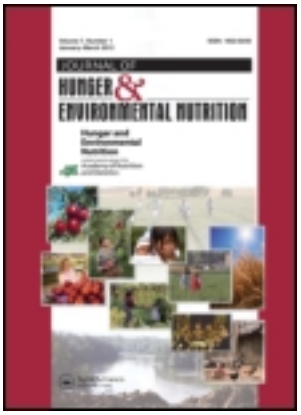

Journal of Hunger & Environmental Nutrition

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/when20

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Published online: 17 Mar 2014.

To cite this article: Olivia M. Thompson, Mary Pat Twomey, Michael A. Hemphill, Kristin Keene, Nikki Seibert, Drew J. Harrison & Kendra B. Stewart (2014) Farm to School Program Participation: An Emerging Market for Small or Limited-Resource Farmers?, Journal of Hunger & Environmental Nutrition, 9:1, 33-47, DOI: 10.1080/19320248.2013.873008

To link to this article: http://dx.doi.org/10.1080/19320248.2013.873008

Journal of Hunger & Environmental Nutrition, 9:33–47, 2014

ISSN: 1932-0248 print/1932-0256 online
DOI: 10.1080/19320248.2013.873008

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Farm to School Program Participation: An Emerging Market for Small or Limited-Resource Farmers?

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We sought to examine the benefits and barriers of farm to school participation among small or limited-resource farmers in the Charleston tricounty area within South Carolina and to discuss food policy factors that contribute to both the scalability and sustainability of farm to school programs in South Carolina and nationwide. To achieve these objectives, we administered a modified version of the Farmer Survey developed by the Institute for Agriculture and Trade Policy and conducted qualitative research with area farmers. Study findings suggest that, before small or limited-resource farmers will be able to truly consider entering "school" markets, appropriate state- and local-level agriculture infrastructure supports (eg, food safety and good agriculture practice training, market-ready workshops, accessible value-add processing centers, and contract-grow procurement options) should be put in place. Moreover, farm to school trainings and networking events that include school foodservice directors, food distributers, and the farmers themselves should be sponsored by state and local

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organizations and conducted on a routine basis. Future research should be conducted at the state level (in South Carolina as well as in other states) to better understand farm to school participation benefits and barriers from the perspective of both the farmer and the school foodservice director.

KEYWORDS obesity, nutrition, fruits and vegetables, farm to school, good agriculture practice certification, policy

INTRODUCTION

Though farm to school programs, policies, and initiatives have been implemented to improve nutritional health outcomes among youth and possibly also prevent and control childhood obesity,[1–3] researchers and practitioners alike suggest that farmers can also reap the benefits of farm to school[4] as initiatives create markets for farmers to sell their goods.[5–7] The 2008 Farm Bill included an amendment to the National School Lunch Act to allow participants in federal child nutrition programs (eg, public school systems) to give geographic preference for the purchase of unprocessed, locally grown and raised agricultural products,[5,8] but oftentimes child nutrition program participants do not take full advantage of this provision. Much of the research conducted to elucidate reasons why farm to school participation by public school systems in particular has been limited has focused on school foodservice directors' perspectives[8–11] because school foodservice directors are the school district-level administrators responsible for purchasing and coordinating foodservices and are thus the glue holding farm and school district partnerships together.

For example, data from a statewide survey administered in 2004 and again in 2009 to Michigan school foodservice directors showed that whereas only 11% of the directors surveyed had purchased foods from a local farm in 2004, 42% of the directors surveyed purchased locally in 2009.[10] In 2004, directors' main motivations for participating in farm to school programs included supporting the local economy (77%), providing access to fresher food (70%), and providing access to higher quality food (59%).[12] In 2009 the directors surveyed continued to be motivated by food access and quality factors, but the directors were increasingly motivated by economic factors such as helping Michigan farms or businesses.[12] In both 2004 and 2009, directors identified the high cost of local foods and both federal and state procurement regulations as major barriers to farm to school participation.[10,12] Data from other school foodservice director surveys have demonstrated that quality of goods, helping farmers and businesses, and positive public relations are farm to school benefits,[9] and the additional labor and time needed to process whole produce and general or good agriculture practice (GAP) food safety requirements are farm to school barriers.[8–12]

