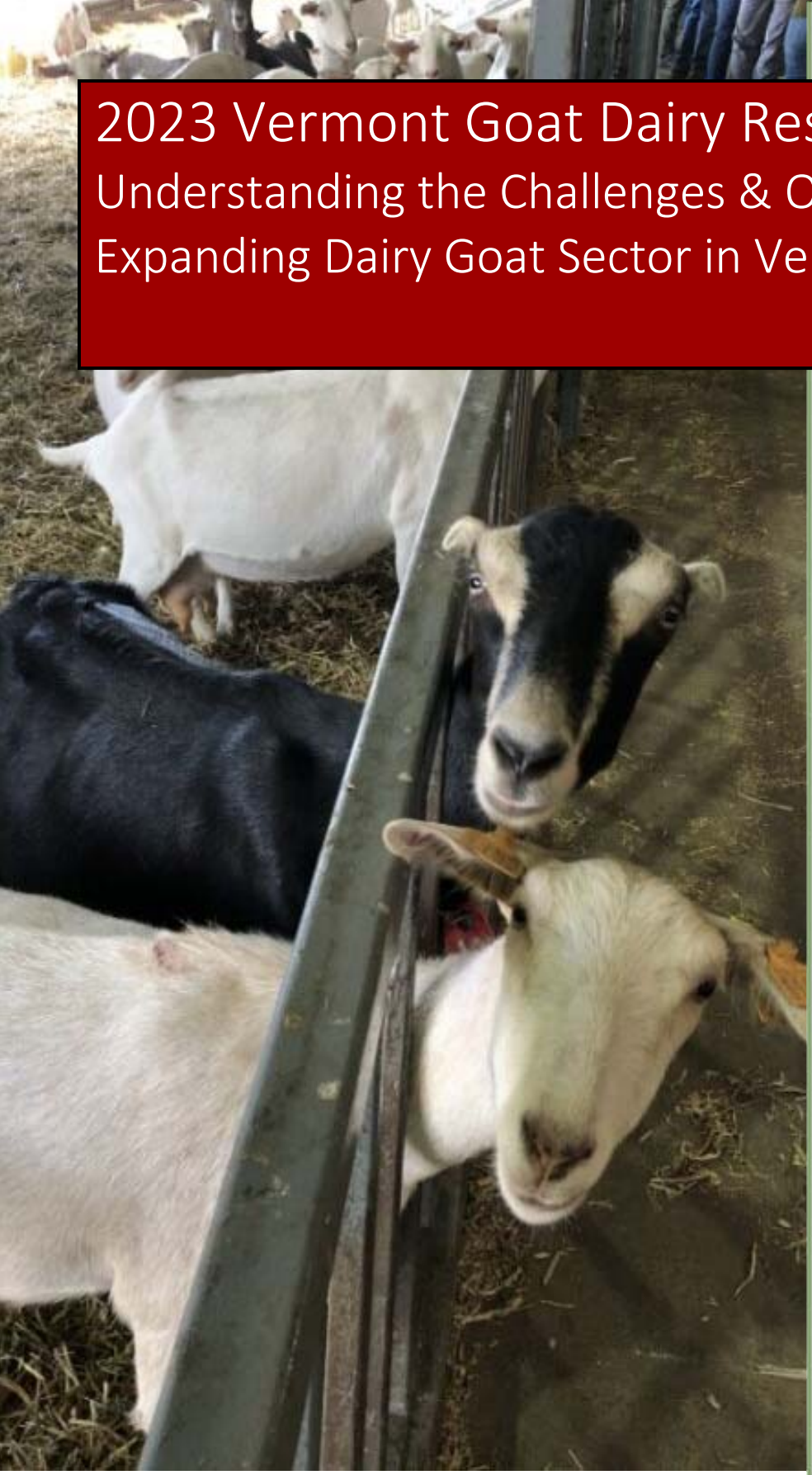
2023 Vermont Goat Dairy Research Report:
Understanding the Challenges & Opportunities of an Expanding Dairy Goat Sector in Vermont



