



Milk Industry Report: Serving Vermont Schools

Spring 2018



Gina Clithero | University of Vermont
Calla Rosenfeld | Middlebury College
Ali Zipparo & Dominique Giroux | Vermont Agency of Agriculture, Food, & Markets

Milk Industry Report: Serving Vermont Schools



This report highlights results from a survey of Vermont Schools conducted in the Spring of 2017. Over one hundred Vermont schools, school food authorities, and food service management companies responded to the survey. The purpose of this survey was to better understand how VT schools are serving milk and the challenges they face.

In 2016, VT schools consume over 750,000 gallons of milk.

101 Survey Responses



78%

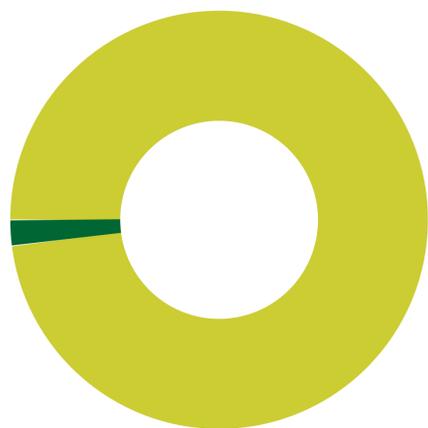
were Food Service Managers

Responses were from child nutrition professionals who represent

65%

of all Vermont students

USDA Federal Child Nutrition Program participation

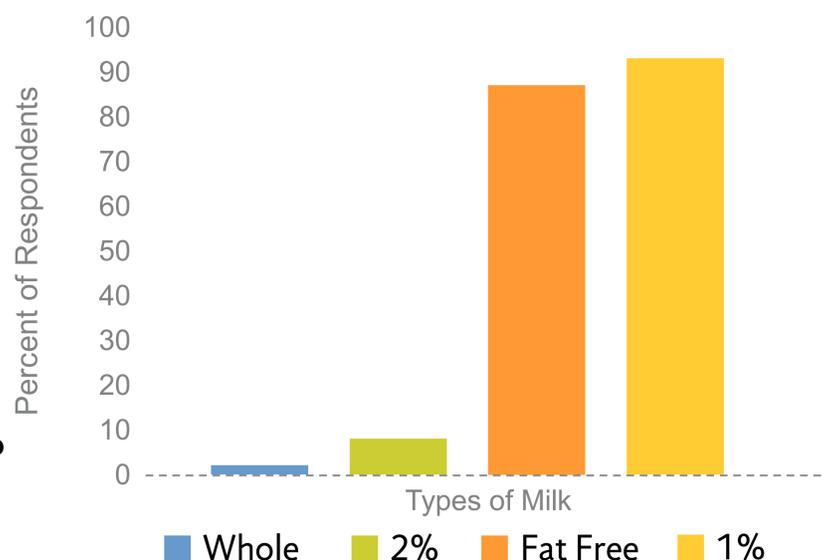


■ Yes ■ No

These programs require that elementary, middle, and high schools offer 8 oz. portions within the meal patterns. Up to 12 oz. containers can be sold à la carte in middle and high schools. These requirements vary for different programs. Summer Food Service programs are most flexible for fat content regulations.

Types of Milk Served: Fat Content

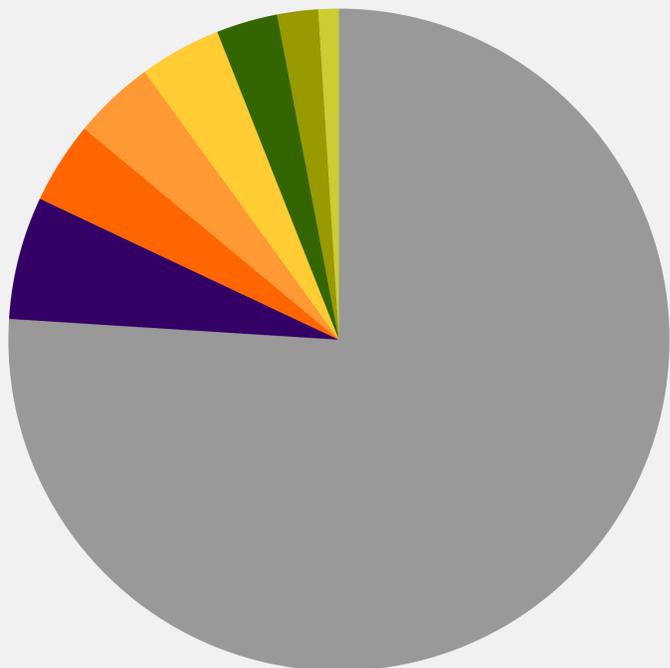
Due to requirements of the federal school meals programs, there is a demand for low-fat and fat-free milk of 8 and 12-ounce portions. Most milk served is 1% plain and fat free chocolate milk.



Vermont-Branded Milk

Some respondents expressed interest in Vermont-branded milk, but reported having difficulty finding such products that meet federal school nutrition standards. Producers, bottlers, and distributors might consider connecting directly with schools, and reaching out to partners and resources, to make schools fully aware of milk options and support schools in source-identification projects.

Milk Serving Methods in Schools



The majority of schools serve their students milk in individual cartons. A significant portion of respondents (17%) are utilizing multiple serving methods for milk service, and few schools are serving milk entirely through bulk dispensers, gallon jugs, or individual bottles.

- 76% Individual cartons only
- 6% Combination: Carton & Bulk
- 4% Combination: Jug & Bulk
- 4% Combination: Jug & Carton
- 4% Combination: Bulk, Carton & Jug
- 3% Bulk milk coolers only
- 2% Milk from jugs poured into cups
- 1% Individual bottles only

Challenges: Individual Cartons vs. Bulk Milk

Individual Cartons



- More wasted milk
- Inability to recycle cartons
- Challenges composting leftovers
- Inadequate cooler storage

Bulk Milk



- Labor of serving milk
- Spills
- Managing portion sizes
- Washing containers

Most respondents are not interested in switching their service methods.

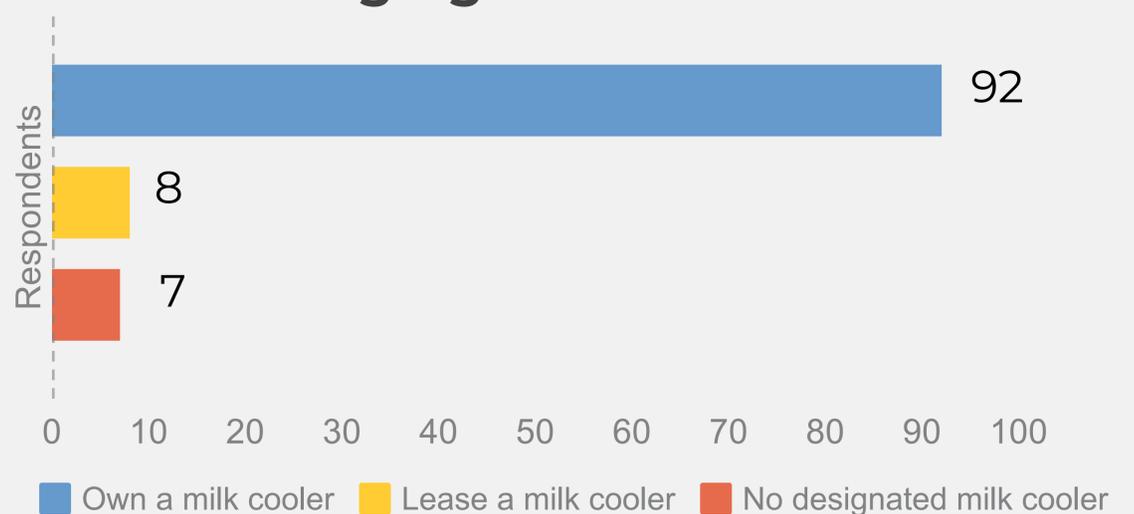
While most were not interested in switching entirely to bulk dispensers, over one fifth of respondents expressed interest in supplementing milk carton service with bulk dispenser service of chocolate, maple, or plain milk. Bulk milk suppliers seeking opportunities to sell their milk to schools might want to develop marketing strategies that clearly communicate the benefits of bulk milk service and assist schools in transitioning from cartons to bulk service. Suppliers should target their marketing of fat-compliant bulk chocolate milk to schools that already serve bulk plain milk and schools that have expressed interest in bulk plain milk.