Farmers have identified farm to school participation benefits and barriers that are similar to those identified by school foodservice directors.[13–16] For example, data from a multistate survey of 101 small- to large-scale farmers primarily in Minnesota and Wisconsin and secondarily Iowa, North Dakota, and South Dakota administered in 2012 to examine overarching benefits and barriers associated with farm to school participation showed that though food safety requirements and liability insurance were identified as major barriers, farmers felt that both could be overcome.[13] Moreover, most of the farmers surveyed expressed interest in future participation in farm to school, if not already participating, and identified several major benefits of farm to school participation. Major benefits included educating children about the food system and where their food comes from (87%); increasing access to healthy, locally grown foods (84%); building relationships within their community (84%); and helping diversify their markets (60%).[13] Farmers surveyed also discussed farm to school participation barriers, including GAP food safety requirements and liability insurance, while noting that barriers must be minimized to fully realize benefits and participate in farm to school. In addition to GAP food safety requirements and liability insurance, which were noted as major barriers by 24% of farmers, other major barriers included seasonality of products fitting with a school's need (45%), guaranteeing specific quantities on specific dates (38%), and a school's willingness to pay the farmer's price (35%).[13]

Surveying small or limited-resource farmers has been noted to have significant recruitment challenges,[14] given their hesitancy to participate in research. Thus, data on small or limited-resource farmers' participation in farm to school programs are limited. For the current study, we sought to examine overarching farm to school participation benefits and barriers among small or limited-resource farmers and to discuss food policy factors that contribute to both the scalability and sustainability of farm to school programs nationwide and in South Carolina specifically.

METHODS

Participants and Their Farms

To connect with local farms, we collaborated with the nonprofit Lowcountry Local First (LLF), an advocate for local farms in the Lowcountry region of South Carolina. LLF works directly with farmers throughout the Lowcountry but predominately with farms located in the tricounty region of Charleston, Dorchester, and Berkeley counties. Moreover, though LLF's services are open to all farm operations in the Lowcountry, the programming and services are targeted to small family-owned farms growing products for direct sale to consumers. For example, of the farms within this network, farm sizes range from one $\frac{1}{4}$ acre to 100 acres, with the majority of farm membership comprised of

farms 10 acres or less and the age of the farmers ranges from 18 to 80 years, acting as owner operator, often as a husband-and-wife team. The organization has a variety of support programs for new and beginning farmers, which lends itself to a high number of farmers in the network with 10 years or less of experience farming. The majority of farms in this network can be described as limited-resource operations and often must maintain off-farm employment to sustain their families. Types of operations include specialty crop produce (ie, noncommodity crops consisting of fruits and vegetables, cut flowers, pasture-raised animals, milk, eggs, honey, and value-added items such as jams and cheeses). Active markets for these farmers include farmers' markets, farm stands, CSAs, direct restaurant sales, and wholesale markets.

Survey Methodology

We modified and administered the Institute for Agriculture and Trade Policy's survey entitled *Grower Perspectives on farm to school in Minnesota: A Survey of Interested Farmers, Ranchers, and Other Producers*.[13] The Institute's survey was designed to evaluate farmers' perceptions of farm to school benefits and barriers as well as to determine strategies that could allow farmers to fully benefit from this emerging market. Our survey was administered online, using Qualtrics survey software,[17] to active, small farms from November 2012 through February 2013. Forty surveys were viewed and, of these, 18 were returned, yielding a participation rate of 45%. Our survey included 26 questions that ascertained general information about the farmers' farm operations and specific information about their perceptions (eg, benefits and barriers) of farm to school. Though 22 of the 26 survey question response options were quantitative, 4 were qualitative and we added an "other" response category to qualify responses to key quantitative questions.

Focus Group Methodology

Using a previously published farmer focus group discussion guide,[10] we conducted a focus group with 9 area farmers in January 2013 to further explore benefits and barriers associated with farm to school program participation from the perspective of the farmer. Farmers were selected based on willingness to actively participate in discussion, understanding of farm to school markets, and availability. We asked overarching questions that addressed (1) farm operation practices and procedures, (2) the market potential of selling products (particularly produce) to K–12 schools relative to selling products through other market outlets, (3) farmer decision-making processes with regard to selecting market venues, and (4) benefits and barriers to farm to school. Focus group discussions were digitally recorded and then data

were transcribed and analyzed using qualitative and mixed method data analysis software.

Data Analyses

Survey data were downloaded from Qualtrics survey software and then analyzed using Microsoft Excel software. We elected to analyze data using descriptive statistics (ie, frequencies and percentages) for all farms combined and also for farms by category of farm gross annual revenue (ie, less than $10 000, $10 000–$25 000, greater than $25 000). Focus group discussion data were analyzed using Nvivo 10 research software[18] utilizing a combination of inductive analyses and constant comparative methods. Focus group data were independently coded and then emergent themes were discussed among study investigators to develop a set of common data themes.

