

Current Dairy Education Activities in Vermont for Middle and High School Age



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Scope of the report

This report covers middle and high school age dairy education activities currently being offered in Vermont through the Vermont Future Farmers of America (FFA), Vermont 4-H, Vermont career and technical education centers (CTEs), Vermont public and independent schools, and other non-school-based programs, as well as curriculum and resources available nationally for this target age group.

Data collection

An online survey was created covering the following aspects of dairy education activities: Description, Location (geographic distribution), Type of activity, Frequency, Number of students served, and Student ages.

A brief invitation and link to the survey were distributed via:

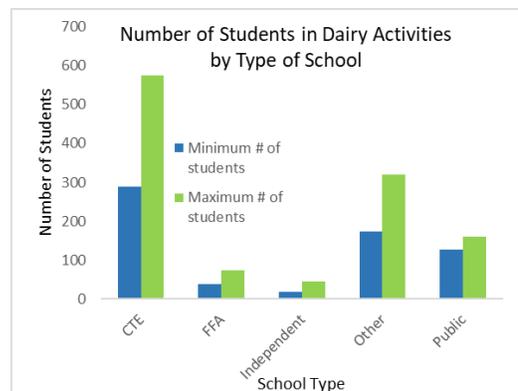
- Direct emails to instructors in Agriculture / Natural Resources and Culinary Arts at all 17 CTEs and to the listed contact person at all 262 Vermont schools
- Multiple postings to: Vermont Agency of Education's Weekly Field Memo Courtesy Postings, Vermont Agency of Education Work-Based Learning listserv, Vermont Farm to School listserv, Vermont Farm to School Network newsletter
- Facebook postings to 2 pages with total of about 2000 followers

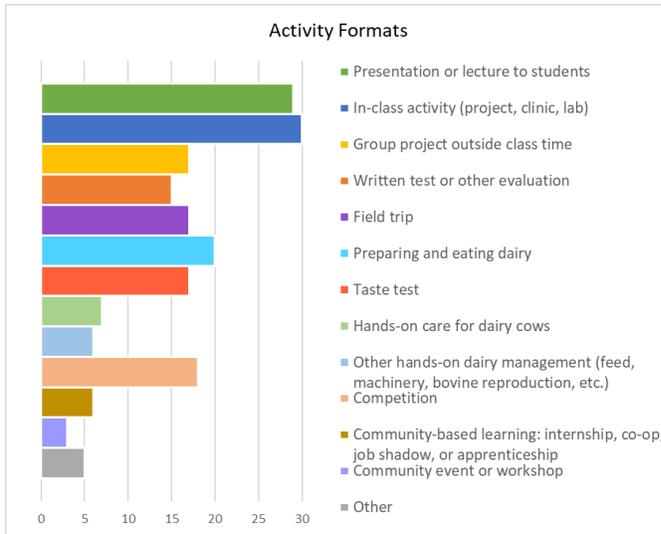
Summary of responses

19 CTE instructors, representing 13 different CTEs, provided details on 90 instances of dairy-related educational programming. CTE instructors and Vermont FFA's Executive Director provided information on FFA activities both by email and in conversation. Vermont 4-H County Educators provided information on club and regional activities. Responses were received from only five public schools and two independent schools (this year's unique challenges are described under Conclusions). Three other educational programs provided information. Because of these response proportions, it should therefore be kept in mind that this report focuses heavily on dairy education taking place in the CTE realm.

Many different dairy education activities are currently offered in Vermont, including anything from making cheese to farm field trips to veterinary science.