Increasing Access to Milk Coolers

Milk distributors might consider discussing potential equipment leases with schools that have outdated or aging milk coolers.

Many school food service managers report repeatedly spending money on repairing old milk coolers, having difficulty finding funds for a new cooler, having old models, or having coolers not properly temperature controlled, which leads to wasted milk.

Vermont schools can access funding for new milk coolers through the VAAFM Milk Cooler Grant Program.



To read the full Milk Industry Report: Serving Vermont Schools report please visit <http://agriculture.vermont.gov>

Contents

Introduction	4
Methods	4
Results and Discussion	5
Serving methods	5
Challenges Associated with Carton Service vs. Bulk Service	6
Interest in Changing Serving Method	8
Market Opportunities for Bulk Milk Suppliers	10
Financial Considerations in Milk Procurement	11
Milk Requirements	12
Milk Variety and Vermont-Branded Milk	14
Special label milks	14
Equipment	15
Conclusion	16
Appendix	18
Survey Questions	18
References	19

Introduction

The Vermont Agency of Agriculture, Food and Markets (VAAFAM) has administered the Farm to School program since 2007. The program helps schools develop and sustain relationships with local producers, enrich the educational experience of children, improve the health of Vermont children, and enhance Vermont's agricultural economy. In Vermont, dairy farming and production is a large part of the State's cultural and economic identity, bringing \$2.2 billion in economic activity to the state each year (Vermont Dairy Promotion Council, 2015). Every year, more than 88,000 students in Vermont schools consume more than 750,000 gallons of milk. Schools represent a large portion of the demand for food in Vermont, feeding more than 13 million meals a year, and since every dollar that schools spend on local food adds sixty cents to the Vermont economy, VAAFAM considers schools an opportunity for economic growth among Vermont producers (Roche et. Al., 2016).

This report summarizes the results of a survey that was conducted in the Spring of 2017, with results from over one hundred Vermont schools, school food authorities, and food service management companies. The purpose of this survey was to better understand how Vermont schools are serving milk and the challenges they face. As a follow up to the 2016 report, *Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies*, this report is intended to inform processors, bottlers and distributors of milk so that they may better serve Vermont schools (Vermont Agency of Agriculture, Food and Markets, 2016).

Many of Vermont's schools have outdated equipment to serve milk as part of their meal service. Since 2015, VAAFAM has made the process of acquiring milk coolers more feasible for schools through the Farm to School Equipment Grant program (formerly known as the Milk Cooler Sponsorship Program). This program, part of the Vermont Farm to School and Childcare Grant Program, supports access to milk for all Vermont students by helping schools purchase milk coolers with financial assistance, which can improve the viability of the child nutrition program overall.

The Vermont Farm to School program hopes that this report provides insights into school milk procurement practices that help Vermont dairy producers deliver high-quality, healthy drinks to schools. This report illustrates current milk serving methods in Vermont schools, evaluates their interest in changing serving methods, and provides insights into market opportunities for fluid milk in Vermont schools. This report explains federal regulations surrounding school milk procurement and discusses how such regulations impact the variety of milk purchased by Vermont K-12 schools. Lastly, the report discusses the need for improved milk cooling equipment and different avenues for improving communication and information flow between schools, industry, Farm to School organizations, and the VAAFAM.

Methods

The survey questions were developed by the Vermont Agency of Agriculture, Food and Markets (VAAFAM), with support from the Vermont Agency of Education Child Nutrition Program, and distributed online to all Vermont schools, school food authorities (SFAs), and food service management companies through the Agency of Education's Food Service Manager listserv, Farm to School listserv, and through partners. The questions focused on current milk programs, perceived challenges, and interest in changing current milk service practices in Vermont schools. Of 101 total survey responses, 67

respondents (or 67 percent of respondents) represent schools, 22 percent represent SFAs and 7 percent represent food service management companies. Survey respondents operate school food programs that serve approximately 60,000 Vermont students, which account for 65 percent of all K-12 students in Vermont. Food Service Managers were the primary contributors to the survey, representing 78 percent of respondents.

Results and Discussion

Serving methods

Most schools serve their students milk in cartons. A large portion of respondents (17%, as shown in *Figure 1* below) are combining multiple serving methods for milk service, and few schools are serving milk entirely through bulk dispensers, gallon jugs, or individual bottles.

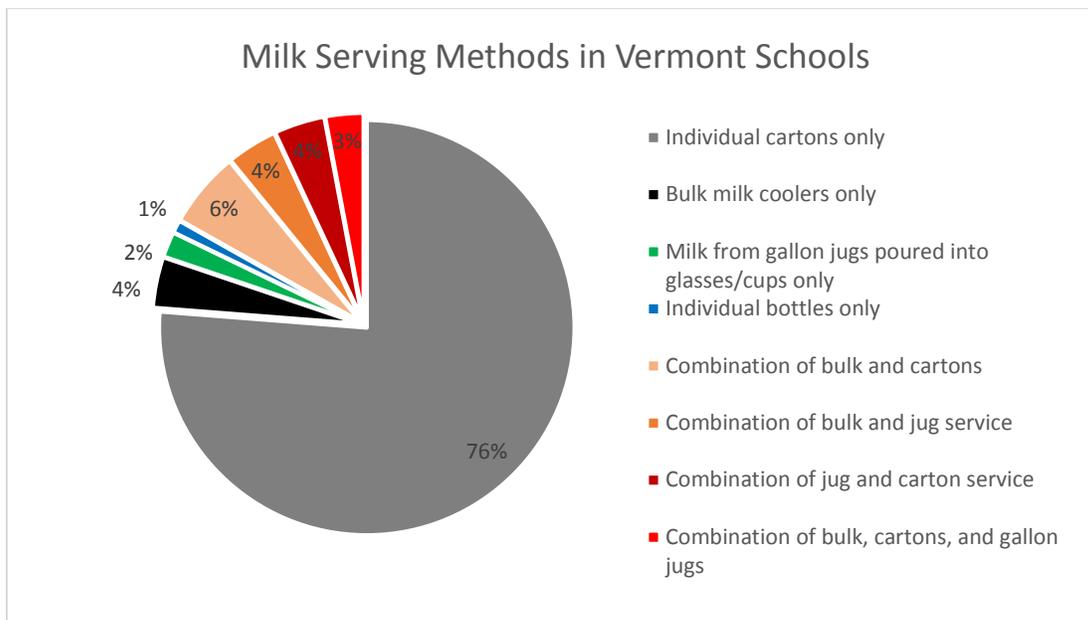


Figure 1. Milk serving methods in VT K-12 schools (101 respondents).

Figure 2 shows that the median students served by serving method. Most respondents who reported serving milk with multiple methods represent larger numbers of students relative to the general sample. The higher volume purchases can be attributed to both the use of multiple serving methods in larger school meal programs and the fact that many school food authorities and food service management companies operate meal programs at multiple schools and utilize different serving methods at different schools. Approximately 35% of respondents using multiple serving methods represent school food authorities (SFA) and food service management companies. Respondents who report serving milk only in cartons tend to be larger, while schools serving milk only in bulk and jugs tend to be smaller. The next section outlines the challenges that respondents report with serving milk in cartons and bulk milk coolers and explores their interests in changing serving methods.