THE UNIVERSITY OF VERMONT CENTER FOR RURAL STUDIES

THE UNIVERSITY OF VERMONT EXTENSION

Requested by Vermont Creamery to improve understanding of Vermont's goat dairy landscape with funding from Northeast Dairy Business Innovation Center

Conducted by the University of Vermont's Agricultural Extension Service and The Center for Rural Studies

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Introduction

Executive Summary

Vermont is a dairy state, with abundant rainfall and a land base that supports extensive pasture and forage production. For generations, dairy has been synonymous with cows in Vermont, but that is changing. With the loss of cow dairies, farmers and businesses have looked to goat dairies as a potentially viable and sustainable alternative enterprise. Nationally, markets for goat milk, cheese, and meat have been expanding, offering a potential alternative for dairy farmers in Vermont.

The goat dairy industry in Vermont covers a wide range of scales and products. Of the approximately 31 Grade-A goat dairy farms in the state, about half are farmstead creameries that process the milk from their farms into value-added products on-site, including cheese, yogurt, kefir, caramels, and bottled milk, while the other half ship fluid milk to processors as their primary revenue.

These Vermont goat dairy processors vary in size from relatively small-scale businesses that purchase milk from a single farm to a limited number of larger processors who aggregate supply from multiple farms to make into cheese and other products at scales that can provide a steady and reliable supply of product sufficient to serve larger markets.

Interviews with Vermont goat dairy producers make up the heart of this report and its findings, and we have anonymized this information to protect the identities of the farmers who generously shared their insights with us.

Similarly, we have sought to remove identifying information about processors. Specific, detailed recommendations related to individual processors were shared directly with those businesses to help them identify opportunities and challenges and adjust their business models.

The Northeast Dairy Business Innovation Center funded Vermont Creamery, which contracted with the University of Vermont Extension Service and the Center for Rural Studies to investigate the opportunities and challenges related to the expansion of the dairy goat sector in Vermont and regionally, with particular attention to the potential for growing bulk fluid goat milk production, in addition to understanding the technical assistance needs of all of Vermont's goat dairy producers.

Glossary of Terms

Processor: An entity that transforms raw milk into processed milk and products

Producer: A person or company that produces milk and dairy products

Fluid Milk Producer: A producer who sells bulk fluid milk to a processor as their primary product

Farmstead Creamery or Farmstead Producer: A producer who processes the milk from their own livestock into value-added product, such as cheese, yogurt, or pasteurized bottled milk, in an on-farm processing plant

Grade A Dairy: A Vermont dairy that complies with the U.S. Food and Drug Administration's Pasteurized Milk Ordinance (PMO)

Non-Grade A Dairy: A Vermont dairy farm that sells only raw milk or products not meant for human consumption (e.g., soap, lotion, and pet food.)

Grade A Milk: Milk produced in compliance with the U.S. Food and Drug Administration's Pasteurized Milk Ordinance (PMO) to qualify for fluid milk consumption

Non-Grade A Milk or Milk Products: Dairy products not necessarily produced in compliance with the PMO, including raw milk and products not meant for human consumption (e.g., soap, lotion, and pet food)

Key Findings and Recommendations

Expanding Supply of Bulk Fluid Goat Milk

Finding:

In the near term, the best option for increasing the supply of bulk fluid goat milk is to assist existing fluid goat milk producers to increase production. Current producers want to expand.

Recommendations:

Barriers to increasing production should be addressed to allow for expansion consistent with the market:

- Improve bi-directional communication between bulk goat milk buyers and farmers. Large processors should designate a farm liaison with goat dairy expertise for producers to contact with questions and ideas.

- Address pricing structures to support growth among suppliers, specifically quota systems used to manage milk supply and demand that may inadvertently penalize producers' growth.

Finding:

Bulk goat milk producers appreciate having a stable market.

Recommendations:

Processors should promote the stability of bulk milk sales to new goat dairy producers and cow dairies considering transition.

Finding:

There is a tension between the demand for fluid milk and the supply of fluid milk. Large processors use tools, such as quotas, to incentivize production to meet demand.

