Federal-State Marketing Improvement Program
Final Performance Report
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An Outline of the Issue or Problem: Because farmers markets are direct-to-consumer marketing venues, vendors assume more marketing roles than they would if they sold their products in other channels, and they need the expertise to manage these marketing activities. The "Assessing Sampling, Price Reporting as Farmers Market Vendor Marketing Tools" project has addressed two marketing mix components – promotion and pricing – that farmers market vendors must understand to improve their economic viability as direct marketers in their local communities.

Product sampling is one alternative that allows vendors to showcase the sensory attributes that drive purchases. Research from the University of Kentucky measured behaviors of farmers market shoppers in eight states, including Missouri. The research suggested that 55 percent purchase after product trial, or sampling, when they hadn't anticipated purchasing. Another 17 percent of consumers who tried products at farmers markets noted that they'd purchase the product in the future. Plus, sampling appears to stimulate product recommendations to friends or family.

By marketing at farmers markets, producers have the opportunity to capture more value as they conduct more value chain activities, including marketing to consumers. Setting prices can be a challenge, however. At prices too low, vendors may undermine neighboring vendors, hinder consumer perceptions about the market and not recoup their own costs, according to a University of Illinois Extension publication. On the other hand, a guide from the Davis Farmers Market Association described that prices set by vendors should align with prices that customers are willing to pay and prices set by other vendors. As a result, vendors must balance forces between covering costs and maximizing their return.

Goals and Objectives: The project goal was to improve Missouri farmers market vendors' marketing capabilities by sharing research findings and making strategy recommendations that help them to better promote and price their products. To achieve this goal, the project had two objectives. First, the project assessed sampling as a marketing promotional tool for Missouri farmers market vendors. Second, the project expanded pricing resources available for Missouri farmers market vendors.

Accomplishing the project goal and objectives involved several steps. To consider sampling as a promotional tool, the project team first created and distributed a survey to evaluate consumer attitudes toward sampling at Missouri farmers markets. The project team built the survey in SurveyMonkey and engaged Research Now, an online market research firm that specializes in survey implementation, to recruit survey respondents. In total, 2,882 consumers began the survey, which was open in December 2015. Of those, 57.3 percent shared that they shopped at farmers markets less frequently than once a month when

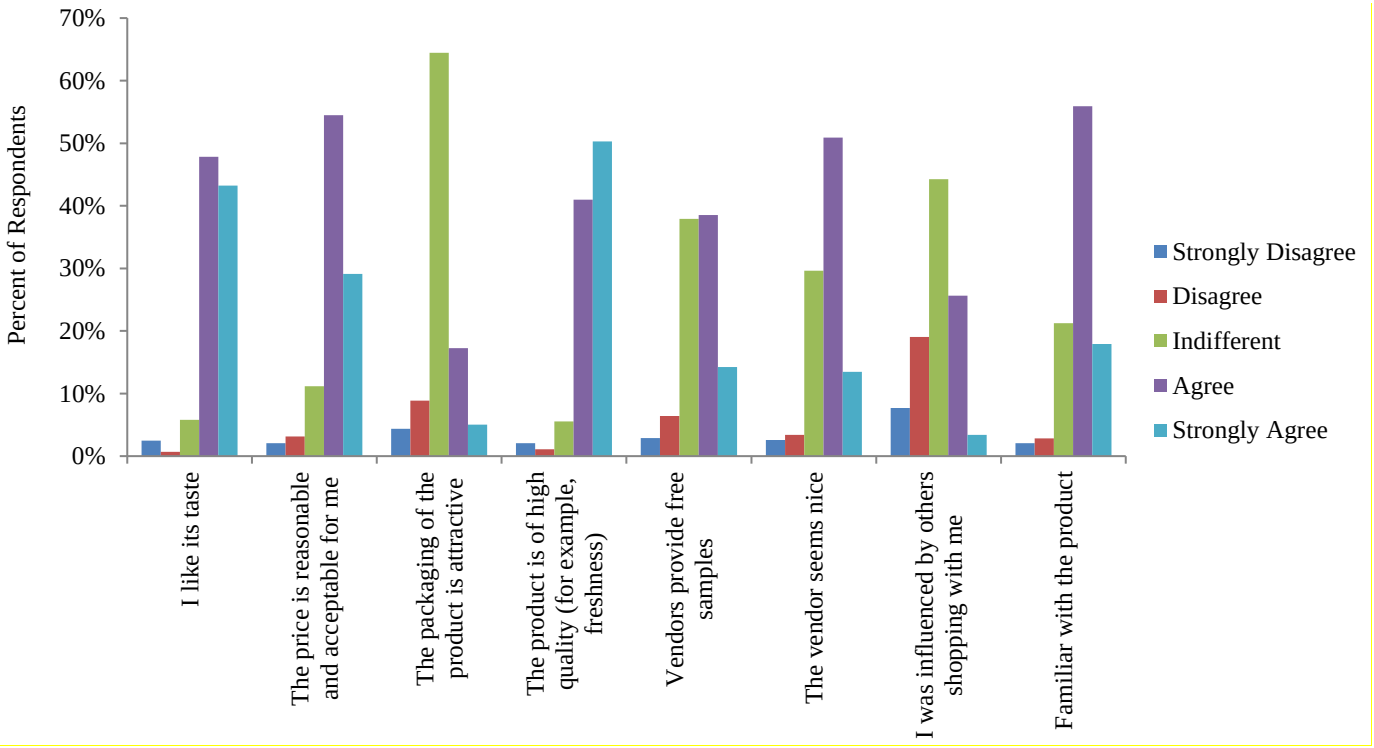
markets are operational. The survey analysis predominantly focused on the 42.7 percent of respondents who reported shopping at farmers markets at least monthly. These individuals were considered "regular" farmers market shoppers. The project team analyzed regular shopper responses for demographics, factors that serve as farmers market product purchase drivers, sampling and purchasing behaviors at farmers markets, price sensitivity after sampling and factors that motivate or discourage sampling at farmers markets. With these insights in mind, vendors can craft a sampling strategy that appeals to shoppers.

In expanding product pricing resources, the project essentially grew the scope of a farmers market price collection and reporting framework. The model leveraged University of Missouri Extension specialists to report reliable and representative price information. This project enabled the team to reach more farmers markets for price reporting efforts and increase the number of crops included in the price collection and reporting program. The project work evolved to develop a partnership among the Parcell and Moreland project team, University of Missouri Extension and the Missouri Department of Agriculture. Through this partnership, the collaborators produced a Farmers Market Report that publishes farmers market prices by region. The Missouri Department of Agriculture shares the report on its Market News website. Also related to pricing intelligence, the project team analyzed price data collected during 2014 and 2015 farmers market visits to identify trends. In particular, the team sought to identify whether factors such as production method (organic or conventional), seasonality, sales arrangement and quality factors influenced prices.

Contribution of Project Partners: The project team – Joe Parcell and Jill Moreland at the University of Missouri – were the chief contributors to the project. However, several partners enabled the project team to successfully execute the project plan. University of Missouri Extension specialists served as one partner group. Selected specialists throughout the state contributed by collecting farmers market prices at farmers markets in their coverage areas. Plus, Extension specialists have served as a critical resource for implementing the project's outreach plan. The specialists are well-positioned to share the project findings and deliverables with farmers markets vendors in their local communities. In 2016, the Missouri Department of Agriculture emerged as a new project partner. The department sought to create a Farmers Market Report for pricing, but it needed assistance in accessing human resources to collect product prices at farmers markets throughout the state. As a result, the project team offered to assist by coordinating Extension specialists to collect and report prices in their home regions.

Results, Conclusions, and Lessons Learned: Based on survey results from Missouri farmers market shoppers, particularly those who shop at least monthly when markets are operational, farmers market vendors can adopt strategies meant to make the most of the sampling experience. For example, regular farmers market shoppers – considered to be those who shop at least monthly at farmers markets when they're operating – prioritize quality and taste when purchasing at farmers markets. Sampling may be a strategy for farmers market shoppers to experience both dimensions and use that information to make purchase decisions. Figure 1 lists various statements that may determine product purchases and the extent to which regular farmers market shoppers answering the survey considered those factors to affect their purchases. Of the regular shoppers, 91.3 percent strongly agreed or agreed that high quality, such as freshness, would determine whether they purchased product at farmers markets. Ninety-one percent strongly agreed or agreed that liking a product's taste would determine a purchase. A reasonable and acceptable price, product familiarity and a nice vendor followed in importance as purchase determinants.

Figure 1
Factors that Determine Product Purchases at Farmers Markets (n = 1,171)

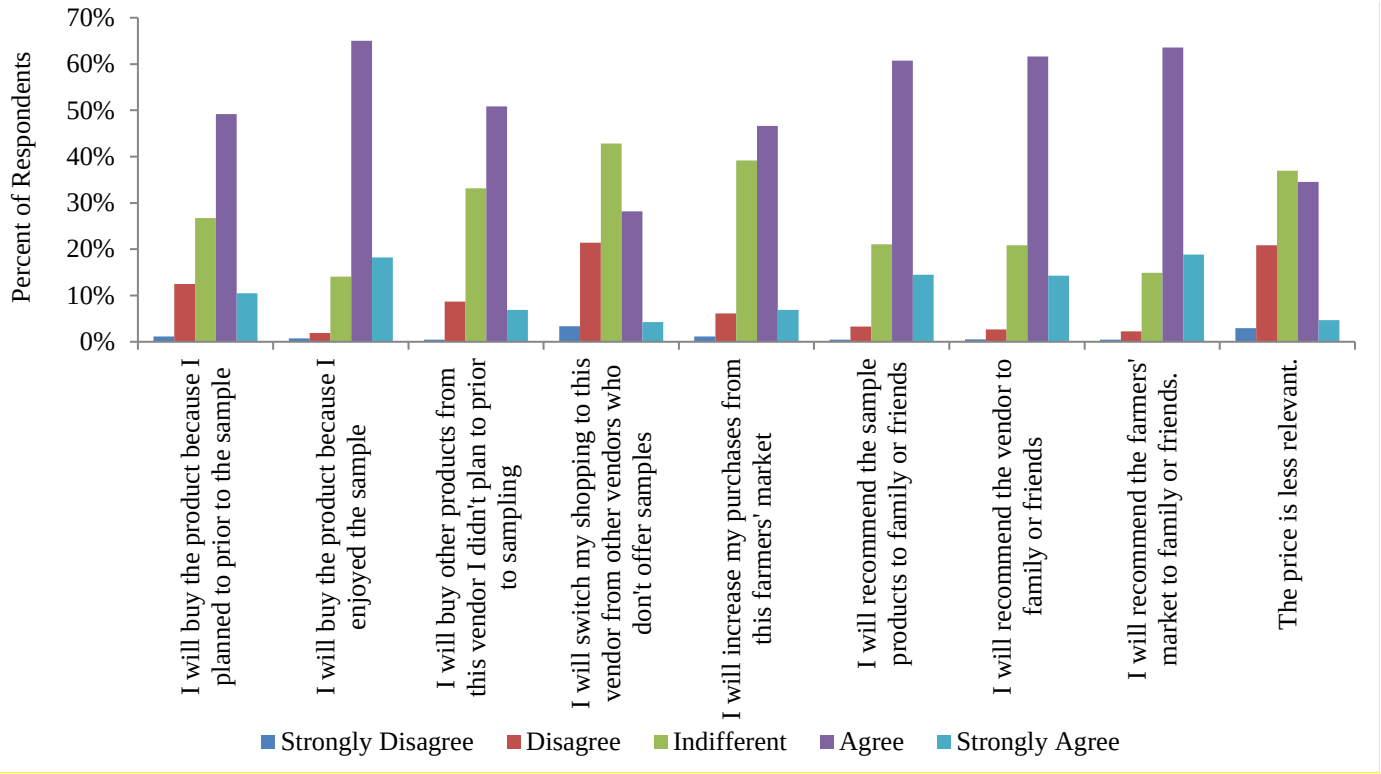


Question: Please rank the following statements which determine whether you will purchase a product at farmers markets.

A satisfactory sampling experience either in a store or at a farmers market has the potential to make some consumers feel less concerned about price. Nearly 57 percent of the 1,171 regular farmers market shoppers surveyed for this research said that they would feel less concerned about price if a product they sampled met their expectations. As this finding suggests, sampling has the potential to induce regular farmers market shoppers to act in some way or somehow respond to their experiences. Figure 2 presents the extent to which the 944 regular farmers market shoppers who had farmers market sampling experience agreed or disagreed that they would behave in certain ways after having tried free samples at farmers markets. After summing the share of shoppers who agreed or strongly agreed with various statements, the greatest share reported that they would buy the product because they enjoyed the sample – 83.3 percent agreed or strongly agreed – and would recommend the farmers market to family or friends – 82.4 percent agreed or strongly agreed.

Roughly three-quarters of the respondents agreed or strongly agreed that they would both recommend the vendor and sampled products to family or friends. Nearly 60 percent of the respondents said that they would buy the product as they had planned prior to sampling, 57.7 percent shared that they would buy other products from the vendor that they didn't plan to buy prior to sampling, and 53.5 percent indicated that they would increase purchases from the given farmers market. Note that just 32.4 percent said that they would switch shopping to a given vendor from other vendors who don't offer samples.

Figure 2
Actions or Responses Following Free Sample Trials at Farmers Markets (n = 944)



Question: As a result of your sampling experience, please rank the following statements which describe your actions/response after having tried free samples at farmers markets.

The sampling research produced several other insights. Among them, regular farmers market shoppers participating in the survey tended to prefer sampling baked goods, cheese and fruits, and they were most likely to buy vegetables, fruits and baked goods. Vendors may choose to offer samples for preferred products to draw traffic to their booths. They may also consider using more frequently purchased products as ingredients in more frequently sampled products to build exposure for the products used as ingredients. Some regular shoppers may not feel confident in food sanitation and safety practices for samples. As a result, they may forgo sampling. This heightens the importance of adopting and sharing about sampling sanitation and safety protocol. The research found that regular farmers market shoppers with previous sampling experience primarily choose to sample when they want to know about product taste, they enjoy sampling, they see an appealing product presentation or display, and the samples are free. Regular shoppers who hadn't sampled in the past were predominantly discouraged from sampling when samples weren't available, they already knew enough product information, they felt booths were too crowded, or they felt pressure to buy after sampling. Appealing to factors that motivate sampling and avoiding factors that discourage it may contribute to a strong sampling plan. For more findings related to the sampling survey research, please see the attached white paper about sampling at farmers markets.

Collecting and analyzing farmers market prices yielded several observations. To maximize sales, farmers market vendors may use strategies such as growing crops organically, identifying the ideal sales arrangement and offering products that fit with customer quality expectations. For example, raising food organically requires a production philosophy that varies from the one that guides conventional food production. As a result, organic production generally involves more intensive management to control challenges like pests and weeds and encourage high yields and crop quality. To compensate producers for investing in organic methods, organic products often command a premium relative to conventional goods. Table 1 presents average Missouri farmers market premiums recorded for organic products during the two-year FSMIP project. The table shares computed organic premiums for crops that had at least 5 percent of

total price reports originating from organic products in a given year. To qualify for being reported in Table 1, the number of observations per category – organic and conventional – for a given crop in a given year also had to be at least 10. Based on average premiums computed for tomatoes, cucumbers and green beans, Missouri farmers market vendors tended to place the highest premium on organic cucumbers. Note, however, that only 2014 data are presented for cucumbers. In 2014, the premium set for organic cucumbers relative to conventional cucumbers averaged 34.7 percent. Premiums for organic green beans and tomatoes averaged 19.4 percent and 17.7 percent, respectively, in 2014 and 2015.

Table 1
Organic Price Premium or Discount as Average Organic Price/Average Conventional Price, 2014 and 2015

	2014-to-2015 Average
Tomatoes	117.7%
Cucumbers*	134.7%
Green beans	119.4%

** Only 2014 data are presented for cucumbers.*

At farmers markets, vendors may choose the preferred sales arrangement, such as marketing product individually or by weight or bundle, for their goods. For some products, they may have an economic incentive to use one sales arrangement rather than another. Sweet corn offers an example. Vendors predominantly sell sweet corn by the dozen. However, in 2015, reporters found a couple of Missouri farmers market vendors selling corn by the ear. Conventional sweet corn price averaged $5.43 per dozen or $0.45 per ear for that year. When vendors sold corn by the ear, the price received per dozen almost always failed to reach the annual average price per dozen. One vendor sold corn at $0.25 per ear, which would generate $3 per dozen. Another charged $0.50 per ear yet provided discounts when selling five ears for $2 or a dozen for $4.50. In all but the $0.50 per ear scenario, vendors would earn less per ear by selling corn per ear than they could by setting a price per dozen equivalent to the average $5.43. That said, vendors selling sweet corn by the ear may generate greater total revenue than those selling sweet corn by the dozen if they can achieve a higher sales volume. Some shoppers may forgo buying sweet corn if the only choice is purchasing a dozen ears.

Other pricing considerations to bear in mind include recognizing that price encompasses a bundle of product characteristics. In application, price should reflect a level that best captures all of a product's traits and their total value. The price analysis research noted the potential for vendors to earn higher prices in some cases if they grow food organically relative to conventionally, offer products earlier or later than typical during a growing season and market higher quality goods. However, adopting the related practices to supply such products can incur costs. Vendors should balance the costs and returns to drive profit for their operations.

As the project team created the price collection and reporting proof of concept, it developed several framework components that enhance price reporting's impact and efficiency. Engaging University of Missouri Extension staff was a key decision. These specialists represent an important audience because they have local knowledge that assists in compiling price data. Also, they're already stationed throughout the state, which positions them well to reach communities and farmers markets in diverse areas, and they regularly interact with constituents in their local areas and can share findings with those individuals. The following photos depict a typical market environment for University of Missouri Extension specialists collecting and recording price and quality information.

A fall data collection day in the Springfield, Mo., farmers market area featured green beans (top left); a vendor selling potatoes, apples, tomatoes and other goods (top right); a diverse berry selection (bottom right); and University of Missouri Extension staff noting price, weight and quality data for produce being sold (bottom left).

The proof-of-concept work also enabled the team to realize an unexpected positive result in that it had an opportunity to collaborate with the Missouri Department of Agriculture and apply its experience with the initial price reporting framework. The USDA Agricultural Marketing Service funded a project to enable the Missouri Department of Agriculture to develop a data collection system and reporting tool for farmers market prices. Through this project, the Missouri Department of Agriculture created a system that can house price data recorded from farmers markets and share that information via an online Farmers Market Report platform. The challenge that the Missouri Department of Agriculture encountered involved organizing the human resources required for collecting prices at farmers markets throughout the state. By collaborating with the project team, the Missouri Department of Agriculture gained access to a price reporting method that leveraged University of Missouri Extension specialists as price reporters. The partnership led to statewide farmers market price reporting in 2016 via the Farmers Market Report, made accessible online by the Missouri Department of Agriculture. The attached white paper about price collection shares more background and information about the collaboration.

The price collection and reporting partnership serves as a model for similar efforts in other states. Using insights gleaned during the initial proof-of-concept phase and the Missouri Department of Agriculture partnership, the University of Missouri project team created a feasibility analysis that can serve as a guide for other states considering statewide farmers market price reporting. The feasibility analysis assumes that a state has eight regions, and each requires an Extension specialist who will record prices at farmers markets in a given region. Throughout a farmers market season, each Extension specialist is assumed to make 12 farmers market visits. Table 2 presents a budget that communicates costs for a state to adopt price reporting similar to the Missouri model and dispatch Extension staff as the price reporters. After accounting for travel costs, personnel expenses, 36.43 percent fringe benefits and a 22 percent indirect rate, the budget assumes that a farmers market price reporting project would annually require $3,355 per specialist and region. For eight regions, costs would total an estimated $26,840. Assume that a state would pay roughly $36,500 per year on average for a full-time market reporter's salary and incur an estimated $73,000 total for the market reporter when accounting for benefits, car and other expenses. Thus, leveraging University of Missouri Extension specialists as price reporters has the potential to yield significant cost savings relative to hiring a dedicated staff person to implement farmers market price collection and reporting.

States would have additional expenses related to the information technology infrastructure necessary for price collection and reporting. For a state to build a similar Farmers Market Report site, it would incur roughly $1,600 to $2,750 for wages and benefits. This estimate also assumes that the developer has an application lamp structure to use when developing the tool. Developers could possibly save time and cost if they were to customize an existing price reporting tool framework. Site hosting is another cost to consider. As a rough estimate, assume that hosting a site for one year would require a $15,000 commitment.

Combined, the travel, price reporting personnel, indirect and reporting platform costs would total an estimated $44,015 in the first year. If a state has more than eight regions or chooses to offer more localized price information for smaller geographic areas, then actual costs may exceed this estimate. A state with fewer regions may incur less costs. In later years, costs may vary somewhat from those estimated here. For example, states should account for possible annual growth in personnel costs, but the cost to develop the online reporting platform would be limited to the first year.

Table 2
Farmers Market Price Reporting Budget Per State

	Estimated Costs
Travel	$750
Personnel*	$2,000
Indirect**	$605
Subtotal cost per specialist	**$3,355**
Number of regions per state	8
Total cost for Extension specialists	**$26,840**
Cost for online reporting platform creation	$2,175
Annual website hosting cost	$15,000
Total estimated costs per state	**$44,015**

** Personnel allocation includes 36.43 percent for fringe benefits and assumes 12 market visits per year.*
*** Indirect costs computed at 22 percent rate.*

Project work also yielded several lessons learned. In terms of unanticipated challenges, this project experienced a delay during the IRB approval process for the sampling survey research. For any survey conducted through the University of Missouri, IRB approval is required. With the approval delay, the project team had to postpone executing the survey from its intended schedule. For farmers market price collection and reporting, flexibility has been important. At least one market that had been selected for price reporting purposes closed mid-year, so the Extension staff needed to identify another market to take its

place. Developing a contingency plan as the project starts would allow for quick action if a similar issue were to arise in the future. Weather has served as another challenge for the price collection and reporting efforts. For example, 2016 did not yield a good tomato crop. Because of the state's poor tomato crop, fewer data points have been available to report. A weather effect could influence price data quality for other crops in future years if too much moisture presents a challenge or drought-like conditions develop.

If the project team were to make modifications to the project plan, then it would consider altering the price collection period windows. The most recent iteration of the price collection and reporting model established two collection periods. The first ranged from June to July and involved making four farmers market visits during June and two during July. Each specialist would make "unique" visits during June and July, meaning that each would visit six different markets during the first collection period. From August to October, Extension specialists gathered price data for the second period. Extension staff could visit markets in the second collection period that they had visited in the first period. In the future, the project team may consider modifying the collection periods. One option would be to incorporate spring price collection dates and, consequently, enable expanded reporting for cool-season crops grown early in the season.

If other entities were to attempt a similar project, then one piece of advice involves planning early and communicating well with all project stakeholders. For the price reporting component, Extension staff need detailed information to understand their roles and responsibilities. As this project was implemented, Extension staff needed to know specific parameters for classifying products as organic, for example. Some farmers market vendors may claim to offer organic goods, but to qualify as organic in the price reports, a vendor must have complied with the USDA organic standards and displayed the certified organic seal. Another important element is standardizing the price reporting process. By all Extension specialists using the same documents for price collection, this project has benefited from uniformity. Other groups would be recommended to adopt a similar consistent method. Planning the project coordination meeting early and sharing all pertinent details, such as the organic qualifications and standardized grading sheets, would enable other projects to proceed smoothly and prices to be recorded consistently.

Evaluation: The sampling piece of the project met project objectives as the project team conducted research about sampling behaviors, practices and preferences, and it produced a white paper to share the results with Extension staff and residents throughout the state. The sampling research also enabled the project team and a visiting scholar at the University of Missouri to present a research paper titled "Consumer Preference for Sampling at Farmers Market" at the 2016 Southern Agricultural Economics Association annual meeting in San Antonio, Texas.

A significant measurable outcome produced by the project is the price collection and reporting collaboration developed among the Parcell-Moreland project team, University of Missouri Extension and Missouri Department of Agriculture. The previous section in this final report and the attached price collection white paper share more details about the partnership. Not only does the collaboration represent a positive result from the project, but it also illustrates the potential that statewide farmers market price collection and reporting may have in other states. For other states interested in offering a price reporting tool, they can use the Missouri experience as a model to replicate or adjust for a state's unique needs. When this project began, the price collection and reporting efforts started as just a concept, so the project met its objective to develop a system that expands product pricing resources available to Missouri farmers market vendors.

Current or Future Benefits/Recommendations for Future Research: The project has produced multiple benefits. First, it has improved understanding about sampling as a factor that shapes purchase decisions at Missouri farmers markets. Vendors can use that information now to adjust or develop sampling plans that appeal to customers and improve their ability to market products well. The price reports improve transparency, which aids vendors in setting realistic prices that fairly compensate them for their products. At present, Missouri vendors benefit from the enhanced transparency. In the future, however, this

project may expand to benefit farmers market vendors in other states. One project component – the farmers market price collection proof-of-concept – especially has replication potential in other states. This project produced a sample price collection and reporting model, including financial analysis, that other states can reference to estimate costs and requirements necessary in implementing a similar model in their own areas.

One theme that future research could address involves sampling and food safety. Some regular farmers market shoppers participating in the sampling survey research indicated that they lack confidence in food sanitation and safety practices for samples available at farmers markets. Further research could pinpoint areas where farmers market vendors can improve their food safety skills and communicate about their practices with shoppers. Second, the research evaluating price and quality relationships concentrated on only a few specialty crops: sweet corn, tomatoes, cantaloupe, cucumbers, green beans, bell peppers, zucchini, blackberries, cabbage, bulb onions and potatoes. Animal products, such as beef, eggs and pork, were added to the reporting platform developed through the Missouri Department of Agriculture partnership. Future research could determine whether quality variables influence prices for animal-derived products. Third, if farmers market price reporting expands to other states, then future research could analyze the extent to which prices vary on quality dimensions, such as conventional, non-GMO, organic or grass-fed production system, and compare those results to the finding that few quality factors appear to influence Missouri farmers market prices. The latter was an observation from this project.

Project Beneficiaries: Several groups benefit from the information generated through this project. First, existing farmers market vendors can reference the project outputs to more capably use sampling as a promotional tool and set fair, reasonable prices. After reviewing price report data, existing vendors could also identify products not currently available in their market areas and consider whether they have an opportunity to add those goods to their product offerings and diversify their businesses. In 2012, the Census of Agriculture reported that nearly 4,100 Missouri farms pursued direct marketing, which includes selling product at farmers markets, roadside standards and pick-your-own farms. For those that participate as farmers market vendors, they all could benefit from this project's work. Said another way, vendors who market at any of the 260 farmers markets in Missouri would benefit from the project work.

Other audiences that benefit include consumers and beginning farmers. Consumers, most notably those that shop at Missouri farmers markets, can reference the price reports generated by the project to find products available at specific markets in prior weeks. The pricing information may help consumers consider whether to shop for certain products at farmers markets or other retail establishments. From a sampling perspective, if existing farmers market vendors devise good sampling strategies, then consumers benefit from enjoying the sampling experience and using the information that they collect from the sampling experience to inform their purchase decisions. With the project's price reports, beginning farmers could review them and identify opportunities to market goods that are not listed and not currently available at given markets. The sampling information has value to beginning farmers who may use sampling as a tool to acquaint farmers market shoppers with the quality of goods that they raise and sell.

Additional Information: This project has three white papers as its main deliverables. The first summarized the price data collected during 2014 and 2015 and reported the extent to which price sometimes varied by factors such as production method and seasonality. The second analyzed the survey research that assessed sampling preferences and experiences from a consumer perspective. The third outlined the evolution in developing a plan to collect and report Missouri farmers markets price data, and it created a plan, including financial commitment, that other states could use as a model if they choose to consider and adopt farmers market price collection and reporting. The three white papers are attached. They will be posted to Dr. Parcell's website and be widely accessible to any Missourians interested in the material.

To supplement the three written white papers produced through this project, the project team also created Power Point presentations that correspond to the content shared in the white papers. Not only could the

project team use the Power Point presentations to share about the project and its work and outcomes, but the project team will also make the presentation files available to field Extension staff, who could use the Power Point presentations to share about the project in the communities that they serve.

Additionally, this project led to a few other outputs. Using the sampling survey data, the project team and a visiting scholar at MU, Lijun Chen, authored a paper titled "Consumer Preference for Sampling at Farmers Market." Accessible at http://ageconsearch.umn.edu/handle/230054, the paper was presented at the 2016 Annual Meeting of the Southern Agricultural Economics Association. The paper is also attached. The sampling paper concluded that consumer trust in the farmers market food system has a significant effect on sampling decisions and that affiliation toward people distributing samples motivates consumers to sample. Additionally, Chen presented the research findings at a Division of Applied Social Sciences Lunch and Learn in March 2016. A copy of her presentation accompanies this report.

A second research paper, authored by Parcell and a few other researchers, used hedonic pricing models to study the effect that product attributes have on vegetable prices. Given data from seven types of produce, some attributes affect product price variation more than others. For example, a higher weight increased product price for some products but decreased price for other products after a certain point. Based on the study's analysis, one factor that most strongly influenced product price was the sale location. The research results suggested that estimated number of competitors, product cleanliness and product deformities didn't affect produce prices. The paper is available as an attachment to this final report. Plus, the research team shared the findings at the Food Distribution Research Society meeting in October 2016.

Last, leveraging its work with farmers market price collection and reporting, and the project team collaborated with the Missouri Department of Agriculture to use Extension staff as price reporters. Currently, the Missouri Department of Agriculture publishes prices gathered by Extension staff online at https://mdafmr.mo.gov/.

Developing a Proof-of-Concept for Farmers Market Price Reporting

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Public price reports equip agricultural producers with information that they can use to market their products and maximize returns from their operations. In many cases, currently available price reports are limiting for farmers market vendors because they fail to account for the experience and locale unique to particular farmers markets. The lack of pricing intelligence may challenge producers from successfully pursuing direct marketing through farmers markets.

The most recent Census of Agriculture data illustrate a drop in Missouri farms participating in direct marketing and making direct product sales. Statewide direct agricultural product sales, including those at farmers markets, roadside stands and pick-your-own farms, decreased from $20.98 million in 2007 to roughly $19.66 million in 2012. Nearly 4,100 Missouri farms in 2012 pursued direct marketing, which is 245 fewer farms marketing directly than in 2007. Such declines in sales and direct marketing participation suggest that Missouri farmers may benefit from information that helps them market products more efficiently and operate more sustainably.

To fill the need for Missouri farmers market price reporting, University of Missouri staff have evaluated proofs of concept for collecting and sharing prices. Leveraging this proof of concept work, a refined and finalized price reporting framework has been developed. Particularly, this work enabled the project team to create a low-cost model for farmers market price reporting.

With this model, established Missouri farmers market vendors would have prices accessible to gauge marketplace supply and demand dynamics. Additionally, the Missouri framework may serve as a model for other states to implement farmers market price reporting in their areas. Not only would existing farmers market vendors benefit from price reports, but consumers and beginning farmers may also realize value from them. Consumers could reference the reports to find products available at specific markets in prior weeks, and beginning farmers could review price reports and identify opportunities to market goods not currently available at given markets.

Initial Price Reporting Model

Initially, the University of Missouri developed a price collection and reporting protocol meant for several specialty crops. University of Missouri Extension field staff contributed to the project by traveling to farmers markets in their respective areas and recording prices during those visits. Work involved naming extension specialists based in field offices throughout state as candidates to support the price reporting efforts. Extension specialists selected to contribute to the project were community development or horticulture extension specialists.

As many as five extension specialists in 2014 and 2015 visited farmers markets in their areas during two data collection periods. The first period extended from June to August, and the second period ranged from September to October. The project team had developed a protocol to guide the data collection process and ensure that data reports would be as reliable and representative as possible. The protocol included creating farmers market produce grading sheets to standardize data collection and engaging horticulture experts to review the grading sheets and make improvement recommendations. Additionally, the project team hosted a meeting to introduce the data collection protocol to all project personnel and give individuals an

opportunity to ask questions before they started collecting prices. Sharing data in aggregate and maintaining vendor price confidentiality were also key elements of the data protocol.

Throughout the initial testing and proof-of-concept period, the farmers market price reporting model underwent a few key changes. First, it added more farmers market price collection points. The expanded coverage area would enable the final price reports to benefit a wider group and add robustness to the reporting tool.

Second, as mentioned earlier, the price reporting framework initially addressed a limited number of specialty crops commonly sold at Missouri farmers markets. The five specialty crops included in 2014 were sweet corn, tomatoes, cantaloupe, cucumbers and green beans. In the following year, the price reporting project's scope grew to also include bell peppers, zucchini, blackberries, cabbage, bulb onions and potatoes. Not only did the extension staff record product prices, but their reports also correlated certain quality indicators and product characteristics to price. Such variables captured in the price reports included color, maturity or development, freshness, variety type, shape, surface characteristics, injury or damage, uniformity, size and coloration. Price reports also denoted market location and whether products had been raised in an organic or conventional production system. Plus, they indicated the extent to which prices varied by sales arrangement, such as selling product by count, weight or volume.