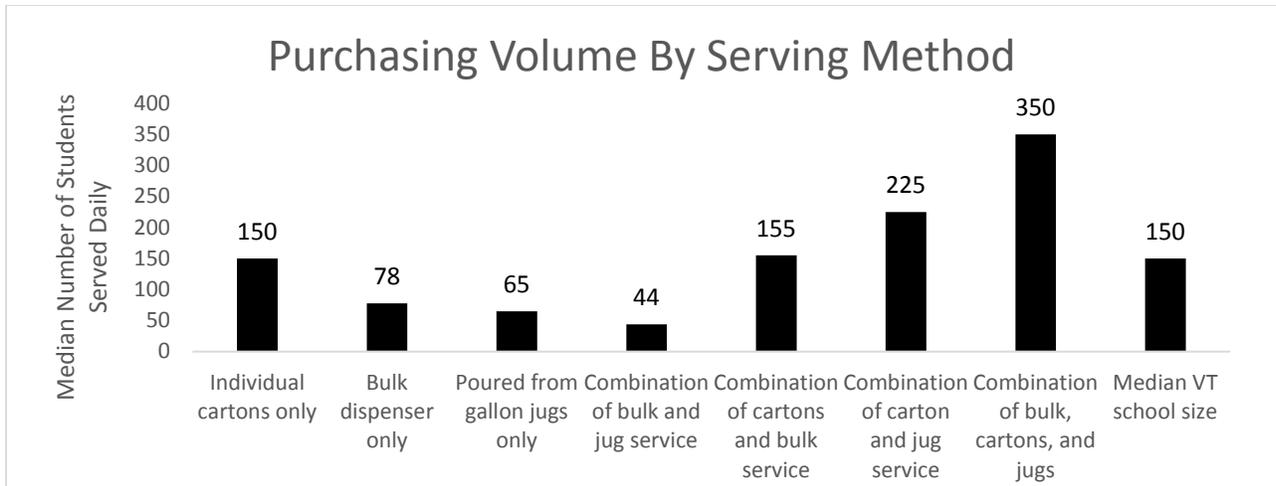


Figure 2. The median number of students served per day by serving method (100 respondents, 1 skipped). Because federal nutrition programs require a standardized serving of milk, the number of students served is indicative of purchasing volume for each respondent. Note: One respondent (1% of sample) solely serves milk in individual bottles through their meal program. This respondent is not represented in the figure. Median was used instead of mean because data is positively skewed by outliers (large food service management companies and school food authorities).

Challenges Associated with Carton Service vs. Bulk Service

The 2016 VAAFM report, *“Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies”* provides a comprehensive examination of the strengths and challenges associated with cartons and bulk milk service. 2017 survey responses analyzed in this report support the major findings from the 2016 VAAFM report, which is based on various case studies.

As mentioned above, the vast majority—almost all—of schools in Vermont serve milk in cartons. Schools make that choice because there are clear benefits to their meal program; however, serving carton milk is not without challenges. The most frequently mentioned challenges of serving milk in cartons are related to waste: disposing of leftover milk and inability to recycle cartons. The Agency of Natural Resources Department of Environmental Conservation (DEC) recommends schools use bulk milk dispensers instead of cartons to support the implementation of Vermont’s Universal Recycling Law (VT Department of Environmental Conservation, 2015). Strategies to reduce waste can reduce costs of hauling and disposing leftover milk and cartons.

In the last few years, VAAFM and DEC have heard from many schools interested in switching to bulk milk, largely due to concerns about Universal Recycling law compliance and general interest in reducing the environmental impact of school food. Due to this amplified interest, VAAFM was interested in learning, on a broad level, how schools feel about bulk milk. This survey helped with that learning process. The common challenges in serving bulk milk are the labor required in serving milk, spills, managing portion sizes, and the washing of containers used to serve the milk, all of which have the potential to require new infrastructure or additional staff time.

It is important to note that the survey’s design limits the accuracy of the results for the data in figures 3 and 4. Between the two multiple-choice questions compared below, more options were offered for the

Challenges of Serving Milk in Bulk question. Additionally, there was a “None” option for the Challenges of Serving Milk in Cartons question, but that was not an option for the Challenges of Serving Milk in Bulk question. This might influence the appearance of more challenges for bulk than cartons. The results would have been the most accurate if the same multiple-choice options were presented for both serving method questions.

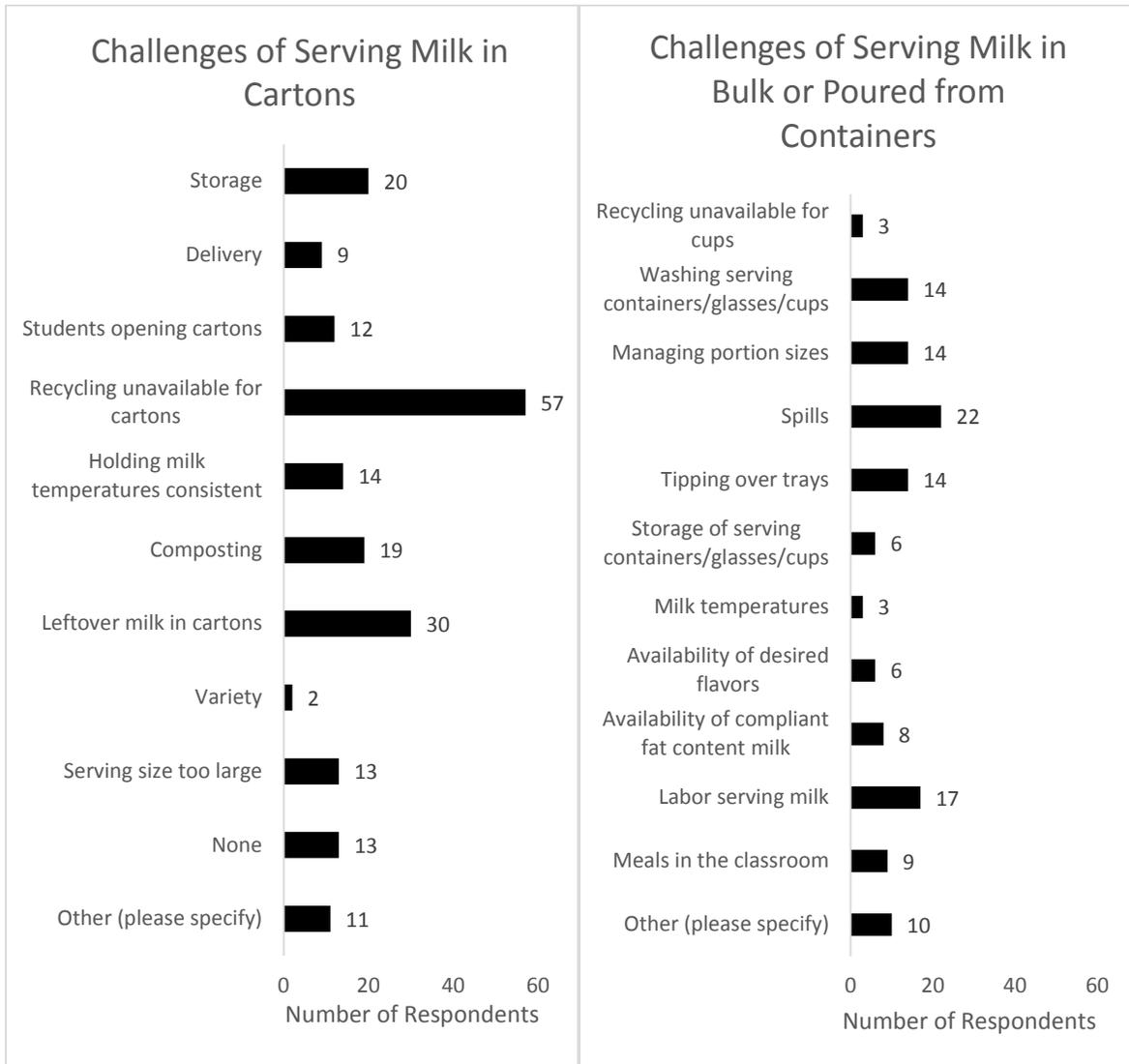


Figure 3. Challenges of serving milk in cartons (91 respondents, 10 skipped).

Figure 4. Challenges of serving milk in bulk or poured from containers (33 respondents, 68 skipped).

Interest in Changing Serving Method

Most respondents are not interested in switching their service methods, whether they serve milk in cartons or bulk. However, there is some interest in combining service methods especially if flavored milk is available.