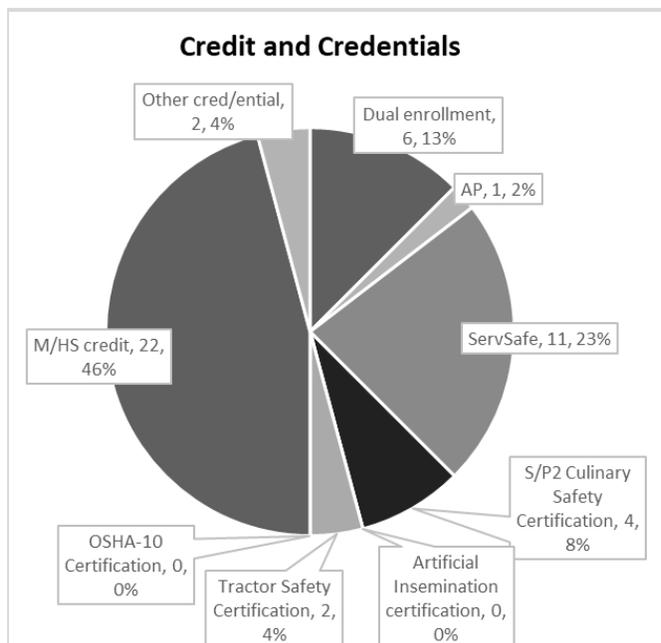
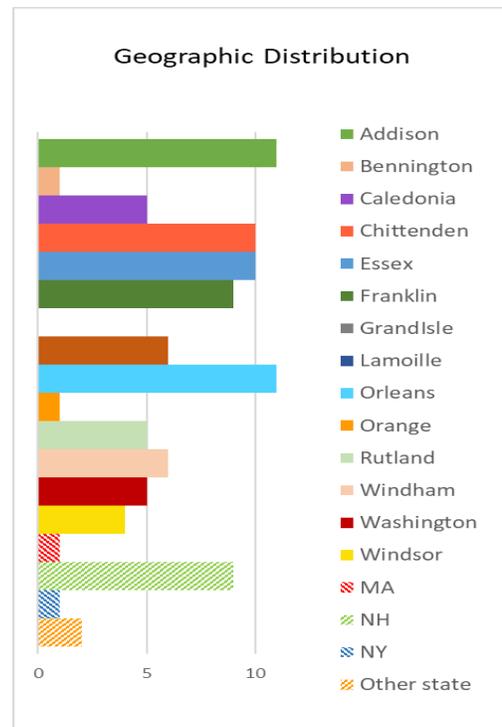
Activities involving a total of at least 645 and not more than 1185 student participants are represented. (Respondents were asked to indicate an approximate range of how many students participated.)





The most common type of activity takes place in the classroom, either as lecture/presentation or as an in-class activity such as a project or lab (most often preparing and/or eating dairy). Competitions, both team-based and individual, are the next most frequent. Most activities in or out of the classroom include a written test or other evaluation component. Field trips are also common, whether to working farms, cheese making facilities, or colleges that offer dairy education.

Educators working in every Vermont county except Grand Isle responded. Note that since CTEs serve more than one county, or even across state lines, this does not necessarily match up with school locations. That said, Addison, Orleans, Chittenden, and Essex Counties appear to have the most active dairy education programming.



A variety of credentials and school credits are being earned through dairy education. Most activities are associated with middle or high school credit. CTE Culinary programs include ServSafe certification and two offer an additional credential through the National Restaurant Association. Several programs offer dual enrollment, most often with VTC's Livestock Production program.

Vermont FFA

According to the Vermont FFA Foundation, “there are more than 500 youth enriched by FFA programs in Vermont,” which includes classroom activities within the CTE system. This year, between 38-75 students (from CTEs around the state as well as homeschooled youth) participated in FFA competitive events.

FFA is a national agricultural education association for middle and high school students. Founded as the Future Farmers of America, the name was changed to reflect the growing diversity of agriculture. Vermont FFA is the State organization for students of agricultural education, organized by school chapters. The incoming Co-Executive Directors, Johnathon Mason and AnnaJo Smith, have divided the state into four regions, with the slate of officers to be represented by two students from each region.