Based on the price report records, some attributes affected product price variation more than others. As an example, one factor that most strongly influenced product prices was the sale location. Weight had some effect on price, but the weight-price relationship varied by product. In some cases, a higher weight increased the product price, but for other products, prices decreased after product weight reached a certain point. Price data suggested that estimated number of competitors, product cleanliness and product deformities didn't affect prices.

This initial farmers market price collection and reporting model helped to determine a low-cost model for gathering Missouri farmers market prices and communicating them to others. University of Missouri Extension specialists played a critical role in efficiently tracking prices within their coverage areas. Using this initial model as a starting point, a more recent price reporting model iteration has refined the concept and adapted it to create a collaborative framework that other states may consider implementing.

Evolution of the Price Reporting Model

For 2016, the University of Missouri project team had an opportunity to apply its experience with the initial price reporting framework and collaborate with the Missouri Department of Agriculture. The USDA Agricultural Marketing Service funded a project to enable the Missouri Department of Agriculture to develop a data collection system and reporting tool for farmers market prices. Through this project, the Missouri Department of Agriculture created a system that can house price data recorded from farmers markets and share that information via an online Farmers Market Report platform. The challenge that the Missouri Department of Agriculture encountered involved organizing the human resources required for collecting prices at farmers markets throughout the state. The human resources challenge was two-fold: identify personnel with horticulture backgrounds and fund price reporting work for those individuals.

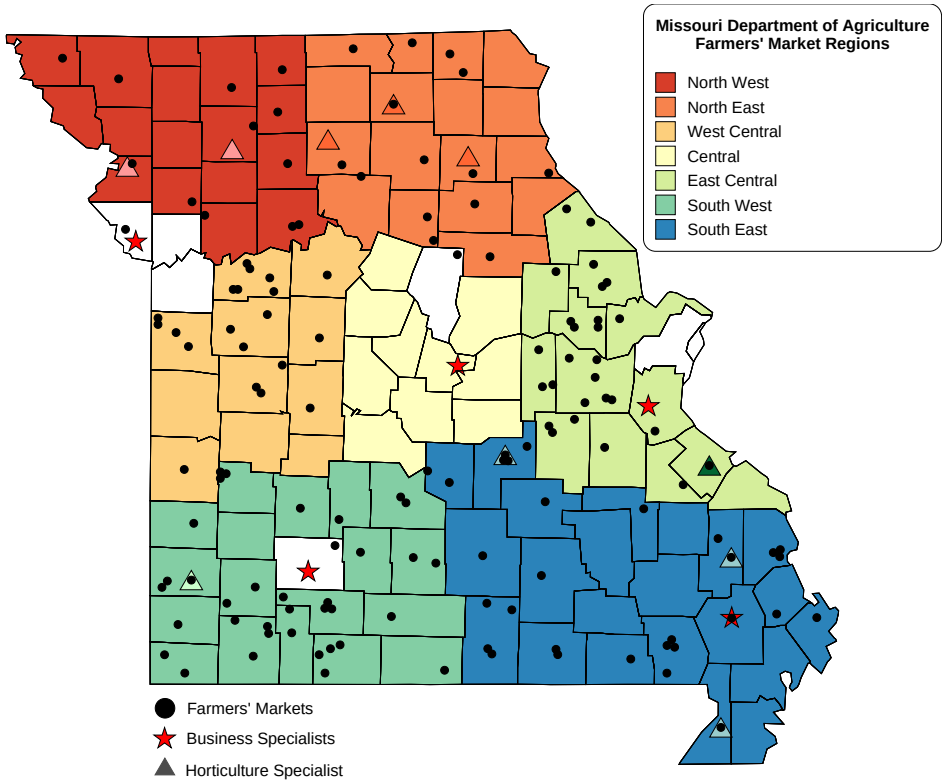
Given that the initial project had honed a process for extension staff to fulfill the data collection function, the Missouri Department of Agriculture and University of Missouri could realize synergies by partnering. As a result, they committed to a joint project that refined the initial

farmers market price collection and reporting framework and, again, relied on extension field staff to record prices at farmers markets.

In refining the price collection framework, one adjustment centered on the sampling plan. To ensure fair geographic representation in farmers market price reports, the combined Missouri Department of Agriculture and University of Missouri team engaged stakeholders in more geographic areas throughout the state. Generally, state agriculture departments or state extension programs categorize geographic areas by region. Alternatively, the USDA National Agricultural Statistics Service has stipulated agricultural statistics districts that also geographically break down states. Reporting prices by such regions or districts encourages fair coverage to all areas. The Missouri Department of Agriculture designated seven regions and four metropolitan areas for farmers market price reporting. See Figure 1. Of the seven regions and four metropolitan areas classified in Missouri, this model focused on supporting extension specialists who would record farmers market prices in six regions: north west, north east, west central, east central, south west and south east. The Missouri Department of Agriculture chose to rely on internal staff to report prices in the central region and four metropolitan areas.

To implement the price reporting, this refined model also broadened the type of extension specialists considered for the price collection roles. This model added an agronomy extension specialist to record prices in her respective region. Agronomy specialists, like the horticulture and community development specialists who also participated in the project, likely have established networks that can assist in reporting prices and making the reporting output most effective for data users. Figure 1 identifies selected office locations for horticulture extension specialists and business extension specialists who work throughout the state. The map's intent was to illustrate that extension personnel were located in areas that needed price reporters. Additionally, the map marks locations for Missouri farmers markets that could serve as price reporting locations for extension specialists participating in the project.

Figure 1
Location of Selected Missouri Extension Horticulture Specialists, Extension Business Specialists and Farmers Markets in or Near Extension Reporting Regions



In the refined model, six extension specialists agreed to record prices in their respective regions. Those participating had expertise in the community development, agronomy, horticulture and agribusiness fields. In total, the specialists targeted 21 different farmers markets. Like in the initial model, the farmers market season was divided into two collection periods, and each price reporter scheduled 12 market visits during those collection periods as follows. The first collection period, which ranged from June to July, involved making four farmers market visits during June and two during July. Each specialist would make "unique" visits during June and July, meaning that each would visit six different markets during the first collection period. From August to October, extension specialists gathered price data for the second period. Extension staff could visit markets in the second collection period that they had visited in the first period. In total, each specialist would visit six markets during the second period.

Compared with the initial model, which centered on collecting prices for eventually 11 specialty crops, the revised framework tracked prices for a more exhaustive database of agricultural products. Table 1 lists products included in the Missouri farmers market price reporting database. As illustrated, the database includes fruit, vegetable, beef, chicken, herb, honey, nut, egg, mushroom, and pork products. The extent to which a regional report lists prices for all of these products will vary by region. Farmers market vendors in some regions offer a more diverse product mix than vendors in other regions. As such, regions with more product diversity will have more extensive price reports than regions with less product diversity. Current and prospective farmers market vendors may use the price reports to pinpoint products not already offered in a particular region. Products missing from a region's price report may signal a future

opportunity for vendors to supply those products. Consumers may also reference price reports to determine whether given products tend to be available at farmers markets in their local areas.

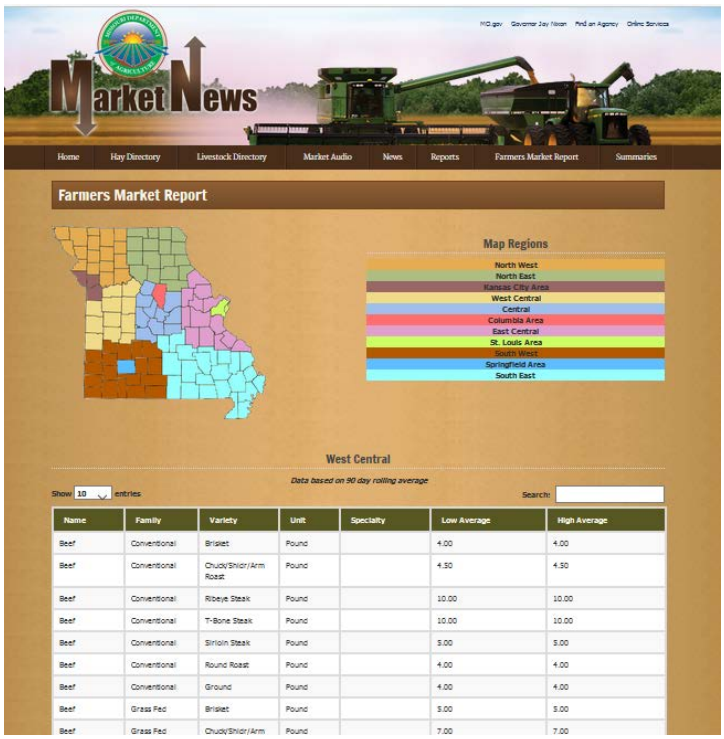
Because the initial model suggested that most quality characteristics had little effect on price, the revised model asked extension specialists to note limited information about product quality. Instead, price listings were predominantly differentiated by factors such as production method, unit size and cut or variety. Production method indicates whether goods have been produced in a conventional, organic, grass-fed or non-GMO production system. For example, when the necessary data have been available, price reports have shared conventional and grass-fed beef prices and offered further detail through evaluating prices by cut, such as ribeye steak, round roast, brisket and ground beef. As another example, egg price reports when possible have reflected differences in certified organic, non-GMO or conventional prices, and some vegetable price reports have distinguished between organic and conventional prices. Variety may refer to color characteristics, such as white, bicolor or yellow sweet corn; intended use, such as pickler or slicer cucumbers; type, such as spaghetti, straightneck or summer squash; or actual variety name, such as Yukon Gold potatoes. From a unit size perspective, product prices may be conveyed by weight, count or volume. Reports for onions, as an example, may list prices per onion, pound or quart. Alternatively, honey price reports may share the price for 8-ounce, 12-ounce, 1-pound, 2-pound or 12-pound containers.

Table 1
Products Listed in Farmers Market Price Reporting Database

Apples	Asparagus	Beef	Blackberries
Black walnuts	Blueberries	Beets	Broccoli
Buffalo	Cabbage	Cantaloupe	Carrots
Cauliflower	Chicken	Cucumbers	Eggplant
Eggs	Garlic	Green beans	Asian greens
Microgreens	Traditional greens	Herbs	Honey
Lamb	Lettuce	Mushrooms	Onions
Peaches	Peas	Pecans	Peppers
Pork	Potatoes	Radishes	Rhubarb
Spinach	Squash	Strawberries	Sweet corn
Tomatoes	Turnips	Watermelon	

After collecting prices, the Missouri Department of Agriculture posts 90-day rolling average prices per product by region in the Farmers Market Report on its Market News website. Both "low average" and "high average" values are displayed. For a given product, the "low average" represents the lowest prices recorded from each farmers market visit during a 90-day period as an average. The "high average" does the same for the highest prices recorded from each farmers market visit. From the website, users can access price data by first selecting a region. When the region's price report loads, users may search within a report for a given product keyword or browse all products and prices listed. Figure 2 presents a snapshot of the Farmers Market Report available online. The price report also links to farmers markets within each given region. To view the Farmers Market Report, go to https://mdafmr.mo.gov/.

Figure 2
Farmers Market Report on Missouri Department of Agriculture Market News Website



Geographically Expanding the Price Reporting Model

To improve farmers market price transparency and offer price intelligence to current and prospective farmers market vendors and shoppers, other universities or state departments of agriculture may consider pursuing farmers market price reporting in their own states. Using insights gleaned from the two Missouri farmers market price reporting iterations, the University of Missouri project team has created the following feasibility analysis that other states can reference as a guide to statewide farmers market price reporting.

The feasibility analysis assumes that a state has eight regions, and each requires an extension specialist who will record prices at farmers markets in a given region. Throughout a farmers market season, each extension specialist is assumed to make 12 farmers market visits. Table 2 presents a budget that communicates costs for a state to adopt price reporting similar to the Missouri model and dispatch extension staff as the price reporters. The travel cost allocation in the table assumes that funds will reimburse extension staff who use a personal vehicle. Per year, the budget assumes a $750 travel cost per extension specialist.

Personnel costs compensate extension specialists for the time that they commit to traveling to and from the 12 market locations per year and recording price data during their farmers market visits. The personnel cost estimate also reflects fringe benefits for extension staff. Fringe benefits are assumed to total 36.43 percent. The sample budget also includes a 22 percent indirect rate. Per specialist and region, the budget assumes that a farmers market price reporting project would annually require $3,355. If classifying a state into eight regions, then costs for extension specialists would total $26,840 per year.

Engaging extension specialists in the farmers market price collection and reporting process has the potential to create significant cost savings. If a state department of agriculture were to hire a full-time market reporter, then assume that it would pay $36,500 per year on average for salary. The specific salary would depend on the individual's experience level. When accounting for a market reporter's benefits, car and other expenses, the cost to maintain the full-time position would increase to an estimated $73,000 per year. Thus, leveraging extension specialists as price reporters has the potential to yield significant cost savings relative to hiring a dedicated market reporter to implement farmers market price collection and reporting.

Note that the $26,840 estimate represents another cost subtotal as it does not account for the expense to support the information technology infrastructure necessary for price collection and reporting. For a state to build a similar Farmers Market Report site, it would incur roughly $1,600 to $2,750 for the developer, assuming a $50 wage per hour and 36.43 percent allocation for benefits. Plus, this estimate assumes that the developer has an application lamp structure setup to use when developing the tool. Developers may also save some time and cost by customizing an existing price reporting tool framework. Site hosting is another cost to consider. As a rough estimate, assume that hosting a site for one year would require a $15,000 commitment.

Combined, the travel, price reporting personnel, indirect and reporting platform costs would total an estimated $44,015 in the first year. Again, this estimate assumes that a state has eight geographic regions from which to collect data and allocates funding for one extension specialist per region to visit 12 markets per year. If a state has more regions or chooses to offer more localized price information for smaller geographic areas, then actual costs may exceed this estimate. A state with fewer regions may incur less costs. In later years, costs may vary somewhat from those estimated here. For example, states should account for possible annual

growth in personnel costs, but the cost to develop the online reporting platform would be limited to the first year.

Table 2
Farmers Market Price Reporting Budget Per State

	Estimated Costs
Travel	$750
Price reporting personnel*	$2,000
Indirect**	$605
Subtotal cost per specialist	**$3,355**
Number of regions per state	8
Total cost for extension specialists	**$26,840**
Cost for online reporting platform creation	$2,175
Annual website hosting cost	$15,000
Total estimated costs per state	**$44,015**

** Personnel allocation includes 36.43 percent for fringe benefits and assumes 12 market visits per year.*
*** Indirect costs computed at 22 percent rate.*

Applying the Results

Reports that improve transparency in farmers market product pricing have the potential to benefit multiple groups including existing farmers market vendors, prospective farmers market vendors, beginning farmers and consumers. As the University of Missouri and its research partners have pursued price reporting, they have refined the model and learned several insights that may assist other states considering farmers market price reporting for their areas.

- *Engage local university extension staff.* Extension specialists can provide local expertise and in-the-field support for farmers market price collection efforts. Plus, they collectively represent a group that can be trained to provide high-quality data for a price reporting system. Not only could extension specialists contribute to a farmers market price reporting framework by collecting prices, but they also serve as an important gateway for disseminating information, such as the price data, to individuals including farmers market vendors and beginning farmers. Local extension specialists engaged in the process may help to promote the reporting tool's availability in local communities.

- *Prioritize the quality indicators that matter in price reports*. Not all quality factors influence price, according to observations collected when developing the Missouri farmers market price reporting platform. As such, statewide price reporting initiatives can avoid investing resources in recording too much quality information. Factors that appear to have a significant effect on price are market location and a product's unit size, which may be measured by count, weight or volume.

- *Attempt market location diversity when reporting prices*. As indicated previously, market location appears to be one of few factors that significantly affect price. Because of this observation, states would benefit from collecting prices from a wide geographic area. The broad price reporting would enable current farmers market vendors, beginning farmers and consumers to better gauge price dynamics in their local areas.

Pricing and Sales Strategies for Missouri Farmers Market Vendors

Joe Parcell
Department of Agricultural and Applied Economics

During recent years, farmers markets have become increasingly popular. During July 2016, USDA listed more than 8,600 farmers markets in its National Farmers Market Directory. That count had increased nearly five times since 1994 when 1,755 farmers markets existed throughout the country.

In July 2016, the National Farmers Market Directory listed that Missouri had 260 farmers markets, which ranked the state ninth for number of farmers markets. California, New York and Michigan ranked as the top three states. Adjusting the farmers market count by resident population estimated that Vermont, North Dakota and the District of Columbia had the most farmers markets per capita. Population data used were July 1, 2015, estimates from the U.S. Census Bureau. Missouri ranked 18th for estimated farmers markets per capita.

Consumer preferences for locally sourced food likely have contributed to the proliferation of farmers markets, and "local" sales are strengthening. In 2014, local food sales were estimated to reach at least $12 billion, according to a May 2016 report from USDA that cited industry data. By 2019, industry projections suggest that local food sales may total $20 billion.

For farmers market vendors to leverage the opportunity to supply local food, they benefit from accessing good information about marketing their goods. Since 2014, University of Missouri staff has collected price data at multiple farmers markets throughout the state. Initially, the price reports focused on five crops: sweet corn, tomatoes, cantaloupe, cucumbers and green beans. In 2015, the price reporting efforts expanded to add bell peppers, zucchini, blackberries, cabbage, bulb onions and potatoes. While collecting price data, the staff noted the extent to which product prices varied by factors like weight; organic or conventionally raised; product appearance such as cleanliness, shape and surface issues; and other quality-related attributes.

The reported prices provide transparency within the marketplace. Vendors can use findings from these reports to set fair prices. Additionally, they can determine other selling strategies that enable them to operate competitively and provide consumers with desired quality attributes. The following sections discuss findings from the 2014 and 2015 Missouri farmers market price reports. Organic, seasonality, sales arrangement, product presentation and quality and product color are all potential factors that may influence pricing and revenue potential for Missouri farmers market vendors and are highlighted in this guide.

Organic Commands a Premium

Raising food organically requires a production philosophy that varies from the one that guides conventional food production. For example, organic production prohibits synthetic inputs like pesticides. As a result, organic production generally involves more intensive management to control challenges like pests and weeds and encourage high yields and crop quality.

To compensate producers for investing in organic methods, organic products generally command a premium relative to conventional goods. Table 1 presents average Missouri farmers market premiums recorded for organic products during the two-year project. The table shares

computed organic premiums for crops that had at least 5 percent of total price reports originating from organic products in a given year. To qualify for being reported in Table 1, the number of observations per category – organic and conventional – for a given crop in a given year also had to be at least 10. Based on average premiums computed for tomatoes, cucumbers and green beans, Missouri farmers market vendors tended to place the highest premium on organic cucumbers. Note, however, that only 2014 data are presented for cucumbers. In 2014, the premium set for organic cucumbers relative to conventional cucumbers averaged 34.7 percent. Premiums for organic green beans and tomatoes averaged 19.4 percent and 17.7 percent, respectively, in 2014 and 2015.

Table 1
Organic Price Premium or Discount as Average Organic Price/Average Conventional Price, 2014 and 2015

	2014-to-2015 Average
Tomatoes	117.7%
Cucumbers*	134.7%
Green beans	119.4%

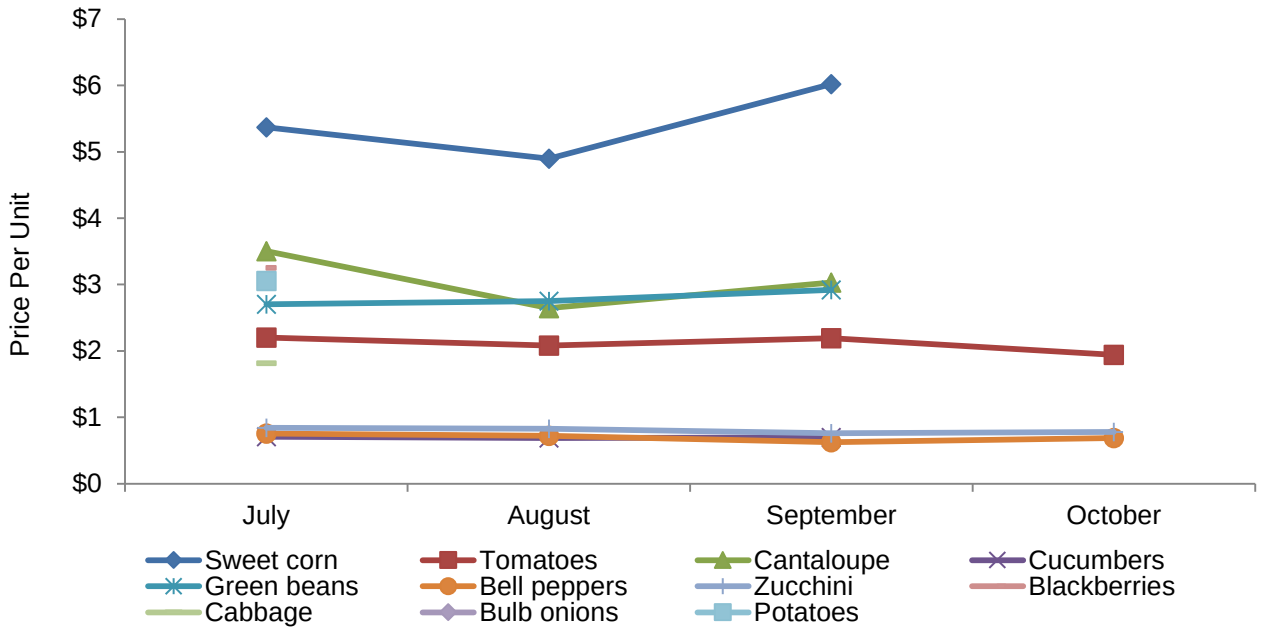
** Only 2014 data are presented for cucumbers.*

Season Extension Add Value

In some cases, the farmers market price reports have indicated that vendors can earn more revenue when they sell products early or late in the season. Prices tend to drop mid-season for a particular crop as supplies tend to reach their highest levels. When a farmers market vendor can offer product earlier or later during a season, competition and total supply generally may be less significant. Such scenarios afford vendors with more pricing flexibility.

By month, Figure 1 illustrates that averaged 2014 and 2015 prices per unit tended to fluctuate somewhat for conventionally raised products. For a given crop in a given year, all months with reported prices included in this analysis had at least 5 percent of total price observations and 10 total observations. If a month failed to have 5 percent of total annual observations or 10 observations for a given crop, then that monthly price average was excluded in a crop's analysis. Note that the chart shows that average product prices tended to peak in either the first month or last month reported for a given crop. Most crops included in the price reports were warm-season crops. As such, mid-season prices can drop lower than those realized in other months as production generally reaches its height during the summer. These findings suggest that prices for conventionally raised crops sold at Missouri farmers markets have some seasonality.

Figure 1
Seasonality of Average Prices Per Unit for Conventional Products, 2014 to 2015*



** Units are sweet corn, dozen; tomatoes, pound; cantaloupe, each; cucumbers, each; green beans, pound; bell peppers, each; zucchini, each; blackberries, pint; cabbage, each; bulb onions, box; and potatoes, box. Bell pepper, zucchini, blackberry, cabbage and potato prices are from 2015 only. September sweet corn price from 2014 only, October tomato price from 2015 only, and September cantaloupe price from2014 only,*

To capture higher prices in a growing season, producers may benefit from considering strategies that lengthen their production seasons. Such practices would provide an earlier crop than typical or extend the season later into the year. High tunnels represent one tool that some growers choose. With a high tunnel, growers may harvest and market products before and after growing conditions would generally allow an outdoor crop to yield marketable product. A note of caution, producers should weigh the cost of meeting seasonal higher prices versus the cost of supplying these products outside the typical growing window.

Revenue Potential May Vary by Sales Arrangement

At farmers markets, vendors may choose the preferred sales arrangement, such as marketing product individually or by weight or bundle, for their goods. For some products, they may have an economic incentive to use one sales arrangement rather than another. Sweet corn offers an example. Vendors predominantly sell sweet corn by the dozen. However, in 2015, this project's price reporters found a couple of Missouri farmers market vendors selling corn by the ear. The conventional sweet corn price averaged $5.43 per dozen or $0.45 per ear for that year. When vendors sold corn by the ear, the price received per dozen almost always failed to reach the annual average price per dozen. One vendor sold corn at $0.25 per ear, which would generate $3 per dozen. Another charged $0.50 per ear yet provided discounts when selling five ears for $2 or a dozen for $4.50. In all but the $0.50 per ear scenario, vendors would earn less per ear by selling corn per ear than they could by setting a price per dozen equivalent to the average $5.43. That said, vendors selling sweet corn by the ear may have generated greater total revenue than those selling sweet corn by the dozen if they could achieve a higher sales volume. Some shoppers may forgo buying sweet corn if the only choice is purchasing a dozen ears.

For bell peppers, farmers market vendors may choose to sell them by boxed count, in singles or by the pound. The sales arrangement selected may influence revenue that vendors can realize. Table 2 presents price per pepper and price per box for 10 instances when Missouri farmers market vendors sold bell peppers in five-count boxes during 2015. Vendors tended to sell boxed bell peppers for $0.30 to $0.60 each and $1.50 to $3 per box. After accounting for product weight, however, Table 2 suggests that the price per pound may vary quite widely. When selling bell peppers in five-count boxes, price per pound averaged $1.90, and it ranged from $1.24 to $3.41. In several cases, vendors marketing boxed bell peppers could have earned more had they established a price per pound similar to the $1.90 average. Note that factors like product quality and market location may force some vendors to deviate from setting a price similar to the average price per pound, however. As farmers market vendors establish prices in the future, they may consider choosing the sales arrangement that enables them to capture the greatest value for their goods.

Table 2
Sales Arrangement Effect on Bell Pepper Prices, 2015

Observation	Price/Pepper	Price/Box	Total Weight for Five Peppers	Price/Pound
1	$0.40	$2.00	1.42	$1.41
2	$0.60	$3.00	1.05	$2.86
3	$0.30	$1.50	1.13	$1.33
4	$0.30	$1.50	1.21	$1.24
5	$0.40	$2.00	1.42	$1.41
6	$0.60	$3.00	1.57	$1.91
7	$0.60	$3.00	1.58	$1.90
8	$0.60	$3.00	2.13	$1.41
9	$0.60	$3.00	0.88	$3.41
10	$0.60	$3.00	1.42	$2.11
				$1.90

Product Presentation and Quality as Pricing Variables

Product presentation refers to aesthetic and quality characteristics of goods marketed by farmers market vendors. When possible, the price reporters recorded whether prices varied by presentation variables such as product cleanliness, surface characteristics and shape. With respect to cleanliness, products could be denoted as clean, somewhat dirty or dirty. Table 3 shares average prices that Missouri farmers market vendors set for conventionally raised "clean" products as a share of average prices for products with "some dirt." This analysis is limited to crops that had at least 5 percent of conventional price reports originating from each "clean" and "some dirt" category in a given year. Additionally, at least 10 observations in a year were necessary for "clean" and "some dirt" products to be included in a given crop's analysis. Other crops either altogether lacked price reports, or the sample was smaller than required by the 5 percent and 10-observation parameters. Although the table estimates 2014-to-2015 averages, it notes instances when crops lacked data for both years.

Based on the data available, clean cantaloupe was priced at a premium on average to cantaloupe with "some dirt." The premium averaged 14 percent in 2014 and 2015. Note that

premiums or discounts reported as less than 15 percent in this guide may not have significance. In other words, they may not consistently vary in practice.

Price reports for bell peppers suggested a slight discount on average for "clean" products relative to those with "some dirt." Based on 2015 data, prices for clean bell peppers were 97.1 percent of prices for bell peppers with some dirt. These data suggest that clean products don't necessarily carry premiums. However, remember that product price reflects many factors. Cleanliness in combination with other marketing variables determines prices that vendors set for their goods. Additionally, because this discount is less than 15 percent, prices of clean and "some dirt" bell peppers may not have an actual difference.

Table 3
Cleanliness Discount or Premium for Conventional Goods as Average "Clean" Price/Average "Some Dirt" Price. A value below 100% indicates a discount, and a value above 100% indicates a premium.

Crop	2014-to-2015 Average
Cantaloupe	114.0%
Bell peppers*	97.1%

** Based on 2015 data only.*

While collecting prices, the price reporters also denoted whether products had surface issues. When farmers market vendors sold conventionally raised products, they tended to price goods that had no surface issues at a slight premium relative to those that had surface issues. Table 4 presents average "no surface issue" prices as a share of "surface issues" prices. Crops reported are those that had at least 10 observations each for "no surface issues" and "surface issues" in a given year and 5 percent of total observations in each respective category. Unless otherwise noted, the premium or discount reflects a 2014-to-2015 average. Exceptions to the generalization about no surface issues demanding a premium were zucchini sold during 2015. On average, zucchini with surface issues sold at a premium in that year. Like explained earlier, prices that farmers market vendors set for their products reflect multiple product attributes. Thus, surface issues alone do not fully dictate product pricing. Also, considering that the premiums or discounts were less than 15 percent, prices between goods with no surface issues and goods with surface issues may not actually vary in all instances.

Table 4
Surface Issues Premium or Discount for Conventional Goods as Average "No Surface Issues" Price/Average "Surface Issues" Price

Crop	2014-to-2015 Average
Tomatoes	102.2%
Cucumbers	111.2%
Green beans	106.9%
Cantaloupe	102.6%
Bell peppers*	102.5%
Zucchini*	88.6%

** Based on 2015 data only.*

Shape is another variable that can suggest product quality. The Missouri farmers market price reports tracked shape's effect on price as price reporters classified whether products had no deformities, slight deformities of less than 25 percent or serious deformities of more than 25 percent. Table 5 illustrates that products without shape deformities had a higher price than products categorized as slightly deformed in the crops analyzed. To qualify for this analysis, crops needed at least 5 percent of annual observations each in the "no shape deformities" and "slightly deformed" categories, and each category had at least 10 observations per year. As a reminder, product price accounts for multiple product characteristics, and shape is just one factor to consider. Also, in all cases, the premiums were less than 15 percent, so an actual difference may not exist between "no shape deformities" prices and "shape deformities" prices.

Table 5
Shape Premium or Discount for Conventional Goods as Average "No Shape Deformities" Price/Average "Slightly Deformed" Price

Crop	2014-to-2015 Average
Tomatoes	100.8%
Cucumbers	110.9%
Green beans	102.4%
Cantaloupe	109.5%
Bell peppers*	110.3%
Zucchini*	103.8%

** Based on 2015 data only.*

The Missouri farmers market price reports also evaluated the effect that several other presentation and quality characteristics had on price. Sunscald and cracking are examples. The price reports suggest that conventional crops have averaged higher prices if they have no sunscald. During 2014, premiums for tomatoes and cucumbers without sunscald averaged 9.8 percent and 8.6 percent, respectively. In both cases, "no sunscald" and "sunscald" categories had at least 5 percent of total observations and 10 observations each in a year. Otherwise, they would have had been ineligible for analysis. Like mentioned previously, premiums less than 15 percent do not necessarily indicate an actual difference in price. Additionally, price is a function of multiple characteristics, not just one. As a result, sunscald alone would not dictate price.

Product Color Influences Price in Some Cases

For some goods, product color may affect pricing potential. According to 2015 price data, zucchini growers may capture more value from selling green zucchini than yellow zucchini. See Table 6. Conventionally raised green zucchini were priced at a 6.8 percent premium relative to their yellow counterparts at Missouri farmers markets. Based on these data, consumers may prefer green zucchini and consequently cause it to demand a higher price. Alternatively, green zucchini supply may have been more constricted and yellow zucchini supply more abundant. Note, however, that product price hinges on more than a single factor like color. Also, premiums less than 15 percent indicate that a color-driven price difference may not consistently exist.

Table 6
Color Effects on Average Prices Per Zucchini, 2015

	Conventional
Green	$0.80
Yellow	$0.75

For sweet corn, 2014 had enough observations reported to compare prices for bicolor and yellow corn. Both color categories at least had 10 observations and 5 percent of total sweet corn observations for the year. White sweet corn lacked enough observations to be included in the analysis. According to the bicolor and yellow sweet corn price data, bicolor corn averaged an 11.8 percent premium. Like previously explained, however, more than color alone would influence sweet corn prices, and when premiums are estimated to be less than 15 percent, assume that no differences may truly exist for sweet corn with different colors. As price reporting continues into the future, additional observations may help to determine whether bicolor sweet corn tends to command a premium over a longer period of time.