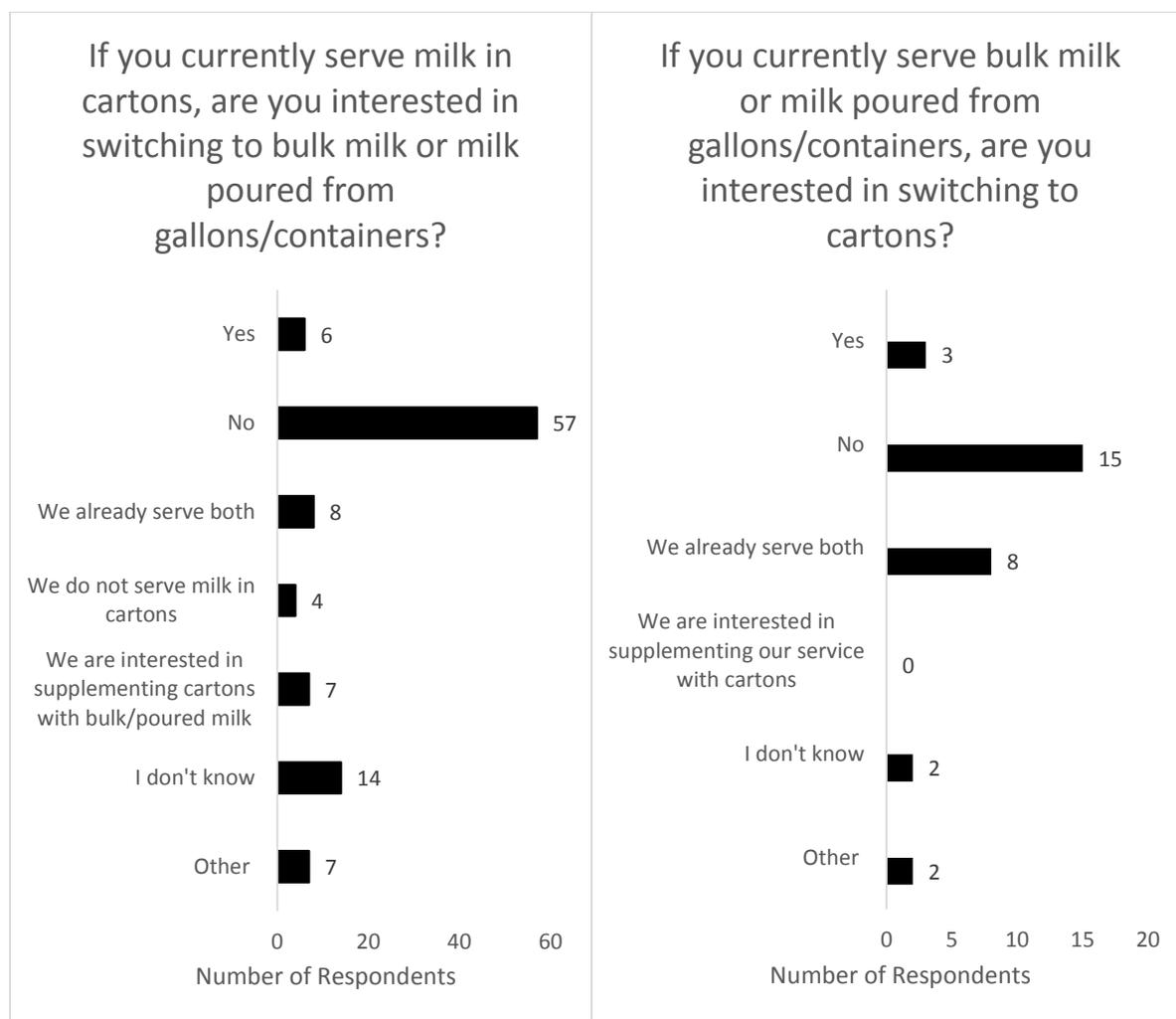


Figure 5. Interest in switching to bulk milk service (90 responses, 7 skipped, 4 N/A).

Figure 6. Interest in switching to carton milk service (29 responses, 42 skipped, 30 N/A).

While only 6 participants (6%) are interested in switching entirely to bulk dispensers, nearly a quarter of respondents are interested in supplementing milk carton service with bulk dispenser service of maple, chocolate, or plain milk. All participants who are interested in switching entirely to bulk are also interested in either offering bulk flavored milk or supplementing their current carton sales with bulk plain milk. Figure 7 (below) indicates that of those who are interested in integrating bulk milk into their meal programs in some form, more respondents are interested in serving bulk maple and/or chocolate milk than serving bulk plain milk, so long as the flavored milks are compliant with fat content standards and offered by a distributor.

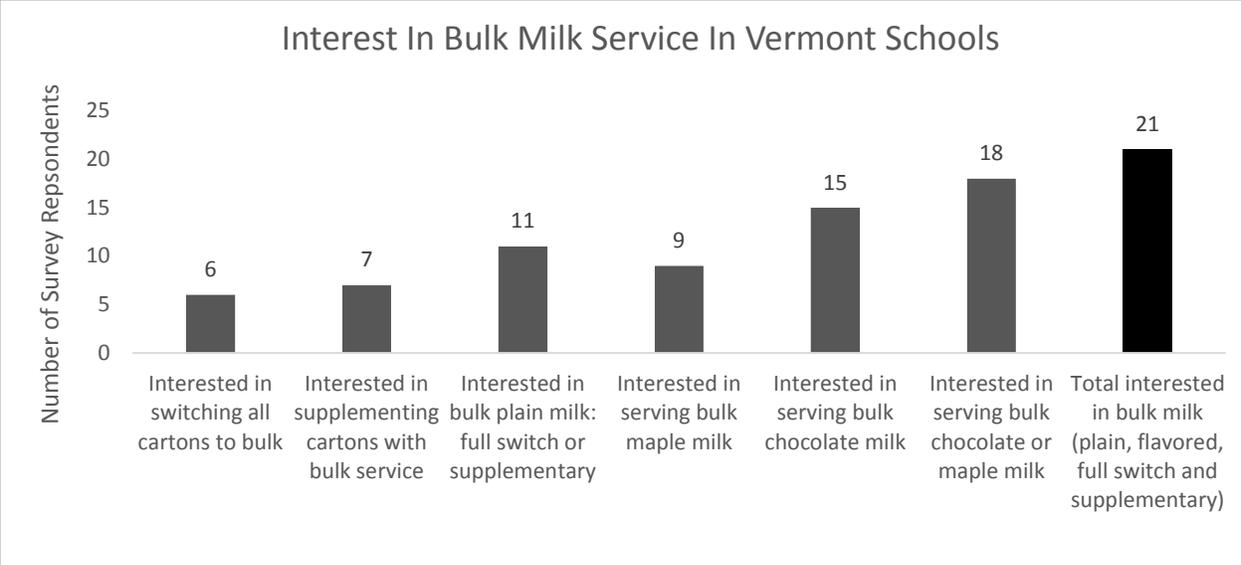


Figure 7. Interest in bulk milk service (data pulled from multiple questions, 94 respondents, 7 skipped).

The graph below shows that participants that either currently serve bulk plain milk or are interested in introducing bulk milk service are more interested in bulk flavored milk options than the general sample. This pattern is particularly pronounced with bulk chocolate milk. Respondents who currently serve bulk plain milk or are interested in serving bulk plain milk are two and a half times more likely to be interested in bulk chocolate milk than the general sample. This indicates that there could be opportunities for targeted marketing of bulk flavored milk for schools that already serve bulk milk or are seeking transition to bulk milk service. In total, 21 participants (22%) are interested in pursuing additional bulk milk opportunities in their school’s meal program.

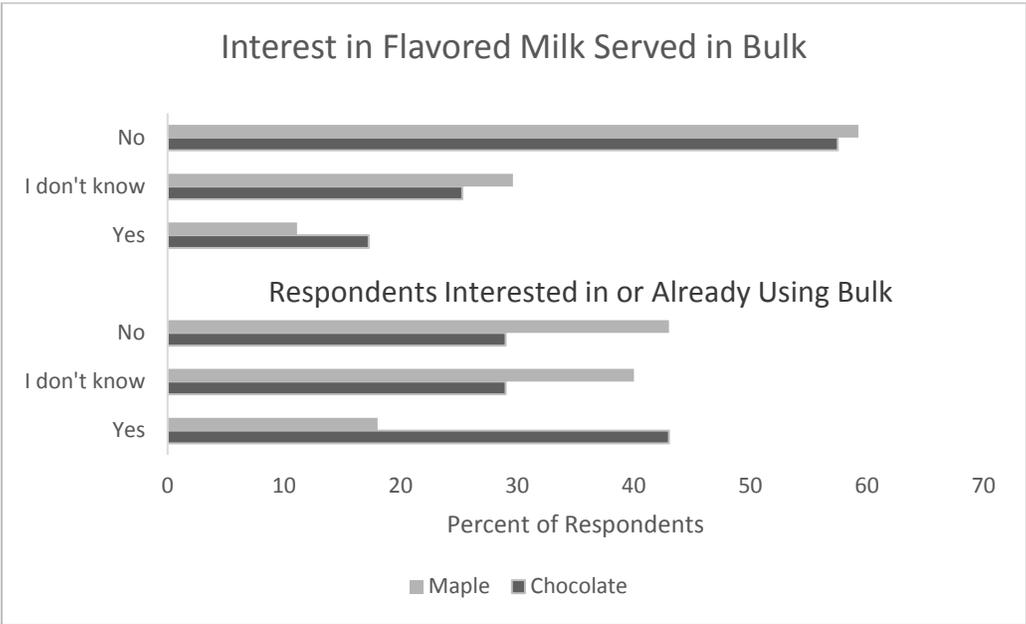


Figure 8. Interest in flavored milk served in bulk among the general sample in comparison to the respondents who expressed interest in switching to bulk service or are already serving plain milk in bulk (89 respondents, 12 skipped).