Recommendations:

- Increase communication to producers about the seasonality of consumer demand for products and the utility of incentives.

- Assist processors to find markets for periods of high seasonal production during periods when processors currently experience lower consumer demand.

Finding:

Bulk fluid goat milk dairies have concerns about cost of production relative to milk price.

Recommendations:

- Funding should be sought for a full cost of production study for goat dairies in Vermont. The *Dairy Goat COP Study* report developed for the Ontario Ministry of Agriculture, Food and Rural Affairs in 2021 provides one model of a comprehensive and regional goat dairy cost of production study. UVM and processors should engage with VAAFM and/or the NE-DBIC about potential funding.

- Work with buyers to maintain milk prices at levels that yield a sustainable income to producers.

- UVM, VAAFM and DBIC seek to support further research into the effect of imported frozen curd on domestic goat milk and curd price.

-Explore extended lactations to reduce production costs.

Finding:

There is concern among fluid milk producers about the dependence on a single, primary bulk fluid goat milk buyer.

Recommendations:

Address the risk of dependence on a single buyer:

- Strengthen the commitment of processors to Vermont's producers by committing to remain in the state over a period of time into the future.

- Support the expansion and development of additional fluid milk buyers in the state and region.

- Vermont's goat milk processors could consider allowing farmers to sell milk to other processors as well.

Finding:

Start-up goat milk producers face challenges obtaining financing without a history of production.

Recommendation:

VAAFM and processors should educate and work with agricultural lenders to evaluate new producers and ease access to credit for viable new goat milk producers.

Finding:

Farmstead goat dairies are unlikely to become a significant source of fluid milk shipped off-farm. Their scale, business models and infrastructure are geared toward farmstead production and processing, not bulk milk shipment.

Recommendation:

Support farmstead creameries with technical assistance related to marketing and distribution.

Finding:

Substantial transition from cow dairies to goat dairy is unlikely in the near term.

Recommendation:

- Improve understanding of costs and benefits for the transition from cow to goat dairy.

- Disseminate technical and financial requirements for transition to cow dairy farmers.

Strengths and Challenges Shared by the Goat Dairy Sub-sectors: Fluid Milk and Farmstead Production

Finding:

Bulk fluid goat milk producers and farmstead goat dairies differ significantly in scale, production levels and marketing issues. There are also important areas where strengths and needs overlap between these two types of dairy goat operations.

Recommendations:

- Develop resources that meet common needs between farmstead and fluid milk producers.

- Develop resources that meet the unique needs of each dairy goat sub-sector.

Finding:

Bulk producers and farmstead producers interact through sales of high-quality goats. Smaller farmstead herds provide genetics to bulk producers that improve health and yields for sales of fluid milk and income for farmstead producers. Conversely, some established and experienced bulk producers have experience that contributes to the development of farmstead producers.

Recommendation:

Facilitate forums and develop events that promote communication, collaboration and information sharing between bulk milk and farmstead producers.

Finding:

Herd health issues were a primary concern of both fluid milk and farmstead producers.

Recommendations:

- Increase technical assistance and educational materials to assist producers managing dairy goat health

- UVM Extension and AAFM work together to fund and develop training program to assist veterinarians to develop knowledge and gain experience supporting goat dairy farmers

- Establish a Vermont state service to provide free or reduced-cost disease testing and management services for diseases such as CAE, CL, and Johne's

Finding:

Farm labor was identified as one of the greatest challenges facing farms. Data indicates labor is a somewhat greater challenge for farmstead producers.

Recommendation:

Shortage of farm labor is a major limitation to expanding goat dairy production. Engage with other farm labor initiatives to increase the availability of labor by addressing misconceptions about farm work, increase benefits, improve human resource management, and create a legal visa program for migrant farmworkers.

Infrastructure Needed for Expansion of Vermont's Goat Dairy Sector

Finding:

Institutional infrastructure needs to be developed to provide more technical support for goat dairies in the areas of health, nutrition, genetics, and extended lactations.

Recommendations:

- UVM, VAAFM and private industry collaborate to ensure technical services are available to producers.