Applying the Results

Pricing goods sold at Missouri farmers markets relies on making an assessment about value that consumers can extract from goods that they purchase. To maximize sales, farmers market vendors may use strategies such as growing crops organically, identifying the ideal sales arrangement and offering products that fit with customer quality expectations. Furthermore, consider these tips to enhance vendor revenue potential:

- *Understand the local market*. Product preferences and buying behaviors can vary widely by geography. To attract an audience for your products, appeal to preferences held by the given customers that you're attempting to serve.

- *Monitor changes in consumer trends*. Consumers don't operate in a stagnant environment. General economic conditions can influence consumer willingness to pay for high-quality and value-added goods, and preferences can evolve. Staying current on consumer preferences and differentiating trends from fads can serve vendors well.

- *Recognize that price encompasses a bundle of product characteristics*. The research summarized here sought to identify the effect that specific variables may have on price. However, in application, price reflects multiple attributes available from a product. Set a price that best captures all of a product's traits and their total value.

- *Evaluate costs and returns when adopting production and marketing practices*. This research noted the potential for vendors to earn higher prices if they grow food organically, offer products earlier or later during a growing season and market higher quality goods. However, adopting the related practices to supply such products can incur costs. Balance the costs and returns to drive profit.

Sampling Serves as Promotional Tool at Farmers Markets

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Department of Agricultural and Applied Economics

When consumers make food purchase decisions, several factors tend to guide their choices. Annually, the International Food Information Council Foundation conducts a survey about food- and health-related topics, including food and beverage purchase influencers. From 2006 to 2016, the survey results consistently indicated that taste has had the greatest impact on food and beverage purchase decisions. Factors following taste in their impact on purchase decisions have been price, healthfulness, convenience and sustainability.

At farmers markets, vendors have the opportunity to offer product samples and enable prospective buyers to experience a product before they purchase. With this approach, consumers can gather information about the food and beverage purchase driver of greatest importance – taste – and make buying decisions accordingly. For farmers market vendors to create a meaningful and impactful sampling experience, they benefit from understanding consumer thoughts and attitudes about sampling at farmers markets.

In December 2015, the University of Missouri Department of Agricultural and Applied Economics conducted a survey to discover insights about consumer sampling at farmers markets. To participate, respondents must have identified as Missouri consumers who had previously shopped at farmers markets. In total, 2,882 consumers began the survey. Of those, 57.3 percent shared that they shopped at farmers markets less frequently than once a month when markets are operational. When farmers markets are operational, 20.7 percent shared that they shopped at farmers markets once a month, 15.2 percent said that they shopped two to three times per month, and 6.8 percent noted being weekly farmers market shoppers.

Regular Shoppers at Farmers Markets

In this guide, consumers who reported shopping at farmers markets at least monthly are considered "regular" farmers market shoppers. The survey asked that these respondents report their demographic information. Of the 1,203 respondents who answered, 58.2 percent were female, and 41.8 percent were male. With respect to age, 6.3 percent were 27 years old or younger, 32.4 percent were 28- to 47-year-olds, 48.9 percent were 48- to 67-year-olds, and 12.5 percent were at least 68 years old.

A majority of consumers who shop at farmers markets at least once a month and reported their demographic information had a higher education degree. Roughly 46 percent indicated that they had a bachelor's degree, and 27.1 percent had earned a master's or doctoral degree. Consumers who had only a high school diploma represented 26.2 percent of respondents who noted shopping at farmers markets at least once a month. Less than 1 percent had no high school diploma or degree. The survey also asked respondents about household income, and it found that 43.9 percent of respondents who shop at farmers markets at least once a month had household incomes that ranged from $50,000 to $99,999. Nearly 23 percent had households that made less than $50,000, and 33.5 percent earned at least $100,000 in household income.

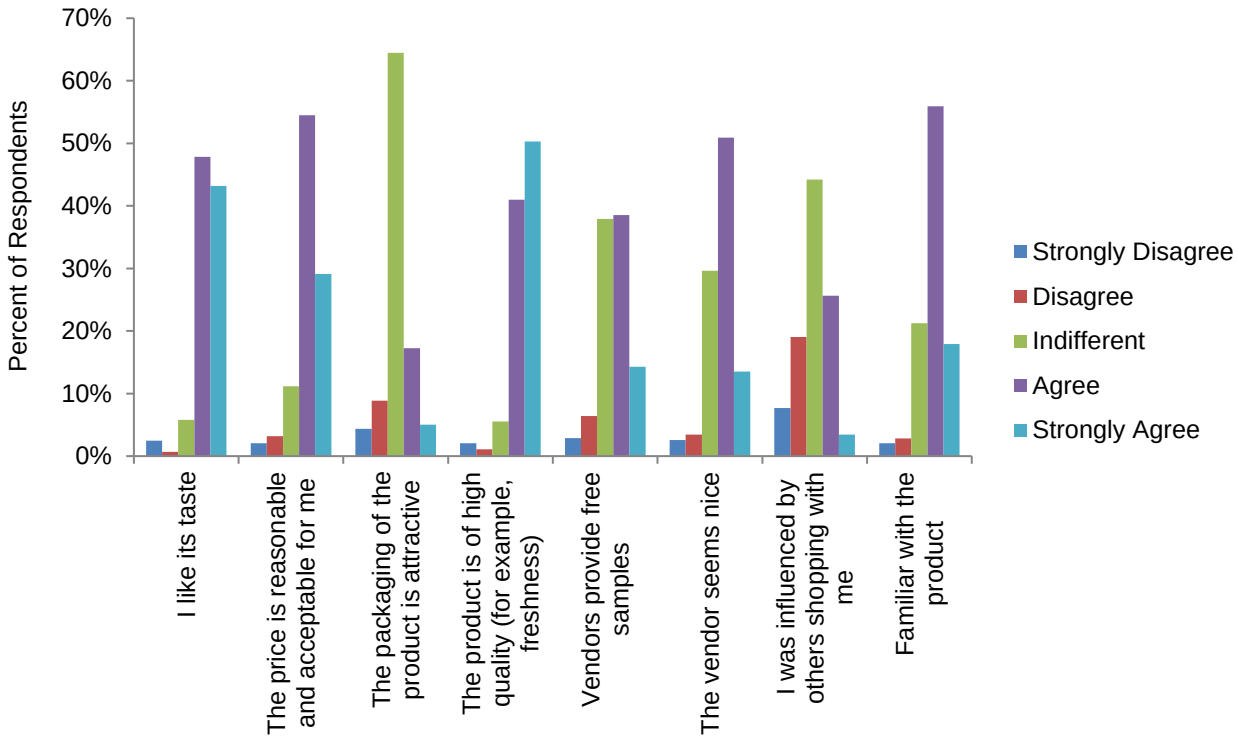
Based on responses from consumers who noted that they shopped at farmers markets at least monthly, this publication identifies their purchase motivations and preferences toward sampling.

Using this information, farmers market vendors can more effectively use sampling as a promotional tool for targeting regular farmers market shoppers.

Purchase Drivers at Farmers Markets

Survey results indicate that regular farmers market shoppers tend to view product quality and taste as the top two factors that determine whether they purchase products at farmers markets. Figure 1 lists various statements that may determine product purchases and the extent to which regular farmers market shoppers considered those factors to affect their purchases. Of those regular shoppers, 91.3 percent strongly agreed or agreed that high quality, such as freshness, would determine whether they purchased product at farmers markets. Ninety-one percent strongly agreed or agreed that liking a product's taste would determine a purchase. A reasonable and acceptable price, product familiarity and a nice vendor followed in importance as purchase determinants. Of the regular farmers market shoppers, 52.8 percent said that they strongly agreed or agreed that vendors providing free samples would determine purchases at farmers markets. They were least likely to agree or strongly agree that influence from others shopping with them and attractive product packaging would determine purchases.

Figure 1
Factors that Determine Product Purchases at Farmers Markets (n = 1,171)



Question: Please rank the following statements which determine whether you will purchase a product at farmers markets.

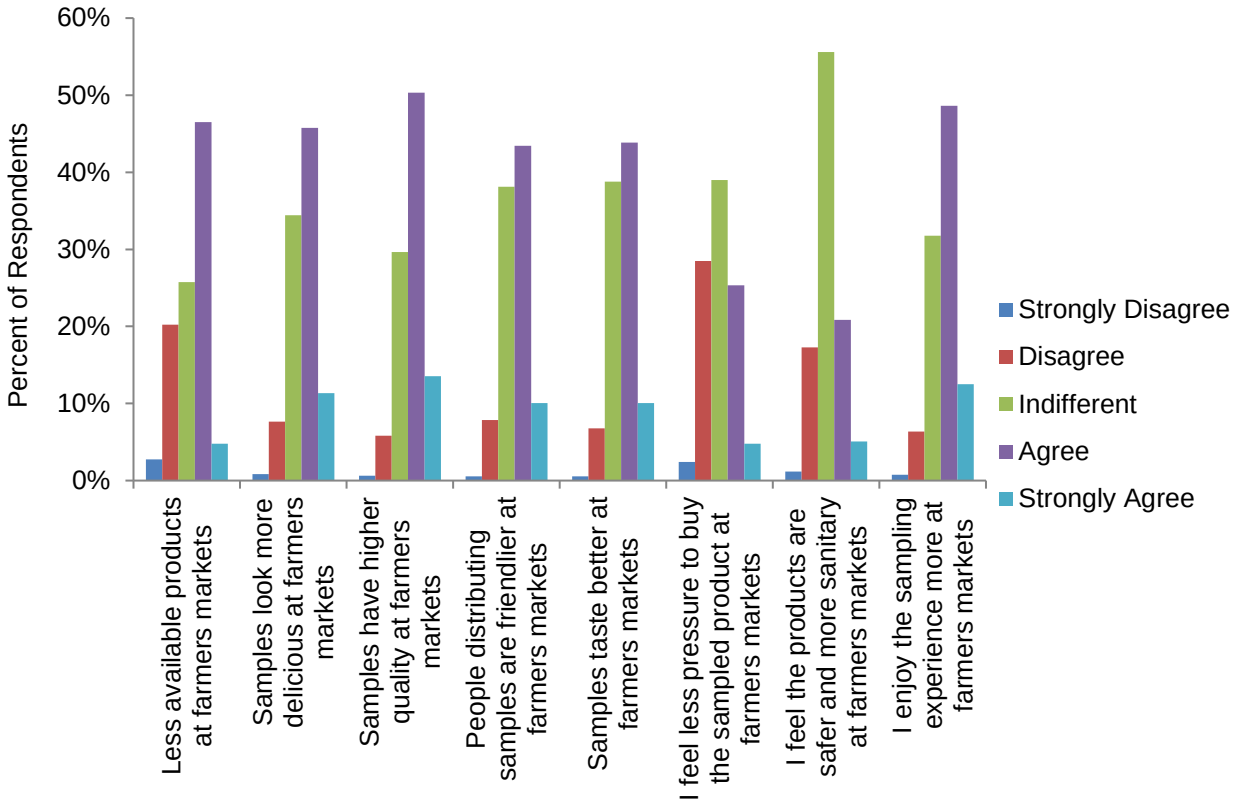
Sampling and Purchasing Behaviors at Farmers Markets

For the most part, regular farmers market shoppers have sampled products at a farmers market. Of those responding, 81.7 percent indicated that they had at some point sampled product at a farmers market. Thus, only 18.3 percent hadn't ever sampled.

Relative to in-store sampling experiences, sampling products at a farmers market in some cases has provided a more favorable experience for individuals who shop at farmers markets at least monthly. Figure 2 shares the extent to which such regular farmers market shoppers who have previously sampled at farmers markets agreed or disagreed with several statements that compare in-store and farmers market sampling. Nearly 64 percent either agreed or strongly agreed that farmers markets offer higher quality samples, and 61.1 percent shared that they agreed or strongly agreed that farmers markets provide a more enjoyable sampling experience.

At least half of the respondents agreed or strongly agreed that samples look more delicious at farmers markets, samples taste better at farmers markets and sample distributors at farmers markets are friendlier. However, 51.3 percent also shared that they agreed or strongly agreed that farmers markets offer fewer products, and only 30.1 percent agreed or strongly agreed that they feel less pressure to buy products that they sample at farmers markets. Additionally, note that just 26 percent of respondents agreed or strongly agreed that farmers markets products were safer and more sanitary. This indicates that vendors may need to assure their customers that they prioritize product safety and sanitation.

Figure 2
Feelings about Farmers Market Sampling Relative to In-Store Sampling (n = 944)



Question: From your experience, in comparison with your sampling experience in-store, please rank the following statements which describe your feelings about sampling at farmers' markets.

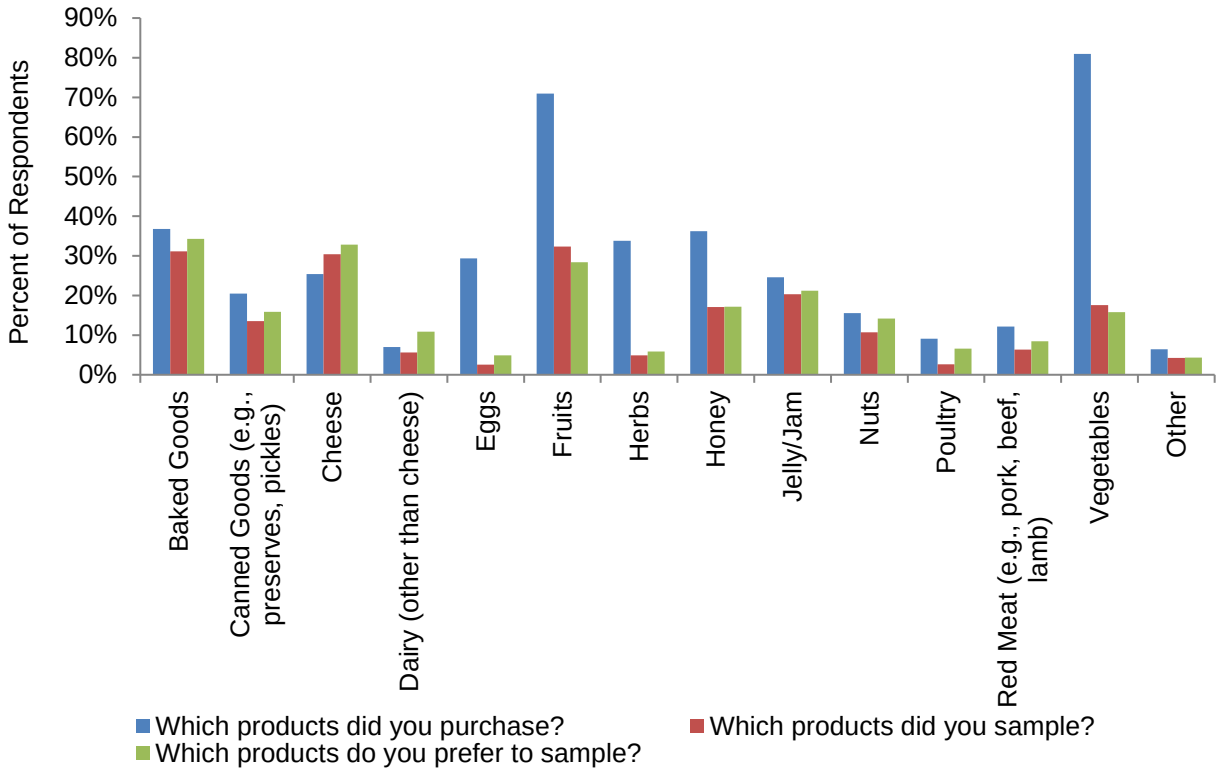
In the survey, regular farmers market shoppers who had previously sampled products at farmers markets also had an opportunity to denote products that they had sampled, products that they preferred to sample and products that they had purchased at farmers markets during

their last experience. Figure 3 reports the results as a share of the 944 respondents who noted shopping at farmers markets at least monthly and having previous sampled at farmers markets. The greatest share preferred to sample baked goods, 34.3 percent of respondents; cheese, 32.8 percent of respondents; fruit, 28.4 percent of respondents; and jelly and jam, 21.2 percent of respondents. Products actually sampled by respondents during their last farmers market experience were quite similar to preferences. The most commonly sampled products were fruits, 32.3 percent of respondents; baked goods, 31.1 percent; and cheese, 30.4 percent.

Based on their most recent farmers market experiences, regular farmers market shoppers who had previously sampled indicated that they were most likely to have purchased vegetables and fruits. The survey results found that 80.9 percent and 71 percent of respondents, respectively, purchased those products during their last farmers market experiences. Baked goods and honey followed as 36.8 percent and 36.2 percent, respectively, had purchased those products. Products that regular farmers market shoppers with market sampling experience were least likely to have purchased during their most recent farmers market visit were poultry, 9.1 percent of respondents; dairy other than cheese, 7 percent; and other, 6.5 percent.

Regular farmers market shoppers who had previously sampled indicated that they preferred sampling baked goods more than any other product. Offering samples for products that farmers market shoppers are most likely to buy – such as vegetables and fruits – in a format that they most want to sample – such as baked goods – may be a strategy that vendors can use to attract shoppers to their product displays and encourage more purchases.

Figure 3
Products Purchased, Sampled and Preferred to Sample at Last Farmers Market Experience by Regular Farmers Market Shoppers Who Previously Sampled at Markets (n = 944)

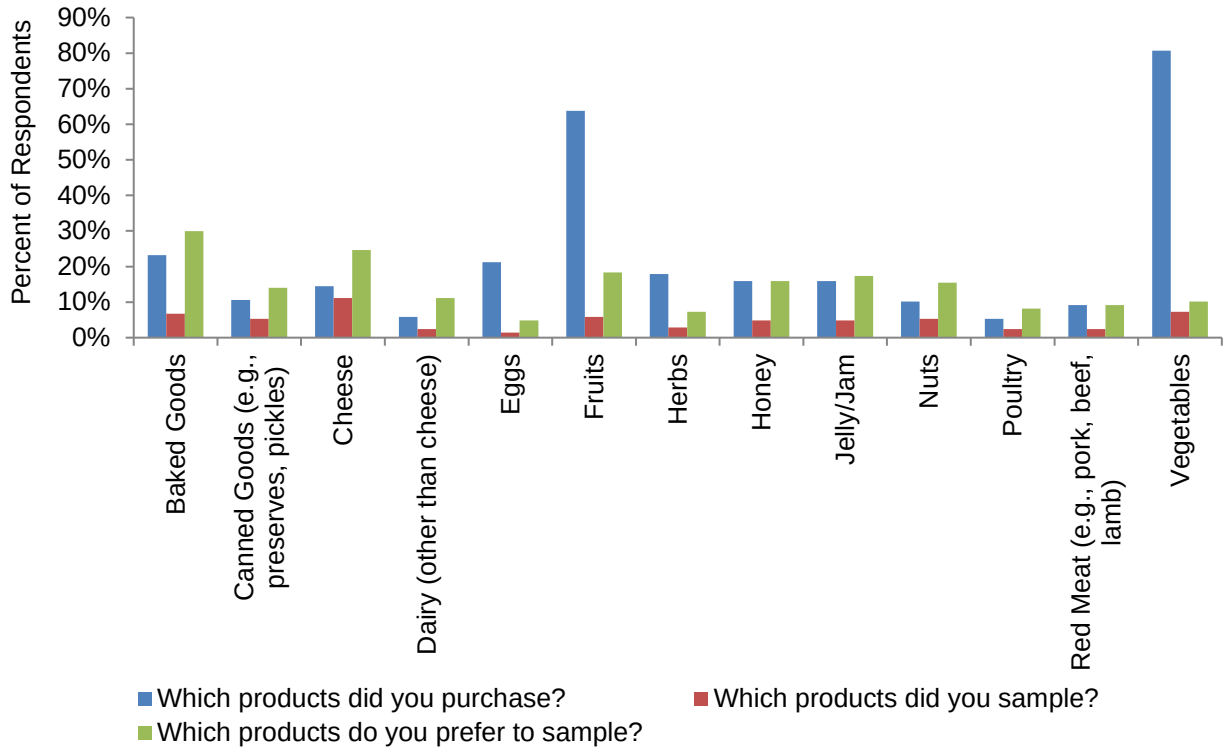


Question: Recall your last experience at a farmers' market. For each column, mark all that apply.

Regular farmers market shoppers who had no sampling experience at farmers markets also were asked to indicate products purchased and products preferred to sample at farmers markets. Figure 4 presents the results. Note that the figure also includes responses that these individuals provided about products that they had sampled during their most recent farmers market experiences. Although these shoppers had in an earlier question said that they didn't have sampling experience at farmers markets, some responded by saying here that they had sampled products during their most recent visits.

Like regular farmers market shoppers who said that they had previously sampled at farmers markets, regular shoppers who did not identify as having sampling experience at farmers markets noted that they would prefer to sample baked goods, cheese and fruits. They were least likely to prefer sampling poultry, herbs and eggs. Respondents without sampling experience also were most likely to have purchased vegetables, fruits and baked goods during their most recent market visit. The same was true for regular shoppers who identified as having previously sampled products at farmers markets.

Figure 4
Products Purchased, Sampled and Preferred to Sample at Last Farmers Market Experience by Regular Farmers Market Shoppers Who Had Not Previously Sampled at Markets (n = 207)



Question: Recall your last experience at a farmers' market. For each column, mark all that apply.

For all products evaluated, regular shoppers were more likely to have purchased during their most recent farmers market experience if they had sampled at some point in the past while visiting a farmers market compared with if they had not ever sampled products at farmers markets. See Table 1. The greatest differences in purchase behavior between regular farmers

market shoppers with no sampling experience and those with sampling experience were the herbs, honey, baked goods and eggs product categories.

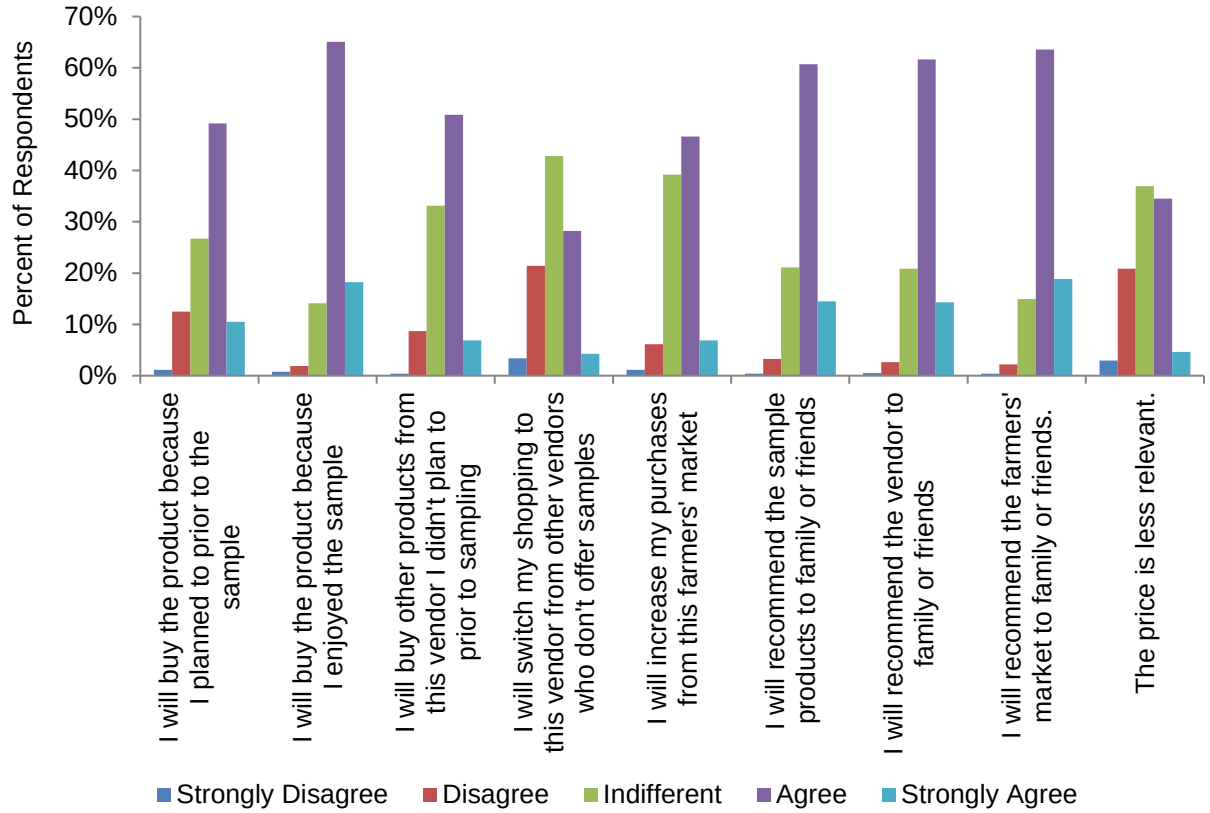
Table 1
Percentage of Regular Farmers Market Shoppers Who Purchased Products During Most Recent Farmers Market Experience

Product Category	Respondents with No Sampling Experience (n = 207)	Respondents with Sampling Experience (n = 944)
Vegetables	80.7%	80.9%
Fruits	63.8%	71.0%
Baked goods	23.2%	36.8%
Honey	15.9%	36.2%
Herbs	17.9%	33.8%
Eggs	21.3%	29.3%
Cheese	14.5%	25.4%
Jelly/jam	15.9%	24.6%
Canned goods	10.6%	20.4%
Nuts	10.1%	15.6%
Red meat	9.2%	12.2%
Poultry	5.3%	9.1%
Dairy (other than cheese)	5.8%	7.0%
Other	--	6.5%

As suggested in the previous table, sampling has the potential to induce regular farmers market shoppers to act in some way or somehow respond to their experience. Figure 5 presents the extent to which the 944 regular farmers market shoppers who had farmers market sampling experience agreed or disagreed that they would behave in certain ways after having tried free samples at farmers markets. After summing the share of shoppers who agreed or strongly agreed with various statements, the greatest share reported that they would buy the product because they enjoyed the sample -- 83.3 percent agreed or strongly agreed -- and would recommend the farmers market to family or friends -- 82.4 percent agreed or strongly agreed.

Roughly three-quarters of the respondents agreed or strongly agreed that they would both recommend the vendor and sampled products to family or friends. Nearly 60 percent of the respondents said that they would buy the product as they had planned prior to sampling, 57.7 percent shared that they would buy other products from the vendor that they didn't plan to buy prior to sampling, and 53.5 percent indicated that they would increase purchases from the given farmers market. Note that just 32.4 percent said that they would switch shopping to a given vendor from other vendors who don't offer samples.

Figure 5
Actions or Responses Following Free Sample Trials at Farmers Markets (n = 944)



Question: As a result of your sampling experience, please rank the following statements which describe your actions/response after having tried free samples at farmers markets.

Sampling and Price Sensitivity

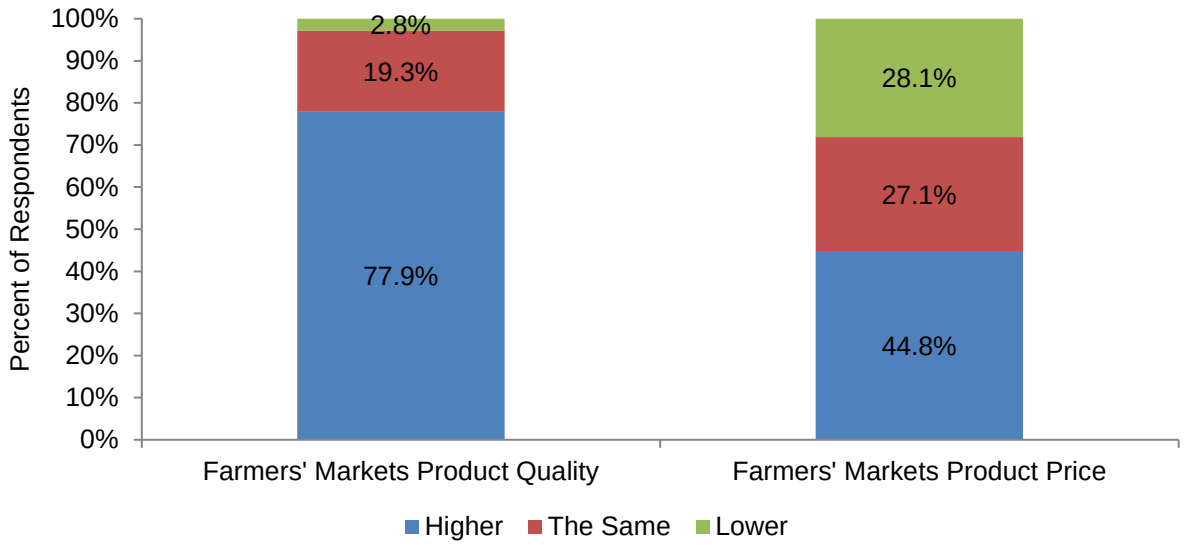
A satisfactory sampling experience either in a store or at a farmers market has the potential to make some consumers feel less concerned about price. Nearly 57 percent of the 1,171 regular farmers market shoppers surveyed for this research said that they would feel less concerned about price if a product they sampled met their expectations.

However, in the question that queried regular farmers market shoppers with sampling experience about actions or responses to sampling at farmers markets, respondents were asked to indicate the extent to which they agreed or disagreed that price becomes less relevant after having tried a free sample at a farmers market. See Figure 5 for the full results. Just 39.2 percent agreed or strongly agreed with the statement. This suggests that some farmers market shoppers may feel less sensitive about price after they try a free sample, but price continues to act as a consideration for others. A sampled product being satisfactory, as indicated in the previous paragraph, may reduce price sensitivity more than just having sampled a product.

Regular farmers market shoppers responding to the survey also were asked to evaluate product prices and quality at farmers markets relative to local grocery stores. More than three-quarters of the respondents shared that they view farmers market product quality to be more favorable. Only 2.8 percent marked that product quality at farmers markets was lower than that at local

grocery stores. See Figure 6. For price, 44.8 percent said that prices at farmers markets were higher, 27.1 percent said that they were the same, and 28.1 percent said that they were lower.

Figure 6
Perceived Price, Quality at Farmers Markets Relative to Local Grocery Stores (n = 1,711)



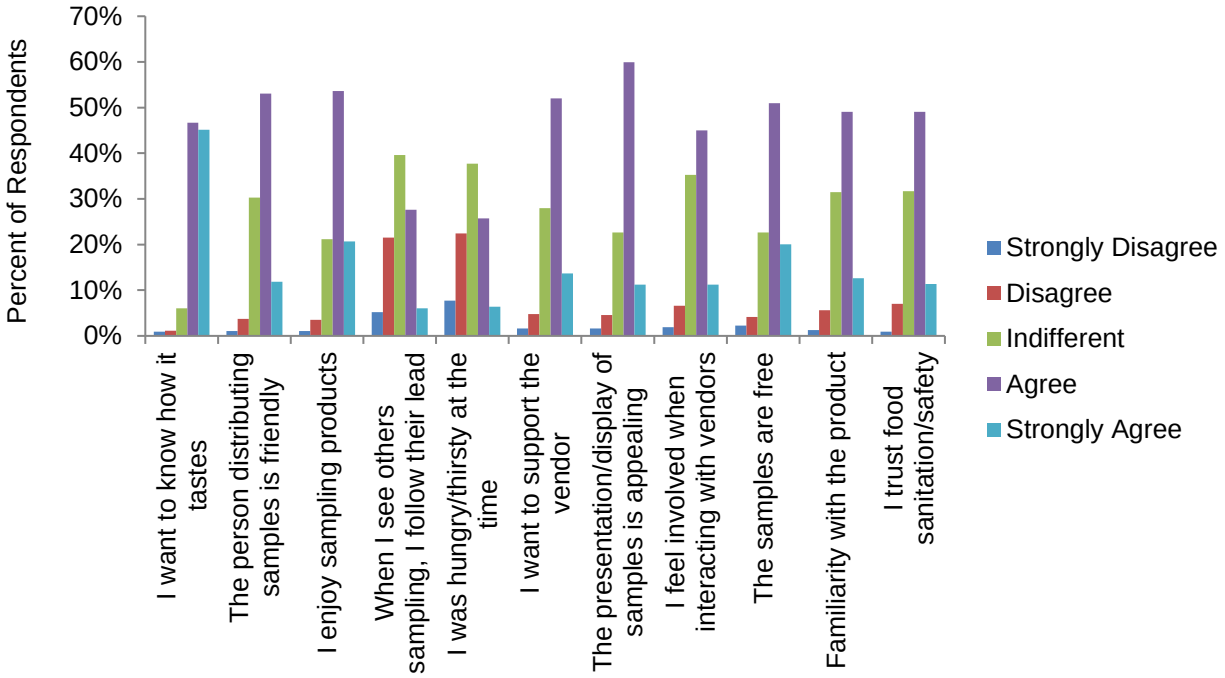
Question: From your experience, compared to local grocery stores, how do you perceive the quality and price to be at farmers' markets?