RESULTS

Table 1 shows farm characteristics as reported by the Lowcountry farmers surveyed ($N = 18$). Most farms were small or limited-resource: 6 farms had gross annual revenue less than $10 000, 3 farms had gross annual revenue between $10 000 and $25 000, and the remaining 6 farms had gross annual revenue more than $25 000 (of note, 15 out of the 18 farmers surveyed elected to disclose their gross annual revenue). Interestingly, despite the small gross annual revenue amounts reported, 8 of 15 farms carried $1 000 000 or more annually in liability insurance and 5 of 15 farms reported not carrying any liability insurance at all. Among the list of products surveyed, watermelon, cantaloupe, other melons, and blueberries were the top 4 fruits produced and tomatoes, cucumbers, greens, and potatoes (sweet and nonsweet) were the top 4 vegetables produced. Of note, approximately 70% of farms produced greens, tomatoes, cucumbers, and peppers. Product distribution venues varied but included direct marketing to consumer outlets such as farm stands and farmers' markets (16 farms); grocery stores (2 farms), restaurants (6 farms), produce distributors (6 farms), multifarm collaborative (1 farm), CSAs (3 farms), and the Internet (1 farm). K–12 was not, however, among the product distribution venues that the farmers selected on the survey.

Table 2 shows farmers' perspectives of farm to school benefits by category of farm gross annual revenue (ie, less than $10 000, $10 000–$25 000, more than $25 000; $N = 15$). Though most of the farmers surveyed indicated future interest in selling to a K–12 school, none of the farmers actually sold to one. When asked about future interest in selling specific products for K–12 schools, among the 6 farmers earning less than $10 000 annually,

TABLE 1 Farm Characteristics ($N = 18$ Farms)

Characteristic	Frequency (%)
Farm gross annual revenue[a]	
Less than $10 000	6 (40)
$10 000–$25 000	3 (20)
$25 000–$100 000	4 (27)
$100 000 or more	2 (13)
Annual liability insurance[a]	
Less than $1 000 000	2 (13)
$1 000 000 or more	8 (53)
No liability insurance	5 (33)
Products produced	
Culinary-defined fruits	
Apples	2 (11)
Blackberries	4 (22)
Blueberries	7 (39)
Cantaloupe	9 (50)
Grapes	3 (17)
Melons	7 (39)
Peaches	3 (17)
Raspberries	1 (6)
Strawberries	6 (33)
Watermelon	10 (56)
Culinary-defined vegetables	
Asparagus	1 (6)
Beans	9 (50)
Broccoli	9 (50)
Cabbage	8 (44)
Carrots	9 (50)
Cauliflower	5 (28)
Corn	8 (44)
Cucumbers	13 (72)
Eggplant	10 (56)
Garlic	1 (6)
Greens	12 (67)
Mushrooms	1 (6)
Okra	2 (11)
Onions	11 (61)
Other root vegetables	1 (6)
Peppers	12 (67)
Potatoes	11 (61)
Pumpkin	1 (6)
Squash	12 (67)
Sweet potatoes	8 (44)
Tomatoes	13 (72)
Other items	
Beef	1 (6)
Eggs	3 (17)
Figs	1 (6)
Flowers	1 (6)
Herbs	1 (6)
Pecans	1 (6)
Sugar cane	1 (6)

(*Continued*)

TABLE 1 (Continued)

Characteristic	Frequency (%)
Product distribution venues	
Direct marketing to consumer	17 (94)
Grocery stores	1 (6)
Restaurants	6 (33)
K–12 schools	0 (0)
Other institutions (eg, colleges, hospitals)	0 (0)
Multifarm collaborative(s)	2 (11)
Producer/distributor	6 (33)
Internet	1 (6)
Community-supported agriculture	3 (17)
Other	6 (33)

[a] $n = 15$.

4 indicated that they were very interested and one farmer indicated that he or she was somewhat interested; among the 3 farmers earning between $10 000 and $25 000 annually, 2 indicated that they were very interested and none indicated that they were somewhat interested; and among the 4 farmers earning more than $25 000 annually, 3 indicated that they were very interested and one farmer indicated that he or she was somewhat interested. Of note, most farmers needed the school to place product orders 3 to 6 months in advance in order to be able to supply for the upcoming school year. Reasons for future interest in selling to K–12 schools varied but included educating children about food systems (10 farms); increasing access to healthy, locally grown foods (10 farms); generating a new revenue source for their farm (10 farms); building community relationships (9 farms); protecting the environment (5 farms); and having "seconds" available to sell to third-party organizations such as schools (7 farms).