- Fund UVM Extension to develop courses and on-line materials to provide an overview of critical issues and resources for new and existing goat dairies.

Finding:

Eighty-two percent of farms surveyed state they do not have sufficient access to a reproductive/genetics specialist.

Forty-four percent state they do not have adequate access to an animal nutritionist specialist.

Farmers described the need for more veterinarians to become familiar with the specific needs of goats as livestock to further support the industry in Vermont

Recommendation:

Educational resources should be directed to specialized infrastructure in support of the goat dairy sector. Veterinarians, reproductive specialists and nutritionists should be incentivized to address the specific needs of small ruminants in Vermont.

Finding:

A major concern for nearly all dairy goat producers at scales larger than a few animals is finding markets for newborn bucklings.

Recommendations:

- Develop a resource guide for marketing bucklings within and outside of Vermont.

- Work with existing Vermont consignment auctions to include buckling and cull goat sales.

- Build markets for Vermont goat meat that increase the profitability of raising bucklings for meat and for sales of cull goats.

Vermont Goat Dairy Operations Data

Finding:

Data on dairy goat operations collected by NASS and that commonly utilized in Vermont diverge substantially and cause confusion.

Recommendations:

- VAAFM should develop a standard definition of a Vermont goat dairy operation that is meaningful for establishing a database of producers.

- VAAFM should develop and maintain a database of Vermont goat dairy operations similar to that for cow dairies.

Deliverable:

Goat Dairy Business Analysis Tool

Deliverable:
An on-line, interactive goat dairy fluid milk business planning tool was built to assist producers assess and refine financial aspects of their business operation

The on-line tool can be found at: https://www.uvm.edu/extension/agriculture/goat-dairy-business-calculator

Detailed description of the tool is included in a later section of this report

Recommendation:
- Encourage producers to utilize this tool and meet with UVM Extension to improve the business analysis and refine the tool
- Obtain funding to maintain and support this as an on-line dairy goat business analysis tool
- Expand tool to include farmstead goat dairy analysis

Project Team

The University of Vermont Team

The University of Vermont project team included researchers and specialists from the UVM Extension Service and the Center for Rural Studies. Team members included:

Roy Beckford, Associate Dean & Director, UVM Extension (Principal Investigator)
Kate Finley-Woodruff, Associate Dean, UVM College of Ag. & Life Sciences (Co-Principal Investigator)
Dan Baker, UVM Extension (Co-Principal Investigator)
Julia Danielsen, Student Research Associate, Center for Rural Studies at UVM
Tony Kitsos, Dairy Business Specialist, UVM Extension
Kelsie Meehan, Dairy Outreach Specialist, UVM Extension
Michael Moser, Research Specialist, Center for Rural Studies at UVM
Zachary Smith, Agricultural Business Educator, UVM Extension
Claire Whitehouse, Research Specialist, Center for Rural Studies at UVM

Methodology

Global and national goat dairy trends were developed by reviewing and compiling USDA and industry data. Goat dairy data for Vermont was developed from National Agricultural Statistics Service datasets (NASS). NASS data was found to use a definition of goat dairy operations that was too broad for use in this study, and the project team worked with partners to develop a producer list that more accurately reflects commercial goat dairy farms in Vermont.

Thirty-nine commercial Vermont goat dairies were identified using data from the Vermont Agency of Agriculture, Food and Markets, augmented by the UVM team's knowledge of dairy farms in the state and data from a large Vermont dairy goat milk processor. The farm list included a total of 31 "Grade A" goat dairies in Vermont that comply with the U.S. Food and Drug Administration's Pasteurized Milk Ordinance (PMO). The remaining 8 non-Grade A farms sell only raw milk or products not meant for human consumption (e.g., soap, lotion, and pet food).

The 31 Grade A dairies included 13 goat dairies supplying milk to Vermont's largest bulk fluid milk processor and 18 farmstead creameries, defined as farms that are processing the milk that they produce into products such as cheese, yogurt, and pasteurized bottled milk in on-site processing plants.

