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Tennessee Consumers' Views About Farmstead Milk

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I. Background and Purpose

Packaging of fluid milks can serve as an initial market entry point for dairy farmers to enter into on-farm processing due to the product requiring less equipment and facilities investment than other dairy products. Understanding consumer preferences for milk that is produced and processed on-farm (farmstead) can aid in understanding the share of milk consumers who are interested in purchasing on-farm processed milk, the attributes of those most interested in the product to aid in target marketing, and consumers' preferred outlets to purchase farmstead milk (FSM) which can assist in marketing the product. In addition, some dairy farmers may host visitors on-farm, either serving as an agritourism venue with educational tours about how milk is produced or on-farm stores to buy the processed milk. FSM is defined in this study as milk where the farmer produces the milk and then processes and packages on a Tennessee dairy farm. FSM may be sold directly to consumers at on-farm stores or farm stands, through farmers markets, through home delivery, or it may be sold by other sellers such as grocery stores, specialty stores or restaurants.

The overall goal of this study is to provide a better understanding of Tennessee milk and dairy products consumers' views about and preferences for FSM. Specific objectives of this study are to ascertain:

a. prior knowledge about and purchases of FSM,
b. interest in future purchases of FSM,
c. how demographics vary across prior purchases and future interest in purchasing FSM,
d. projected FSM purchases and expenditures among those interested in purchasing FSM,
e. attitudes about on-farm produced and processed milk and dairy products,
f. anticipated outlets where respondents would purchase FSM among those interested in purchasing it, and
g. on farm purchases and visits by those interested in visiting a dairy farm.

II. Data and Methods

An online survey of Tennessee residents was conducted in April and May 2021. Prior to this, a pre-test of 50 respondents was conducted in March and the survey instrument adjusted based on the pre-test responses. To qualify for the study, respondents were required to be Tennessee residents and at least 18 years old or older. They, or another member of their household, had to be consumers of milk or dairy products. The respondents were also required to be the person who is primarily responsible for household food shopping. A copy of the survey instrument is available upon request from the authors.

The survey instrument contained several sections including a definition of FSM, familiarity with and prior purchases of FSM, milk attributes choice sets, interest in future purchases of FSM, likely purchase venues, and interest in dairy farm visits. The questions were designed to obtain information about Tennessee consumers' views about FSM, including past purchases of FSM, interest in purchasing it in the future, and interest in visiting a dairy farm to purchase FSM. Respondents were also asked about household spending on dairy products, attitudes toward dairy products and demographic questions, such as age, gender and income.

This study uses means for continuous data (for example, age) and frequencies for categorical data (for example, gender) to summarize the responses. In addition, demographics and attitudes are compared across interest in future purchases of FSM. T-tests for means comparisons of continuous data are used to test for demographic differences across future interest in purchasing FSM, while chi-square tests of association are used to statistically examine the degree of association between two categorical variables, for example, gender and interest in purchasing FSM.

III. Results

III.1 Comparison of Tennessee Survey Sample Demographics with the Tennessee Population

A total of 817 Tennesseans responded to the survey overall. For each question, the number of respondents who answered a particular question is indicated by "N=". Several summary measures can be compared between the survey respondents and the population of Tennessee (Census Bureau, 2021). As seen in Table 1, the sample was somewhat older in age than the median age for the Tennessee population. The percent female was nearly 62 percent compared with 51.2 percent for the Tennessee population. This may in part be due to the survey topic and, to qualify, the person had to be primarily responsible for household food shopping, and a higher percentage of primary food shoppers are female rather than male (Schaefer, 2019). The percent college graduates among the sample was higher than the overall state population (for those adults aged 25 and older). The household size among the sample was 3.48, while for the state it was 2.52 persons. The household income was also somewhat higher than the median household income for the state.