Market Opportunities for Bulk Milk Suppliers

The table below breaks down survey respondents' interest and engagement in bulk milk by county. This table can help suppliers identify potential markets near their existing accounts and processing facilities. If you are seeking additional information about schools to connect within a particular county, please contact the Farm to School Program at the Vermont Agency of Agriculture, Food and Markets.

Table 1. School Food Service Interest in Bulk Milk by County

County	Respondents whose institution or company already serves bulk milk	Interest in bulk milk (switch, supplement, flavored, and plain)*	Interested in switching entirely to bulk service	Want to supplement current serving method with bulk plain milk	Interested in bulk chocolate milk	Interested in bulk maple milk
Addison	1	1	1	1	1	1
Bennington	1	1	0	0	1	0
Caledonia	1	1	0	0	1	0
Chittenden	1	5	2	1	3	3
Franklin	0	1	1	1	1	0
Lamoille	3	1	0	0	1	1
Orange	1	2	0	0	1	1
Orleans	0	1	1	1	1	0
Rutland	3	2	0	0	2	0
Washington	0	3	0	2		1
Windham	1	2	1	1	2	1
Windsor	1	1	0	0	1	1
Total	12	21	6	7	15	9

Table 1. Interest in bulk milk service by county (data pulled from multiple questions, 94 respondents, 7 skipped).

*Starred column represents total respondents per county interested in pursuing bulk milk service, which aggregates data from the gray columns (on the right side of the table) about which particular bulk milk opportunities respondents are interested in.

One-third of survey respondents answered, “I don’t know” when asked of their interest in purchasing plain, maple, or chocolate milk in bulk, indicating a high level of uncertainty around switching from cartons to bulk milk. This uncertainty may be due to a lack of information about bulk milk service, unwillingness to commit to a decision, or mere indifference to the topic. We cannot determine the significance of the large number of “I don’t know” responses without reaching out to survey respondents directly for more information. Staff from Vermont Farm to School program will follow up with these respondents to understand where the uncertainty comes from and provide them with the 2016 VAAFAM report “*Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies*” to help schools make informed decisions about milk service.

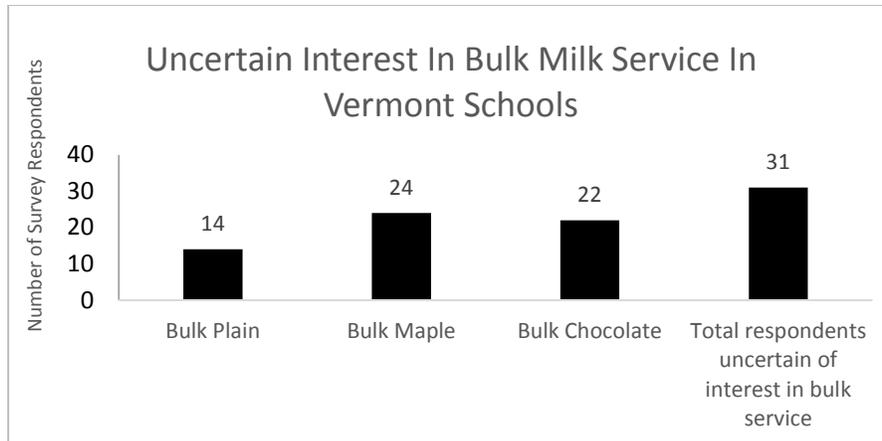


Figure 9. Number of respondents that responded “I don’t know” regarding their interest in different varieties of milk served in bulk (94 respondents, 7 skipped).

High levels of uncertainty coupled with higher levels of interest in supplementary bulk milk compared to a full switch to bulk milk might reflect a reluctance to make drastic changes to milk service programs among schools selling milk cartons. Bulk milk suppliers seeking opportunities with schools could develop marketing strategies that clearly communicate the benefits of bulk milk service and assist schools in transitioning from cartons to bulk service. VAAFMT would provide the “Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies” (2016), to all bulk milk suppliers as a potential outcome of this marketing strategy. This high level of uncertainty also suggests a need for general outreach and education to schools, regarding this topic.

Financial Considerations in Milk Procurement

On average, this survey shows no difference between the costs of buying milk in bulk versus cartons. There appear to be slight cost savings for schools pouring milk from gallon jugs, but the number of schools exclusively using this method is very low (3 schools) and thus we are unable to make inferences about costs of serving milk in gallon jugs at all Vermont schools. While research on schools in Vermont and in other states demonstrates cost savings in switching to bulk milk service, there are many factors that could contribute to the lack of price variation in our results.

One important financial consideration is the purchasing volume of the institution or company. Figure 2 (page 4) shows that most respondents purchasing cartons only purchase much higher volumes of milk than those serving milk exclusively through other service methods (bulk-only or gallon jugs only). These larger volume purchasers might experience economies of scale that enable lower milk carton prices than small schools are able to obtain. Since the respondents who serve bulk milk only represented relatively small school meal programs, we cannot assess how larger school meal programs that switch to bulk service might benefit from economies of scale.

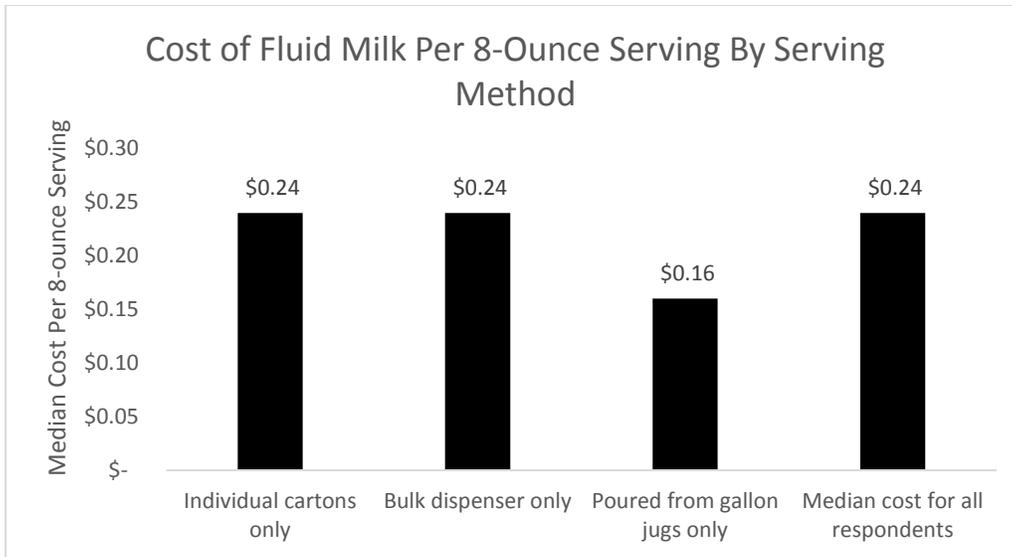


Figure 10. Cost per 8-ounce serving of milk by serving method (79 respondents, 22 skipped). 58 school representatives serve milk entirely in cartons, 4 school representatives serving only bulk milk, and 2 school representatives serving only with gallon jugs responded to this question. Note: One respondent solely serves milk in individual bottles through their meal program; this respondent is not represented in the figure. The median is used as a measure of central tendency instead of mean because data contains outliers.