To form conclusions about product price, 90.6 percent of the regular farmers market shoppers shared that they use primary information collected during farmers market and grocery store visits. Secondary information sources, including sales circulars and brochures, supplied information for 15.6 percent of the regular farmers market shoppers, and 18.4 percent noted using word-of-mouth information from friends and family.

Factors Motivating or Discouraging Sampling at Farmers Markets

Regular farmers market shoppers who shop at least once a month and have sampled product during a previous market visit had the opportunity to share factors that motivate or encourage them to try free samples at farmers markets. Figure 7 presents results from 944 respondents. The predominant factor motivating free sample trial at farmers markets was wanting to know how a product tastes; 91.8 percent of respondents strongly agreed or agreed with that factor motivating or encouraging free sample trial. Nearly three-quarters of respondents strongly agreed or agreed that they enjoy sampling products. Other top factors motivating or encouraging trial were an appealing sample presentation or display and samples being free. Roughly 71 percent of respondents strongly agreed or agreed with those statements. Factors least likely to motivate or encourage free sample trials were being influenced by others sampling and being hungry or thirsty at the time.

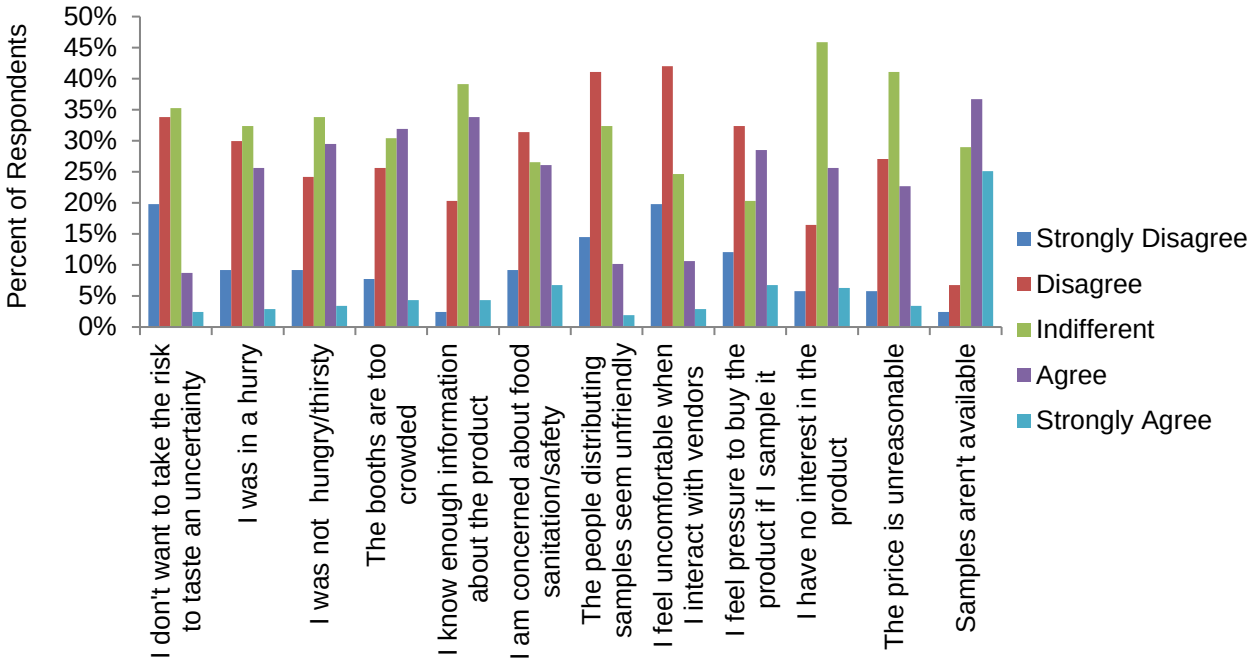
Figure 7
Factors Motivating or Encouraging Free Sample Trial at Farmers Markets among Regular Shoppers with Past Sampling Experience (n = 944)



Question: Please rank the following statements which explain what motivates/encourages you to try free samples at farmers markets.

The regular farmers market shoppers who had not previously sampled products at farmers markets were asked to identify factors that discourage or stop them from trying free samples. Figure 8 summarizes their thoughts by presenting the share of these individuals who agreed or disagreed with various statements. The top reason discouraging or stopping these shoppers from trying free samples was samples not being available. Nearly 62 percent of the respondents agreed or strongly agreed with that statement. Already knowing enough information about the product, booths being too crowded and feeling pressure to buy after sampling were other main reasons discouraging or stopping free sample trial. The percentage of respondents agreeing or strongly agreeing with these statements totaled 38.2 percent, 36.2 percent and 35.3 percent, respectively. Note that 32.9 percent of these respondents agreed or strongly agreed that they felt concerned about food sanitation and safety and recognized that as a factor that discouraged or stopped them from trying free samples. Vendors may consider opportunities to address these concerns and assure farmers market patrons that they observe good food handling and sanitation practices when providing free samples.

Figure 8
Factors Discouraging or Stopping Free Sample Trial at Farmers Markets among Regular Shoppers without Past Sampling Experience (n = 207)



Question: Please rank the following statements which explain what discourages/stop you from trying free samples at farmers markets.

Applying the Results

Taste represents a significant factor influencing food and beverage purchases. As a result, farmers market vendors may offer samples that would acquaint shoppers with a product's taste and ultimately promote their goods. Based on survey results from Missouri farmers market shoppers, particularly those who shop at least monthly when markets are operational, farmers market vendors can adopt strategies meant to make the most of the sampling experience.

- *Target the highest value customers.* Not all farmers market shoppers shop regularly. In this research, just 42.7 percent of the Missouri farmers market shoppers surveyed actually shopped more than once per month. To support repeat business, vendors should feel incentivized to appeal to the frequent shoppers.

- *Focus effort on taste and quality*. Regular farmers market shoppers – considered to be those who shop at least monthly at farmers markets when they're operating – prioritize quality and taste when purchasing at farmers markets. Sampling may be a strategy for farmers market shoppers to experience both dimensions and use the information that they collect during sampling to make purchase decisions.

- *Attract shoppers by offering product samples that they prefer to try*. Regular farmers market shoppers tended to prefer sampling baked goods, cheese and fruits, and they were most likely to buy vegetables, fruits and baked goods. Vendors may choose to offer samples for preferred products to draw traffic to their booths. They may also consider

using more frequently purchased products as ingredients in more frequently sampled products to build exposure for the products used as ingredients. .

- *Adopt food handling and safety procedures, and assure shoppers that you follow them.* Some regular farmers market shoppers – in this research, roughly one-third of those who lacked farmers market sampling experience – may not feel confident in food sanitation and safety practices for samples. As a result, they may forgo sampling. Adopting and sharing about sampling sanitation and safety protocol should be a priority.

- *Create an ideal sampling environment.* For regular farmers market shoppers with previous sampling experience, they primarily choose to sample when they want to know about product taste, they enjoy sampling, they see an appealing product presentation or display, and the samples are free. Regular shoppers who hadn't sampled in the past were predominantly discouraged from sampling when samples weren't available, they already knew enough product information, they felt booths were too crowded, or they felt pressure to buy after sampling. Appealing to factors that motivate sampling and avoiding factors that discourage it may contribute to a stronger sampling plan.

Factors Affecting Farmers Market Produce Prices in the United States Midwest

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Factors Affecting Farmers Market Produce Prices in the United States Midwest

Abstract: Farmers markets produce vendors, as well as direct marketers of produce, should understand not only location-related characteristics that affect consumer selection of local, fresh produce but also the product attributes that consumers prefer in local products. Understanding attribute-price relationships will allow marketers to better plan for value-added marketing opportunities. Using a hedonic pricing model, this study analyzed the influence that product attribute levels have on prices for seven types of produce: sweet corn, tomatoes, cantaloupe, cucumbers, green beans, bell peppers and zucchini. Based on data collected from Missouri farmers markets, multiple attributes affect produce price variation. For example, in the data set, one of the strongest effects was exerted by sale location. Additionally, a higher weight may increase prices for some types of produce but decrease prices of others after a certain point. Farmers market vendors, as well as direct marketers, can use attribute pricing information for deciding how to best to deliver quality attributes that consumers reveal preference.

Keywords: Hedonic, Modeling, Produce, Farmers Markets

Factors Affecting Farmers Market Produce Prices in the United States Midwest

Given the increasing popularity of farmers markets, as well as direct marketing, producers and marketers should understand not only location-related characteristics that affect consumer selection of local, fresh produce but also the product attributes that consumers prefer in local products. Conner et al. (2009) point to several factors leading to higher prices at farmers markets, including quality. Understanding attribute-price relationships will allow farmers to better plan for value-added marketing opportunities (Bond, Thilmany & Bond 2009). Produce can be differentiated based on quality level, which cannot be purchased separately yet contributes to a product's total price (Estes 1986; Unnevehr et al. 2010). Unnevehr et al. (2010) concluded that non-price factors and factors related to food quality heterogeneity play a key role in food consumption decisions, consumer preferences and purchasing behavior. This study's objective is to explore quality-price relationships for produce sold at Missouri farmers markets. The results of the study are important for informing marketers in developed countries as well as developing countries where producers may be adopting direct marketing skills, e.g., Syrovátková, Hrabák, and Spilková 2015.

Consumers derive utility from the satisfaction that they receive from a product. Accordingly, producers can alter product attributes by adjusting their management decisions, and in doing so, they can target supplying product attributes of greatest value (Ladd & Zober 1977). This study reports the impact that different attribute levels for seven produce types have on prices. It uses a hedonic pricing model based on data collected from Missouri farmers markets.

To account for the impact that intrinsic attributes have on food product prices, agricultural economists were the first to measure hedonic prices, which help producers to maximize their returns (Unnevehr et al. 2010). Hedonic price analysis assumes that a consumer

price represents the total value of implicit prices for a unit or presence of different product attributes. Similarly, this means that the utility that consumers capture from a product purchase consists of utilities derived from each separate product attribute (Lancaster 1966; Rosen 1974). Ladd and Suvannunt (1976) also agreed that product characteristics influence consumer demands, and they described hedonic pricing as "… the price paid for the product equals the sum of the marginal monetary values of the product's characteristics" (p.1).

Owners of some small and medium-sized farms with somewhat limited production scale have directly marketed their production to consumers through niche markets. This local foods movement has been a crucial revenue source for small-scale producers (Bond, Thilmany & Bond 2008). Brown (2002) noted that usually farmers market participation is the only, and the best, way for farmers to gain market access. Consumers visit farmers markets and make purchases from farmers markets for various reasons, among which is the belief that farmers markets provide high-quality produce at fair prices. Social interaction is also a factor that attracts both farmers and consumers to farmers markets (Brown 2002).

The number of U.S. farmers markets has increased significantly, and according to the USDA National Farmers Market Directory, more than 8,100 markets operated during the 2013 farmers market season (Kremen, Greene & Hanson 2004; USDA 2015). American Farmland Trust conducted a national survey in 2001 that involved 1,024 participants. The survey results showed that more than 50 percent of the respondents indicated that it was somewhat or very important that the food they consume come from farms and ranches in their own states rather than other states. Seventy percent of respondents mentioned that they had made a purchase transaction from a farmers market or stand at a farm or ranch in the past 12 months (AFT 2001).

Thilmany, Bond and Bond (2008) noted that the local farmers market movement had gained popularity to the extent that the New Oxford American Dictionary recognized the word "locavores" as the Word of the Year for 2007. A locavore is defined as a person who endeavors to eat only food that is grown locally within a 100-mile radius. Thilmany et al. (2008) used the rise in the "locavore" term's popularity to show that more people have become environmentally conscious food and beverage consumers. Demand for healthier, environmentally friendly, safer and higher quality food items continues to grow (Schröck 2014).

Literature Review

The hedonic pricing model theory has been widely applied. Waugh (1928) analyzed the impact of fresh vegetable characteristics on wholesale prices by using data collected on individual lots of tomatoes, cucumbers and asparagus from Boston wholesale markets. Measuring the ratio of each lot's price to its average sale price on the product characteristics generated prices for each characteristic. For asparagus, the results indicated that the most important quality factor affecting price was the green color; it explained 41 percent of price variation. Per bunch of a dozen asparagus, each additional inch of green color increased the bunch's price by 38.5 cents. Average number of stalks per bunch had a somewhat weaker effect on price; it explained 15 percent of price variation. When the number of stalks in a bunch increased by one, these results suggested that prices dropped by 4 percent per dozen bunch.

Organic is another attribute that has attracted research interest. Studies have measured price premiums and consumers' willingness to pay for organic foods (Smith, Huang, and Lin, 2009). Based on data collected from two large urban areas in Spain, one study used the contingent valuation method and confirmed other findings that willingness-to-pay for organic

products differs based on consumer segments, location and products (Sanjuán, Sánchez, Gil, Gracia & Soler 2003). Sanjuán et al. (2003) found that consumers who were most concerned about health and lived in large cities were willing to pay the highest premium, which reached from 22 percent to 37 percent for vegetables. Potatoes were the exception; their premiums ranged from 13 percent to 17 percent.

Using multivariate regression, Zhang, Epperson, Huang and Houston (2009) estimated price premiums for organic tomatoes and apples in the U.S. They found that those price premiums averaged about 22 percent and 24 percent, respectively. They also found that smaller households and households with young children were market segments that had the highest willingness-to-pay for organic produce. In general, depending on the product and location, organic price premiums ranged from 10 percent to 30 percent (Huang & Lin 2007).

Loureiro and Hine (2002) assessed consumer preferences for local, organic and GMO-free potatoes using consumer survey data collected in supermarkets at different Colorado locations. They found that sociodemographic factors, such as age, education and income, play a key role in consumer willingness-to-pay for organic products. The data suggested that older consumers tended to have a lower willingness-to-pay for organic, but well-educated and wealthy consumers were willing to pay $0.04 more per kilogram on average for organic potatoes.

Many studies have highlighted price premiums observed for different organic fruits and vegetables. However, availability of such produce at local farmers markets may not be a strong factor motivating consumer visits to those markets because many supermarkets have also started offering organic products. Thus, farmers markets may need to place a greater emphasis on other attributes such as freshness, purity, nutritional content and production-related techniques such as locally produced and free-range. All such attributes have been identified as those that are

important to consumers (Sunding 2003; Bond et al. 2009). Groff, Kreider and Toensmeyer (1993) found that females in Delaware valued organically grown produce more than their male counterparts. Another study conducted in the U.S. found that low awareness of organic food in some rural areas produced negative interest toward such goods (Kremen et al. 2004). Bond et al. (2008) found that consumers valued local production more than organic production by using national survey data on purchasing habits, attribute preferences and willingness-to-pay and employing a cluster analysis to evaluate those data.

Estes (1986) found that firmness, color and defects were significant factors affecting prices for wholesale green pepper buyers at The Atlanta Farmers' Market. That study employed a Box-Cox methodology to choose the data-desired functional form of the model estimate using data collected from mid-June and July 1985. Data points from 20 pepper containers, which held roughly 1,400 peppers to 1,800 peppers in total, were included.

McCluskey (2000) suggested that third-party certification is important for analyzing the credibility of credence goods and producer claims about product quality attributes because it is the only way that consumers can confirm the presence or absence of such attributes. McCluskey suggested that this could also increase producers' welfare. However, many producers who sell directly to consumers prefer to not use nutritional, attribute or brand labeling. Factors driving those decisions include high costs associated with certification, lower organic price premiums attributed to increasing organic product availability at mainstream supermarkets and grocery stores and producer-consumer interaction facilitated at markets. The latter factor creates trust between consumers and producers and reduces the need for third-party certification (Huang & Lin 2007; Thilmany et al. 2008; Bond et al. 2009).

For the current study, these previous studies provided the foundation for the conceptual model specified and the empirical model estimated.

Conceptual Model

Consumers at farmers markets purchase products for them to consume themselves. Therefore, consumers derive the marginal implicit value for an attribute by maximizing their at-home consumption utility function subject to budget constraints. Hedonic models decompose retail prices into individual attribute values based on consumer-revealed preferences to purchase products with varying attribute levels. That is, hedonic model estimation captures changes in willingness-to-pay for an attribute, or imputed price, based on changes in the attribute's level.

Lancaster (1966), Dhrymes (1967), Grilliches (1971) and Ladd and Suvannunt (1976) provided the theoretical underpinnings for consumer-level hedonic modeling. Contanigro and McCluskey (2014) extended those earlier works to hedonic modeling in food markets. Their theoretical foundations motivate why consumers and producers reach attribute-price equilibrium. This study follows the theoretical model's general form with application to the sell-purchase relationship between a farmers market vendor and consumers. Consumers at farmers markets make purchasing decisions based on the expected utility derived from consuming all food products ($\mathbf{F} \mid f_i$; i = 1, 2, 3, …..t) for which each i^{th} food product contains a vector ($\boldsymbol{Z} \mid z_j$; j = 1, 2, . . . k) of j different characteristics.

Consumers face a set of food prices (**P**), so that **PF** represents consumer expenditures on retail food products. Consumer expenditures could be decomposed into farmers market purchases and grocery store purchases. Unless consumer decision-making differs between a farmers market and grocery store, however, there is no reason to make this decomposition, i.e., the farmers market venue is treated as another retail outlet undifferentiated from other retail

outlets. However, this study evaluates only a subset of food purchases: produce. From here forward, the term "produce" is used in place of the term "food."

Because consumers allocate wealth to activities other than produce purchases, referred to as **Y**, utility is specified in the form as:

(1) $$U=U(\mathbf{Z(F)}, \mathbf{Y}, \mathbf{a}),$$

where **a** is a vector of exogenous observed and unobserved factors that describe consumer preferences. The consumer budget constraint is defined as ***B***. Each of the i^{th} produce items has observed price $p_i(\mathbf{Z})$, and the consumer consumes quantity q_i of the i^{th} produce item. The produce item price $p_i(z_1, z_2, \ldots z_j)$ is the price paid for the i^{th} produce item purchased with a vector (**Z)** of j unique product attributes. Also, $z_{j\cdot}$ is the total amount of attribute j from consumption of the i^{th} produce item. For example, $z_{j\cdot}$ is the total number of sweet corn ears consumed. Given all of this information, a consumer's willingness to pay for the i^{th} produce item can be expressed as $\Gamma_i(\mathbf{Z(F)}, \mathbf{B}, U, \mathbf{a})$. Consumer willingness-to-pay is a function of the total quantity of product characteristics $z_{j\cdot}$ available in the i^{th} product, income, utility and exogenous preferences.

Parcell and Schroeder (2007) provided the computational steps from the utility function deriving first-order conditions that express that the consumer price paid for the i^{th} good is determined by product attribute availability from a good and consumer willingness-to-pay for additional attribute units. We skip directly to the specification of the hedonic model that can be estimated following from Parcell and Schroeder (2007) as:

(2) $$p_i = \sum_j R_j \left(\partial z_{j\cdot} / \partial f_i\right) + \varepsilon_i,$$

where R_j is the rate of substitution between expenditures and the j^{th} product attribute in purchasing decisions. The second term $(\partial z_{j\cdot} / \partial f_i)$ captures how much of an attribute is added by consuming one more unit of a good, and ε_i is an identically and independently distributed error

term. The term $(\partial z_{j.} / \partial f_i)$ refers to the marginal yield of attribute *j* for one additional unit of the i^{th} product. This term represents, for example, the marginal change in organic sweet corn consumption given the purchase of an additional ear of sweet corn, i.e., if the ear is organic, then a consumer consumes organic, and if a consumer has no preference for organic, then the sweet corn ear is conventional.

Equation (2) specifies that the price paid for product *i* equals the sum of the marginal implicit values of the *j* characteristics of the product. Following Ladd and Suvannunt (1976), $\left(\partial z_{j.} / df_i\right)$ is assumed constant and equal to z_{ji}. In sweet corn, the number of organic ears purchased increases total organic sweet corn consumption in a constant proportion. Therefore, equation (2) can be re-specified as:

$$p_i = \sum_j R_j z_{ji} + \tau_i, \quad (3)$$

The marginal implicit values for product characteristics (R_j) need not be linear. Ladd and Suvannunt (1976) indicated that these could be specified using a nonlinear functional form where the marginal implicit price for an individual product depends on the level of a characteristic. For example, the marginal implicit sweet corn price may vary as ear size changes, e.g., one may pay more per ear for a 6.5-inch ear compared with a 4-inch ear because the 4-inch ear has too few kernels to completely satisfy the desire to consume sweet corn. Data collected for the estimated hedonic model are described in the next section.

Data and Descriptive Statistics

The University of Missouri-Columbia, United State, has been collecting data from local Missouri farmers markets to determine relationships between price and quality attributes of products sold

at those markets. Data for sweet corn, tomatoes, cantaloupe, cucumbers and green beans were collected by five University of Missouri Extension specialists during summer and early fall of 2014 and 2015. Data for bell peppers and zucchini were collected only during summer and early fall of 2015.

To ensure that data were collected uniformly, collection periods lasted four weeks, and data were collected at the market start time or before the market opened if vendors were receptive. The two data collection periods were from July 6 to July 31 and Aug. 31 to Sept. 25. The second period represented the seasonal close for most outdoor Missouri farmers markets.

For each product, extension specialists had a grading sheet provided. A sample tomato grading sheet is shown in appendix A. Data collectors were asked to complete as many as four grading sheets per product at each market attended. Although extension specialists could collect data for each product from the same four vendors, they were advised to evenly collect data from all vendors. Total weight reported for each produce type, except green beans, was based on the average weight five items. For green beans, total weight recorded was for 20 green beans.

Table 1 presents summary statistics for price based on level of product attributes and market-related attributes. A number of not applicable (n/a) signs are shown in the table because some attributes were not identifiable for some products. The empirical model is specified next.

Empirical Model

This paper follows the Ladd and Suvannunt (1976) approach of hedonic analysis but extends the initial model to consider how farmers market vendors can modify product attributes and characteristics based on consumer needs and, in return, capture economic returns. It is based on the hedonic hypothesis that utility is not received directly from the purchased product but rather

from the bundle of attributes and properties that a product provides and that attribute impacts on price are not obvious. Thus, hedonic prices are defined as implicit prices of attributes that differ depending on the specific attribute level provided by a given product. The distribution of consumer tastes and vendor costs determines the market-clearing price of $p(\mathbf{z})= p(z_1, z_2,. . . , z_n)$ in a competitive market, where p is the price of the product described by *n* attributes, $\mathbf{z} = (z_1, z_2,. . . , z_n)$. A conventional regression analysis that employs the hedonic approach can be used to estimate the impact of different quality attributes on product prices (Estes 1986). Based on the idea that hedonic analysis assumes not only consumer preferences but also producer costs, Nerlove (1995) states that:

> "A large and statistically significant coefficient for a particular quality attribute in an estimated hedonic price function may reflect, not consumers' high valuation of that attribute, but rather the difficulties or high costs which producers have in achieving that attribute per se or in relation to other attributes" (p. 1699).

That is, the attribute's estimated implicit value can be viewed as consumers' revealed willingness-to-pay and producers' maximum marginal cost of supplying the attribute. A producer will supply higher attribute levels as long as the implicit price paid by consumers is greater than his or her marginal cost of increasing the attribute level.

Most hedonic researchers agree that the exact functional form depends on the underlying data, market and product type. Costanigro and McCluskey (2014) further discussed functional form. Hedonic models are not very restrictive, and previous hedonic analysis researchers have employed different functional forms, such as linear function, semi-log, log-log, log-linear and even more flexible Box-Cox model transformation (Maguire, Owens & Simon 2004; Parcell, Dhuyvetter, Patterson & Randle 2006; Costanigro, McCluskey & Mittelhammer, 2007; Huang & Lin 2007; Elliott, Parcell & Patterson 2013; Schröck 2014). For example, using retail scanner

data, Parcell et al. (2006) found a log-linear relationship between weight and price based on consumer preferences for certain meat portion size ranges.

Feenstra (1995) argued that a linear model can be used in cases when firms have the power to influence prices so that marginal prices are higher than marginal costs. In the case of a competitive market where marginal costs equal marginal prices, Feenstra also suggested that a log-log model can be used. The practicality of the estimates is that hedonic model estimation yields results valuable to practitioners, and the linear model specification is easy to interpret. Following the theoretical model of equation (3), the empirical hedonic model to be estimated here is specified as:

$$\text{Price}_i = f(\text{Organic}_i, \text{GM}_i, \text{Freshness}_i, \text{Clean}_i, \text{Full Ear Tip}_i, \text{Not Bumpy}_i, \text{Not Deformed}_i, \text{Under Ripe}_i, \text{Yellow}_i, \text{Tip Injury}_i, \text{Competition}_i, \text{Portion Size}_i, \text{Portion Size}_i, \text{Time of Year}_i, \text{Year}_i, \text{Location of Market}_i)_n. \quad (4)$$

Where subscript *i* represents the specific transactions. Variable definitions are presented in Table 2. The dependent variable Price_i represents the price per unit for the *i*th observation for sweet corn, cucumbers, bell peppers, tomatoes, green beans, zucchini or cantaloupe.

A set of binary 0 or 1 variables were specified to capture consumer preferences for credence attributes and experience attributes. The only two credence attributes were organic and genetically modified (GM). Credence attributes reflect characteristics that define production, processing or management practices that consumers may view as desirable or undesirable. Organic products were expected to garner price premiums given that organic production costs are higher. GM sweet corn was the only genetically modified item in the data set, and no *apriori* expectation was set for the genetically modified attribute's effect on sweet corn price.

Experience attributes refer to those that consumers can verify by using their senses. The full set of experience attributes studied here was composed of freshness, cleanliness, full ear tip, texture, deformities, ripeness, color and tip condition. The price-attribute level relationships for these characteristics were maintained as empirical questions. Generally, however, more sensory-appealing products should receive a price premium because consumers typically prefer more eye-appealing attributes (Estes and Smith, 1996).

The variable portion size was included as both a linear term and a quadratic term to determine whether farmers market consumers express produce size preferences.

Market factors reflect non-product related, i.e. exogenous, factors that may influence price. Season was included to assess whether product prices were higher during mid-summer or toward the end of the season. Prices were expected to be higher toward the end of the season in response to some product volume no longer being available unless grown in specialized production facilities. The competition variable represents the estimated number of competitors present at a given sale *n.* As competition increases, price per unit is expected to decrease so that the lower price allows for supply and demand to clear the market. For location of the *n* markets, places with higher populations than Columbia, Mo., (default at 110,000 population) were expected to have higher prices. On the other hand, smaller market locations were expected to register discounted prices relative to those in the Columbia, Mo., market.

The hedonic model was estimated linearly except for portion size. Each model was tested for normality (skewness/kurtosis test and graphical examination) and heteroscedasticity (Breusch-Pagan / Cook-Weisberg and White's tests). White's test and, where applicable, the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity suggested that there was not enough evidence of heteroscedasticity for any produce type at the 95 percent confidence interval. The

normality test for tomatoes, cantaloupe and green bean suggested that the residuals were distributed normally. Robust regression was used for the other produce.

Results

Regression results from estimating equation (4) are presented in Table 2. Given this paper's purpose and the underlying data, the R-squared for all seven models were within the expected range. Depending on produce type, the hedonic model explained about 31 percent to 52 percent of price variation.

Based on the estimation results, portion size seems to be an important factor affecting prices as it was statistically significant for all produce, except sweet corn. For example, ceteris paribus, a 1/4-kilogram weight increase per item will on average increase cantaloupe and zucchini prices by about $0.13 (= 0.515 x ¼) and $0.25 (= 1.014 x ¼), respectively. For cucumbers, each additional 1/10-kilogram weight increase would increase the price up until an item weight of 4/10-kilogram and price would decline after this level. At an item weight of 4/10-kilogram would yield the optimal preferred size according to the revealed willingness-to-pay. This supports the previous finding by Waugh (1928), who stated that the Boston market preferred long cucumbers of about 20.34 centimeters and a weight that totaled 20 percent to 25 percent of cucumber length. He argued that shorter cucumbers sell at considerably lower prices, and chunky and heavy cucumbers sell at much lower prices. Thus, this paper's finding can be combined with that of Waugh (1928) to suggest that a weight increase, which occurs due to a longer product, increases cucumber prices. For green beans, the finding is that the seller will try to sell the largest green beans possible without sacrificing quality issues.

According to the model results, competition in the given markets did not impact prices for the seven selected produce types because the variable coefficients were statistically insignificant. This finding supports the assumption that growers raising these commodities are price-takers. The data also show that the organic attribute was only important for tomatoes and green beans. That is, on average, an organic tomatoes or 20 units of green beans were $0.095 and $0.107 more expensive, respectively, than conventional ones. Everything else held constant, excellent development and freshness (relative to poor and good development and freshness) of bell peppers and green beans increased prices on average by about $0.110 per item and $0.469 per item, respectively. According to the results, cleanliness and shape deformities did not seem to affect produce prices.

Additionally, sweet corn with developed ear tips (rather than underdeveloped ear tips) sold on average at a price lower by $0.049 per item. Ceteris paribus, a unit of under-ripe tomatoes was cheaper by $0.128 on average than ripe tomatoes, and an item of green zucchini was $0.116 cheaper compared with yellow zucchini. Also, compared with 2014, tomato prices had increased by $0.55 per item in 2015.

In terms of seasonality, the models suggest that, ceteris paribus, a unit of tomatoes, 20 units of green beans and a unit of cucumbers sold at a price lower by $0.05, $0.05 and $0.08 during the summer compared with fall, respectively.

Last, farmers market location seemed to affect produce prices. Compared with Columbia, sweet corn was cheaper on average in Jefferson City by $0.03 per item and more expensive on average in St. Louis by $0.09 per item. On average, a unit of tomatoes was cheaper by $0.23, $0.17 and $1.28 in Webb City, Jefferson City and Cape Girardeau and more expensive by $0.17 in St. Louis compared to Columbia. For cantaloupe, the models suggested no statistically

significant price difference between cities, except that cantaloupe prices were higher on average in St. Louis by $0.86 per item. On average, cucumbers were cheaper by $0.45 per item, $0.26 per item, $0.41 per item, $0.49 per item and $0.38 per item in Webb City, Springfield, Jefferson City, Cape Girardeau and Kansas City, respectively, compared with Columbia. The only statistically significant location-related price difference for bell peppers was that they were cheaper on average in Cape Girardeau by $0.22 per item. According to estimations, green beans were cheaper in almost all cities where data were collected and compared with Columbia prices. Specifically, 20 items of green beans were cheaper in Webb City, Springfield, Jefferson City, Cape Girardeau, St. Louis and Kansas City on average by $0.32, $0.19, $0.42, $0.34, $0.16 and $0.17, respectively. Last, zucchini was cheaper on average by $0.50 per item, $0.30 per item, $0.36 per item and $0.20 per item in Webb City, Springfield, Cape Girardeau and Kansas City, respectively, and again, compared with Columbia, zucchini prices were higher by $0.188 per item on average in St. Louis.

Conclusion and Recommendations

Using hedonic pricing models, this study analyzed the effect of product attributes on product prices. Data were collected from Missouri, U.S., farmers markets. Overall, seven produce types were selected for analysis. The results suggest that estimated number of competitors, cleanliness and deformities do not affect produce prices. Portion size seems to be an important factor; it generally increased produce prices. Weight was an important factor for all produce types. For cucumbers, an initial weight increase led to prices increasing but only to a certain point. After that, additional weight caused prices to decrease. For green beans, an initial weight increase led to a price decrease up to a certain point and after that point it caused prices to increase.

According to the estimations, another finding suggested that tomatoes and green beans sold at a premium when grown organically, but no such premium existed for cucumbers, bell peppers and zucchini. For tomatoes, ripeness was an important factor. The data suggested that ripe tomatoes sold at a higher price than under ripe ones. Also, green beans and bell peppers that had excellent freshness were more expensive than those with good or poor freshness. Yellow zucchini was also found to sell at a higher price than green zucchini.

Location seemed to be an important factor that influenced prices. Most produce was cheaper almost everywhere compared with Columbia, Mo. Only in the case of sweet corn, tomatoes, cantaloupe and zucchini were St. Louis prices higher than those in Columbia.

Given the results, producers should consider the costs associated with controlling product quality or obtaining certain product attributes. If the potential price premium or benefit is higher than the costs incurred to get the premium, then producers are incentivized to improve their welfare and meet product attribute expectations. The statistically significant marginal implicit values do not necessarily represent consumers' willingness to pay extra for those attributes, but they can be related to higher costs associated with providing those characteristics.

Shi and Hodges (2015) point to strategies for improving consumer access and interest in farmers markets. Vendors offering the most desirable portion size and quality attributes could improve marketing and revenue. To further narrow the knowledge gap in this field, hedonic researchers would benefit from conducting a nationwide U.S. study and comparing outcomes across states. Also, given the data available, comparing whether attribute importance changes depending on product label was not possible. For example, some characteristics such as color and size may be important for organic products but not for those raised conventionally. Further

study could explore such relationships and offer related insights to producers and the research community.