Table 1. Demographic Characteristics of the Tennessee Survey Sample and the Tennessee Population

	Sample	Current Population Survey[a]
Age (N=817)	49.01	39.0[b]
Female (N=813)	61.99%	51.2%[b]
College Graduate (N=814)	40.17%	27.3%[c]
Household size (N=812)	3.48	2.52[d]
Household Income (N=765)	$59,229	53,320[e]

[a] *Source: Census Bureau, 2021.*
[b] *Value for 2019*
[c] *Percent of persons aged 25 or older, 2015-2019.*
[d] *Persons per household 2015-2019.*
[e] *Median household income (in 2019 dollars), 2015-2019*

III.2. Prior Knowledge About FSM Among Tennessee Survey Respondents

As shown in Figure 1, about 44.8 percent of the respondents had heard of FSM. Among those who had heard of FSM, about 72.95 percent had purchased FSM in the past. Shown in Figure 2, the most often cited sources of learning about FSM were word of mouth, farmers' markets, followed by retail shelves, social media, other media, farmstands, Pick Tennessee Products website and signage. Less than 10 percent had heard about FSM from a restaurant menu or directly from the farmer.

Figure 1. Percent of Tennessee Respondents Who Had Heard of FSM Prior to Survey

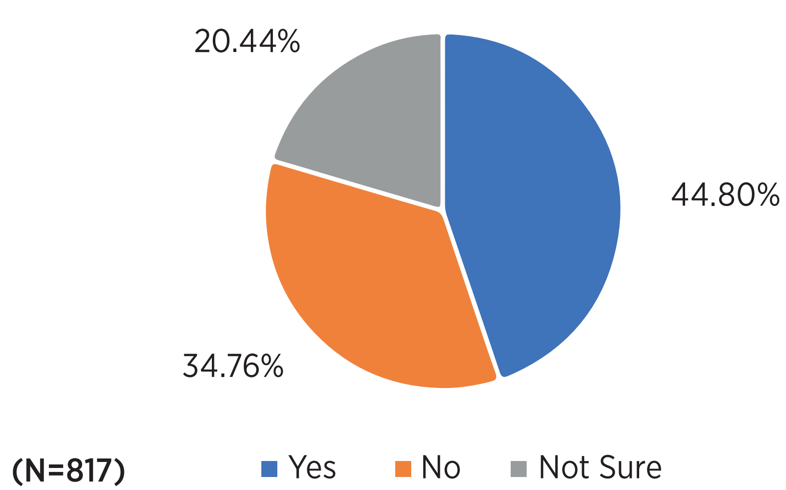
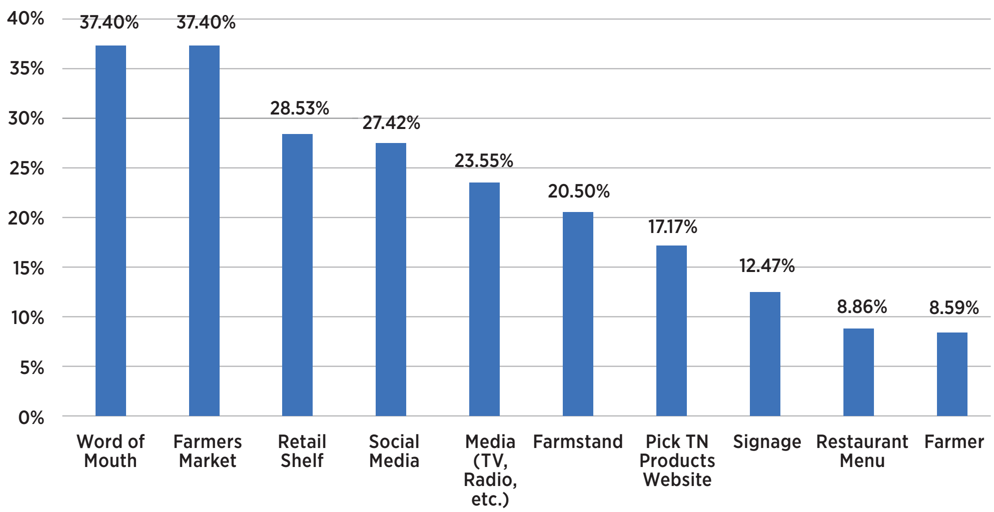


Figure 2. Sources Where Tennessee Respondents Had Heard About FSM



(N=361)

III.3. Prior Purchases of FSM Among Tennessee Survey Respondents

Of the 817 respondents to the question about prior purchase of FSM, 32.68 percent indicated they had purchased FSM in the past. Hence, among the responding household food shoppers whose household members at least occasionally consumed milk or dairy products about a third had purchased FSM in the past.