The results from VAAFM’s survey do not show variation in price between bulk and carton milk. However, other research conducted in Vermont schools and in schools outside of Vermont suggests long-term cost-savings with the use of bulk milk service due to lower prices per 5-gallon bag, minimized waste, and increased milk consumption (Berkfield, 2016; Larsen, 2014; Mace, 2016; Recycling Association of Minnesota, n.d.). For example, one study comparing milk costs for 10 Vermont schools shows an average cost of \$0.25 per 8-ounce serving for bulk milk and \$0.35 per 8-ounce serving for milk in cartons (Berkfield, 2016). While there are cost-savings involved with the use of bulk service, there are also up-front costs including cups, bulk milk dispensers, and dishwashing equipment. For more information on the financial considerations of milk serving methods, reference the 2016 report, *“Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies”*.

Milk Requirements

Most Vermont schools participate in federal programs that provide reimbursement based on student demographics and meal participation rates. Schools that participate in Federal Child Nutrition Programs must meet nutritional requirements for all food served, including milk. The National School Lunch Program (NSLP) is a program that almost all Vermont schools participate in that serves to provide school children nutritionally balanced, low-cost or free lunches. Nationally, over 30 million children benefit from this program each day (United States Department of Agriculture, 2016). The National School Breakfast Program (SBP) operates in the same manner as the NSLP and serves 13.5 million children each day (United States Department of Agriculture, 2017). School breakfasts and lunches under these programs must meet the meal pattern and nutrition standards based on the latest Dietary Guidelines for Americans.

Almost all (98 percent) of the survey respondents participate in one of the federal school meals programs which have requirements on milk variety and fat content. These standards are important to understanding market opportunities for types and quantities of milk in Vermont schools. These programs require that elementary, middle, and high schools offer 8-ounce portions within the meal pattern, while in middle and high schools up to 12-ounce containers can be sold a la carte (Food and Nutrition Service, 2015).

National School Lunch (NSLP) and National School Breakfast (SBP) programs require plain milk to be fat-free or low-fat (1% milk fat or less). On May 1st, 2017, a proclamation by the United States Department of Agriculture Secretary Perdue expanded all national school meals programs to allow schools to serve 1% flavored milk (i.e. chocolate, strawberry, or maple), and this change is going through the regulatory process. Prior to this proclamation, schools could only serve fat-free versions of flavored milk. Though permitted, the Vermont Agency of Education is not yet offering schools waivers to serve 1% flavored milk. Schools also have the option to offer lactose-free and reduced-lactose milk (fat-free and/or low-fat). For the NSLP and SBP, the variety requirement states that schools must serve at least two choices of milk, which can be accomplished by offering different allowable fat levels (fat-free and low-fat) and milk flavor (Food and Nutrition Service, 2012).

Milk fat content requirements for the Summer Food Service Program are less restrictive. Allowable beverages for the Summer Food Service Program include whole milk, low-fat milk, skim milk, and buttermilk, so long as milk is fluid, pasteurized, and meets applicable state and local standards. If milk from a Vermont producer doesn't meet the NSLP or SBP fat content requirements, one could consider seasonal partnerships with schools that offer Summer Food Service because the summer program allows for more flexibility in milk fat content.

Child and Adult Care Food Program (CACFP), which benefits childcare programs and senior care programs, has variable regulations based on the age of the participant. Plain milk, lactose-free milk, buttermilk, or acidified milk must be low-fat or fat-free for consumers two years old and older, and for adults. For children 1-5 years old, flavored fluid milk is not allowed. For children 6 years and older, and for adults, flavored milk must be fat-free.

Figure 11 shows the variety of federal programs survey respondents participate in. Most respondents participate in NSLP and NSBP.

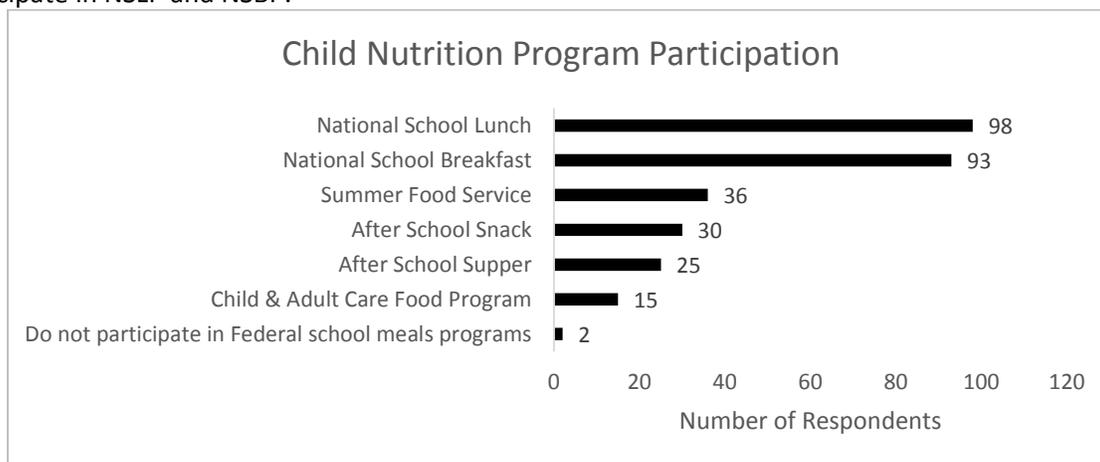


Figure 11. Child Nutrition Program participation (101 respondents).

Milk Variety and Vermont-Branded Milk

1% plain and fat-free chocolate milk are the most commonly served varieties of milk across all school respondents. Of the few schools serving 2% milk and whole milk, most report selling milk a la carte (outside of meal pattern), which allows for more flexibility in milk fat content, flavors, and size portions.

Due to the requirements of the federal school meals programs, there is a demand for low-fat and fat-free milk of 8 and 12-ounce portions. Some respondents commented on the demand for fat-free flavored milk, observing that the taste improvements from flavored milk are an effective way to get the essential nutrients that milk provides to more school children.

Milk is a regional product and Vermont produces 63% of the milk in New England, so almost all milk served in Vermont schools is supplied, in part, by Vermont dairy farmers. However, some respondents expressed that they are seeking increasing source identification for their milk purchases. This indicates an interest in increased sourcing of Vermont-branded milk. These respondents reported having difficulty finding Vermont-branded milk products that also meet federal nutrition standards. Producers, bottlers, and distributors might consider connecting directly with schools to make schools fully aware of milk options or reaching out to partners and resources like School Nutrition Association, The Vermont Agency of Education's Summer Food Service Institute, and regional food hubs to market their products. School food service managers would likely be interested in source-identification projects to highlight farms near schools, or at least those within the state of Vermont, that are producing milk that is consumed in the school.

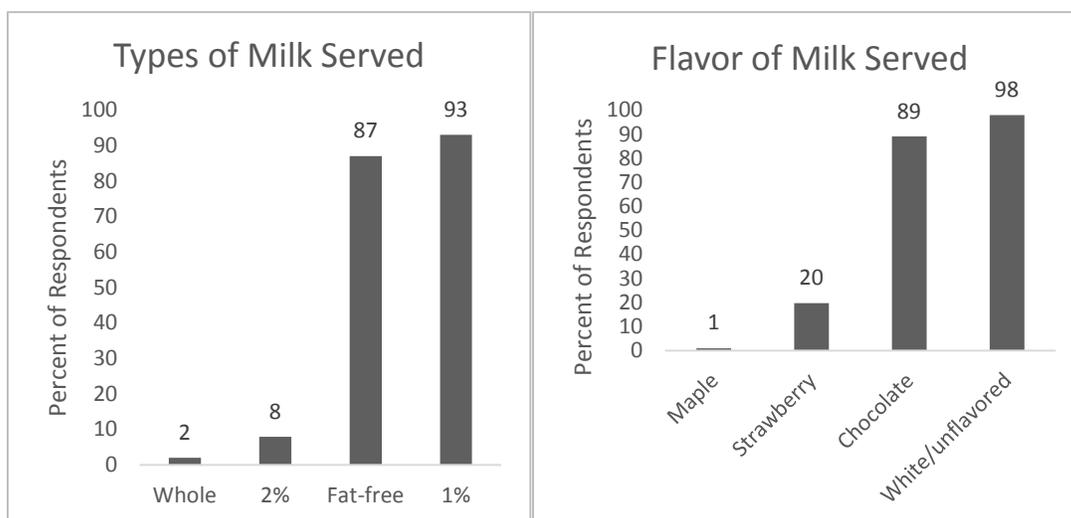


Figure 12. Types of milk served (101 respondents). Figure 13. Flavor of milk served (101 respondents).