FFA members compete in Career Development Events (CDEs) that demonstrate their ability to apply classroom knowledge to real-life situations. For example, Dairy Cattle Evaluation and Management CDE includes six classes of dairy cattle, herd record evaluation and dairy management team activity. The competitions are staged at the state level and winners are eligible to represent Vermont at the events held at the FFA National Convention.

During FFA Day at the annual Vermont Farm Show in January, the dairy-related CDEs include Milk Quality Judging and Poster events (on various topics), as well as visiting the agricultural displays. At the annual state convention in May, the dairy-related competitions include Farm Tractor Safety, Dairy Handling and Judging, Ag. Mechanics, and Business Management. Each CDE has a handbook of the procedures, judging rubrics, and other details of these events.

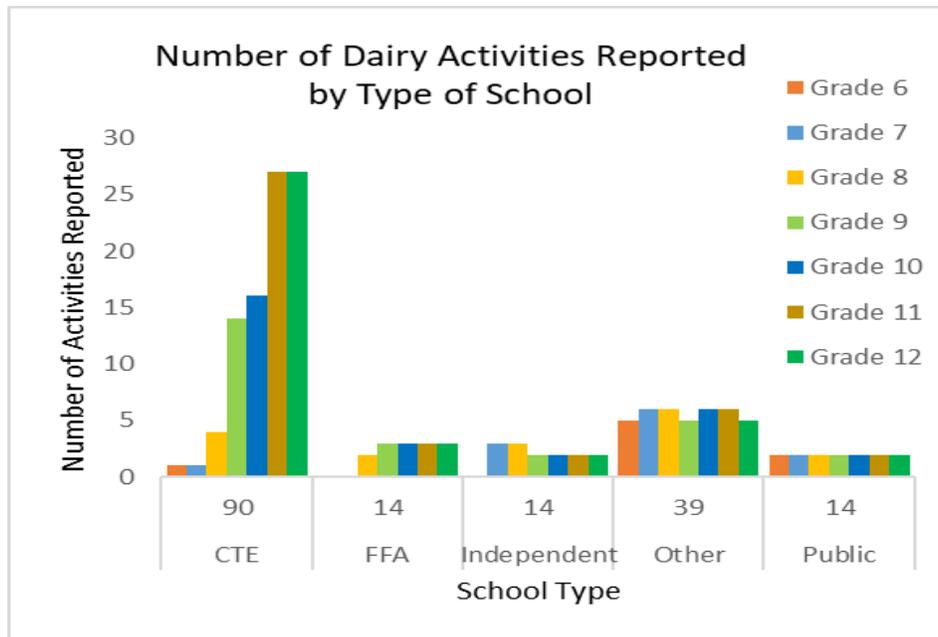
Information sources: phone and email communications with Suzanne Buck, Executive Director (former); survey responses from and/or conversations with CTE instructors, some of whom are FFA advisors and/or members of the Vermont Ag Teachers Association; websites of Vermont FFA, Vermont CTSO, Vermont Ag Teachers Association, and individual CTE centers.

Vermont 4-H

181 youth in grades 6-12 were enrolled in an active Dairy project during the 2019-20 4-H year.

Each 4-H member undertaking a Dairy project cares for at least one animal (owned or leased/loaned) and uses a record book to track related labor, expenses, health, growth, production (lactation and calving), as well as their own learning goals and reflections.

In addition to or alongside club membership, 4-H offers dairy-related activities at the county, regional, state, and national levels. A few events are open to youth who are non 4-H members, though most are club-related events. Events include clinics, quiz bowls, shows, and judging contests.



Vermont Career and Technical Education (CTE)

Between 288-585 students participated in CTE dairy education, with the majority in grade 11-12 and about half that number in pre-tech programs in grade 9-10, plus a few students in grade 6-8 (in a health & nutrition class at a small 7-12 school which includes CTE).

Agriculture programs that are active in FFA competitions appear to be the most consistent in providing dairy education, with variations on topics and activities. Several programs are taught by dairy farmers who incorporate their own experiences and resources into the class.