Table 3 shows farmers' perspectives of farm to school barriers by category of farm gross annual revenue (ie, less than $10 000, $10 000–$25 000, more than $25 000; $N = 15$). Again, though most of the farmers surveyed indicated future interest in selling to a K–12 school, none of the farmers actually sold to one. When asked about challenges in selling to K–12 schools, among the 9 farmers earning less than $10 000 annually, most indicated that government regulations like GAP certification were a challenge; similarly, among the 6 farmers earning between $10 000 and $25 000 annually, most indicated that government regulations were a challenge; and among the 6 farmers earning more than $25 000 annually, most indicated that the difficulty of guaranteeing a specific quantity of a product on a specific date was a challenge. Information needs required to work with K–12 schools varied, but top information needs included the need for information about what products schools want (10 farms), information about schools requirements for cleaning products (10 farms), and opportunities to meet with school foodservice staff (10 farms).

TABLE 2 Farmers' Perspectives of Farm to School Benefits by Farm Gross Annual Revenue ($N = 15$ Farms)

	Frequency (%)		
	Farm gross annual revenue[a]		
Characteristic	<$10 000	$10 000–$25 000	>$25 000
Month that order would have to be made by K–12 schools[b]			
Less than 3 months	0 (0)	0 (0)	0 (0)
3 months	2 (15)	1 (8)	2 (15)
4 months	0 (0)	0 (0)	1 (8)
5 months	1 (8)	0 (0)	0 (0)
6 months	2 (15)	1 (8)	1 (8)
7 months	0 (0)	0 (0)	1 (8)
8 months	0 (0)	0 (0)	0 (0)
9 months	0 (0)	1 (8)	0 (0)
More than 9 months	0 (0)	0 (0)	0 (0)
Future Interest in Selling to K–12 Schools[b]			
Very interested	4 (31)	2 (15)	3 (23)
Somewhat interested	1 (8)	0 (0)	1 (8)
Not at all interested	1 (8)	1 (8)	0 (0)
Future interest in selling specific products for K–12 schools[c]			
Very interested	5 (42)	2 (17)	1 (8)
Somewhat interested	0 (0)	0 (0)	2 (17)
Not at all interested	0 (0)	1 (8)	1 (8)
Reasons for future interest in selling to K–12 schools			
Educate children about food systems	4 (27)	2 (13)	4 (27)
Increase access to healthy, locally grown foods	5 (33)	1 (7)	4 (27)
New revenue source for the farm	5 (33)	1 (7)	4 (27)
Build community relationships	5 (33)	2 (13)	2 (13)
Environmental protections	3 (20)	1 (7)	1 (7)
"Seconds" available to sell to schools	3 (20)	1 (7)	3 (20)
Interest in student visitations to the farm			
Interested	6 (40)	0 (0)	5 (33)
Not interested	0 (0)	3 (20)	1 (7)
Interest in farmer visitations to the schools[b]			
Interested	6 (46)	3 (23)	3 (23)
Not interested	0 (0)	0 (0)	1 (8)

[a]Farms' gross annual revenue did not exceed $250 000.
[b]$n = 13$.
[c]$n = 12$.

Table 4 shows results from a focus group discussion with Lowcountry farmers about farm to school benefits and barriers ($N = 9$). When asked about their farm operation, farmers discussed the types of products grown and associated growing and packing practices and then described their customers. The majority of farmers indicated that they grew produce items such as tomatoes, greens, brassica vegetables, onions, garlic, and beets. Market outlets commonly used by the farmers included restaurants, CSAs, and at

TABLE 3 Farmers' Perspectives of Farm to School Barriers by Farm Gross Annual Revenue ($N = 15$ Farms)