As shown in Table 2, among those who had purchased FSM in the past, a higher percentage were male, college graduates, had children in the household and more tended to be in East Tennessee than those who had not purchased FSM in the past. Those who had purchased FSM in the past also tended to have higher incomes, spend more on milk and dairy products each week, be younger in age and have a larger household size.

Table 2. Summary Measures of Demographics Across Whether Have Purchased Tennessee FSM in the Past[a]

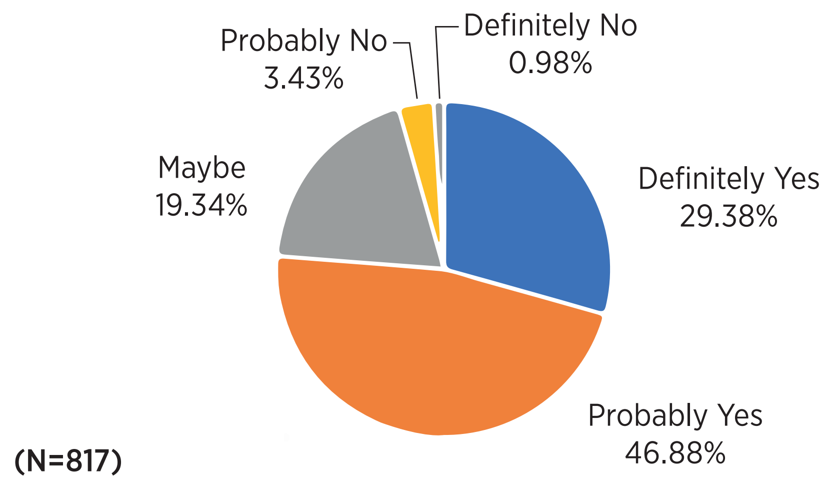
Shopper or Household Characteristic	Have Purchased	Have Not Purchased	Chi-square	T-test
Percentages				
Female Gender (N=813)	53.01	66.36	15.5464***	
College Graduate (N=814)	59.83	46.82	7.2987***	
Children in Household	38.20	16.00	49.644***	
Region (N=817)				
East	42.32	34.00	7.1940**	
Middle	40.82	42.55		
West	16.85	23.45		
Means				
Household Income (N=765)	$67.081.71	$52,255.91		3.7982***
Milk and Dairy Products Weekly Expenditures (N=805)	$13.31	$9.43		5.5671***
Age (N=817)	43.311	51.785		7.0831***
Household Size (N=812)	3.860	3.293		4.8057***

[a] *The asterisks indicates significant degree of association for the Chi-square tests or significant differences in means for the t-tests at α=.01 for *** and α=.05 for **.*

III.4. Interest in Future Purchases of FSM Among Tennessee Survey Respondents

As can be seen in Figure 3, about 76.25 percent of the respondents indicated they probably or definitely would purchase FSM in the future. Less than 5 percent indicated they probably or definitely would not purchase FSM in the future.

Figure 3. Percent of Tennessee Respondents Who Would Purchase FSM in the Future



III.5. Tennessee Survey Respondent Demographics Across Future Interest in Purchasing FSM

A closer look at whether the respondents had purchased FSM in the past and plans for future purchases reveals that among those who indicated they probably or definitely would purchase FSM in the future, about 39.17 percent had purchased FSM in the past, reflecting repeat customers. However, about 60.83 percent had not purchased FSM in the past, reflecting potential first-time customers for FSM. Table 3 exhibits the summary demographic measures across interest in future FSM purchases. Notably, those respondents more interested in FSM purchases in the future were more likely to have children in the household, had higher household incomes, spent more each week on milk and dairy products, and were younger in age than less interested respondents.