Culinary programs appear to be the most consistent in cooking with dairy, although specific dishes and practices differ, and some Agriculture programs include a taste test or cheese making. Most tech centers have a student-run restaurant in some form.

CTE activities frequently include FFA competitions (CDEs) and classes also cover topics like veterinary science, manure management, and agribusiness.

Vermont high schools and middle schools

Activities reported by the responding teachers illustrate the breadth and variety of school-based, dairy-related education in Vermont:

In a Caledonia County high school class on Engineering Sustainable Systems, around a dozen students in grades 9-12 visited dairy farms in conjunction with learning about animals as part of food and natural systems. The same teacher also mentioned a project-based Family

and Consumer Science class in the middle school, where the inclusion of dairy depends on interest and enrollment.

At a K-8 school in Franklin County, the Fuel Up to Play 60 program coordinator is also a classroom teacher and a farmer. The program, which serves over 100 students, focuses on healthy nutrition and exercise habits through activities including in-class activities, group projects, field trips, taste tests, and competitions.

At a school in Rutland County serving incarcerated youth, a summer math and science class reached 8 students in grades 7-12. Through the processes of making cheese and ice cream, students also learned about the conservation of mass by exploring environmental factors that can impact the coagulation of milk.

A high school Biology teacher involved about 25 students in the following two classes. In AP Biology, students took a farm tour of the teacher's own Addison County family dairy farm "to highlight the many aspects of the Biology curriculum that apply to dairy farming (cellular respiration/fermentation for silage production; genetics in ruminant physiology; biotech in crops, behavior science in herd management, etc.)"

In the same teacher's class on "Biology of Food," students undertook a project called "Controversial Topics in Agriculture." They chose a topic, investigated both sides of the issue which included a visit to several dairies to directly interview the farmers about their topic, then presented their research and their own personal opinion based on their research.

During a middle school science class that reached about 15 students in grades 7-8 in Orleans County, the class visited agricultural businesses to focus on "the science of food and water." These included Butterworks Dairy, Vermont Compost, and Green Mountain Girls Farm.

In a special education program in Franklin County, a teacher (who is also a farmer and the Farm to School coordinator) led their 6th-8th grade students in a project to create a farm directory of their community. They defined what a farm is and looked up location and contact information for local farms.

A Science teacher in Chittenden County worked with Shelburne Farms' Cheese Team to demonstrate carbon cycling for more than 50 students in grades 10-11. "Students visited the dairy and the cows, then to the fields where they took carbon readings and again after the milk was turned to cheese." Shelburne Farms staff also involved the students in a "Rocks to Cheese" activity that "traces the journey of calcium from the ancient Champlain Valley rocks, to the soil, to the pasture grasses and cows, and, ultimately, into the milk we drink or cheese we eat."

Other dairy education programs in Vermont

Dairy Grazing Apprenticeship (UVM Extension)

Dairy Grazing Apprenticeship is the only accredited apprenticeship for farming in the country, connecting Master Graziers with qualifying high school graduates over 18. The two-year DGA apprenticeship provides paid training and on-farm employment for a guided pathway to independent farm ownership, in order to strengthen the economic and environmental well-being of rural communities and the dairy industry. Vermont DGA's Education Coordinator (a farmer who has also trained 12th graders on her own farm in Windham County) has presented the opportunity to over a dozen students in grades 11-12 in Lamoille and Franklin Counties and in Massachusetts.

Migrant Education and Farmworkers Programs (UVM Extension)

The Vermont Migrant Education Program (MEP) provides free educational support services (books, tutoring, referrals, etc.) to eligible children and youth under 22 who lack a high school diploma or GED and who relocate independently or with their families in order to obtain seasonal or temporary employment in agriculture. MEP served 82 youth age 12-18 in the 2019-20 school year.

MEP and UVM Extension's other programs that serve farmworkers provide a "Dairy 101" training to staff and volunteers which covers the basics of Vermont dairy farm operations: division of labor, the dairy herd/cow life cycle, feed and feed storage, milking routines, and seasonal variation.