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Table 1. Descriptive Statistics for Seven Produce Products observed at Farmers Markets in 2014 and 2015

	Sweet Corn (per 12)		Tomato (each)		Cantaloupe (each)		Cucumber (each)		Bell Peppers (each)		Green Beans (per 20)		Zucchini (each)	
Number	124		351		115		273		150		229		143	
Continuous Variable Definition	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
Average Price ($ per specified unit)	0.45	1.10	2.22	0.63	2.72	0.95	0.72	0.33	0.68	0.29	0.82	0.19	0.81	0.34
Portion Size (kilograms/ specified unit)	0.29	0.07	0.20	0.07	2.18	0.47	0.27	0.09	0.14	0.05	0.12	0.05	0.33	0.33
Estimated number of competitors at market	5.06	4.54	8.45	5.25	4.48	4.98	7.04	5.12	7.92	5.60	6.97	7.74	7.27	5.92
Categorical Variable Definition	**Percent**													
Collection Period, % of total observation														
Fall	4.03		44.73		22.61		37.36		36.00		45.85		44.06	
Summer	95.97		55.27		77.39		62.64		64.00		54.15		55.94	
Label, % of total observation														
Conventional	89.52		90.60		100.00		90.84		100.00		91.70		95.10	
Organic	10.48		9.40				9.16				8.30		4.90	
City location of market, % of total observation														
Columbia	11.29		10.83		8.70		8.06		5.33		9.61		5.59	
Webb City	14.52		9.69		18.26		13.19		17.33		14.41		14.69	
Springfield	11.29		13.68		11.30		122.82		13.33		17.03		19.58	
Jefferson City	12.10		7.98		10.43		6.59		4.67		6.55		2.80	
Washington	0.81		0.85		1.74		0.73		1.33		0.87		1.40	
Cape Girardeau	9.68		15.95		5.22		18.68		17.33		12.66		13.99	
Farmington	1.61		1.14		1.74		0.37		1.33		N/A		N/A	
Jefferson County	N/A		1.42		N/A		1.47		0.67		1.75		3.50	
St. Louis	19.35		14.81		21.74		16.48		11.33		14.85		11.89	
Kansas City	19.35		23.65		20.87		21.61		27.33		22.27		26.57	
Cleanliness, % of total observation														
Some Dirt	8.87				33.91		7.33		8.00					
Clean	91.13				66.09		92.67		92.00					

Table 1 (cont'd). Descriptive Statistics for Seven Produce Products observed at Farmers Markets in 2014 and 2015.

	Sweet Corn (per 12)	Tomato (each)	Cantaloupe (each)	Cucumber (each)	Bell Pepper (each)	Green Beans (per 20)	Zucchini (each)
Shape Deformities; percent of total observed							
None	N/A	69.80	72.17	59.34	60.00	71.17	65.03
Slightly Deformed		30.20	27.83	40.66	40.00	28.82	34.97
Development and Freshness; percent of total observed							
Poor						2.18	
Good				43.59	38.67	29.69	
Excellent				56.41	61.33	68.12	
Color; percent of total observed							
Green (Unicolor)	20.16						91.16
Yellow (Bicolor	79.84						8.39
Ear Tip Development; percent of total observed							
Underdeveloped	17.74						
Developed	82.26						
Husk Freshness & Color; percent of total observed							
Fairly Fresh and Mostly Green	15.32						
Fresh and Green Husk	81.45						
Wilted and Discolored	3.23						
Tip Injury; percent of total observed							
No Tip Injury	85.48						
Tip Injury	14.52						
Maturity; percent of total observed							
Underride		6.27					
Ripe		93.73					
Year; percent of total observed							
2014	66.13	46.15	39.13	43.22	N/A	58.08	N/A
2015	33.87	53.85	60.87	56.78		41.92	
Texture; percent of total observed							
Bumpy and Rough				28.94			
Not bumpy or Rough				71.06			

Table 2: Estimation Results of Hedonic Price Model, by Product as Specified by Equation 1.

Variable	Sweet Corn (per 12)	Tomato (each)	Cantaloupe (each)	Cucumber (each)	Bell Pepper (each)	Green Beans (per 20)	Zucchini (each)
Credence Attributes							
Organic (vs conventional)		0.095*		0.120		0.107*	
		(0.046)		(0.080)		(0.036)	
GMO (vs conventional)	0.014						
	(0.019)						
Experience Attributes							
Bicolor (vs unicolor)	0.008						
	(0.022)						
	(0.029)			(0.039)	(0.042)	(0.079)	(0.055)
Clean (vs some dirt)	0.034		0.181	0.101	-0.085		
	(0.034)		(0.178)	(0.072)	(0.075)		
Excellent Freshness and Development				-0.012	0.110*	0.049*	
(vs good or poor)				(0.039)	(0.042)	(0.002)	
Full Ear Tip (vs not full)	-0.050**						
	(0.027)						
Not Bumpy (vs bumpy)				-0.037			
				(0.045)			
Not Deformed (vs deformed)		0.001	0.137	0.035	0.057	-0.002	-0.001
		(0.029)	(0.177)	(0.039)	(0.044)	(0.021)	(0.054)
Under ripe (vs ripe)		-0.128*					
		(0.053)					
Yellow (vs Green)							0.116**
							(0.064)
Tip Injury (vs no tip injury)	-0.007						
	(0.019)						
Portion Size	-0.129	-0.382**	0.516*	3.578*	2.979*	-2.129*	1.014*
	(0.172)	(0.088)	(0.088)	(0.689)	(0.541)	(0.663)	(0.219)
Portion Size Square				-4.591*		5.330*	
				(1.025)		(2.038)	

[a] The top value is the coefficient estimate, and the bottom value is the standard error, and * and ** asterisks represent statistical significance at the 5 percent and 10 percent levels, respectively.

Table 2 (continued): Estimation Results of Hedonic Price Model, by Product as Specified by Equation 1.

Variable	Sweet Corn (p)	Tomato (each)	Cantaloupe (each)	Cucumber (each)	Bell Pepper (each)	Green Beans (per 20)	Zucchini (each)
Market Factors							
Competition	-0.002	-0.001	-0.029	0.003	-0.002	-0.001	0.004
	(0.002)	(0.003)	(0.026)	(0.005)	(0.004)	(0.002)	(0.004)
	(0.019)		(0.187)	(0.036)			
Summer (vs Fall)	-0.070	-0.046**	0.196	-0.077*	0.044	-0.046*	0.024
	(0.055)	(0.028)	(0.202)	(0.039)	(0.044)	(0.020)	(0.047)
2015 (vs 2014)	-0.011	0.055*	0.139	0.029		-0.004	
	(0.019)	(0.027)	(0.187)	(0.036)		(0.020)	
Webb City (vs Columbia)	-0.020	-0.225*	-0.391	-0.454*	-0.120	-0.316*	-0.498*
	(0.021)	(0.058)	(0.355)	(0.091)	(0.088)	(0.042)	(0.079)
Springfield (vs Columbia)	0.049**	-0.070	0.000	-0.263*	-0.131	-0.188*	-0.303*
	(0.029)	(0.053)	(0.381)	(0.110)	(0.108)	(0.040)	(0.077)
Jefferson City (vs Columbia)	-0.036*	-0.172*	-0.189	-0.410*	-0.159**	-1.423*	-0.449*
	(0.018)	(0.060)	(0.343)	(0.093)	(0.086)	(0.048)	(0.111)
Washington (vs Columbia)	-0.043	0.411*	-0.548	-0.448*	0.074	-0.303*	-0.257
	(0.041)	(0.143)	(0.656)	(0.099)	(0.101)	(0.105)	(0.288)
Cape Girardeau (vs Columbia)	-0.002	-0.283*	0.169	-0.492*	-0.216*	-0.338*	-0.358*
	(0.028)	(0.052)	(0.422)	(0.090)	(0.082)	(0.043)	(0.083)
Farmington (vs Columbia)	-0.065	-0.211**	-0.493	-0.591*	-0.245*		
	(0.108)	(0.127)	(0.643)	(0.105)	(0.094)		
Jefferson (vs Columbia)		0.057		-0.440*	0.149	-0.505*	-0.002
		(0.115)		(0.116)	(0.112)	(0.088)	(0.126)
St. Louis (vs Columbia)	0.094*	0.173*	0.864*	-0.117	0.033	-0.162*	0.188**
	(0.041)	(0.053)	(0.322)	(0.106)	(0.119)	(0.047)	(0.113)
Kansas City (vs Columbia)	-0.015	0.025	0.417	-0.378*	-0.028	-0.165*	-0.204*
	(0.034)	(0.052)	(0.386)	(0.097)	(0.089)	(0.040)	(0.085)
Intercept	0.550*	0.982*	1.378*	0.384*	0.311*	1.200*	0.682*
	(0.130)	(0.065)	(0.365)	(0.162)	(0.148)	(0.072)	(0.088)
Number of observations	124	351	115	273	150	229	143
R-squared	0.43	0.34	0.40	0.31	0.38	0.52	0.44

Appendix A.

Tomatoes

Avg. Price Per Unit: _____ ***Estimated # of Competitors:*** _____

**Note: Be sure to make unit known (ex: $/pound)

How many tomatoes per pound? _____

Please circle the best option for each category.

Tomato Variety: *Slicing* 			
Marketing Label:	Organic	Conventional	
Development:	Under Ripe	Ripe	Overripe
Cleanliness:	Clean	Some Dirt	Dirty
Shape:	No Deformities	Slightly Deformed	Seriously Deformed
Cracking:	No	Yes	
Bad Spots or Bruising:	No	Yes	
Insect Injury:	No	Yes	
unscald/Yellow Shoulders:	No	Yes	
Additional Comments:			

Vendor:_____ Date:_____ Farmer's Market:_____ Observer:_____

Consumer Preference for Sampling at Farmers Markets

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Consumer Preference for Sampling at Farmers Markets

Abstract: From a survey of farmers' markets shoppers, this study aims to investigate the factors that differentiate samplers and non-samplers, factors that motivate and discourage consumers to take free samples presented by vendors, and estimate to what extent sampling affects consumer behavior and perceptions about products. A survey questionnaire was conducted yielding 1145 usable responses. A simultaneous equation model and exploratory factor analysis assessment was conducted. Results show that consumers' trust in farmers' markets food system have a significant impact on sampling decisions, and affiliation towards persons distributing samples motivate consumers to sample. The post sampling effect can be reflected by consumers' immediate purchase, generating word of mouth and an increase in unplanned purchase.

Keywords: Sampling, Farmers' Markets, Consumer Preference

Consumer Preference for Sampling at Farmers Markets

Consumers are adopting the habit of buying local. Farmers' markets are the consumers' option of choice to buy local for over the past thirty years. In the last few years, the number of farmers markets across the America increased rapidly, USDA's National Farmers Market Directory listed 8,268 markets by August 2014, an increase of 76 percent since 2008 (USDA). Researchers show that vendors' sales at farmers' markets make up a significant portion of their income, especially for retired farmers and small sized farmers. Results of a 2006 farmers' markets survey show average per vendor sales of $7,108 and farmers' market sales as the sole source of farm income for 25% of vendors (USDA, 2006).

In order to increase vendors' revenue in farmers' markets and improve community economy, vendors need the expertise of promotion. Typically, farmers' markets vendors have many options when promoting their foods including: labeling "organic" and "local" products, displaying their farm stories, sharing recipe cards, suggesting complementary products, and distributing brochures (Cowee, Curtis, & Gatzke, 2009). A marketing strategy recently adopted by vendors of farmers' markets is sampling[1]. Sampling allows for a bundle of marketing strategies to promote products. Sampling, for example, allows one to experience a recipe card and be introduced to complementary products. This allows consumers to learn about the item through sensory experience (Marks & Kamins, 1988). In return, the sensory experience helps introduce new products, improve product image (Bettinger, Dawson, & Wales, 1979) and generate word of mouth advertising (Meyer, 1982). Free samples presented at the point of purchase (POP) have an even greater impact on purchasing behavior, both on

[1]Adoption of sampling is often constrained by state-level health ordinances.

short term and long term purchasing habits of shoppers (Heilman, Lakishyk, Radas, & Nakamoto, 2004). As a result of trial of free sample, consumers' behavior towards products, brands and even markets may change if the experience is positive (McGuinness, Gendall, & Mathew, 1992).

Empirical studies on sampling are diffused on different markets such as grocery stores and supermarkets, and on different areas such as software and fragrance. As for farmers' markets, we are aware of no research analyzing sampling as a promotion technique. Our study focuses on sampling of food products presented in a farmers' market setting. The purpose of our study is: 1) to examine factors that motivate consumers to take free samples presented by vendors and factors that discourage consumers to take free samples presented by vendors, and 2) to estimate what extent sampling affects consumer behavior and perceptions about products, vendors, and farmers' markets. Our data set of 1145 usable responses was collected through an electronic survey of farmers' market attendees. Our study provides valuable insights into the use of sampling as a marketing mix to promote food products at farmers' markets.

Previous Research

Farmers' markets have played a critical role in helping small-size and medium-size farmers gain access to consumers directly, and sales from farmers' markets can be a crucial component or supplement of farmers' income (Kezis, Gwebu, Peavey, & Cheng, 1998). The increasing popularity of farmers' markets is owed to the consumers increasing demand for fresh, local, and organic produce, and it also leads to an increase in research about promotion methods at farmers' markets, which provide useful insights for vendors to improve their

marketing tactic and sales income (Kezis et al., 1998; Marianne M Wolf, Spittler, & Ahern, 2005). A survey of Indiana farmers' markets vendors found that the majority of vendors keep farming as their full-time occupation (Brown & Miller, 2008). A study of farmers' markets in 2000 by the USDA showed 19,000 farmers use farmers' markets as their sole marketing outlet (Payne, 2002). On the other hand, farming can also be a part-time activity, providing only supplemental income to many vendors, who reported produce sales less than $5,000 in an Iowa study (Varner & Otto, 2008). Farmer-vendors are responsible for their individual promotional campaigns because of the importance to make direct sales to overall revenue (Kohls & Uhl, 1972). Researchers found that the long-term viability of the farmers' markets increased when promotion activity is incorporated, especially when a part-time marketing coordinator is hired (Conrey, Frongillo, Dollahite, & Griffin, 2003).

Promotion helps consumers generate perception and awareness of the product and persuade consumers to buy it as an important component of marketing mix (Marianne McGarry Wolf, 1997). In farmers' markets, there is a variety of promotion methods applied to increase sales, recruit new customers, build vendors' images, etc. Promotions involving free gifts were proved to increase purchase likelihood when the decision is affective, but to decrease purchase likelihood when the decision is cognitive with uncertainty (Laran & Tsiros, 2013). Besides, the application of promotional tools needs to take price effect into consideration. In promotion of a special category such as organic food, consumers are less price-sensitive and more brand-sensitive, and sales promotion might increase the perceived risk when product quality is uncertain (Ngobo, 2011). Providing coupons to consumers help create a more direct marketing opportunity for vendors (Balsam, Webber, & Oehlke, 1994).

Yet, researchers found the effectiveness of a coupon is comparable to a price discount (Dong, 2010). As for advertising, it is a common strategic planning for a farmers' market venues to use vendor fees for attracting consumers in ways such as road signs, flags, and other media (Baker, Hamshaw, & Kolodinsky, 2009). Most of these promotional tools may have intrinsic disadvantages, for advertising has a cost that cannot be ignored, pricing strategies have different impacts on consumers, and coupons may be less effective because of delays in reimbursement (Suarez-Balcazar, Martinez, Cox, & Jayraj, 2006).

Sampling is a unique element in the marketing mix and appears to have increased in recent decades. Sampling has also proved to be effective in different market types such as grocery stores (Heilman et al., 2004), shopping malls (Freedman, 1986), perfume, skin care, and make up (Amor & Guilbert, 2007), information goods, and software (Dey, Lahiri, & Liu, 2013; Wyss & Jorgensen, 1998), and in aspects such as intangible traits of brand image (Amor & Guilbert, 2007), word of mouth (Holmes & Lett, 1977), etc. Nevertheless, there are few studies on sampling at farmers' markets that can provide meaningful insights.

Methods and Empirical Findings

A survey on sampling at farmers' markets was carried out via Survey Monkey and Research Now online. Survey respondents answered questions related to location, demographic information, trust in farmers' markets, factors that encourage consumers to sample, factors discouraging consumers from sampling, and reactions to sampling. The questionnaire distinguishes 939 respondents willing to sample and 206 respondents unwilling to sample.

Willingness to Sample

Inspired by prior research related to demographic characteristics tied to consumers involvement with purchasing habits (Quester & Smart, 1996; Slama & Tashchian, 1985), we became interested in whether personal characteristics and shopping behaviors will differentiate "samplers" and "non-samplers" (Heilman, Lakishyk, & Radas, 2011). The information shown in Table 1 is summary statistics for both samplers and non-samplers.

We conducted a test of means between samplers and non-samplers, shown as p-values, in the following discussion. Four demographic characteristics were found to be statistically different between non-samplers and samplers. Respondents willing to sample are more likely to possess a bachelor's degree ($p<0.1$) and higher household income ($p<0.05$), which indicates that consumers with higher education level and higher household income may be more willing to take part in the promotion of sampling. Meanwhile, the assumed effective factor of social capital is measured by the number of internet-based ($p<0.1$) and non-internet-based social organizations ($p<0.01$) a respondent belongs. This suggest that internet-based social organizations (e.g., Facebook) and non-internet-based social organizations (e.g., church) have a positive influence on consumer decision to sample or not. The more social organizations a consumer is involved, the more he or she is likely to take the sample. Consumers shopping behavior also contribute to differentiate samplers from non-samplers. Samplers are likely to shop more frequently ($p<0.05$) and eat out more often ($p<0.05$). Consumers who eat out more may find sampling as a curiosity to enjoy new foods.

We assume that demographic characteristics, shopping behaviors, and consumers' trust in

farmers' markets food system may have an impact on consumers' willingness to sample. The survey design required respondents to compare their trust in farmers' markets with grocery stores, with scores for seven discrete variables including food labels, certifications, fair price, traceability, safety, quality, and word of mouth. And mean value of these seven variables is defined as "TRUST". Following, we note that demographic characteristics may affect consumers' trust scores, which cause the three aspects to share a complex interaction with each other. Considering the dependent variable as a discrete choice variable of sampling (=1) or not sampling (=0), a Simultaneous Equation Model was specified to analyze this assumption (Amemiya, 1978), allowing for the endogeneity of TRUST (Cai, 2010).

Table 1. Summary Statistics

Name	Variable Description	Non-sampler	Sampler
G	%Females	11.00%	46.81%
A	Age of respondent (1= Younger than 18, 2=18-27, 3=28-37, 4=38-47, 5=48-57, 6=58-67, 7=68 and older)	2=4.85% 3=18.45% 4=17.48% 5=18.93% 6=26.21% 7=14.08%	2=6.60% 3=16.83% 4=15.23% 5=21.62% 6=27.80% 7=11.93%
WC	Self-selected weight category (1=Underweight, 2=Average, 3 = Overweight, 4=Obese)	1=2.91% 2= 53.40% 3= 41.75% 4= 1.94%	1=2.34% 2=54.85% 3=40.47% 4=2.34%
E*	%with Bachelor's Degree or higher	69.93%*	74.76%*
HS	Household size (1=No more than 2 people, 2=3-4 people, 3=5-6 people, 4=7 or more people)	1=67.96% 2=25.24% 3=6.31% 4=0.49%	1=65.60% 2=28.01% 3=5.54% 4=0.85%
HI**	Household income ($s) (1= Less than $25k, 2= $25-50k, 3=$50k-100k, 4=$100-150k, 5= More than $150k)	1=6.31% 2=18.93% 3=47.09% 4=18.93% 5=8.74%	1=5.11% 2=17.15% 3=43.02% 4=22.58% 5=12.14%
CH	Children in household under 18 (1=None, 2=1-2, 3=3-4, 4=More than 4)	1=74.27%2=21.84% 3=3.40% 4=0.49%	1=72.95% 2=22.68% 3=3.83% 4=0.53%
ISO*	Average internet-based social organization in the past year	1.90*	2.05*
NISO***	Average non-internet-based social organizations in the past year	1.26***	1.54***

ST**	Monthly shopping visits to (1=Weekly, 2=2-3 times per months, 3=Once a month)	1=53.40% 2=34.47% 3=12.14%	1=47.82% 2=35.57% 3=16.61%
DTF	Distance to nearest farmers' markets(1=Under 2 miles, 2=2-5 miles, 3=6-9 miles, 4= More than 10 miles, 0= I don't know)	1=3.40% 2=23.79% 3=37.38% 4=21.36% 0=14.08%	1=0.75% 2=20.98% 3=41.11% 4=23.54% 0=13.63%
ET**	Weekly eat-out times (0=Never, 1=1-3 times, 2=4-6 times, 3=7 or more times)	0=8.25% 1=79.13% 2=12.14% 3=0.49%	1=4.79% 2=80.62% 3=12.57% 4=2.02%

Notes:*Statistically different at p<0.1;**Statistically different at p<0.05; ***Statistically different at p<0.01; G, A, WC, E, HS, HI, CH, ISO and NISO are demographic characteristics, ST, DTF and ET are shopping behaviors.

We are not studying the willingness to sample, but the behavior of sampling or not sampling. So, we extracted the six direct factors that lead consumers to take or reject free samples into the first equation as listed in Table 2 and Table 3 below, which are extracted from five-point Likert Scales discussed in the next session. For expositional simplicity, the bulk of conceptual analysis here is conducted for two equation systems (Heckman, 1977) as follows:

Equation 1:

$$\mathrm{SAFM_i} = \alpha_1 + (\beta_1 * \mathrm{WTK_i} + \beta_2 * \mathrm{HT} + \beta_3 * \mathrm{SF_i} + \beta_4 * \mathrm{TFS_i} + \beta_5 * \mathrm{FDP_i} + \beta_6 * \mathrm{IIV_i}) + \beta_7 * \mathrm{TRUST_i} + (\beta_8 * \mathrm{ISO_i} + \beta_9 * \mathrm{NISO_i}) + (\beta_{10} * \mathrm{ET_i} + \beta_{11} * \mathrm{DTF_i})$$

Equation 2:

$$\mathrm{TRUST}_i = \alpha_2 + (\rho_1 * G_i + \rho_2 * A_i + \rho_3 * WC_i + \rho_4 * E_i + \rho_5 * HS_i + \rho_6 * CH_i + \rho_7 * HI_i) + (\rho_8 * ST_i + \rho_9 * ET_i + \rho_{10} * DTF_i) + +(\rho_{11} * ISO_i + \rho_{12} * NISO_i)$$

All abbreviations of variables can be seen in Table 1. Equation 1 is specified to include all possible factors that impact consumers to take the free sample or not, and equation 2 is specified to include all possible characteristics and factors that influence consumers' trust in farmers' markets food system. The α_1 and α_2 are the constants of two equations.

A 3SLS estimator was used allowing for sampling (equation 1) and trust (equation 2) to

be endogenous variables. The estimated coefficients and level of significance are presented in Table 2.

Table 2. Simultaneous Equation Model with 3SLS

Sampling			Trust		
Common elements directly affect sampling decision	WKT	0.142***	Demographic characteristics	G	-0.077**
	HT	-0.020*		A	-0.040***
	SF	0.073***		WC	0.004
	TFS	0.044***		E	-0.035
	FDP	-0.016		HS	-0.029
	IIV	-0.063***		CH	0.045
	TRUST	0.182*		HI	-0.025
	ISO	-0.005		ISO	0.038**
	NISO	0.018**		NISO	0.003
	ET	0.03	Shopping behaviors	ST	0.092***
	DTF	0.019*		ET	-0.011
	CONS	-0.323*		DTF	-0.039**
				CONS	2.385***

Notes:*Statistically different at p<0.1;**Statistically different at p<0.05; ***Statistically different at p<0.01

For the sampling model (equation 1), eight significant explanatory variables were found. The variable TRUST has the highest impact on the choice to sample, which indicates an improvement in consumers' trust in FM food systems could increase the probability to sample. The six common elements that affect a consumer's decision to sample are all significant except the friendliness of the person offering the sample (FDP). The FDP is less important in a consumer's decision to sample. An increase in the number of non-internet social organizations (NISO) has a positive effect on a consumer's choice to sample. Perhaps, consumers belonging to more non-internet social organizations have a higher interest of interacting with FM vendors, and consequently such interactions as talking with vendors

about seasonal foods and new recipes have a positive effect on sampling (Hunt, 2007). Shoppers traveling a farther distance to visit farmers' markets (DTF) is positively related to the travel cost theory. Consumers who travel farther to shop at a FM's have higher search costs, so experiencing the food product is important to ensure the shopping experience has both hedonic value and utility value (Babin, Darden, & Griffin, 1994).

The variable trust (TRUST) is an endogenous variable, and the level of trust is explained primarily by five explanatory variables. Shopping frequency (ST) has the highest positive effect on trust. Consumers frequenting FM's more often have a higher trust in the FM food system. An increase in distance to farmers market (DTF) is negatively related to shopper's trust in the FM. This finding supports the proliferation of FM's, demonstrating the closer the FM, the greater consumer trust and the more frequent one is to shop at the farmers' market. This relates to increasing demand for local food that consumers trust more in food markets surrounding his or her living space (Katchova & Woods, 2011).

Age and gender both have a negative coefficient and significantly influence respondent trust in FM food system. These findings indicate that male respondents and younger respondents tend to hold more trust in FM products. As the number of internet-based social organizations one belongs to increases, a consumer has a higher tendency to trust the FMs food system. This result quantifies why FM's have developed online social networking presence to not only increase awareness of the market, but to build trust between consumers and vendors.

Motivations for sampling

In addition to measuring sampling behavior from personal determinants, we were

interested in specific reasons farmers' market shoppers may accept free samples. Respondents were ranked on a five-point Likert scale based on their agreement with the list of direct motivations to sample, as shown in Tables 3. The six direct factors that influence sampling decision are included in Equation 1.

Table 3 Scale A: Samplers' response to the question, "Please rank the following statements which explain what motivates you to try free samples"

Name	Motivations to take free samples	Mean[a]	SD
WKT[b]	I want to know how it tastes	4.34	0.73
FDP[b]	The person distributing samples is friendly	3.71	0.76
ES	I enjoy sampling products	3.89	0.80
FOL	When I see others sampling, I follow their lead	3.08	0.97
HT[b]	I was hungry/thirsty at that time	3.00	1.02
SV	I want to support the vendor	3.71	0.82
APD	The presentation/display of samples is appealing	3.75	0.78
IIV[b]	I feel involved when interacting with vendors	3.57	0.85
SPFS	The samples are free	3.82	0.87
SF[b]	Familiarity with the product	3.66	0.82
TFS[b]	I trust food sanitation/safety	3.63	0.81

Note: N (sample size, similarly hereinafter) =939; M (retained variables, similarly hereinafter) =11; [a]5-point Likert Scale with 1 for "Strongly Disagree" and 5 for "Strongly Agree"; [b]the six direct factors influence sampling decision; Cronbach's Alpha is 0.829; Kaiser-Meyer-Olkin (KMO) Measure=0.872, Bartlett's Test of Sphericity (p Value)=0.000

We performed exploratory factor analysis (EFA) to decompose variables into a more meaningful and manageable level and examine the structure or relationship between these motivations with the principal component method and varimax rotation (Heilman et al., 2011). First, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of sphericity, shown in footnote Table 3, are supported in Murtagh and Tabachnick (Murtagh & Heck, 2012). Next, factor extraction decisions based on simultaneous use of multiple decision rules were conducted following Kaiser's criteria (eigenvalue > 1 rule), and the cumulative percent of variance extracted (Williams, Brown, & Onsman, 2012).

Three factor categories could be extracted from 11 variables (Table 4), and they explained 58.1% of total variance commonly accepted in humanities science (Williams et al., 2012). Column 5 is the comprehensive value, which indicates that the model explains a reasonable proportion of the variance in each variable, which is communality (Klopcic, Hocquette, Kuipers, & ebrary, 2013). A value less than 0.4 is considered unacceptable. Column 4 comprehensive values shows all variables carry the acceptable communality (Paul & Rana, 2012).

Table 4. Rotated Component Matrix and Extracted Factors of Scale A

Variable	Affiliation Motivation	Passive Motivation	Utilitarian Motivation	Communality
SV	0.765	0.181	-0.003	0.618
APD	0.682	0.201	0.198	0.545
IIV	0.672	0.309	0.104	0.558
SF	0.603	-0.020	0.245	0.424
FDP	0.556	0.303	0.301	0.491
TFS	0.539	-0.051	0.377	0.436
HT	0.059	0.811	0.092	0.669
FOL	0.282	0.761	0.043	0.660
WKT	0.198	-0.100	0.821	0.724
ES	0.203	0.379	0.670	0.633
SPFS	0.205	0.484	0.595	0.630
Eigen-value	4.166	1.205	1.016	
% variance explained	37.9%	11%	9.3%	58.1%

Note: Rotation converged in six iterations

The first factor explains 37.9% of total variance and captures personal emotions towards sampled products and vendors, which was labeled “Affiliation Motivation”. Consumer interaction with the person distributing samples has a mean value of 3.7 (see Table 3), which indicates that positive affiliation towards involved persons are commonly recognized to motivate consumers to sample. The other 3 variables APD, SF, and TFS, describe consumers’ satisfaction about the product itself, display and presentation, and sanitation and safety, which

provides the understanding that offering a favored product sample in an appealing and sanitary way will simulate consumers to sample.

The second factor captures a passive situation a consumer was in when he or she took the free sample. This was labeled “Passive Motivation”. It explains the reason why a consumer who takes samples is perhaps not intentionally, but is affected by realistic conditions, such as hunger or influence by others. This motivation had the lowest mean of 3.00 (see Table 3), which indicates that providing samples around lunch time is an ineffective sampling strategy, or that depending on word of mouth for a sampling experience is an unrealistic expectation.

The last factor is “Utilitarian Motivation”. Sampling enables consumers to have access to taste the product prior to purchase. Some consumers take the free samples because of the pleasure of sampling and not because of interest in the product. The variable ES also has a high score of 3.89 (see Table 3). This finding indicates that sampling may be a shopping habit expected and not so much about trying a new product prior to purchasing. Thus, sampling may attract consumers to a vendor not to purchase the item being sampled, but to cause the consumer to stop at the vendor’s booth.

Why not sample?

To measure specific reasons farmers’ market shoppers may reject free samples, respondents were ranked on a five-point Likert scale based on their agreement with the list of direct discouragements to sample as shown in Table 5. The six direct factors that influence sampling decisions in Equation 1 are included.

Following the same procedures employed in the previous scale, an EFA was performed to estimate dimensions of factors discouraging consumers to sample. In the rotated

component matrix shown in Table 6, four factors were extracted from the eleven items.

Table 5 Scale B: Non-samplers' response to the question, "Please rank the following statements which explain what discourage you from trying free samples"

Name[c]	Name	Discouragements to take free samples	Mean[a]	SD
WKT	RTU[b]	I don't want to take the risk to taste an uncertainty	2.40	0.98
	IH	I was in a hurry	2.83	1.01
HT	NH[b]	I was not hungry/thirsty	2.93	1.02
	CB	The booths are too crowded	3.00	1.03
SF	EPI[b]	I know enough information about the product	3.17	0.89
TFS	FSC[b]	I am concerned about food sanitation/safety	2.89	1.10
FDP	UFDP[b]	The people distributing samples seem unfriendly	2.44	0.93
IIV	UIV[b]	I feel uncomfortable when I interact with vendors	2.35	1.01
	PTB	I feel pressure to buy the product if I sample it	2.86	1.16
	NIP	I have no interest in the product	3.10	0.95
	UP	The price is unreasonable	2.91	0.93
	UAS	Samples aren't available	3.76	0.99

Note: N=206; M=11; [a] 5-point Likert Scale with 1 for "Strongly Disagree" and 5 for "Strongly Agree"; [b] the six direct factors influence sampling decision; [c] indicate the counterpart variables in samplers' scale; Amended Cronbach's Alpha is 0.801(without variable UAS); Kaiser-Meyer-Olkin (KMO) Measure=0.745, Bartlett's Test of Sphericity (p Value)=0.000

Table 6. Rotated Component Matrix and Extracted Factors of Scale B

	Passive Rejection	Risk Rejection	Exogenous Factor Rejection	Psychological Rejection	Communality
NH	0.792	0.167	0.210	0.155	0.723
IH	0.738	0.141	0.290	0.187	0.683
EPI	0.614	0.156	-0.102	-0.062	0.416
CB	0.517	0.118	0.369	0.229	0.470
FSC	0.197	0.826	0.026	0.005	0.722
RTU	0.314	0.688	0.017	0.169	0.601
UFDP	0.003	0.627	0.482	0.238	0.683
UP	0.038	0.179	0.796	0.104	0.679
NIP	0.272	-0.062	0.743	0.026	0.631
PTB	0.199	-0.029	0.093	0.872	0.809
UIV	0.036	0.314	0.099	0.809	0.763
Eigen-value	3.764	1.214	1.168	1.034	
% variance explained	34.222	11.032	10.622	9.395	65.272

Note: Rotation converged in six iterations

The first factor was labeled “Passive Rejection” since four items that load significance on this dimension present the situation that consumers reject free samples passively. The most typical reason seems to be EPI with highest mean, which proposes that vendors had better focus on food products that are less frequently considered easy to sample. These products trigger shopper curiosity, i.e., every consumer knows the flavor of a cucumber but not every shopper knows the flavor of a cucumber with a unique dressing applied.