Table 3. Summary Demographics Characteristics Across Whether Tennessee Survey Respondent Interested in Future Purchases of FSM[a]

Shopper or Household Characteristic	Definitely or Probably Yes	Maybe, Probably, or Definitely No	Chi-square	T-test
	Percentages			
Female Gender (N=813)	61.77	62.69	0.0529	
College Graduate (N=814)	40.90	37.82	0.5804	
Children in Household	24.88	18.04	3.8761**	
Region (N=817)				
East	37.72	33.51	5.3729	
Middle	39.81	48.97		
West	22.47	17.53		
	Means			
Household Income (N=765)	$60,968.01	$53,187.13		2.1906**
Milk and Dairy Products Weekly Expenditures (N=805)	$11.32	$8.63		3.4180***
Age (N=817)	48.170	51.742		2.6425***
Household Size (N=812)	3.504	3.392		0.8587

[a] *The asterisks indicates significant degree of association for the Chi-square tests or significant differences in means for the t-tests at α=.01 for *** and α=.05 for **.*

III.6. Overall Projected FSM Purchases and Expenditures Among Tennessee Survey Respondents Interested in Purchasing FSM in the Future

As shown in Table 4, the average number of times a respondent indicated they would purchase FSM is 32.23 times per year (2.7 times/month), and the respondents stated they would spend about $5.33 per purchase. This would total $177.96 per year. On average, the respondents stated they would buy 1.48 half gallons per purchase. This totals 49.53 half gallons per year. This results in about $3.71 per half-gallon for FSM. As a basis for comparison, retail organic milk prices in the U.S. sold for around $4.09 per half-gallon in the first half (January-June) of 2021 (USDA/AMS, 2021). Nearby areas, such as Atlanta and Louisville, were priced at $3.40 and $3.18 per half-gallon of organic milk during the same time period. Hence, prices consumers would pay for FSM appear to be comparable to prices of organic half gallons of milk in early 2021.

Table 4. Projected FSM Half-Gallons, Expenditures on FSM, and FSM Half-Gallon Price Tennessee Survey Respondents Would Pay for FSM Among those Interested in Purchasing FSM in the Future

	Mean (N=735)
Average number of times would purchase FSM	32.23
Spending per purchase of FSM	$5.33
Total spending FSM per Year	$177.96
Half gallons FSM per purchase	1.48
Total half gallons FSM per year	49.53
Price per half gallon FSM	$3.71

III.7. Tennessee Survey Respondent Attitudes About On-Farm Produced and Processed Milk and Dairy Products

Respondents agreed on average with each of the statements in Table 5 about milk and dairy products processed on-farm in Tennessee. Respondents to the survey agreed most with the statement that they believed milk and dairy products produced and processed on-farm were safer, higher quality and fresher than those from out-of-state.

Table 5. Tennessee Survey Respondent Attitudes About Milk and Dairy Products Produced and Processed On-Farm in Tennessee

Statement	Agreement (1=Strongly Agree, ..., 5=Strongly Disagree) (N=817)
I know more about where milk or dairy products produced and processed or packaged on-farm come from, so I believe they are safer.	1.88
I believe milk or dairy products produced and processed or packaged on-farm are of higher quality than non-local milk or dairy products.	2.00
Milk or dairy products produced and processed or packaged on-farm are fresher than those from out-of-state.	2.19
Purchasing milk or dairy products produced and processed or packaged on-farm reduces my carbon footprint.	2.33
Purchasing milk or dairy products produced and processed or packaged on-farm makes me feel as if I am helping the local economy.	2.54
Milk or dairy products produced and processed or packaged on-farm have to be transported shorter distances, so it is better for the environment	2.64
Purchasing milk or dairy products produced and processed or packaged on-farm makes me feel as if I am supporting dairy farmers in my state.	2.81

III.8. Anticipated Outlets Where Tennessee Survey Respondents Interested in Purchasing FSM Would Purchase FSM

Shown in Table 6, the most commonly cited retail outlet was retail grocery stores, with about 74.66 percent indicated they would anticipate purchasing FSM at a retail grocery store (N=760). About 40.92 indicated they would anticipate purchasing it at a big box store (for example: WalMart). Only about 12.89 percent anticipated buying it at specialty stores. Over 36 percent stated they would shop for farmstead milk at farmers markets. About 40.13 percent of the respondents indicated they would either buy the product from a farm store or as part of a dairy farm visit.