Special label milks

All milk served in the sampled Vermont Schools is rBST-free, but not all school food service managers are aware that the products they serve are rBST-free. Over a third of school representatives serve at least one kind of special label milk (lactose-free, dairy-free, non-GMO, or organic). No raw milk, grass-fed milk, or ultra-high temperature processed (UHT) milk is served in any of the schools sampled. Lactose-free milk and alternative soy/nut/rice beverages are the most popular special label milks served by respondents. Half of the respondents who sell special label milk also sell milk a la carte. Since special

label milks are generally more expensive than conventional fluid milk, half of the schools selling special label milk might sell it separately from the meal pattern to charge a slightly higher price.

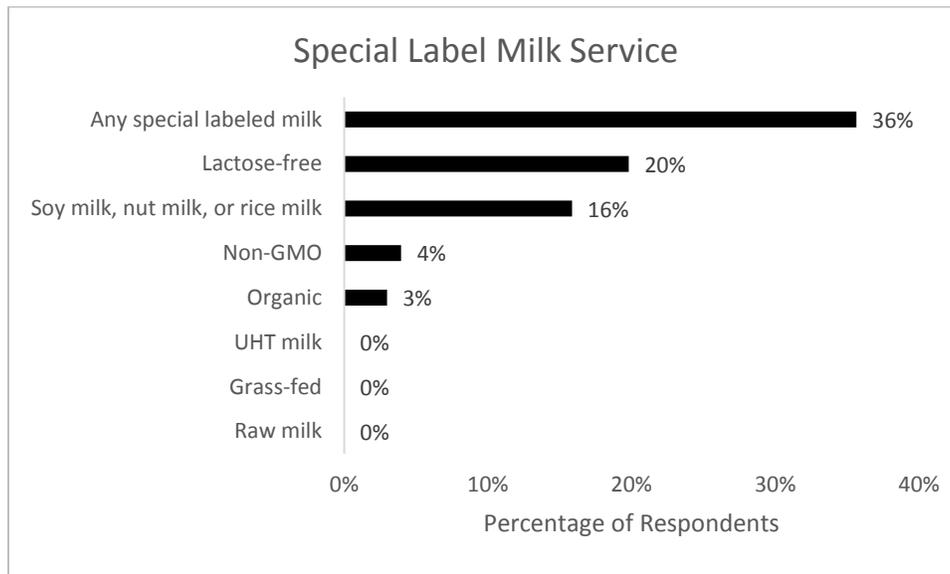


Figure 14. Percentage of respondents that sell special label milks (101 respondents).

Equipment

Since VAAFM began offering milk cooler grants, there is strong evidence suggesting inadequate cooling equipment poses significant barriers to milk service in Vermont schools. Many school food service managers reported in milk cooler grant applications of repeatedly spending money on repairing old milk coolers, having difficulty finding funds for a new cooler, having old models that were difficult or even dangerous to use, or having coolers that were not properly temperature controlled, which lead to wasted milk. As a result, VAAFM has made a strong commitment to continue financial assistance through the Vermont Farm to School Equipment Grant, given the clear need for this basic equipment. Between 2015 to 2018, \$39,410 was allocated to 39 schools to support their purchasing of new milk coolers.

Most respondents do own a milk cooler, but some report that their cooler is too old, no longer works properly, or is not suitable for their space. Few respondents lease a milk cooler from their milk distributor, and a few others do not have a dedicated cooler for milk.

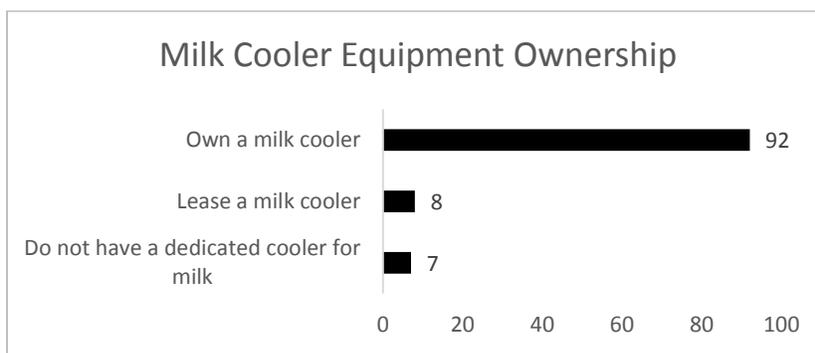


Figure 15. Milk cooler equipment ownership (101 respondents). Some respondents indicated that they both own and lease milk coolers and some selected both due to uncertainty about their cooler's ownership status.

VAAFMs Farm to School Grant Program makes the process of acquiring milk coolers more feasible for schools through grants for new milk coolers but need for proper milk service equipment is greater than the resources available. While most Vermont schools own their milk refrigeration equipment, it might be more financially feasible to rent equipment to reduce capital expenses and not be responsible for repairs and upgrades. For schools interested in serving bulk milk, a bulk milk dispenser lease can reduce the upfront costs of transitioning to bulk milk service. The companies that serve only Vermont-produced milk do not serve milk in cartons, but serve milk in bulk milk dispensers, gallon jugs, and individual bottles. By providing bulk milk dispenser leases and making bulk milk dispensers more accessible, distributors can help meet demand in schools for Vermont-branded milk. Milk distributors might consider discussing potential equipment leases with schools that have outdated or aging milk coolers to improve the quality and quantity of milk that schools can serve.

Conclusion

The purpose of the information presented in this report to better inform milk processors, bottlers and distributors about the regulatory, financial, and infrastructure constraints that shape how schools serve milk. Almost all schools that participated in the survey were part of a federal meals program, which restricts the variety of milk they can purchase and serve students. The Vermont dairy industry might want to consider partnering with schools to ensure a supply of milk that meets federal and state nutritional requirements on size, fat content and milk variety. Since summer Food Service program requirements for fat content are less restrictive than National School Lunch Program (NSLP) or School Breakfast Program (SBP) requirements, it may also be more feasible to consider developing seasonal partnerships with schools that offer Summer Food Service.

This report shows that most Vermont schools are serving milk in individual cartons. Primary challenges with milk cartons relate to higher levels of waste, and the additional labor required with bulk milk is a challenge for schools using bulk milk service. While there is not much interest among school food service managers in switching entirely to bulk milk service, many respondents are interested in supplementing milk carton service with bulk dispenser service. Nearly one-fifth of survey respondents currently serve milk using multiple methods (i.e. both in cartons and in bulk). There is interest in fat-free bulk chocolate milk that can be available through convenient distribution channels. Milk producers and distributors selling bulk chocolate milk should target schools that currently serve plain bulk milk because representatives from these schools are more likely to be interested in bulk chocolate milk. These findings point both to an opportunity for bulk market growth and chocolate milk market growth.

Many respondents indicated that they were uncertain of their interest in bulk milk opportunities. VAAFMs staff will follow up with schools to provide information on making informed decisions about milk service methods. This could also be an opportunity for the dairy industry to increase outreach and education for schools regarding bulk milk.

This report also demonstrates that most schools own milk coolers. The need for new milk coolers is a challenge for Vermont schools, regardless of how they serve milk. The cost of procuring a refrigerated bulk milk dispenser may be a major barrier in considering a switch from individual milk cartons. Milk distributors might find market opportunities in leasing bulk milk dispensers to schools to reduce the capital costs of new equipment purchases.

Finally, this report identifies the need to further engage milk distributors in Vermont school milk service. Some respondents expressed that they want to serve more Vermont-branded milk but reported having

difficulty finding options that meet the size and nutrition standards required. Milk distributors might benefit from connecting directly with schools to uncover new branding opportunities. Additional resources for helping Vermont's milk service industry connect with schools are School Nutrition Association, Summer Institute of the VT Agency of Education, Vermont Agency of Education Child Nutrition Programs, regional food hubs, and potential dairy matchmaking events organized by the Vermont Agency of Agriculture, Food, and Markets. Dairy industry leaders can help schools maximize their purchases of Vermont-branded milk by encouraging schools to seek buying clubs and aggregation entities, such as food hubs, which can purchase in larger volumes to utilize economies of scale. Through collaboration and networking, Vermont dairy businesses can identify new market opportunities, increase milk consumption for students, and support the Vermont economy by improving milk service in Vermont schools.