The second factor captures consumers’ sense of “risk aversion”, including worries for uncertainty to taste new food, and food sanitation and unfriendly vendor, so it was labeled “Risk Rejection”. Among which FSC has the highest score, as food safety and food borne disease are a concern. This variable set emphasizes the importance that the vendor assumes all liability, and furthermore, sampling systems may have more value than individual vendors that offer sampling. Besides, food–neophobia gradually is reaching a wide range of consumers (Dolgopolova, Teuber, & Bruschi, 2015), so RTU may suggest vendors take it into consideration when deciding which product to sample.

The third factor, “Exogenous Factor Rejection,” represents why consumers might reject a free sample because of other connected aspects and not the act of sampling itself. Price is an example of an exogenous factor. This finding offers more credence to why a FM may set up a centralized sampling booth instead of allowing individual vendors to provide samples. This can allow consumers to feel more comfortable without exogenous factors coming into to play. Shoppers can then go to individual vendors without a negative disposition of seeing factors not appealing to the consumer.

The last factor was labeled “Psychological Rejection” for it referred to psychological activities that cause consumers to reject samples, mainly including psychological barriers to interact with vendors and the apprehension to sample due to the perceived obligation to purchase.

The final column of Table 5 indicates that the combined scale has a relatively low score in comparison with Scale A, we considered two reasons accounted. First, typically it is easier for people to rank why you accept something than to rank why you don’t like something. Second, consumers’ reasons about why to reject a free sample vary in different dimensions, and are not as convergent as Scale A.

Reactions to sampling

Sampling activity may be positively correlated with consumers’ short- and long-term purchasing behavior (Heilman et al., 2011). We show the average of a 5-point Likert Scale to investigate consumers’ reactions or responses to sampling as shown in Table 7.

Table 7 Scale C: Samplers’ response to the question, “Please rank the following statements which describe your reactions after having tried free samples at farmers’ markets”

Name	Reactions to Sampling	Mean[a]	SD
PPS	I will buy the product because I planned to prior to the sample	3.55	0.88
ETS	I will buy the product because I enjoyed the sample	3.98	0.68
BODP	I will buy other products from this vendor I didn't plan to prior to sampling	3.55	0.76
SSTV	I will switch my shopping to this vendor from other vendors who don't offer samples	3.08	0.89
IPFM	I will increase my purchases from this FM	3.52	0.76
RPTF	I will recommend the sample products to family or friends	3.86	0.71
RVTF	I will recommend the vendor to family or friends	3.86	0.7
RFTF	I will recommend the FM to family or friends.	3.98	0.68
PLR	The price is less relevant.	3.17	0.91

Note: N=939; M=9; [a]5-point Likert Scale with 1 for “Strongly Disagree” and 5 for “Strongly Agree”; Cronbach’s Alpha is 0.825; Kaiser-Meyer-Olkin (KMO) Measure=0.862, Bartlett's Test of Sphericity (p Value)=0.000

After the first, EFA was performed to Scale C, the variable PPS got a quite low communality of 0.1 and PLR got a communality of 0.246. Considering PPS describes the circumstance that consumer will buy the product as planned no matter he samples or not, we removed the item since it cannot affect reactions to sample. In this way, a second EFA was performed. Results showed the variable PLR can reach a high communality of 0.963 only if it is extracted as a single factor. However, at least two variables should load on one factor so it can be given a meaningful interpretation traditionally (Williams et al., 2012). Under this circumstance, we performed a third EFA with PLR also removed, and the loadings of seven items shown in Table 8.

Table 8. Rotated Component Matrix and Extracted Factors of Scale C

Name	Affective Reaction	Practical Reaction	Communality
RVTF	0.881	0.209	0.820
RFTF	0.863	0.166	0.772
RPTF	0.841	0.244	0.766
ETS	0.621	0.306	0.480
SSTV	0.055	0.894	0.802
IPFM	0.348	0.727	0.649
BODP	0.382	0.549	0.447
Eigen-value	3.71	1.03	
% variance explained	52.95	14.71	67.66

Note: Rotation converged in three iterations

Two factors are extracted. The first factor had high coefficients for the following variables ETS, RVTF, RFTF and RPTF, and each of the four have a high mean of more than 3.86 (see Table 7). ETS has the highest mean to account purchase for enjoyable sampling experience. Meanwhile, RVTF, RFTF and RPTF describe how consumers generate a word-of-mouth, which also indicate when consumers' participation in an enjoyable sampling activity may lead to affective reaction first. That is why we labeled the first factor as

"Affective Reaction".

The second factor was labeled "Practical Reaction" for SSTV, IPFM and BODP captures direct purchase behavior in response to sampling, especially it give us the empirical proof that a satisfied sampling will attract unexpected additional purchase both in the vendor and the FM.

As for the item of PLR removed from EFA, we can draw two notifications. Firstly, it has a relatively low mean 3.17 (see Table 7) of whole Scale C, which reflects that sampling as a promotion tool does really have the ability to make price less relevant, but the ability is not that powerful. Secondly, it indicates that maybe there exists a defect in our scale that more items relate to consumers' perception about price after sampling need to be added, which will add robust to scale's structure and we can conduct a more meaningful estimate of price influence and sampling influence.

Conclusion and Directions for Future Research

The study investigated consumer behavior to sampling activity at farmers' markets. The research provides some interesting findings. First, the study demonstrated consumers' trust in farmers' markets food system has the most significant impact on the consumer sampling decision. Consumers with higher levels of trust are more willing to take free samples because they don't worry about food quality and food safety. Consumers generally have a higher level of trust in fair price at farmers' markets, food quality at farmers' markets and word-of-mouth publicity associated with farmers' markets than with grocery stores, but lower levels at farmers' markets for trust in food safety, labeling system, and traceability. Consumers' trust emerges with frequent shopping activity, by younger male consumers, and by those who live

closer to farmers' markets. Internet-based social organization have a positive effect on trust and non-internet social organization have a positive effect on sampling.

We identified specific reasons to accept samples and to reject samples. Sampling motivations related to what we termed affiliation motivation, which emphasizes the significance of consumers' affiliation for samples. It gives vendors a hint that to attract samplers, two aspects need to be considered. Well-trained friendly vendors are preferred by consumers. Samples following a certification process is preferred by consumers, which indicates that a centralized farmers' market sampling booth is preferred.

As for reason why consumers don't sample, passive rejection is the most important. Consumers have an instinct to explore desirable foods so these persons want a unique sampling experience. But, if consumers are faced with the pressure to purchase from an unfriendly vendor, or shopping in a crowded environment, they will reject sampling passively. In summary, friendliness may not be a determinant in consumers' decision to sample or not to sample, but a friendly vendor plays an important role as to whether the consumer sampling experience is enjoyable.

As a promotional tool, sampling positively impacts consumer behavior both in short-term and long-term (Heilman et al., 2011). The current study found consumers react to sampling in two ways, affective reaction and practical reaction. An enjoyable sampling experience firstly arouses consumer's affection towards the product. This, in turn, leads to a direct purchase following word-of-mouth coming from consumers of farmers' markets. These practices lead to subsequent purchase behavior and an increase in unplanned product purchases. It is reasonable to make this assessment because it can explain how short-term and long-term

impact generates.

As for food products, it is generally agreed that sampling experiences are more enjoyable, which is derived from the high satisfaction of psychological elements including a harmonious sampling environment with friendly vendors. The assessment of survey respondents concluded that free samples of food products are not adequately available at farmers' markets.

A future research direction is to investigate how effective sampling will be under a complex promotion situation with reference to prices, and to what extent the post sampling experience will impact price relevance to the decision. Another valuable extension is to see how much sampling contributes to sales improvement, how vendors manage sampling's cost and increased income, and how consumers' actual purchase behavior change after sampling in future. We believe these may provide valuable insights for future research.

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Consumer Preference for Sampling at Farmers Markets

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Motivation for Study

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- Farmers market sales become important source of vendors' income
- Sampling is an efficient promotion tool
- Lack of empirical studies
  Vendors need guidance
- Support community & economy

P1

Previous Research

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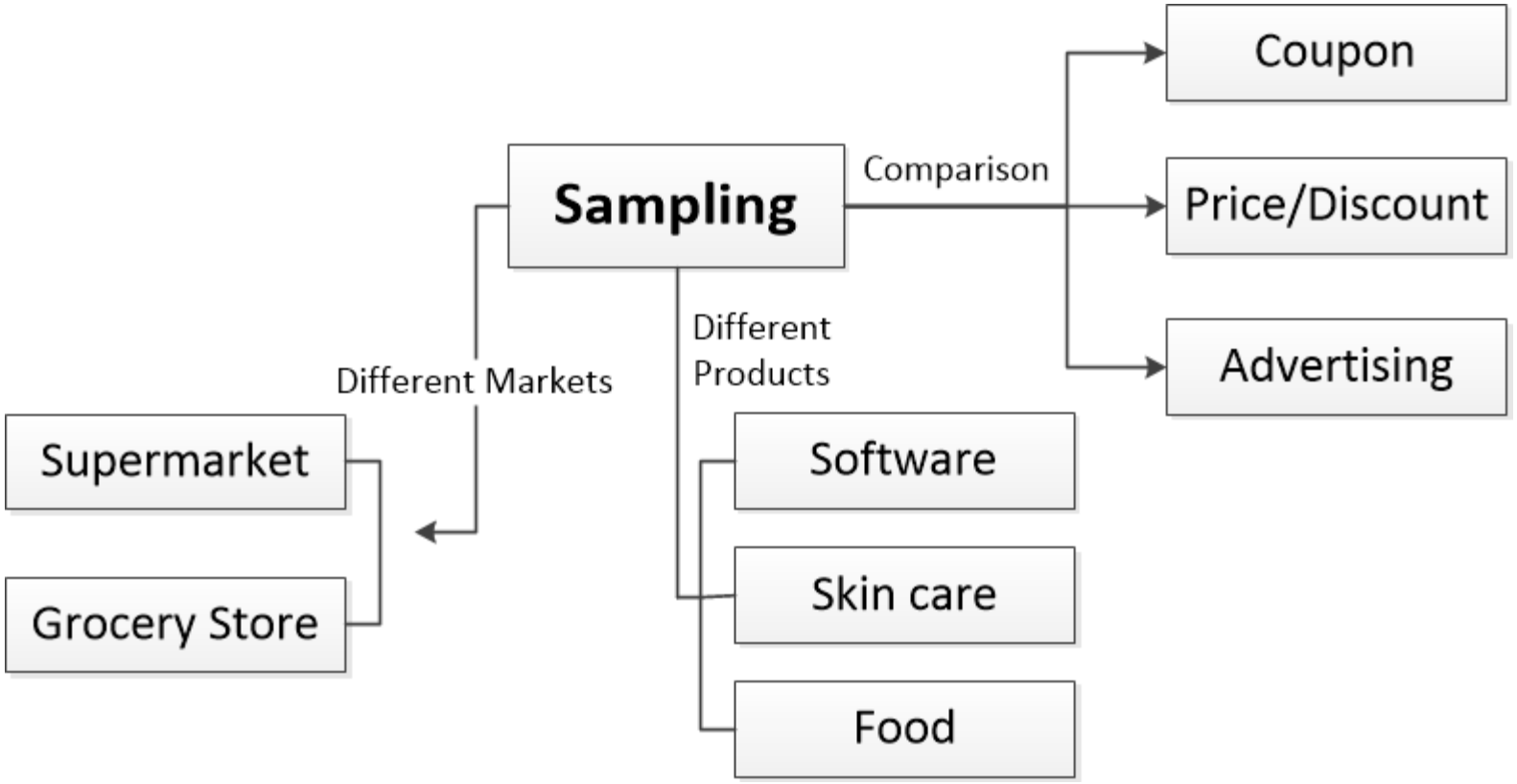

P2

Data

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- **Experiment Method——Structural Survey**

  Closed-ended questions

- **Data collected via Survey Monkey and Research Now**

  Samplers 939

  Non-samplers 206

P3

Framework

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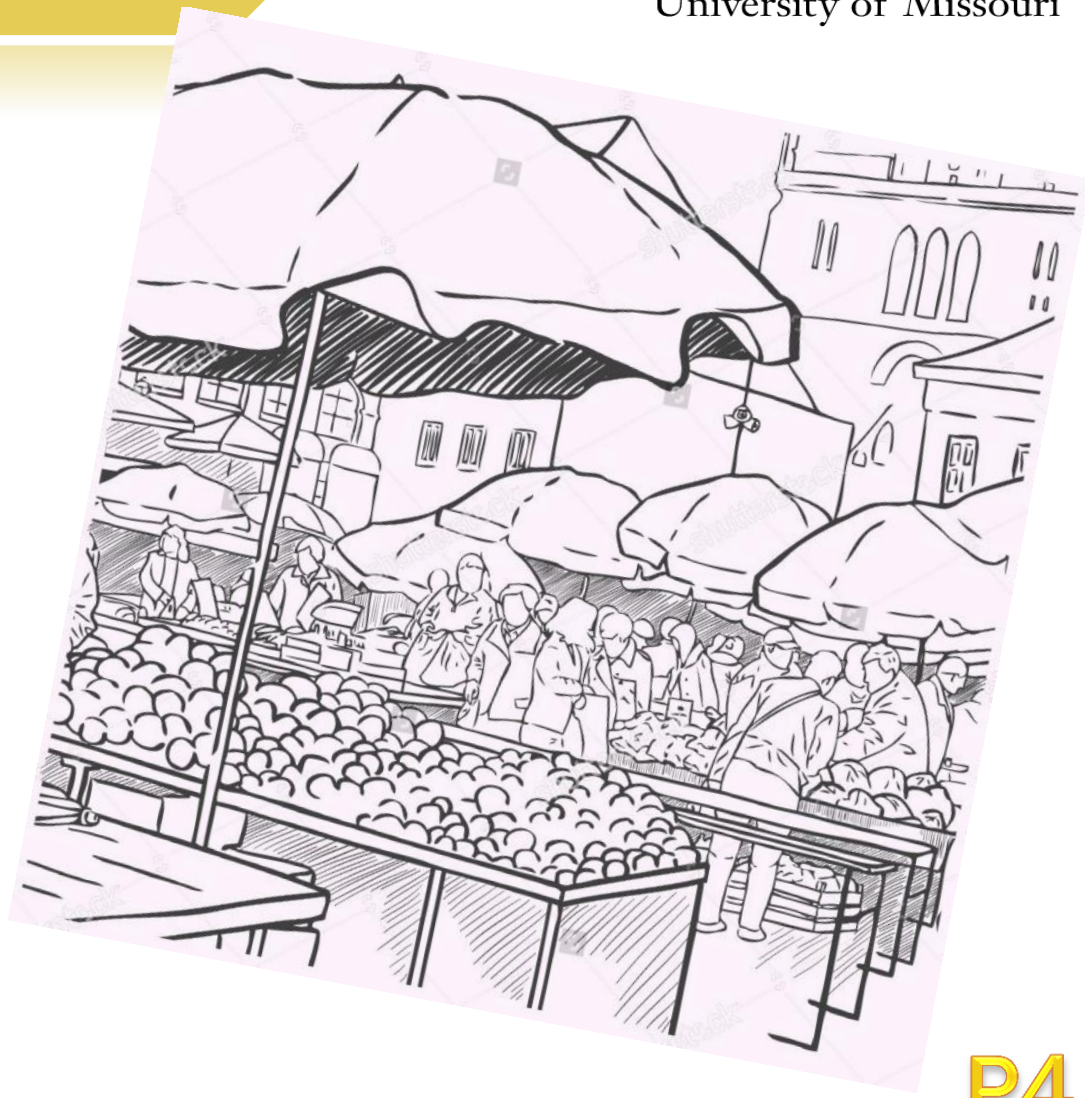

P4

Framework

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P5

Framework

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Framework

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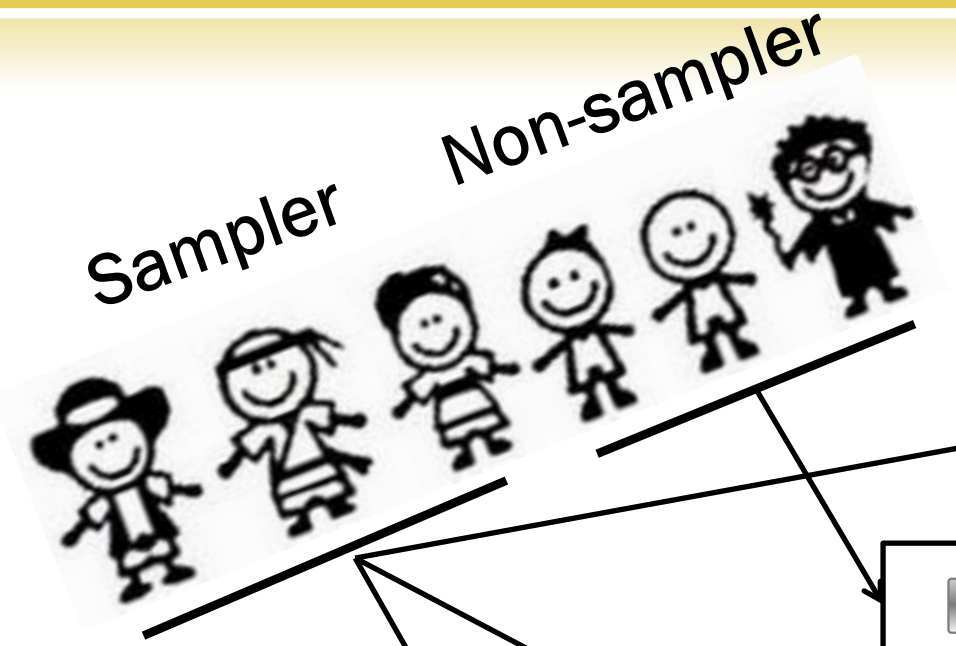

- Sampling or not
- Food Category
- Motivations to Sample
- Discouragement to Sample
- Reactions to Sampling
- Comparison between FM & In-store

Sampling or not

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Simultaneous Equation Model

Equation 1:

$$SAFM_i = \alpha_1 + (\beta_1 * WTK_i + \beta_2 * HT + \beta_3 * SF_i + \beta_4 * TFS_i + \beta_5 * FDP_i + \beta_6 * IIV_i) + \beta_7 * TRUST_i + (\beta_8 * ISO_i + \beta_9 * NISO_i) + (\beta_{10} * DTF_i) + \ (\beta_{11} * HI_i)$$

Equation 2:

$$TRUST_i = \alpha_2 + (\rho_1 * G_i + \rho_2 * A_i + \rho_3 * WC_i + \rho_4 * E_i + \rho_5 * HS_i + \rho_6 * CH_i + \rho_7 * HI_i) + (\rho_8 * ST_i + \rho_9 * DTF_i) + (\rho_{10} * ISO_i + \rho_{11} * NISO_i) + \rho_{12} * SAFM_i$$

A 3SLS estimator was used allowing for safm(dummy, 1=sampler) and trust to be endogenous variables.

Sampling or not

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Abbreviation	Variables Definition
WKT	I want to know how it tastes
HT	I was hungry/thirsty at the time
SF	Familiarity with the product
TFS	I trust food sanitation/safety
IIV	I feel involved when interacting with vendors
ISO	In the last year, how many internet-based social organizations do you belong to? (For example, Facebook, Pintrest, etc.)
NISO	In the last year, how many non-internet social organizations do you belong to? (For example, church, bowling league, PTA, etc.)
DTF	Please select the distance between where you live and the nearest farmers' market.
ST	How often do you shop at farmers' markets when they are in operation?
ET	Number of times eating out per week?
TRUST	The average score of food label, certification, fair price, traceability, safety, quality and word of mouth

Sampling or not

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	Sampling			Trust	
Common Direct Motives	WKT	0.124***	Demographic Information	G	-0.075**
	HT	-0.020**		A	-0.037***
	SF	0.064***		WC	0.002
	TFS	0.052***		E	-0.031
	FDP	-0.013		HS	-0.028
	IIV	-0.050***		CH	0.035
Trust	TRUST	0.259**		HI	-0.042**
Social Capital	ISO	-0.007	Social Capital	ISO	0.034**
	NISO	0.017*		NISO	-0.008
Distance	DTF	0.023*	Sampling	SAFM	0.423***
Income	HI	0.025**	Shopping Behavior	ST	0.080***
	CONS	-0.511**		DTF	-0.046***
				CONS	2.115***

Notes:*---p<0.1;**---p<0.05; ***---at p<0.01

Sampling or not

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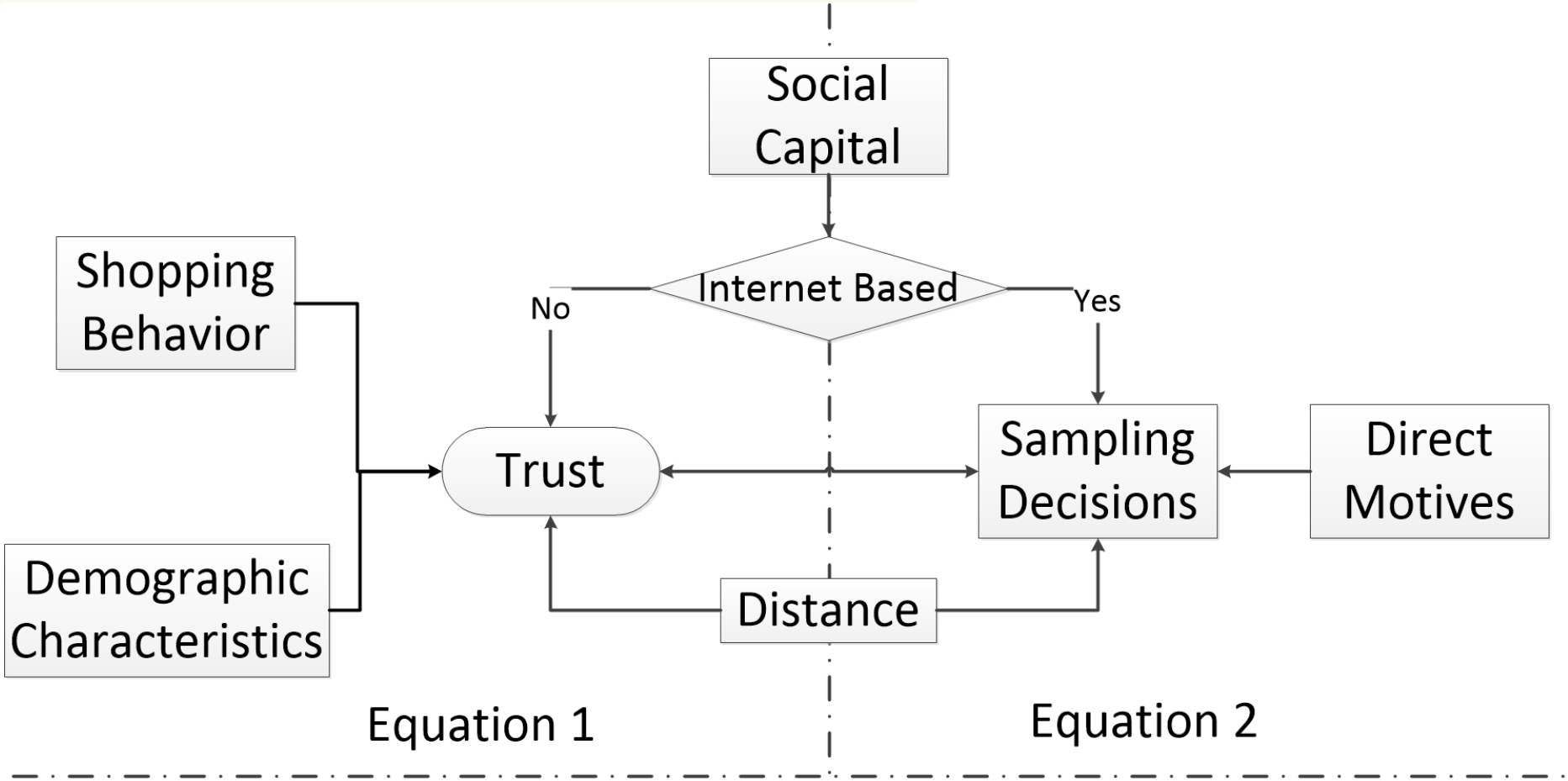

Framework

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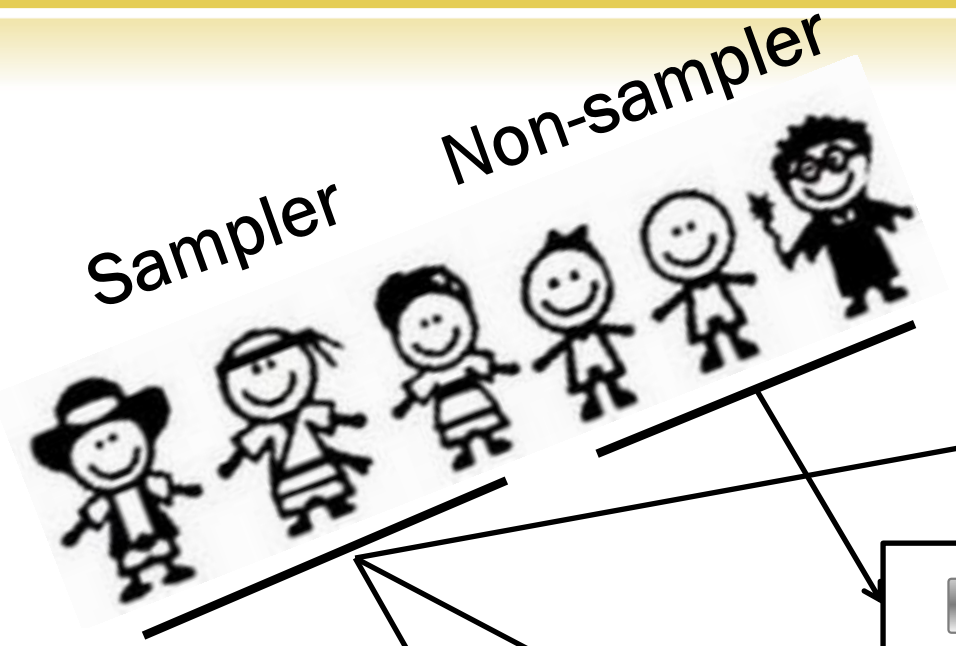

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Food Category

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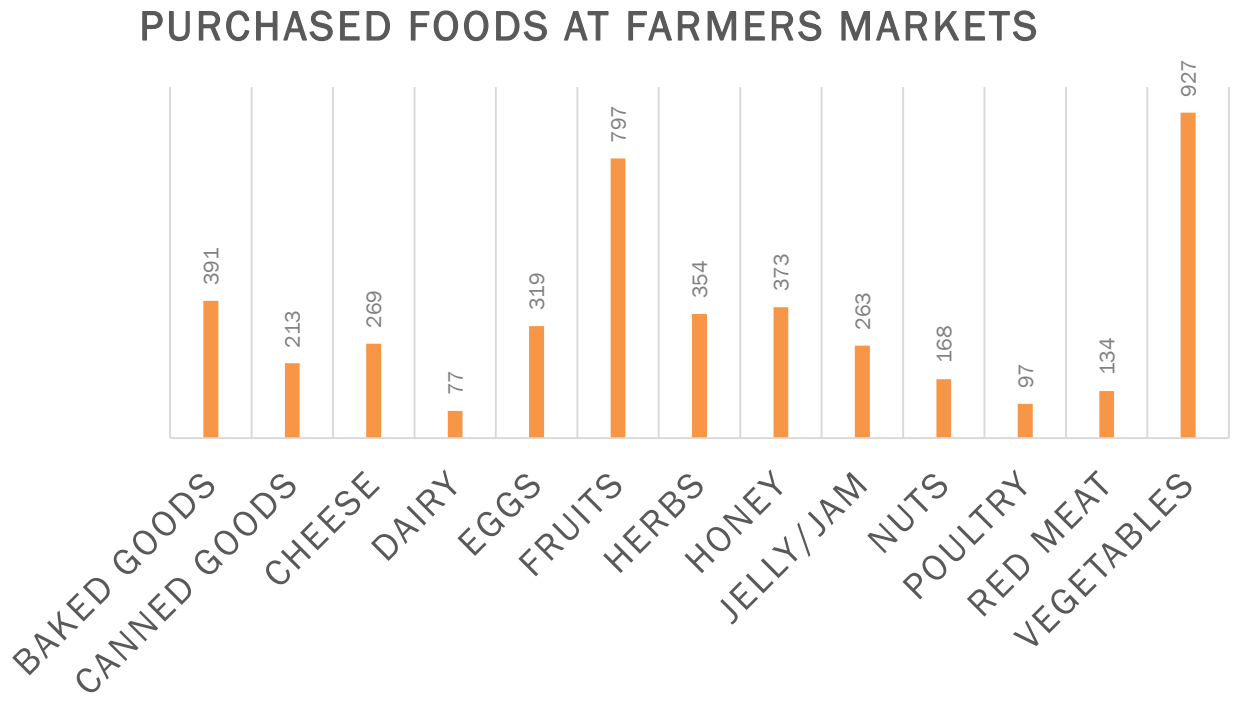
- **13 food categories often displayed at FMs**

  Proposed National Food Category & Subcategory Table (USDA, 2014)

  What We Eat in America (WWEIA) Food Categories (USDA, 2015)



Food Category

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Recalling last shopping experience at a FM

Non-samplers

- Purchased foods
- Foods prefer to sample

Samplers

- Purchased foods
- Sampled foods

Food Category

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	Non-sampler				Sampler				
	A[a]	B[b]	C[c]	D[d]	E[e]	F[f]	G[g]	H[h]	I[i]
Baked Goods***	29.61%	24.59%	75.41%	22.82%	36.63%	31.10%	55.48%	52.91%	21.85%
Canned Goods***	14.08%	3.45%	96.55%	10.19%	20.45%	13.53%	43.31%	71.35%	9.64%
Cheese***	24.76%	11.76%	88.24%	14.56%	25.45%	30.35%	52.98%	36.82%	19.14%
Dairy	11.17%	0.00%	100.00%	5.83%	6.92%	5.64%	16.98%	86.15%	5.03%
Eggs***	4.85%	0.00%	100.00%	20.87%	29.39%	2.56%	16.67%	98.55%	3.02%
Fruits*	18.45%	52.63%	47.37%	64.08%	70.82%	32.37%	82.57%	62.26%	19.34%
Herbs***	7.28%	13.33%	86.67%	17.48%	33.87%	4.90%	41.30%	94.03%	4.35%
Honey***	16.02%	9.09%	90.91%	15.53%	36.32%	17.04%	57.50%	73.02%	11.37%
Jelly/Jam***	17.48%	19.44%	80.56%	15.53%	24.60%	20.34%	46.60%	61.47%	14.41%
Nuts**	15.53%	6.25%	93.75%	10.19%	15.65%	10.76%	37.62%	74.15%	7.95%
Poultry**	8.25%	5.88%	94.12%	5.34%	9.16%	2.66%	8.00%	97.67%	2.70%
Red Meat	9.22%	5.26%	94.74%	9.22%	12.25%	6.39%	35.00%	81.74%	4.73%
Vegetables	10.19%	71.43%	28.57%	80.58%	81.04%	17.68%	78.31%	82.92%	20.22%

Notes:*---p<0.1;**---p<0.05; ***---at p<0.01

Food Category

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9 calculated indicators

A: percentage of prefer to sample;
B: percentage of prefer to sample & purchase in all prefer to sample;
C: percentage of prefer to sample & non-purchase in all prefer to sample;
D: percentage of purchase in all non-samplers;
E: percentage of purchase in all samplers;
F: percentage of sample in all samplers;
G: percentage of both sample & purchase in all sample;
H: percentage of both non-sample & purchase in all purchase;
I: percentage of both sample & non-purchase in all non-purchase

Food Category

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Non-samplers:

A-sampling preference-baked goods, cheeses and fruits
ABC-actual purchase & preference-vegetables and fruits
AC-possible uncertainty- baked goods, cheese and jelly/jam

Insights for vendors:

Guarantee basic sales
Proper sampling brings additional sales

Food Category

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Samplers:

F-most sampled-cheeses and fruits
G-direct purchase-vegetables, fruits, baked goods & cheese
H-necessities-eggs, meat, dairy, herbs and vegetables
FI- potential foods-baked goods, fruits and cheese

Insights for vendors:

Pay attention to--baked goods, cheese, fruits, jelly/jam
Avoid--eggs, meat, dairy, herbs, vegetables

Framework

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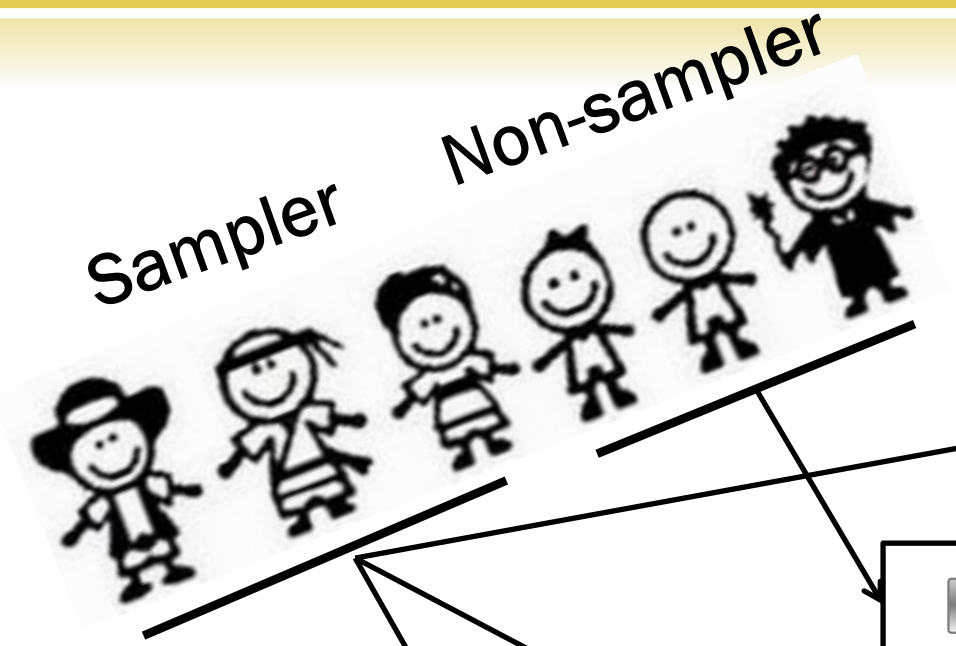

- Sampling or not
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- Comparison between FM & In-store

Motivation to Sample

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- Measurement: five point Likert scale with 1 for “strongly agree” and 5 for “strongly disagree”
- Reliability: Cronbach’s Alpha =0.829
- KMO =0.872
  Bartlett’s Test (p value)=0.000
  --Assess the data suitability for EFA
- Exploratory Factor Analysis
  –Decompose influential variables into factor level
  –Examine the mechanism of motives

P20

Motivation to Sample

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Name	Items	Mean	Affiliation Motivation	Passive Motivation	Utilitarian Motivation
SV	I want to support the vendor	3.71	0.765	0.181	-0.003
APD	The presentation/display of samples is appealing	3.75	0.682	0.201	0.198
IIV	I feel involved when interacting with vendors	3.57	0.672	0.309	0.104
SF	Familiarity with the product	3.66	0.603	-0.020	0.245
FDP	The person distributing samples is friendly	3.71	0.556	0.303	0.301
TFS	I trust food sanitation/safety	3.63	0.539	-0.051	0.377
HT	I was hungry/thirsty at that time	3.00	0.059	0.811	0.092
FOL	When I see others sampling, I follow their lead	3.08	0.282	0.761	0.043
WKT	I want to know how it tastes	4.34	0.198	-0.100	0.821
ES	I enjoy sampling products	3.89	0.203	0.379	0.670
SPFS	The samples are free	3.82	0.205	0.484	0.595

Note: 58.1% of total variance are explained

P21

Framework

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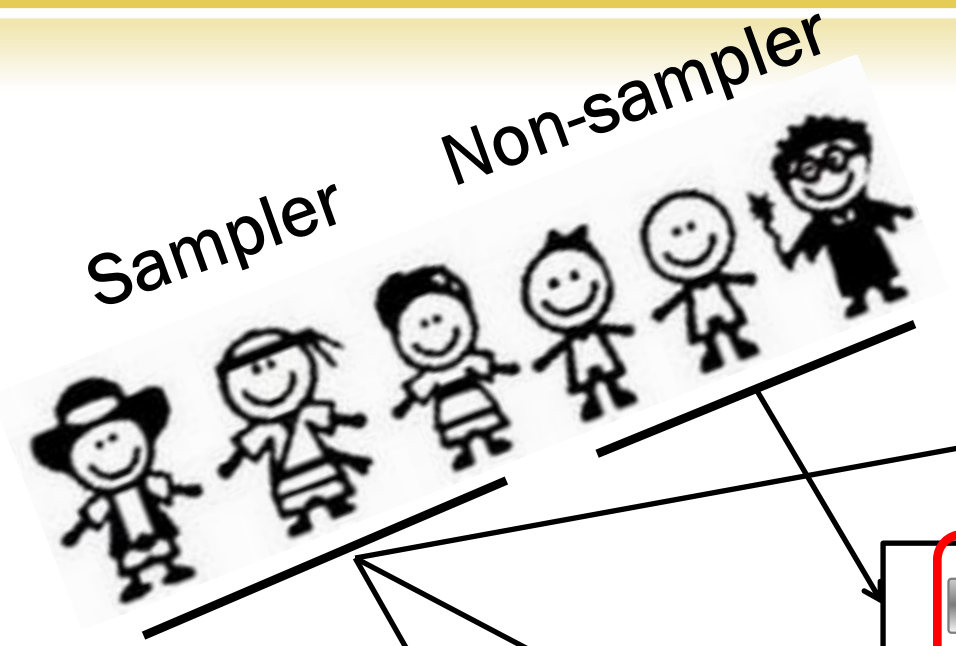

- Sampling or not
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P22

Discouragement to Sample

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- **Measurement: five point Likert scale with 1 for "strongly agree" and 5 for "strongly disagree"**
- **Reliability: Cronbach's Alpha =0.801**
- **KMO =0.745**
  Bartlett's Test (p value)=0.000
  --Assess the data suitability for EFA
- Exploratory Factor Analysis
  –Decompose influential variables into factor level
  –Examine the mechanism of discouraging

P23

Discouragement to Sample

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Name	Items	Mean	Passive Rejection	Risk Rejection	Exogenous Rejection	Psychological Rejection
NH	I was not hungry/thirsty	2.93	0.792	0.167	0.210	0.155
IH	I was in a hurry	2.83	0.738	0.141	0.290	0.187
EPI	I know enough information about the product	3.17	0.614	0.156	-0.102	-0.062
CB	The booths are too crowded	3.00	0.517	0.118	0.369	0.229
FSC	I am concerned about food sanitation/safety	2.89	0.197	0.826	0.026	0.005
RTU	I don't want to take the risk to taste an uncertainty	2.40	0.314	0.688	0.017	0.169
UFDP	The people distributing samples seem unfriendly	2.44	0.003	0.627	0.482	0.238
UP	The price is unreasonable	2.91	0.038	0.179	0.796	0.104
NIP	I have no interest in the product	3.10	0.272	-0.062	0.743	0.026
PTB	I feel pressure to buy the product if I sample it	2.86	0.199	-0.029	0.093	0.872
UIV	I feel uncomfortable when I interact with vendors					

Note: 65.27% of total variance are explained

Framework

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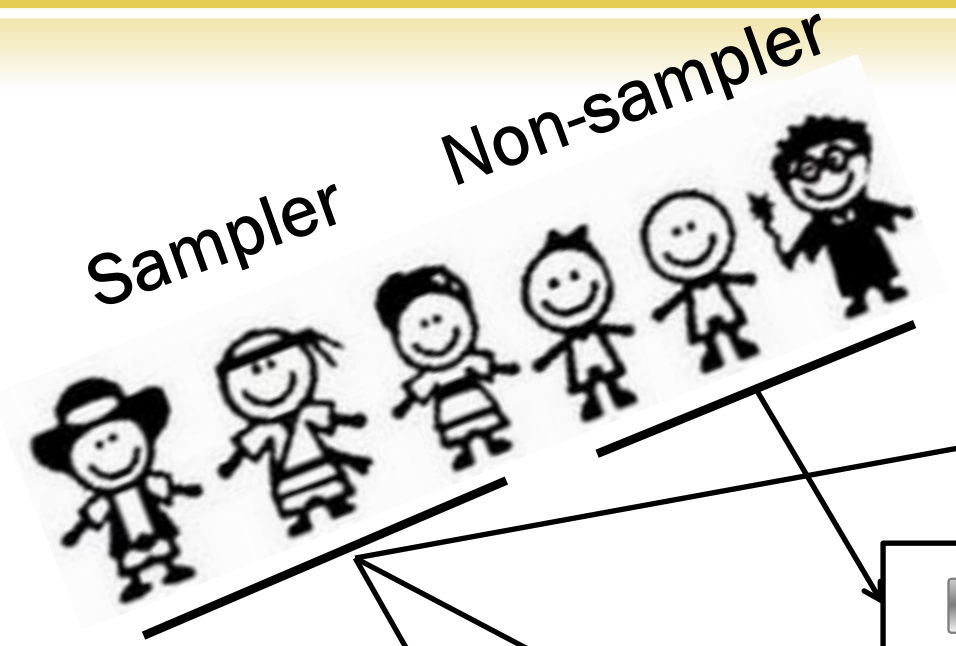

- Sampling or not
- Food Category
- Motivations to Sample
- Discouragement to Sample
- Reactions to Sampling
- Comparison between FM & In-store

P25

Reactions to Sampling

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- **Measurement: five point Likert scale with 1 for "strongly agree" and 5 for "strongly disagree"**
- **Reliability: Cronbach's Alpha =0.825**
- **KMO =0.862**
  Bartlett's Test (p value)=0.000
  --Assess the data suitability for EFA
- Exploratory Factor Analysis
  –Decompose influential variables into factor level
  –Examine the mechanism of reacting

Reactions to Sampling

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Name	Items	Mean	Affective Reaction	Practical Reaction
RVTF	I will recommend the vendor to family or friends	3.86	0.881	0.209
RFTF	I will recommend the FM to family or friends.	3.98	0.863	0.166
RPTF	I will recommend the sample products to family or friends	3.86	0.841	0.244
ETS	I will buy the product because I enjoyed the sample	3.98	0.621	0.306
SSTV	I will switch my shopping to this vendor from other vendors who don't offer samples	3.08	0.055	0.894
IPFM	I will increase my purchases from this FM	3.52	0.348	0.727
BODP	I will buy other products from this vendor I didn't plan to prior to sampling	3.55	0.382	0.549

Note: 67.66% of total variance are explained

Framework

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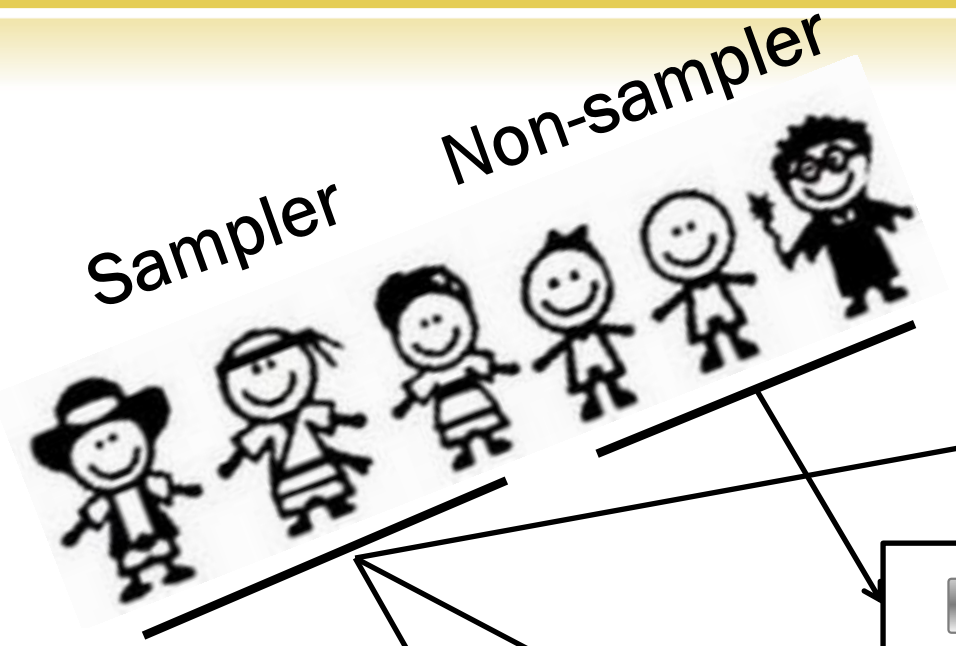

- Sampling or not
- Food Category
- Motivations to Sample
- Discouragement to Sample
- Reactions to Sampling
- Comparison between FM & In-store

P28

Comparison with in-store

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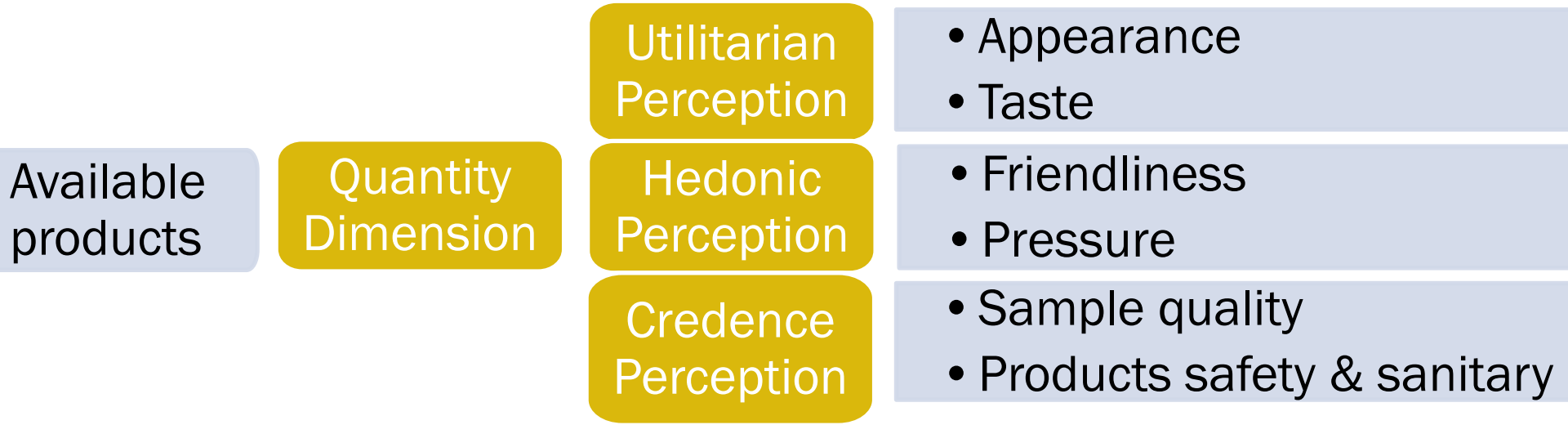
- **How to create a more enjoyable sampling experience?**
- **How to attract samplers?**



OLS regression

$$ESM_i = \alpha_3 + \gamma_1 * LAP_i + (\gamma_2 * MDS_i + \gamma_3 * STB_i) + (\gamma_4 * MFDP_i + \gamma_5 * LPTB_i) + (\gamma_6 * HQS_i + \gamma_7 * MSS_i)$$

Comparison with in-store

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		Name	Compared with in-store, your sampling experience at FM are	Mean[a]	SD	Coefficient[b]
Dependent Variable		***ESM***	*I enjoy the sampling experience more*	*3.66*	*0.81*	
Quantity Dimension		**LAP**	More available products	2.70	0.94	0.019
Perception Dimension	**Utilitarian Perception**	**MDS**	Samples look more delicious	3.59	0.82	0.208***
		STB	Samples taste better	3.56	0.79	0.237***
	Hedonic Perception	**MFDP**	People distributing samples are friendlier	3.55	0.8	0.184***
		LPTB	I feel less pressure to buy the sampled product	3.01	0.91	0.036
	Credence Perception	**HQS**	Samples have higher quality	3.7	0.8	0.039
		MSS	I feel the products are safer and more sanitary	3.11	0.79	0.140***
		CONS				0.266***

Notes:*---p<0.1;**---p<0.05; ***---at p<0.01

Reliability: Cronbach's Alpha =0.736

P30

Implications

Sampling decisions—trust—social capital

Potential foods: baked goods, cheese, fruits, jelly/jam

Motivation/Discouragement---affiliation motivations and passive rejections --- sampling tactics

Affective reactions are direct reactions

Friendliness

Higher perception about samples, vendors & products

Future Research

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- Sampling cost & sampling benefits analysis
- Assess actual shopping behavior after sampling
- How long will sampling be effective
- Sampling & pricing tradeoffs
- Sampling to community improvement (relationship & economy)

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Thank you for attention!

Please feel free to join the discussion!

PRICING AND SALES STRATEGIES FOR MISSOURI FARMERS MARKET VENDORS

DR. JOE PARCELL

MU DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS

GROWTH AND REVENUE OF FARMERS MARKETS

8,600
Number of farmers markets in the National Farmers Market Directory

5x
The number of times the count of farmers markets has increased since 1994 when 1755 existed

9th
Missouri's rank for number of farmers markets per state

260
Number of farmers markets in Missouri

$20 Billion
Projected amount of local food sales in 2019

ORGANIC COMMANDS A PREMIUM

- Because raising food organically requires more intensive management to control challenges like pests and weeds, organic producers are compensated for their investment in organic methods by commanding a premium relative to conventional goods.
- Table 1 presents average Missouri farmers market premiums recorded for organic products during a two-year project.
  - Example: Organic tomatoes were listed as 117.7% of the price of conventional tomatoes. Organic tomatoes were listed with a 17.7% premium in relation to conventional tomatoes.

Table 1
Organic Price Premium or Discount as Average Organic Price/Average Conventional Price, 2014 and 2015

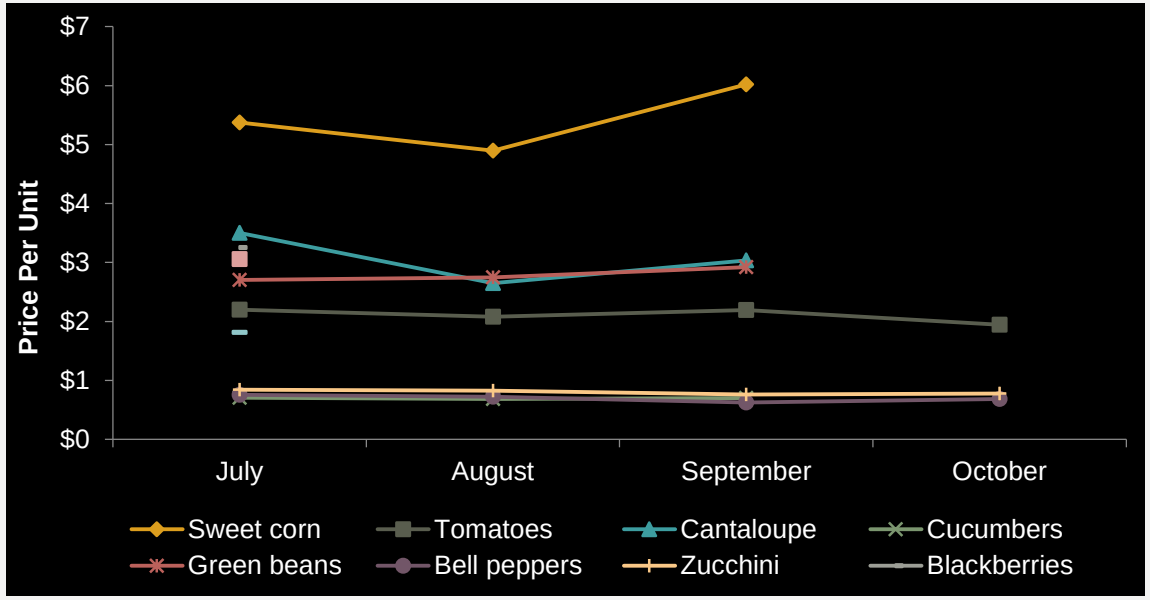
	2014-to-2015 Average
Tomatoes	117.7%
Cucumbers*	134.7%
Green beans	119.4%

** Only 2014 data are presented for cucumbers.*

SEASON EXTENSIONS ADD VALUE

- Because prices tend to drop mid-season because of a higher supply of products and more competition, vendors may earn more revenue when they sell products early or late in the season.
- Figure 1 illustrates that averaged 2014 and 2015 prices per unit tend to fluctuate somewhat for conventionally raised products.
- To capture higher prices in a growing season, producers may benefit from considering strategies that lengthen their production seasons.
  - An example of this would be high tunnels.

Figure 1
Seasonality of Average Prices Per Unit for Conventional Products, 2014 to 2015*



** Units are sweet corn, dozen; tomatoes, pound; cantaloupe, each; cucumbers, each; green beans, pound; bell peppers, each; zucchini, each; blackberries, pint; cabbage, each; bulb onions, box; and potatoes, box. Bell pepper, zucchini, blackberry, cabbage and potato prices are from 2015 only. September sweet corn price from 2014 only, October tomato price from 2015 only, and September cantaloupe price from2014 only,*

REVENUE POTENTIAL MAY VARY BY SALES ARRANGEMENT

- At farmer's markets, vendors may choose the preferred sales arrangement, such as marketing product individually or by weight or bundle for their goods.
- For some products, they may have an economic incentive to use one sales arrangement rather than another.
- An example of this is bell peppers. Vendors may decide to sell them by boxed count, in singles, or by the pound.
- The sales arrangement selected may influence revenue that vendors can realize.
- Table 2 (next slide) presents price per pepper and price per box for 10 instances when Missouri farmers market vendors sold bell peppers in five-count boxes during 2015.
- After accounting for product weight, Table 2 suggests that price per pound may vary quite widely.

REVENUE POTENTIAL MAY VARY BY SALES ARRANGEMENT

- Vendors sold bell peppers for $0.30 to $0.60 each and $1.50 to $3.00 per box.
- When selling bell peppers in five-count boxes, price per pound averaged $1.90 and it ranged from $1.24 to $3.41.
- In several cases, vendors marketing boxed bell peppers could have earned more had they established price per pound similar to the $1.90 average.
- Note that factors like product quality and market location may force some vendors to deviate from setting price similar to the average price per pound, however.

Table 2
Sales Arrangement Effect on Bell Pepper Prices, 2015

Observation	Price/Pepper	Price/Box	Total Weight for Five Peppers	Price/Pound
1	$0.40	$2.00	1.42	$1.41
2	$0.60	$3.00	1.05	$2.86
3	$0.30	$1.50	1.13	$1.33
4	$0.30	$1.50	1.21	$1.24
5	$0.40	$2.00	1.42	$1.41
6	$0.60	$3.00	1.57	$1.91
7	$0.60	$3.00	1.58	$1.90
8	$0.60	$3.00	2.13	$1.41
9	$0.60	$3.00	0.88	$3.41
10	$0.60	$3.00	1.42	$2.11
				$1.90

PRODUCT PRESENTATION AND QUALITY AS PRICE VARIABLES

- Product presentation refers to aesthetic and quality characteristics of goods marketed by farmers market vendors. Price recorders recorded whether prices varied by presentation variables such as product cleanliness, surface characteristics, and shape.
  - With respect to cleanliness, products could be denoted as clean, somewhat dirty, or dirty. (Table 3)
  - With respect to surface characteristics, products could be denoted as having "no surface issues" or "surface issues." (Table 4)
  - With respect to shape, products could be denoted as having "no shape deformities" or "slightly deformed." (Table 5)
- The tables on the next slide list the observed premiums for these three characteristics.

PRODUCT PRESENTATION AND QUALITY AS PRICE VARIABLES

Table 3
Cleanliness Discount or Premium for Conventional Goods as Average "Clean" Price/Average "Some Dirt" Price. A value below 100% indicates a discount, and a value above 100% indicates a premium.

Crop	2014-to-2015 Average
Cantaloupe	114.0%
Bell peppers*	97.1%

Table 4
Surface Issues Premium or Discount for Conventional Goods as Average "No Surface Issues" Price/Average "Surface Issues" Price

Crop	2014-to-2015 Average
Tomatoes	102.2%
Cucumbers	111.2%
Green beans	106.9%
Cantaloupe	102.6%
Bell peppers*	102.5%
Zucchini*	88.6%

Table 5
Shape Premium or Discount for Conventional Goods as Average "No Shape Deformities" Price/Average "Slightly Deformed" Price

Crop	2014-to-2015 Average
Tomatoes	100.8%
Cucumbers	110.9%
Green beans	102.4%
Cantaloupe	109.5%
Bell peppers*	110.3%
Zucchini*	103.8%

PRODUCT COLOR INFLUENCES PRICE IN SOME CASES

- For some goods, product color may affect pricing potential.
- An example of this is zucchini.
- See Table 6.
- Conventionally raised green zucchini were priced at 6.8% premium relative to their yellow counterparts at Missouri farmers markets.
  - Consumers may prefer green zucchini and consequently cause it to demand a higher price.
  - Alternatively, green zucchini supply may have been more constricted and yellow zucchini supply more abundant.

Table 6
Color Effects on Average Prices Per Zucchini, 2015

	Conventional
Green	$0.80
Yellow	$0.75

APPLYING THE RESULTS

- Pricing goods sold at Missouri farmers markets relies on making assessment about value that consumers can extract from goods that they purchase. To maximize sales, farmers market vendors may use strategies such as growing crops organically, identifying the idea sales arrangement and offering products that fit with customer quality expectations. Furthermore, consider the following tips to enhance vendor revenue potential:
  - ***Understand the local market.*** Product preference and buying behaviors can vary widely by geography. To attract an audience for your products, appeal to preferences held by the given customers that you're attempting to serve.
  - ***Monitor changes in consumer trends.*** Consumers don't operate in a stagnant environment. General economic conditions can influence consumer willingness to pay for high-quality and value-added goods, and preferences can evolve. Staying current on consumer preferences and differentiating trends from fads can serve vendors well.
  - ***Recognize that price encompasses a bundle of product characteristics.*** The research summarized here sought to identify the effect that specific variables may have on price. However, in application, price reflects multiple attributes available from a product. Set a price that best captures all of a product's traits and their total value.
  - ***Evaluate costs and returns when adopting production and marketing practices.*** This research noted the potential for vendors to earn higher prices if they grow food organically, offer products earlier or later during a growing season and market higher quality goods. However, adopting the related practices to supply such products can incur costs. Balance the costs and returns to drive profit.

UNIVERSITY OF MISSOURI Extension
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College of Agriculture, Food and Natural Resources

Using Sampling as Promotional Tool

Surveying Regular Shoppers at Farmers Markets

Why Sampling at Farmers Markets Works

- Throughout a ten year span, the International Food Information Council Foundation's annual food and health survey found that taste is the largest factor of food and beverage purchase decisions.
- Farmers markets allow vendors to offer product samples and enable prospective buyers to experience a product before making the purchase.
- Not only does this benefit the consumer, but also provides vendors with valuable information about the consumer's reactions to their food product.

Conducting the Study

- In December of 2015, MU Department of Agricultural and Applied Economics conducted a survey to gain insight to consumer sampling at farmers markets
- Respondents to the survey were identified as Missouri consumers who had previously shopped at farmers markets
- The survey generated 2,882 consumer respondents
  - “Regular” shoppers were defined as those who attended the farmers market at least monthly

Respondents to the Survey

57.3%

Shopped at farmers markets less than once a month

20.7%

Shopped at farmers markets once a month

15.2%

Shopped two to three times a month

6.8%

Weekly farmers market shoppers

Demographics of “Regular” Shoppers

- 26.1% Master’s or higher
- 46% Bachelor’s Degree
- 26.2% High School Diploma
- <1% No High School Diploma

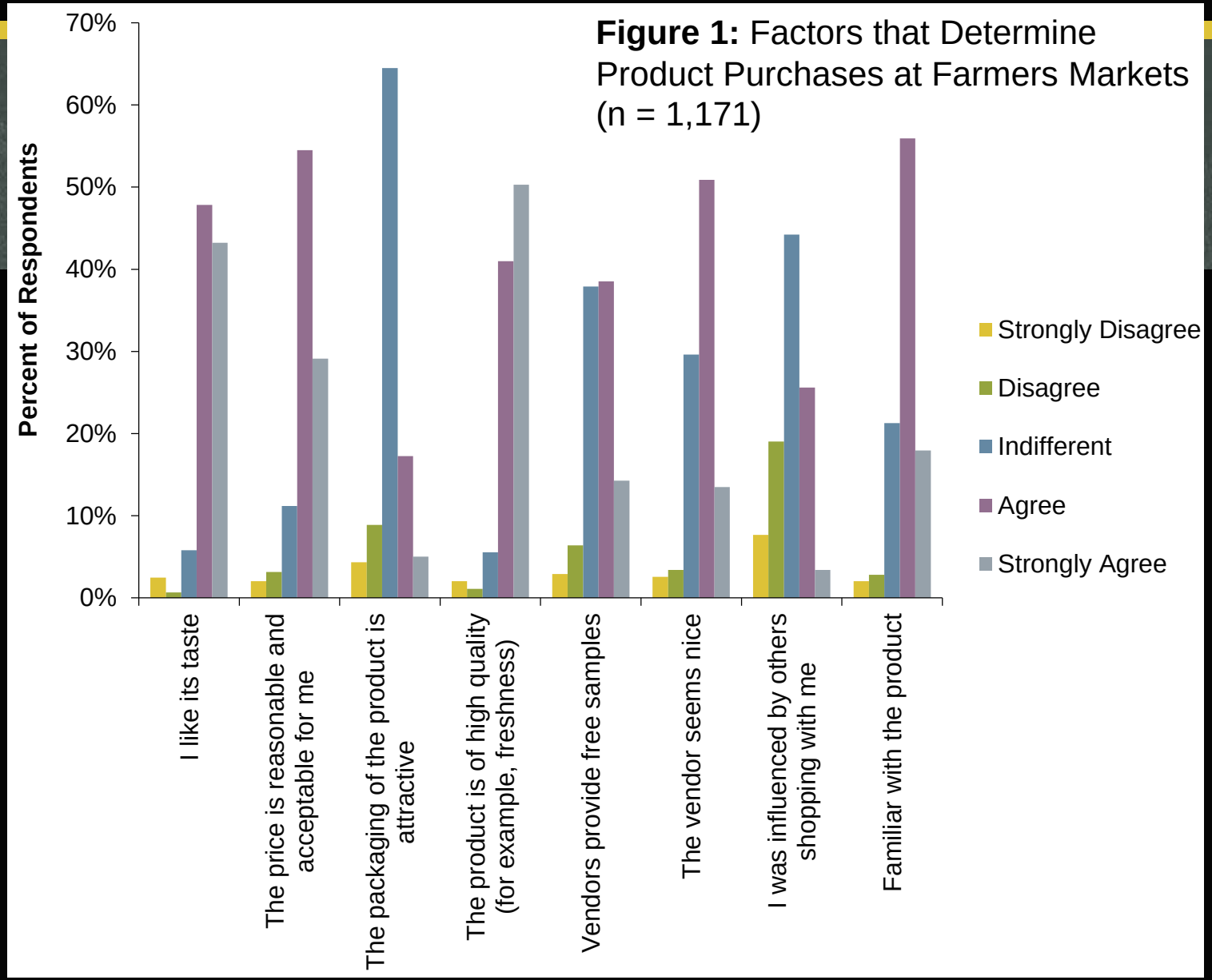
- 23% - less than $50,000
- 43.9% - $50,000 to $99,999 household income
- 33.5% - at least $100,000 household income

- 6.3% 27 years old or younger
- 32.4% 28 – 47 years old
- 48.9% 48 – 67 years old
- 12.5% at least 68 years old

58.2% 41.8%

Purchase Drivers at Farmers Markets

- Top two factors that determine purchasing:
  - Product Quality
  - Taste
- Figure 1 shows various statements that may determine product purchases and the extent to which regular shoppers consider the factors to affect their purchases.



Question: Please rank the following statements which determine whether you will purchase a product at farmers markets.