MEP is currently working with Cornell University to develop an online course based on Cornell's existing PRO-Dairy program. Current resources for teaching English as a Second Language (ESL) lack an agricultural focus. The new course will combine ESL instruction with dairy content, which includes science and math as well. Farmworkers will build relevant professional skills while they work toward English fluency and/or a diploma. MEP staff also hope that the course will interest and benefit farm owners who participate in the National Dairy FARM (Farmers Assuring Responsible Management) Program, which includes a requirement to provide workforce development.

Shelburne Farms

In addition to hosting many visitors to their working dairy, publishing farm and food curricula that reach thousands of youth, and acting as an integral part of the Vermont Farm to School Network, Shelburne Farms hosts an overnight summer camp for teenagers. This past year, 16 youth in 7th-12th grade competed in the Calf Olympics. After campers have been previously oriented to the barn and cared for animals during the morning chores, all participants try out halter leading, good quick-release knots, cleaning a calf, researching DHIA/registration information, and presenting the animal to judges "4-H style" – all without causing it stress.

Dairy in the Classroom (DITC) is another program hosted by Shelburne Farms that works statewide with 40 classrooms in grades K-6. The program includes 3 classroom visits from a dairy educator and a farm field trip. Information from two 6th grade classrooms (approximately 30 students out of the 800 reached last year) is represented in this report.

Vermont's DITC program coordinator provided further details: "Each classroom visit and the farm field trip has a number of activities and is crafted for each classroom based on teacher request and curriculum integration. During classroom visits, students learn about dairy farming, dairy cows, cook with dairy products, taste test dairy foods, and make connections to their communities and Vermont history and economy. The farm field trips include a tour, hands-on activities, and usually a service to the farm."

Dairy education resources available nationally

The attached spreadsheet includes books or websites cited by educators responding to the survey, as well as those found through searching or referral.

Conclusions

Dairy education takes a wide variety of forms in Vermont. **Teachers are interested in connecting their students with living food systems and hands-on activities in the classroom and on the working landscape.** Unfortunately, the overall timing of this project probably could not have been worse for contacting schools.

Challenges: The original start date was November 2019 for June 30 completion; the contract was finalized in March 2020. Work began with survey design and collation of contact information for Vermont's public and independent middle and high schools, which took several weeks. Centralized communication to schools was not possible, so time was spent gathering contact information from SD/SU webpages and AoE lists. The pandemic and lockdowns came into effect in late March. AoE listservs exist for relevant populations (for instance, middle and high school science, STEM, grade 7-12 afterschool programs, independent schools, homeschoolers), but as of early April, became almost entirely unavailable except for official distribution of essential guidance information. Teachers and administrators became increasingly busy with the demands of adapting to and delivering remote learning and then with the end of the school year.

Despite this, the few responses from public and independent schools are quite varied in both subject area and what kind of activities are included. This suggests that there is likely far more dairy-related educational activity than this report can represent with current data. It is possible that new routines are in place since the transitions of this pandemic year, and another round of inquiry would garner better information (possibly with assistance from or working through the Agency of Education's communication channels).