	Frequency (%)		
	Farm gross annual revenue[a]		
Characteristic	<$10 000	$10 000–$25 000	>$25 000
Challenges in selling to K–12 schools			
Difficulty guaranteeing a specific quantity on a specific date	1 (7)	1 (7)	3 (20)
Schools not interested	1 (7)	1 (7)	1 (7)
Delivering to schools problematic	0 (0)	0 (0)	0 (0)
Schools' volume needs are too small	0 (0)	0 (0)	0 (0)
Schools' volume needs are too large	0 (0)	1 (7)	1 (7)
No relationship with school foodservice staff	1 (7)	0 (0)	1 (7)
Schools' product specifications are hard to meet	0 (0)	0 (0)	0 (0)
Government regulations	6 (40)	3 (20)	0 (0)
Information needs required to work with K–12 schools			
Information about what specific products schools want	4 (27)	1 (7)	5 (33)
Information about schools' requirements for cleaning product	4 (27)	2 (13)	4 (27)
Information about the farm shared with nearby schools	4 (27)	1 (7)	4 (27)
Information about product pricing strategies	3 (20)	1 (7)	4 (27)
Information about the ins and outs of how school lunch works	4 (27)	1 (7)	4 (27)
Opportunities to meet face-to-face with school foodservice staff	5 (33)	1 (7)	4 (27)
Phone and e-mail addresses for area K–12 foodservice staff	4 (27)	1 (7)	2 (13)
Assistant marketing products to schools	4 (27)	1 (7)	1 (7)
Food Safety training including GAP certification	4 (27)	1 (7)	3 (20)

[a]Farms' gross annual revenue did not exceed $250 000.

least one farmers' market. Though none of the farmers who participated in the focus group discussion indicated that they had sold to K–12 schools, the majority of farmers stated that they would very much like to do so in the near future.

When asked about potential benefits realized in selling products to schools, most of the farmers indicated that expanding their markets and promoting local food consumption were the top benefits. For example, as one farmer stated, "I think the schools could be another outlet that nobody is pursuing at the moment," and another farmer stated, "A 40- to 60-acre farm could provide consistently to a farm to school program." The majority of farmers in the focus group stated that they perceived several barriers in selling their goods to schools. When asked about potential barriers in selling products to schools, the majority of farmers indicated that GAP certification was a major barrier. For example, as one farmer stated,

TABLE 4 Farmers' Perspectives of Farm to School Benefits and Barriers: Results From a Farmer Focus Group Discussion ($N = 9$ Farmers)

Theme	Example quotes
Can you tell me about your farm operation?	
Products grown	"We are all trying to be organic, as much as possible."
	"[We grow] heirloom tomatoes, kale, shard, fennel, greens, leeks, beets, brassica [vegetables], flowers, onions, and garlic."
What market outlets do you use/plan on using?	
Non-school markets	"[We sell] to restaurants and CSA [programs] and to at least one farmers' market. Farmers' markets are not so primary [for us]."
School-based markets	"I think the schools could be another outlet that nobody is pursuing at the moment. I had plans to start a mobile farmers' market, visit the schools 1 day a week at the end of the day."
	"[We] could sell to other school-based programs at market price and they could incorporate [our products] into their programs."
	"A 40- to 60-acre farm could provide consistently to a farm to school program."
	"[We] can grow lots of lettuces on a small amount of space, but things like okra take a lot of land."
	"I would look at a really specialized crop. Something that I knew a medium- to large-scale grower wouldn't mess with."
What benefits do you see in selling your products to schools?	
Opening a school market	"Being able to sell district-wide, to a large number of schools."
Opening a parent market	"It is more realistic to sell to the parents—like through a CSA. There needs to be an educational component—recipes, nutrition, science, and visits to the farm."
Nutrition education	"If we don't teach people where their food comes from, they don't care where their veggies comes from because they don't get it."
What barriers do you see in selling your products to schools?	
Good agriculture practice (GAP) certification	"GAP certification is something that I would never move toward unless I was forced to do it, and when I am forced to do it they will have realized that the way that they have set up the system is ineffective from small farmers."
Cost-effectiveness	"The only way that [farm to school] would work for a small farmer is, number one, for the system to contract-grow a certain crop for [the school]. For example, if I am going to grow you leeks this year, how many would you take?"

(*Continued*)

TABLE 4 (Continued)

Theme	Example quotes
Value-add processing facilities	"As a small farmer we are usually going to operate in a different niche market than the schools are operating in, my price point and the price point that schools are buying are never going to meet."
	"[Not having] a Department of Health and Environmental Control–approved kitchen is a major barrier. [We] could have satellite kitchens [as] the centralized kitchen could be a barrier because people would all want to use it at once."