Appendix

Survey Questions

1. How do you serve milk in your school? Choose all that apply. If you represent a school food authority (SFA) please answer the following questions for your SFA instead. Options: individual cartons, bulk milk coolers, milk from gallon jugs poured into glasses/ cups, we do not serve milk, individual bottles, don't know, other.
2. What type of milk do you serve? Choose all that apply. Options: fat-free, 1%, 2%, whole, I don't know, other.
3. How many students does your school serve meals to on a daily basis?
4. Do you own a milk cooler? Choose all that apply. Options: yes, we own a milk cooler; yes, we own a cooler for cartons/cases; yes, we own a glass door merchandising cooler; no, we lease a bulk milk cooler; no, we lease a cooler for cartons/cases; no, we lease a glass door merchandising cooler; no, we do not have any dedicated cooler(s) for milk; I don't know; other.
5. What flavor(s) of milk do you serve? Choose all that apply. Options: white/plain; chocolate; strawberry; maple; coffee; I don't know; other.
6. Which brand(s) of milk do you serve? Choose all that apply. Contact info for each supplier is included in case you wanted to reach out to a specific one with questions, comments or inquiries. Options: Hood 800-662-4468 <https://hood.com/connect/contactus>; Monument Farms Jon Rooney 802-545-2119 https://www.facebook.com/MonumentFarmsDairy/?ref=page_internal; Thomas Dairy Abbey Thomas 802-773-6788 <http://www.thomasdairy.com/>; Garelick Farms 781-599-1300 <http://garelickfarms.com/contact-us>; Kimball Brook Cheryl Devos 802-482-6455 <http://www.kimballbrookfarm.com/>; Booth Bros. Jerry Booth 802-476-6605 <http://boothbrosdairy.com/>; I don't know; other (please specify).
7. Are you currently purchasing any of the following special label milks? Choose all that apply. Options: organic; non-GMO; rBST-free; UHT milk; Grass-fed; Lactose-free; raw milk; Alternative milks, such as soy milk, nut milk, or rice milk; Other (please specify).
8. What company or companies deliver the milk you serve? Choose all that apply. Hood; Thomas Dairy; Monument Farms; Reinhart; Sysco; Black River; I don't know; Other (please specify).
9. On average, what do you pay per fluid ounce of milk?
10. If you currently serve milk in cartons, are you interested in switching to bulk milk or milk poured from gallons/containers? Options: yes; no; we already serve both; we do not serve milk in cartons; we are interested in supplementing cartons with bulk/poured milk; I don't know; other (please specify).
11. If you currently serve bulk milk or milk poured from gallons/containers, are you interested in switching to cartons? Options: yes; no; we already serve both; we do not serve milk bulk/poured milk; we are interested in supplementing bulk/poured milk with cartons; I don't know; other (please specify).
12. If it was offered in bulk, would you be interested in serving... chocolate milk compliant with fat content (yes; no; I don't know); maple milk compliant with fat content (yes; no; I don't know).
13. If you serve milk in cartons, what challenges do you face with serving milk this way? Options: Recycling unavailable for cartons; Leftover milk in cartons; Storage; Composting; Holding milk

- temperatures consistent; Serving size too large; Students opening cartons; Delivery; Variety; None; Other (please specify).
14. If you serve bulk milk or milk poured from gallons/containers, what challenges do you face with serving milk in this way? Options: Spills; Labor serving milk; Managing portion sizes; Tipping over trays; Washing serving containers/glasses/cups; Meals in the classroom; Availability of compliant fat content milk; Storage of serving containers/glasses/cups; Availability of desired flavors; Recycling unavailable for cups; Milk temperatures; Other (please specify).
 15. Is milk served as a 'competitive food' (a la carte or in a vending machine or at a school store) in your school? If so, please specify. Options: yes; no; I don't know.
 16. Which Child Nutrition Programs does your school participate in? Choose all that apply. Options: National School Breakfast; National School Lunch; Summer Food Service; After School Snack; After School Supper; Child & Adult Care Food Program; We do not participate in Federal school meals programs but do serve meals; We do not serve meals at all; I don't know; Other (please specify).
 17. What type of organization do you represent? Options: a school; a school food authority; other (please specify).
 18. What is the name of the organization that you represent (optional)?
 19. What is your role/title? Options: Food Service Manager; School Administrator; Farm to School Coordinator; School Nurse; School Food Authority Representative; CACFP Director; Summer Program Coordinator; Other (please specify).
 20. What county is your school (or other organization) in? Addison; Bennington; Caledonia; Chittenden; Essex; Franklin; Grand Isle; Lamoille; Orange; Orleans; Rutland; Washington; Windham; Windsor.
 21. If you represent a school, what district/SU is your school in?
 22. What grades does your school (or SFA) serve?
 23. Please, share any other additional information you would like us or dairy stakeholders to know.

References

Berkfield, R. (2016) Vermont bulk milk. Paper presented to Vermont Agency of Agriculture, Food & Markets.

Energy Summit.

Retrieved from <http://www.youthenergysummit.org/wpcontent/uploads/2008/09/Bulk-milk-dispenser-report-7-21-2014.pdf>.

Food and Nutrition Service. (2015) *Offer Versus Serve Guidance for the National School Lunch Program and the School Breakfast Program*.

Retrieved from https://www.fns.usda.gov/sites/default/files/cn/SP41_2015a.pdf

Food and Nutrition Service. (2012) *Federal Register / Vol. 77, No. 17 / Thursday, January 26, 2012 / Rules and Regulations*.

Retrieved from <https://www.gpo.gov/fdsys/pkg/FR-2012-01-26/pdf/2012-1010.pdf>

- Larsen, K. (2014). Bulk milk dispenser review: A case study at New London-Spicer High School. Youth Energy Summit. Retrieved from <http://www.youthenergysummit.org/wpcontent/uploads/2008/09/Bulk-milk-dispenser-report-7-21-2014.pdf>.
- Mace, R. (2016). Elementary school milk audit. Paper presented to Vermont Agency of Agriculture, Food & Markets.
- Office of Disease Prevention and Health Promotion. (2015) *Scientific Report of the 2015 Dietary Guidelines Advisory Committee*. Retrieved from <https://health.gov/dietaryguidelines/2015-scientific-report/06-chapter-1/d1-2.asp>
- Recycling Association of Minnesota. (n.d.) Bulk milk dispenser review [PowerPoint slides]. Retrieved from https://recycleminnesota.org/wp-content/uploads/2014/10/MilkDispensors_MFairbourne-PreConf2014.pdf.
- Roche, E., Becot, F., Kolodinsky, J., Conner, D. (May 2016). *Economic Contribution and Potential Impact of Local Food Purchases Made by Vermont Schools*. Retrieved from <http://agriculture.vermont.gov/sites/ag/files/PDF/Economic%20Contribution%20of%20Farm%20to%20School%20in%20Vermont%20.pdf>
- United States Department of Agriculture. (2016) *National School Lunch Program*. Retrieved from <https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program.aspx>
- United States Department of Agriculture. (2017) *School Breakfast Program*. Retrieved from <https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/school-breakfast-program/>
- United States Department of Agriculture. (2015) *Dietary Guidelines for Americans 2015-2020*. Retrieved from <https://health.gov/dietaryguidelines/2015/guidelines/>
- Vermont Agency of Agriculture, Food and Markets. (2016) *Milk Service in Vermont Schools: Decision Making Criteria, Best Practices and Case Studies*. Retrieved from <http://agriculture.vermont.gov/sites/ag/files/Milk%20Cooler%20Report.pdf>
- Vermont Dairy Promotion Council. (2015) *Milk Matters*. Retrieved from http://vermontdairy.com/wp-content/uploads/2015/12/VTD_MilkMatters-Brochure_OUT-pages.pdf

Vermont Department of Environmental Conservation. (2015). *School Recycling Scorecard* [Data file]. Retrieved from <http://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Universal-Recycling/School.Recycling.Scorecard.2015.xlsx>