Table 6. Shopping Locations Where Tennessee Survey Respondents Interested in Purchasing FSM Would Consider Purchasing FSM

Shopping Location	(N=760)
Grocery	74.66%
Big Box Stores	40.92%
Specialty Stores (ex: ice cream or cheese shop)	12.89%
Farm Store or Stand	24.21%
Farmers Market	36.05%
Convenience Store	18.55%
Home Delivery Service	11.58%
Farm Cooperative	9.74%
Online (through internet or third-party marketer site)	8.42%
Dairy Farm	15.92%
Other	1.18%

III.9. On Farm Purchases and Visits by Tennessee Survey Respondents

Among these respondents who indicated they anticipated buying FSM directly from the farm, they would travel about 24.07 miles to visit the farm on average (N=230). About 73.04 percent of the respondents indicated they would travel to visit the dairy once per month or less frequently (N=230). On average, the dairy farm visitors would spend about $8.32 per visit (N=209).

As shown in Table 7, among those who indicated interest in visiting a farmstead dairy, the factors receiving the most important ratings as influential on dairy farm visits were the ability to sample products before buying, knowing the history of the farm and or farmer and open spaces/countryside to enjoy outdoors.

Table 7. Factors Influencing Visits to Dairy Farms by Tennessee Survey Respondents Interested in Visiting a Farmstead in the Future

Factor	Importance to Dairy Farm Visit (1=Extremely, ...,5=Not at All) (N=230)
Ability to sample products before buying	2.08
Knowing the history of the farm and or farmer	2.16
Open spaces/countryside to enjoy outdoors	2.17
Ability to purchase and consume on-site	2.27
Farm educational tours to see milking dairy cows	2.47
Processing facility educational tours	2.49
Find out about special events through social media or email	2.76
Find out about new products through social media or email	2.85

IV. Conclusions and Implications

Research suggests that the vast majority of households consume some type of dairy product (Hale, 2019). This study included only respondents who themselves have a household member who at least occasionally consumes milk. While projecting the overall market potential is difficult, about 7.71 percent indicated they would definitely purchase FSM in the future and have a history of purchasing it in the past. Hence, these respondents are most likely to be future customers for FSM. As far as pricing, the study estimates are around $3.71 per half-gallon for FSM. This pricing is similar to organic milk pricing during the study timeframe.

Some demographic patterns emerge for households more likely to have tried FSM in the past. These are male respondents, college graduates, had children in the household and tended to be more located in East Tennessee. As for future intentions, those more likely to probably or definitely intend to purchase FSM in the future had children in the household, had higher household incomes, had higher milk and dairy products expenditures and were younger in age those who were less certain or did not plan to purchase FSM in the future. These demographics might be used in building profiles for the marketing of FSM in the future.

The respondents to this study indicated that the most common ways of learning about FSM were word of mouth and at farmers markets, in part reflecting that many FSM operations sell milk through booths at farmers markets. Respondents tended to like purchasing FSM because they felt these products were safer, higher quality and fresher than milks that were not FSM. These might be attributes that are emphasized in marketing and promotion campaigns for FSM. Among those who planned to visit a dairy farm to purchase FSM, they would travel about 24 miles. The respondents preferred to be able to sample the product before buying. They also wanted to know more about the farm and farmer's history and to have outdoor spaces to enjoy on their visit. Providing samples, history information about the farm and farmers and open outdoor spaces for the visitors to enjoy on their visits could serve as amenities provided by dairy farms selling FSM on-site.

This study has several limitations. First, the study is a snapshot of consumer preferences at one point in time. Second, some households may be more likely to respond to the survey than others. For example, lower-income households may be underrepresented in this sample. Third, additional research should likely examine the types of milk, packaging and other attributes of the milk sold to gauge consumer preferences for the FSM to be sold.

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