To characterize goat dairy producers and understand their strengths and needs, the project team interviewed 20 Vermont Grade-A goat dairy producers of varying size and production models, 9 of which sell to a large processor and 11 of which are farmstead creamery operations.

Dairy Goat Sector Background and Context

Goats have been part of the Vermont agricultural landscape for more than 100 years for meat, milk, and hides. Awareness of the commercial potential for goats as dairy animals has increased in the past 40 years through the growth of value-added, award-winning producers selling goat dairy products like cheese, yogurt, soap and caramels. The potential for farms to produce and wholesale goat milk received a significant boost when a Vermont processor began purchasing fluid goat milk from local farms in 1987. In addition, Vermont's farmstead cheese producers have won national and international awards. As Vermont's cow dairy industry has witnessed a precipitous loss of farms, research on the potential for the goat dairy industry to absorb some of these farms has attracted interest. This report considers the potential for expansion of the Vermont goat dairy sector through interviews with existing goat dairy producers and processors, assessment of cow dairy farmer interest in transitioning to goat dairy, and analysis of current market conditions. The project team developed an interactive financial planning tool which current and potential fluid goat milk producers can use to evaluate the financial aspects of starting or expanding a goat dairy operation. Project activities included five well-attended farm tours open to farmers, agricultural service providers, and the public that aimed to increase understanding of the strategies farmers are using to support and grow their goat dairy businesses.

In addition to this report, a separate presentation with specific recommendations was delivered at the annual meeting of a large Vermont goat milk processor.

The project addressed 5 objectives:

- **Objective 1** - Identify the need for additional Vermont-sourced fluid milk production from existing processors, including but not limited to Vermont bulk fluid milk processors
- **Objective 2** - Identify gaps or opportunities in technical assistance provision, financing, and animal husbandry (e.g., veterinarians, genetics, feed consultants/nutritionists, and other goat health and management professionals)
- **Objective 3** – Engage with producers to gauge the interest in cow to goat conversions and understand the specific needs of those businesses.
- **Objective 4 –** Assess educational opportunities that exist for dairy goat production at Vermont or regional institutions of higher education.
- **Objective 5 –** Engage with the regional dairy sector and partake of opportunities to host, attend and/or speak at other dairy focused events to share knowledge and engage with the broader community of stakeholders about goat dairy farming.

The goat dairy business planning tool was developed utilizing input from several Vermont goat dairy farms that dedicated their time to review and share detailed production, income, and expense records. We also reviewed several publications for reference (see References.)