"GAP certification is something that I would never move toward unless I was forced to do it, and when I am forced to do it they will have realized that the way that they have set up the system is ineffective for small farmers." Other major barriers to farm to school participation included lack of value-add production facilities and cost-effectiveness. For example, as one farmer stated, "[not having] a Department of Health and Environmental Control–approved kitchen is a major barrier." Moreover, as another farmer stated, "The only way that [farm to school] would work for a small farmer is, number one, for the system to contract-grow a certain crop for [the school]."

DISCUSSION AND POLICY RECOMMENDATIONS

We administered a modified version of the farmer survey developed by the Institute for Agriculture and Trade Policy[13] to farmer representatives from small or limited-resource farms in the Charleston tricounty area within South Carolina and conducted qualitative research to elucidate farmer farm to school benefits and barriers and to inform a model state-level GAP certification policy and practice for small or limited-resource farmers in South Carolina as well as in other states. Study findings show that though some of the farmers surveyed sold their products in traditional markets such as grocery stores and restaurants, none of the farmers surveyed indicated that they had ever sold directly to a school (elementary, middle, or high), which is a noted emerging market for small or limited-resource farmers specifically.[19,20] Importantly, however, the majority of farmers surveyed suggested that they would be interested in farm to school participation as well as in opening up direct-to-consumer marketing venues such as mobile farmers' markets and selling directly to parents through school-based CSA programs. The farmers surveyed were particularly interested in physically visiting schools and having the school children physically visit their farms. Other reasons for farmer interest in farm to school participation were akin to those identified by previous researchers,[17,20–22] including having a new revenue source; increasing

access to healthy, local produce; educating children about food systems; and building relationships with the community.

Like benefits, barriers to farm to school participation for small or limited-resource farmers also abound but, importantly, barriers have to be minimized for farmer participation in farm to school initiatives to occur. GAP audit and certification processes (ie, audits that focus on best practices to ensure that produce items are handled such that microbial food safety hazards are minimized)[23] were identified as major farmer barriers to farm to school participation. GAP implementation, compliance, and record-keeping can increase production costs and thus small or limited-resource farmers may not fully seize all opportunities associated with GAP certification unless they are adequately informed, technically prepared, and organized to meet the challenge of compliance with government and public agency auditing standards.[24] The other major farm to school participation barriers for farmers included general information need requirements, access to value-add facilities, and, notably, cost effectiveness—the farmers were not confident that they could make money selling their products to K–12 schools unless, for example, they could contract-grow for individual schools or entire school districts.

Limitations

Our study had several limitations. Though the farmer survey was administered to farmers representing small or limited-resource farms in the Charleston tricounty area, it is unclear whether the farmers' survey responses are generalizable to other small or limited-resource farms located in the tricounties and in other geographic areas within the state of South Carolina and beyond. Moreover, because our survey was administered online, it is possible that we did not capture data from some of the more senior farmers because they may not have access to the Internet or be comfortable completing a survey online. Finally, despite our participation rate of 45%, our study lacked sufficient power to analyze the quantitative data beyond that of descriptive statistics.

CONCLUSIONS

Farm to school initiatives can only be successful if both the demand and supply for them exists. School foodservice directors must be aware of the social and health values of purchasing local foods for their students to consume, and importantly, local foods must be economically viable and available in forms that can be easily prepared and served by school foodservice staff. Farmers who source foods to schools should include those who are local, and local farmers include those from small or limited-resource farms—farms that could be unable to even consider entering emerging markets such as

schools if they do not adhere to GAP certification guidelines because schools are increasingly requiring third-party GAP certification as a condition of purchase.[5,25–27] To minimize GAP certification as a barrier to farm to school participation and more fully realize it as a benefit, we suggest that South Carolina as well as other states consider adopting a modified GAP certification program for small or limited-resource farmers that certifies an entire farm, rather than specific commodities, and we offer Rhode Island's GAP certification as a model (http://web.uri.edu/foodsafety/grow/). To minimize other farm to school participation barriers, we suggest that appropriate state- and local-level agriculture infrastructure supports (eg, food safety and good agriculture practice trainings, market-ready workshops, accessible value-add processing centers, and contract-grow procurement options) be put in place. Additionally, to help meet farmers' farm to school information needs and ensure that the demand for local foods and farm to school remains high, we suggest that state and local agricultural-focused agencies convene key farm to school partners such as district-level school foodservice directors, local food distributers, and farmers on a regular basis through both in-person and online media. Future research should be conducted at the state level (in South Carolina as well as in other states) to better understand farm to school participation benefits and barriers from the perspective of both the farmer and the school foodservice director.

FUNDING

This project was funded by a grant from Boeing.

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