Curriculum, Resource or Program Title	Organization or publisher name (if different from resource title)	Notes	URL
AgDiscovery	USDA APHIS in partnership with universities and colleges	Free, on-campus, 2- to 4-week summer outreach program which targets middle and high school students (grade 7-11) who are interested in learning more about plants, animals, and agribusiness through hands-on labs, workshops, and field trips	https://www.aphis.usda.gov/aphis/ourfocus/civilrights/agdiscovery/ct_agdiscovery_program
Agricultural Experience Tracker	N/A	Online record system that assists students in tracking experiences in agricultural education, FFA and SAE activities. Includes lesson plans, quizzes, personal finance lab, safety resources, grading rubrics, and teacher-developed resources.	https://www.theaet.com/
Before the Plate (documentary film)	N/A	Follows each ingredient (including milk) from one plate of restaurant food back to farms with narration by John Horne, a Canadian chef, about issues facing farmers, evolving agricultural landscape, food system context.	https://www.beforetheplate.com
Cabot Creamery Co-operative	N/A	Resources for grades K-9 to build healthy nutrition habits and sustainability: community project scout patches, Calcium Challenge, Farm-to-You units (for grades K-5), and other activities	https://www.cabotcheese.coop/youthful-matters/
CASE (Curriculum for Agricultural Science Education)	NAEE (National Association of Agricultural Educators)	Curricula, professional development, and peer networking around agricultural education topics. One CASE-certified teacher is listed for Vermont (Joseph Depatie at Missisquoi).	https://www.case4learning.org/
CDE handbooks	FFA	"Career and Leadership Development Events develop college and career readiness skills. The competitive events serve as an outgrowth of instruction in the agricultural education classroom for FFA members in grades 7 to 12."	https://www.ffa.org/participate/cde-ide/
Center for Dairy Excellence / Dairy Excellence Foundation	Dairy Leaders of Tomorrow	Designed to prepare high school students to work in the dairy industry. "A three-part model program, Dairy Leaders of Tomorrow offers classroom instruction, on-farm experiences and scholarship opportunities." Industry recognized certificates in both Dairy Herd Management and Dairy Business Management. Also offering free virtual farm tours to the public.	https://www.dairyleadersoftomorrow.com/curriculum/
Center for Dairy Excellence / Dairy Excellence Foundation	Discover Dairy (Pennsylvania Dairy Promotion Program with additional materials from Mid-Atlantic Dairy Association and the Center for Dairy Excellence)	Four lessons: Animal health, Milk quality & safety, Dairy in the environment, Dairy in the Community. Additional enrichment opportunities include a Children's Literature List, the "Adopt A Cow" year-long program and dairy-focused computer games to reinforce concepts, and ask Discover Dairy questions (via the contact page). Also see https://www.centerfordairyexcellence.org	https://www.discoverdairy.com/middle-school-curriculum/
Cow to You: A Virtual Visit to Two New England Dairy Farms	New England Dairy	Virtual Farm Tours by grade level, to be offered on YouTube Live and Zoom in October 2020 (for grades 3-5, 6-8, and 9-12). Registration includes vocabulary list, scavenger hunt, Cabot's Farm Love guide for virtual farm tours, and a grade 5-8 curriculum designed for this event (https://ymiclassroom.com/lesson-plans/ned360/).	https://www.newenglanddairy.com/live-virtual-farm-tour-schools/
Dairy 101 (unpublished)	UVM Extension Migrant Education Program	Overview of dairy farming, provided as internal training for UVM Extension staff and partners working with GED and ESL students	N/A
Dairy Leaders of the Future	Kansas State University	"Training the next generation of dairy professionals by exposing them to opportunities in the dairy industry"	https://dairyleaders.com/ and https://dairyleadersofthefuture.com/ (password protected sites)
Dairy Migrant Labor curricula	Middlebury College	Grade-level lesson plans for K-5: migration and mindfulness. Grades 6-8: migrant labor on dairy farms in Vermont. Grades 9-12: labor and immigration policy. Created by Middlebury College students in 2016.	http://www.middlebury.edu/system/files/media/MJ_Final_DM_1.pdf

