Small Farms. (1998). *A time to act a report of the USDA national commission on small farms*. Retrieved from http://www.iatp.org/files/258_2_106175.pdf

- United States Department of Agriculture Economic Research Service. (2008). *The 2002 farm bill: Provisions and economic implications*. ERS AP-022 Retrieved from <https://www.ers.usda.gov/publications/pub-details/?pubid=42674>
- United States Department of Agriculture Economic Research Service. (2009). *The 2008 farm bill side-by-side comparison*. Retrieved from <https://wayback.archive-it.org/5923/20111128201038/http://ers.usda.gov/FarmBill/2008/>
- United States Department of Agriculture Farm to School Team. (2011). *2010 Summary Report*. Retrieved from http://www.fns.usda.gov/sites/default/files/2010_summary-report.pdf
- United States Department of Agriculture Food and Nutrition Service. (2012). *Nutrition standards in the national school lunch and school breakfast programs*. Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2012-01-26/pdf/2012-1010.pdf>
- United States Department of Agriculture Food and Nutrition Service. (2015). *The farm to school census*. Retrieved from <https://farmtoschoolcensus.fns.usda.gov/home>
- United States Department of Agriculture, Food and Nutrition Service. (2017a). *National school lunch program: Participation and lunches served*. Retrieved from <https://www.fns.usda.gov/sites/default/files/pd/slsummar.pdf>
- United States Department of Agriculture, Food and Nutrition Service. (2017b). *Procuring local foods for child nutrition programs*. Retrieved from https://www.fns.usda.gov/sites/default/files/f2s/F2S_Procuring_Local_Foods_Child_Nutrition_Prog_Guide.pdf
- Wiemerslage, T. (2016). Increasing the capacity of a local food hub to service the public school market. *Leopold Center Completed Grant Reports*, Paper 518. Retrieved from http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1517&context=leopold_grantreports

BIOGRAPHY

Stokes is an Assistant Professor in the Nutrition, Dietetics, and Food Science Department at Brigham Young University in Provo, Utah. Arendt is a Professor in the Apparel, Events, and Hospitality Management Department at Iowa State University in Ames, Iowa.