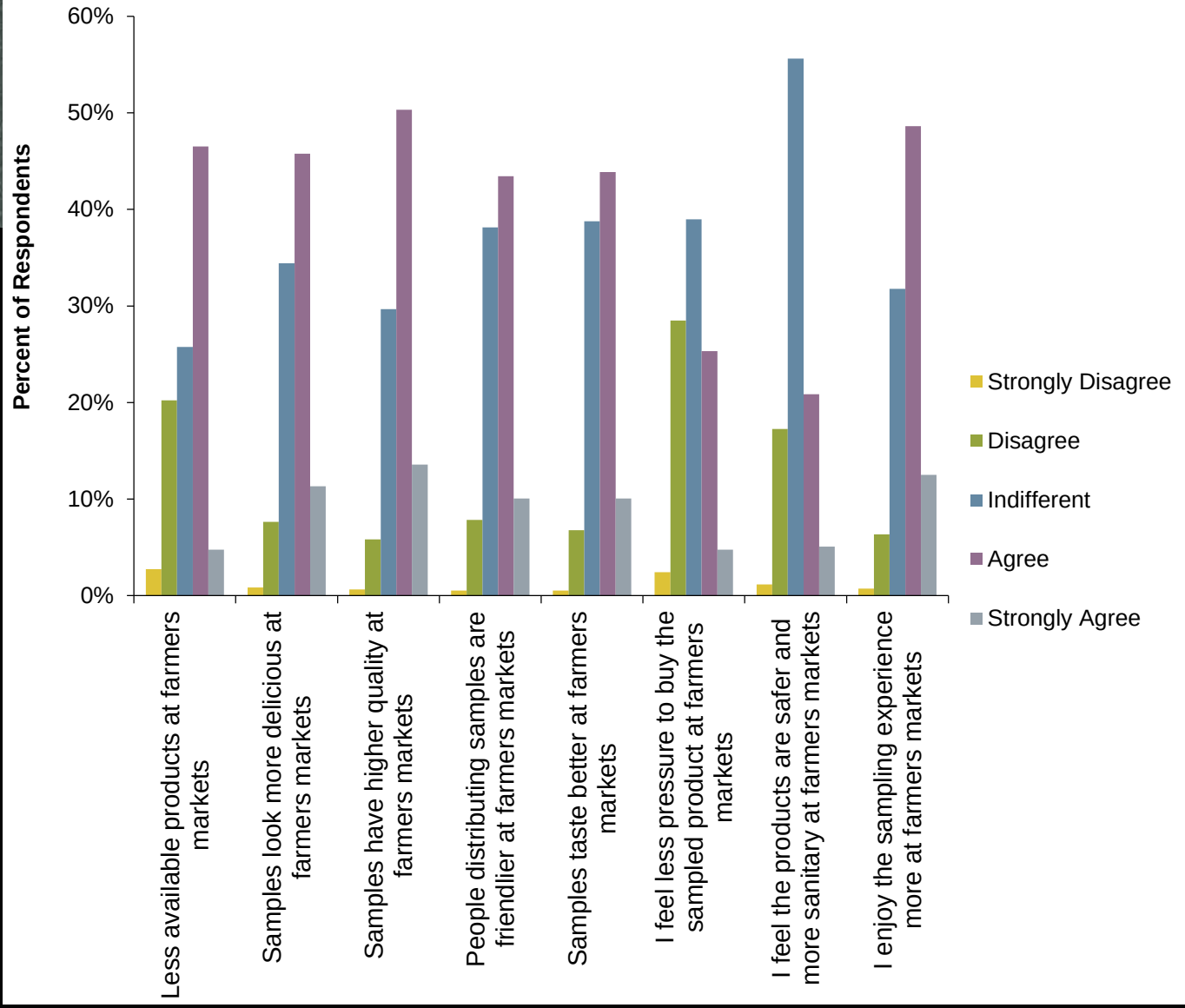
Purchase Drivers at Farmers Markets

- Of the regular shoppers surveyed, **91.3%** strongly agreed or agreed that **high quality**, such as freshness, would determine whether they purchased product at farmers markets.
- **91%** strongly agreed or agreed that liking a **product's taste** would determine a purchase.
- **Reasonable and acceptable price, product familiarity**, and a **nice vendor** followed in importance.
- **52.8%** strongly agreed or agreed that providing **free samples** would determine purchases at a farmers market.

Farmers Market Sampling Relative to In-Store Sampling

- Relative to in-store sampling experiences, sampling products at farmers markets in some cases has provided a more favorable experience for regular farmers market shoppers.
- Figure 2 shows the feelings of shoppers who have sampled at both farmers markets and in-store.

Figure 2: Feelings about Farmers Market Sampling Relative to In-Store Sampling (n = 944)



Question: From your experience, in comparison with your sampling experience in-store, please rank the following statements which describe your feelings about sampling at farmers' markets.

Farmers Market Sampling Relative to In-Store Sampling

- **Nearly 64%** of regular shoppers either agreed or strongly agreed that farmers markets offer **higher quality samples** than in-store sampling.
- **61.1%** agreed or strongly agreed that farmers **markets provide a more enjoyable sampling experience**.
- **At least half** of the respondents agreed or strongly agreed that **samples look more delicious** at farmers markets and that sample **distributors at farmers markets are friendlier**.
- However, **51.3%** also shared that they agreed or strongly agreed that farmers markets **offer fewer samples**.
- Only **30.1%** agreed or strongly agreed that they feel **less pressure to buy** products that they sample at farmers markets.
- Just **26%** of respondents agreed or strongly agreed that farmers markets products were safer and more sanitary.

What products are best marketed with sampling?

- Both regular farmers market shoppers who **HAD** previously sampled at markets and regular shoppers who **HAD NOT** previously sampled at markets were asked which products they purchased and products preferred to sample at farmers markets. The results are indicated in Figure 3 and 4.

Figure 3: Products Purchased, Sampled and Preferred to Sample at Last Farmers Market Experience by Regular Farmers Market Shoppers Who Previously Sampled at Markets (n = 944)

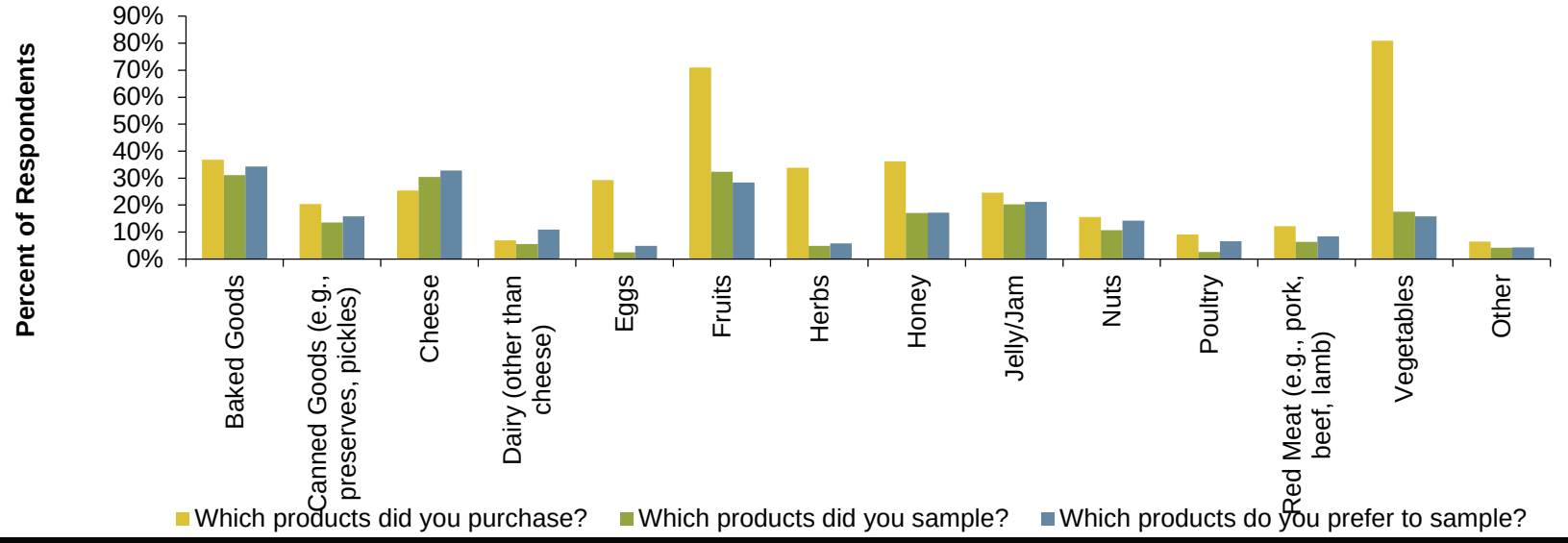
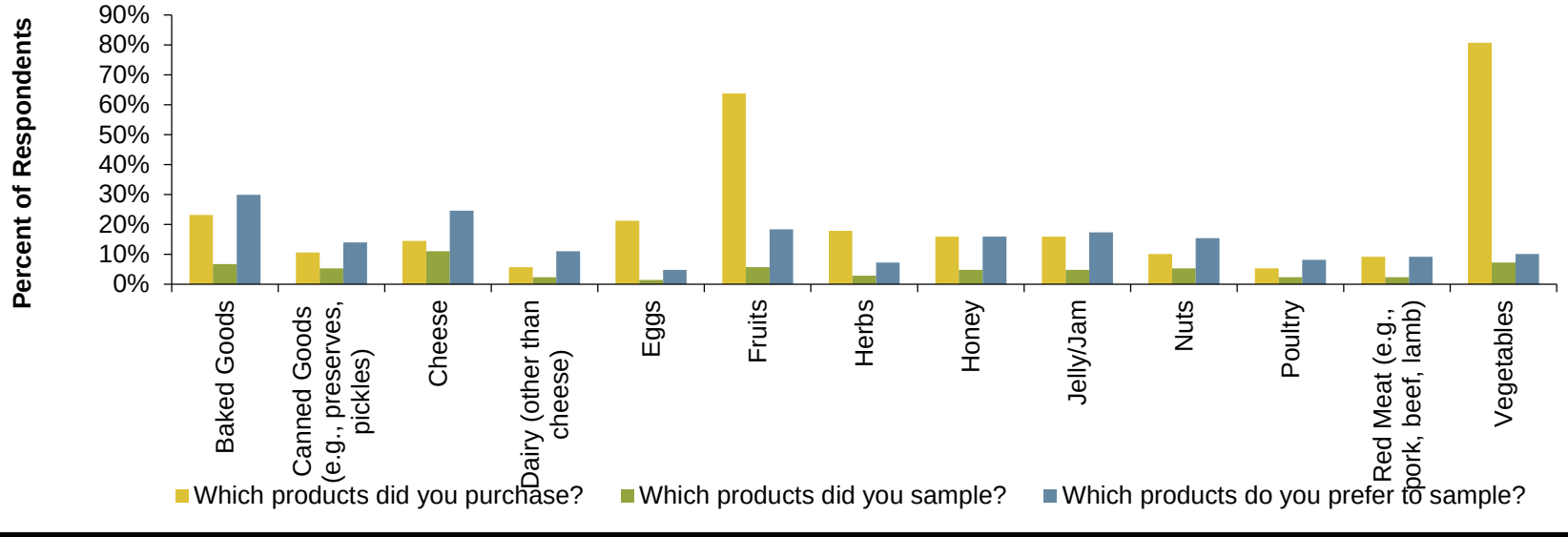


Figure 4: Products Purchased, Sampled and Preferred to Sample at Last Farmers Market Experience by Regular Farmers Market Shoppers Who Had Not Previously Sampled at Markets (n = 207)



What products are best marketed with sampling?

- The percentage of regular shoppers that preferred to sample the following products is shown below:
  - Baked goods: 34.3%
  - Cheese: 32.8%
  - Fruit: 28.4%
  - Jelly and Jam: 21.2%
- The percentage of products actually sampled by respondents during their last farmers market experience are as follows. The results were quite similar to preferences.
  - Fruits: 32.3%
  - Baked goods: 31.1%
  - Cheese: 30.4%

What products are best marketed with sampling?

- Like regular farmers market shoppers who said that they had previously sampled at farmers markets, regular shoppers who did not identify as having sampling experience at farmers markets noted that they would prefer to sample…
  - Baked goods
  - Cheese
  - Fruit
- They were least likely to prefer sampling…
  - Poultry
  - Herbs
  - Eggs
- Respondents without sampling experience also were most likely to purchase…
  - Vegetables
  - Fruits
  - Baked goods

Sampling in Relation to Purchasing

- Sampling has the potential to induce regular farmers market shoppers to act in some way or respond to their experience, as illustrated in Table 1. In every product category, shoppers who had sampling experience had a higher purchasing percentage than those that had no sampling experience.

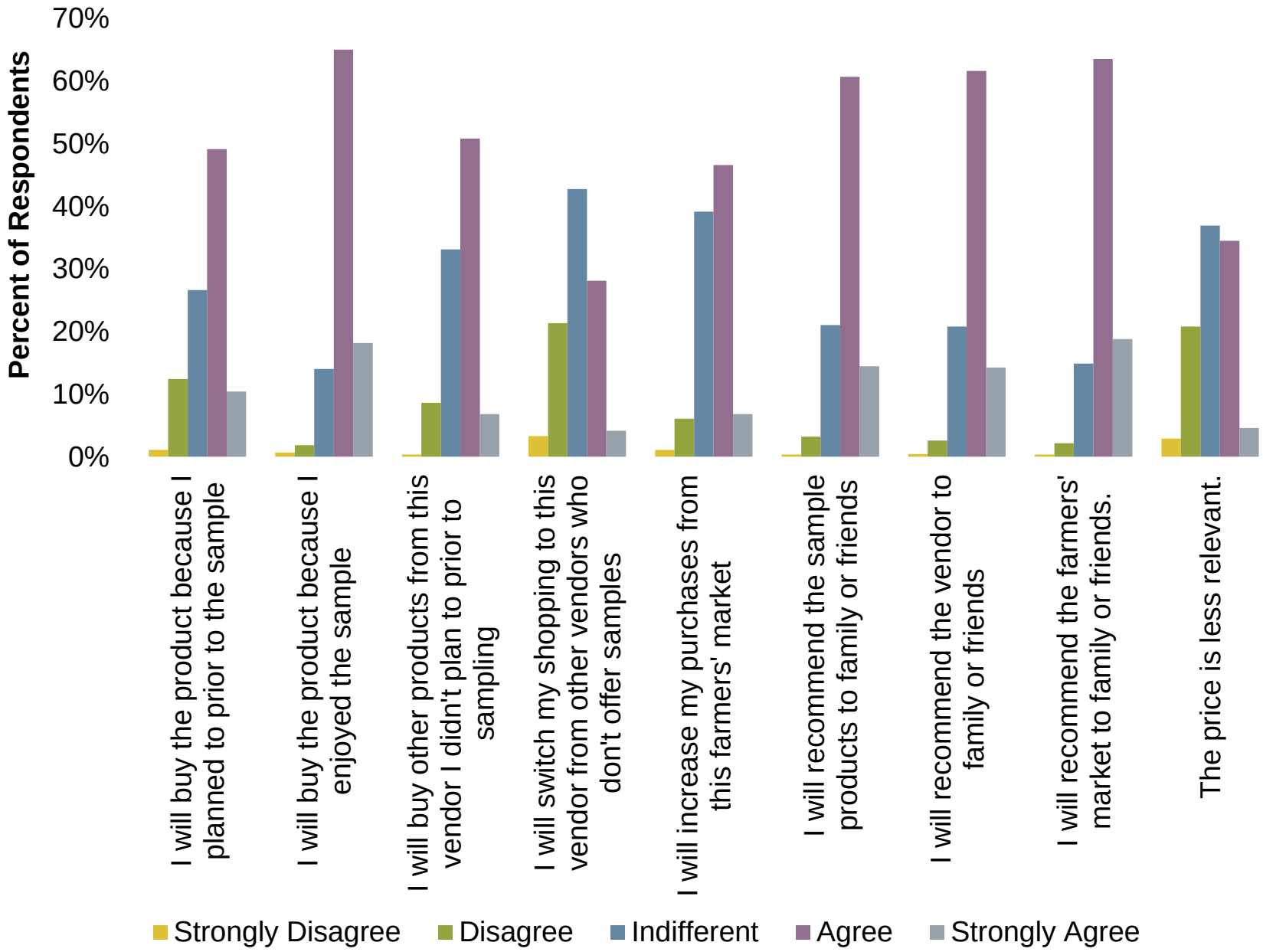
Table 1: Percentage of Regular Farmers Market Shoppers Who Purchased Products During Most Recent Farmers Market Experience

Product Category	Respondents with No Sampling Experience (n = 207)	Respondents with Sampling Experience (n = 944)
Vegetables	80.7%	80.9%
Fruits	63.8%	71.0%
Baked goods	23.2%	36.8%
Honey	15.9%	36.2%
Herbs	17.9%	33.8%
Eggs	21.3%	29.3%
Cheese	14.5%	25.4%
Jelly/jam	15.9%	24.6%
Canned goods	10.6%	20.4%
Nuts	10.1%	15.6%
Red meat	9.2%	12.2%
Poultry	5.3%	9.1%
Dairy (other than cheese)	5.8%	7.0%
Other	--	6.5%

Sampling in Relation to Purchasing

- Figure 5 presents the extent to which the 944 regular farmers market shoppers who had farmers market sampling experience agreed or disagreed that they would behave in certain ways after having tried free samples at farmers markets.

Figure 5: Actions or Responses Following Free Sample Trials at Farmers Markets (n = 944)



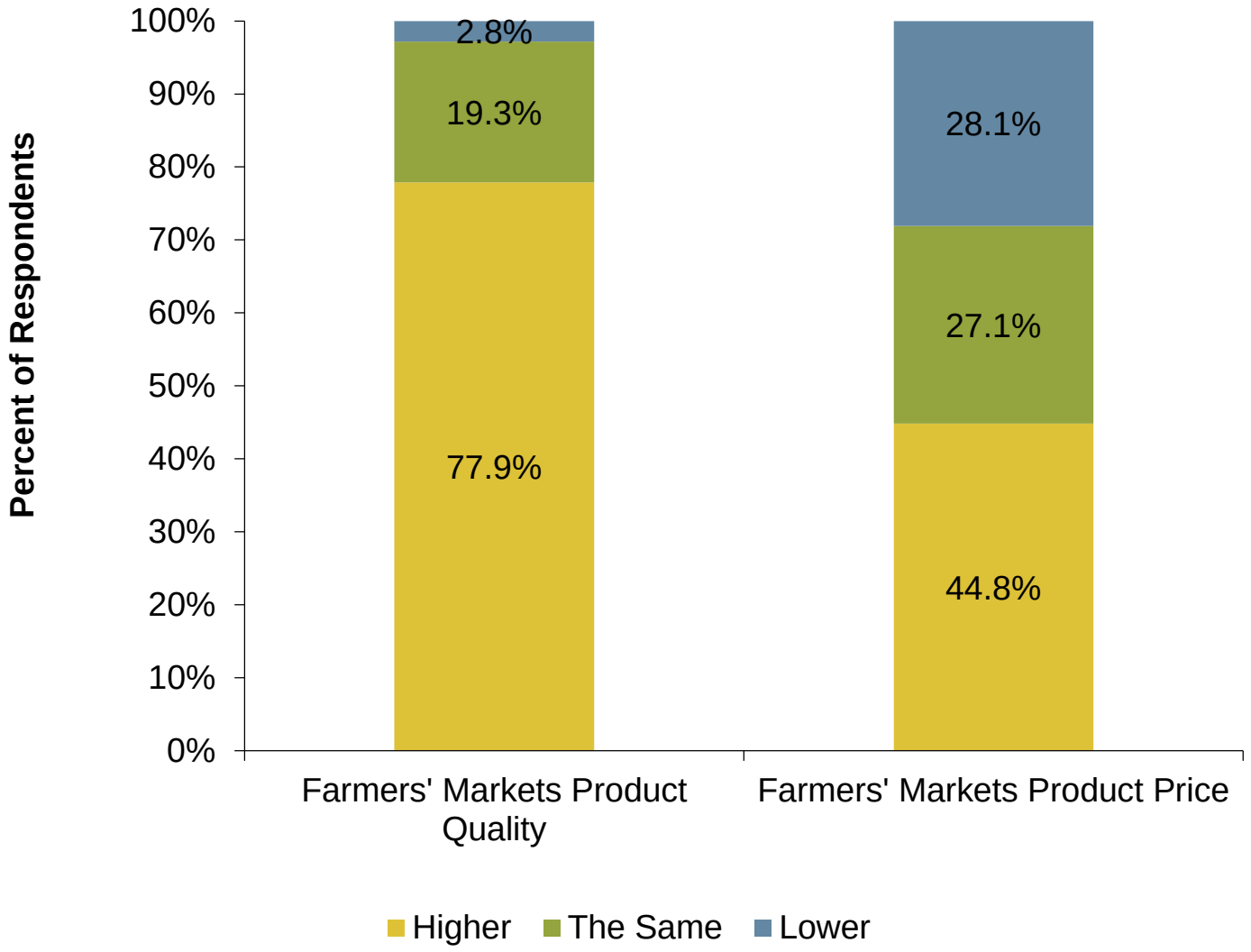
Sampling in Relation to Purchasing

- **83.3%** agreed or strongly agreed they would buy the product because they **enjoyed the sample**.
- **82.4%** agreed or strongly agreed they would **recommend the farmers market** to family or friends
- **Roughly ¾** of the respondents agreed or strongly agreed they would **both recommend the vendor and sampled products to family or friends**.
- **Nearly 60%** said they would **buy other products from the vendor that they didn't plan to buy prior to sampling.**
- **53.5%** indicated that they would **increase purchases** from the given farmers market
- **32.4%** said they would **switch shopping to a given vendor** from other vendors who don't offer samples

Farmers Market vs. Grocery Stores: Quality and Price

- Regular farmers market shoppers responding to the survey also were asked to evaluate product prices and quality at farmers markets relative to local grocery stores. More than three-quarters of the respondents shared that they view farmers market product quality to be more favorable.

Figure 6: Perceived Price, Quality at Farmers Markets Relative to Local Grocery Stores (n = 1,711)



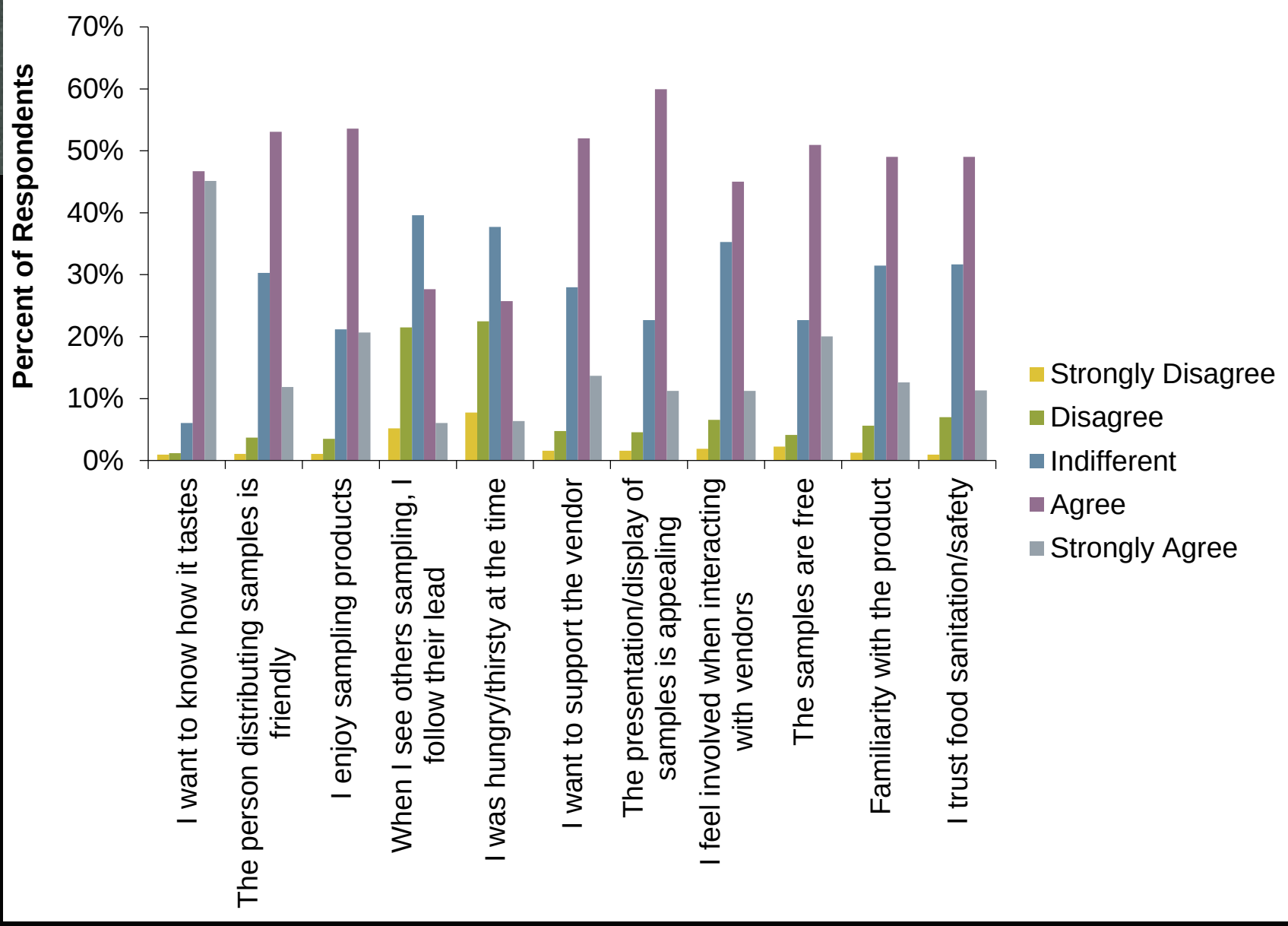
Farmers Market vs. Grocery Stores: Quality and Price

- To form conclusions about product price, 90.6% of the regular farmers market shoppers shared that they use primary information collected during famres market and grocery store visits.
- 15.6% obtained their information from secondary sources like sales circulars and brochures
- 18.4% noted using word-of-mouth information from friends and family

Motivational Factors for Sampling

- Regular farmers market shoppers who shop at least once a month and have sampled product during a previous market visit had the opportunity to share factors that motivate or encourage them to try free samples at farmers markets. Figure 7 presents results from 944 respondents.

Figure 7: Factors Motivating or Encouraging Free Sample Trial at Farmers Markets among Regular Shoppers with Past Sampling Experience (n = 944)



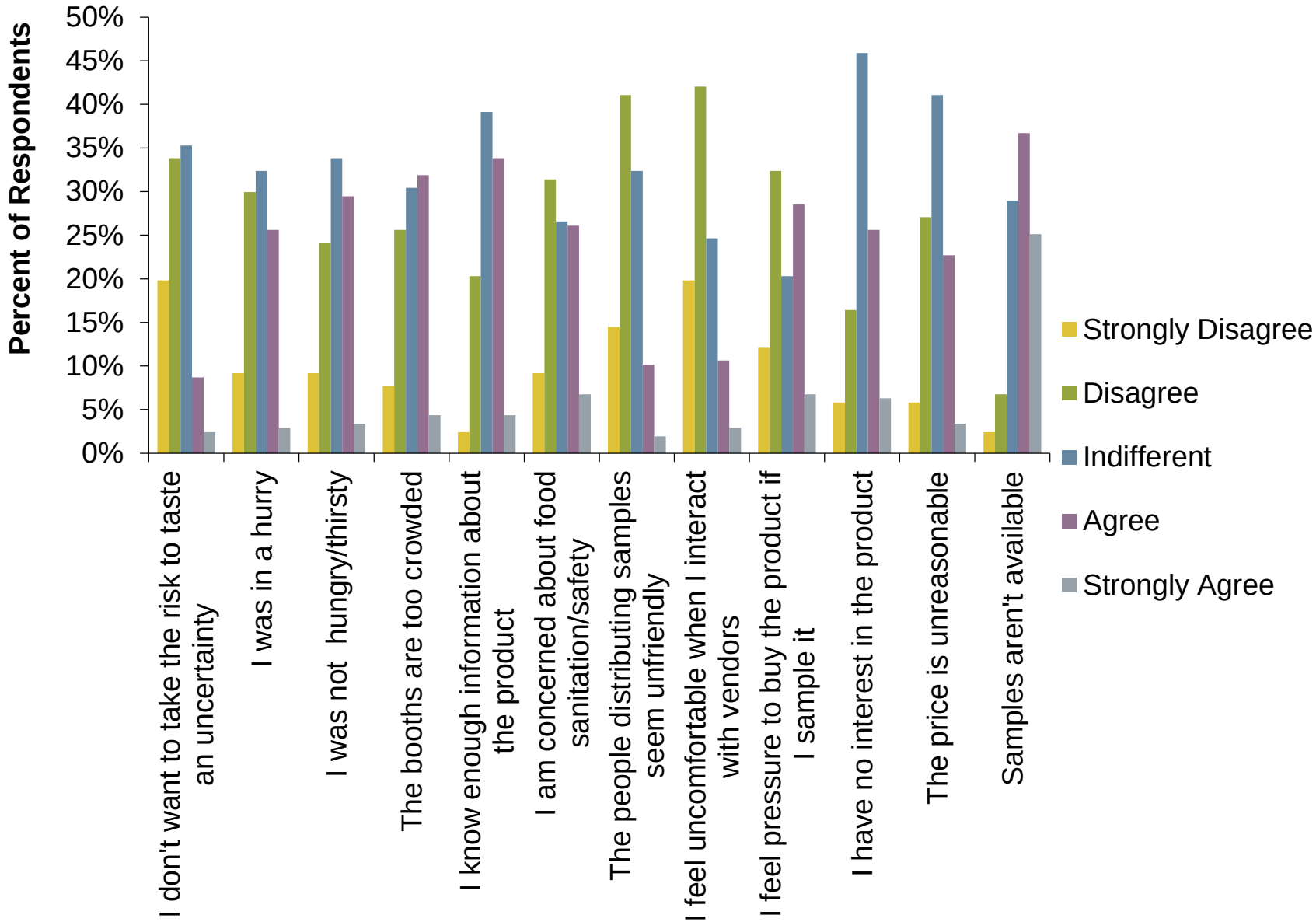
Motivational Factors for Sampling

- The predominant factor motivating free sample trial at farmers markets was wanting to know how a product tastes. 91.8% of respondents agreed or strongly agreed this was their reason for sampling.
- Nearly ¾ of respondents strongly agreed or agreed that they enjoy sampling products.
- Other top factors motivating or encouraging trials were an appealing sample presentation or display and the samples being free (71%)
- Factors least likely to motivate or encourage free sample trials were being influenced by others sampling and being hungry or thirsty at the time.

Discouraging Factors for Sampling

- The regular farmers market shoppers who had not previously sampled products at farmers markets were asked to identify factors that discourage or stop them from trying free samples. Figure 8 summarizes their thoughts by presenting the share of these individuals who agreed or disagreed with various statements.

Figure 8: Factors Discouraging or Stopping Free Sample Trial at Farmers Markets among Regular Shoppers without Past Sampling Experience (n = 207)



Discouraging Factors for Sampling

- Nearly 62% of the respondents agreed or strongly agreed that samples not being available was the reason discouraging or stopping shoppers from trying free samples.
- Other factors discouraging respondents from sampling were as follows:
  - Already knowing enough information: 38.2%
  - Booths being too crowded: 36.2%
  - Feeling pressure to buy after sampling: 35.3%
  - Concerns about food sanitation and safety: 32.9%

Applying the Results

- Taste represents a significant factor influencing food and beverage purchases. As a result, farmers market vendors may offer samples that would acquaint shoppers with a product's taste and ultimately promote their goods. . Based on survey results from Missouri farmers market shoppers, particularly those who shop at least monthly when markets are operational, farmers market vendors can adopt strategies meant to make the most of the sampling experience.

Applying the Results

- *Target the highest value customers*
  - Not all farmers shoppers shop regularly. To support repeat business, vendors should feel incentivized to appeal to frequent shoppers.
- *Focus effort on taste and quality*
  - Regular farmers market shoppers prioritize quality and taste when purchasing
- *Attract shoppers by offering product samples that they prefer to try*
  - Regular farmers market shoppers tended to prefer sampling baked goods, cheese and fruits. Vendors may choose to offer samples for preferred products to draw traffic to their booths.
- *Adopt food handling and safety procedures and assure shoppers that you follow them*
  - Some regular farmers market shoppers may not feel confident in food sanitation and safety practices.
- *Create an ideal sampling environment*
  - Factors like appealing product presentation, the crowdedness of a vendors booth, and pressure to buy after sampling are all things to keep in mind when creating an ideal sampling environment.
  - Work collectively within the farmers market to have a centralized sampling space.
  - Consider off-site sampling kiosks in high foot traffic areas.