Curriculum, Resource or Program Title	Organization or publisher name (if different from resource title)	Notes	URL
El viaje mas caro (The Most Costly Journey)	UVM Extension Bridges to Health, Open Door Clinic, Vermont Folklife Center, UVM Anthropology, and Comics Workshop	Collection of 18 different cartooned stories about migrant workers' experiences with mental health	https://www.vermontfolklifecenter.org/elviajemascaro-eng/ and https://opendoormid.org/most-costly-journey/
Hide (documentary film)	N/A	"Hide takes us inside the daily lives of several migrant dairy workers from Latin America who sustain Vermont's iconic dairy farms and working landscapes. Hide illuminates the feelings and experiences of the hidden lives of migrant farmworkers"	https://vimeo.com/92736899
Into the Outdoors	N/A	For middle school. Two lesson plans and links to other resource collections / videos on on the history, science, and technology of dairy farming	https://intotheoutdoors.org/topics/dairy-science/
Introduction to Culinary Arts	Culinary Institute of America	"This book provides everything needed to teach the culinary arts to high school students. More than 100 hands-on culinary skills are highlighted that include general procedures and techniques."	https://www.pearson.com/us/higher-education/product/The-Culinary-Institute-of-America-Introduction-to-Culinary-Arts/9780131171404.html
Land Stewards Award	Vermont Land Trust	Annual \$250 prize recognizing outstanding high school juniors and seniors who are dedicated to agriculture (including dairy students) and forestry	
Milk Matters: The Role of Dairy in Vermont	Vermont Dairy Promotion Council	16-page brochure outlining the economics, nutrition, etc., of dairy industry in Vermont	https://vermontdairy.com/wp-content/uploads/2015/12/VTD_MilkMatters-Brochure_OUT-pages.pdf
My Plate	USDA Center for Nutrition Policy and Promotion (CNPP)	"MyPlate offers ideas and tips to help you create a healthier eating style that meets your individual needs and improves your health."	https://www.choosemyplate.gov/
PRODairy	Cornell University		https://prodairy.cals.cornell.edu/
Professional Baking by Wayne Gisslen	Wiley Publishing	"instructions in the theory and techniques necessary to meet the demands of the professional kitchen"	https://www.wiley.com/en-us/Professional+Baking%2C+7th+Edition-p-9781119251910
Progressive Dairy training tools	Progressive Dairy	Short info sheets about specific dairy topics (milking routine, parts of the cow, etc) in English/Spanish to facilitate communication between employers and workers.	https://www.progressivedairy.com/topics/training-tools
Project Seasons	Shelburne Farms	"Developed at Shelburne Farms, Project Seasons is a collection of hands-on education activities for discovering the wonders of the world. Classroom educators, pre-school & after-school teachers, camp instructors and parents will find it invaluable in cultivating an awareness and appreciation of agriculture and natural resources."	https://shelburnefarms.org/our-work/resources/project-seasons
Return to Sender by Julia Alvarez	Penguin Books	Award-winning young adult book from the perspectives of a boy from a dairy farm family and a girl from a Mexican migrant family working on the farm. See animated "commercial" for the book by Lincoln Community School 5-6 graders https://www.youtube.com/watch?v=z42AQFyifc0	book https://www.juliaalvarez.com/young-readers , publisher's study guide https://migrantjustice.net/sites/default/files/ReturntoSenderGuide.pdf
The Golden Cage	Vermont Folklife Center	Collection of photographs and interviews with Mexican Migrant Workers and Vermont Dairy Farmers	http://goldencageproject.org/index.htm
Undeniably Dairy and Fuel Up to Play 60	National Dairy Council	Undeniably Dairy: activities for grades 5-8 to explore modern farming, dairy's journey from farm to school, and the innovations that are helping care for cows and communities. Fuel Up to Play 60: information, guidance, and support for building good nutrition and physical activity habits.	https://www.discoverundeniablydairy.com/curriculum and https://www.fueluptoplay60.com/
Vermont Cheese Council			https://vtcheese.com/vermont-cheeses/vermont-cheese-search/
Waterford Agriscience Curriculum	Craig Kohn, Michigan State University	Agriscience educator: teacher, professor, and researcher	http://wuhsg.weebly.com/
Young Cooperator Program	St. Albans Co-operative Creamery	Under the National Milk Producers Federation Young Cooperator Program, whose purpose is to educate and build leadership ability in young dairy farmers. SAC also offers an annual \$500 education scholarship opportunity.	http://www.stalbanscooperative.com/membership/young-cooperators/