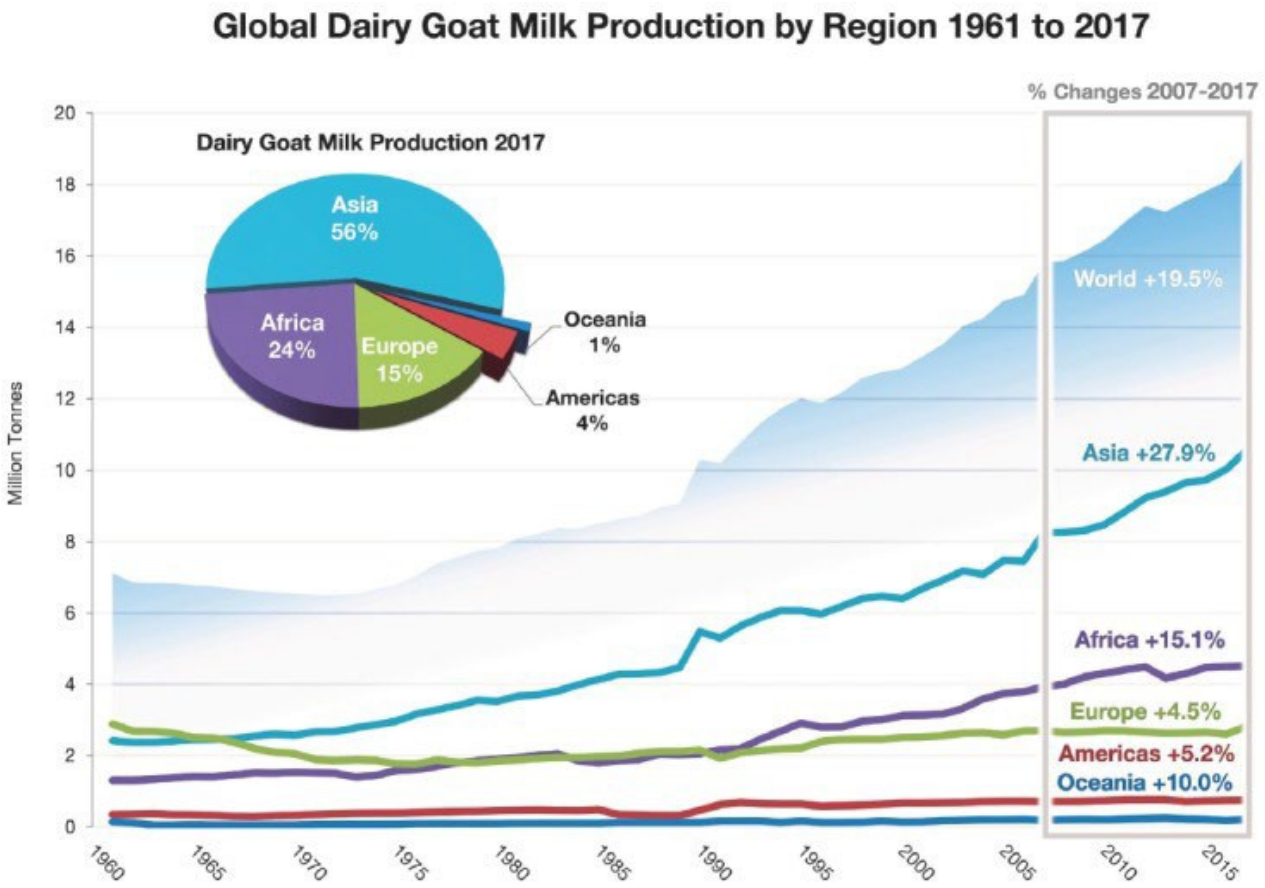
The survey of dairy goat milk processors utilized the team's list of Vermont-based goat dairies and internet research to compile a list of larger-scale processors across the United States that purchase fluid milk for processing. Both lists were contacted via phone and/or email where available, or through the firm's website contact form. Seven total goat dairy processors agreed to be interviewed: four Vermont farmstead processors and three processors that purchase in milk in other parts of the United States. All seven respondents made cheese; two sold milk; one made kefir; and two made other goat dairy-based products. Three respondents completed the survey over the phone and four completed the survey online in Qualtrics.

Global, National, and Local Market Trends

Global Trends

According to a 2022 market analysis report from Arizton Advisory and Intelligence, the global market demand for goat milk is expected to grow from about $11.46 billion (about $35 per person in the US) in 2021 to about $17.95 billion (about $55 per person in the US) by 2027, an 8% increase over the next six years. This increase in demand is noted to be partially a result of growing consumer interest in goat milk's nutritional benefits and for some, its easier digestibility compared to cow's milk. Although Asia is the largest producer of goats globally, Europe is currently the world's largest goat milk market, with about a third of the total share (31.4%) in 2021, followed by North America at 30.3%.

A 2019 article published in the Asian-Australasian Journal of Animal Sciences, reported that the global goat population continues to expand and is now over one billion. The study also found that the number of goats raised primarily for milk production is also increasing due to growing demand. Consumer demand for goat milk is also increasing in countries that formerly had relatively low demand for goat milk, including the United States and China.



Source: (Miller and Lu, 2019)

National Trends

On a national level, consumer demand for goat milk has also risen in the United States. Though there is little publicly available data that directly addresses goat dairy demand, goat dairy herd statistics (supply side) can serve as a proxy for understanding demand changes over time. While the U.S. produces relatively less goat milk than Asia, Africa and Europe, production in the United States increased 5.2% between 2007-2017.

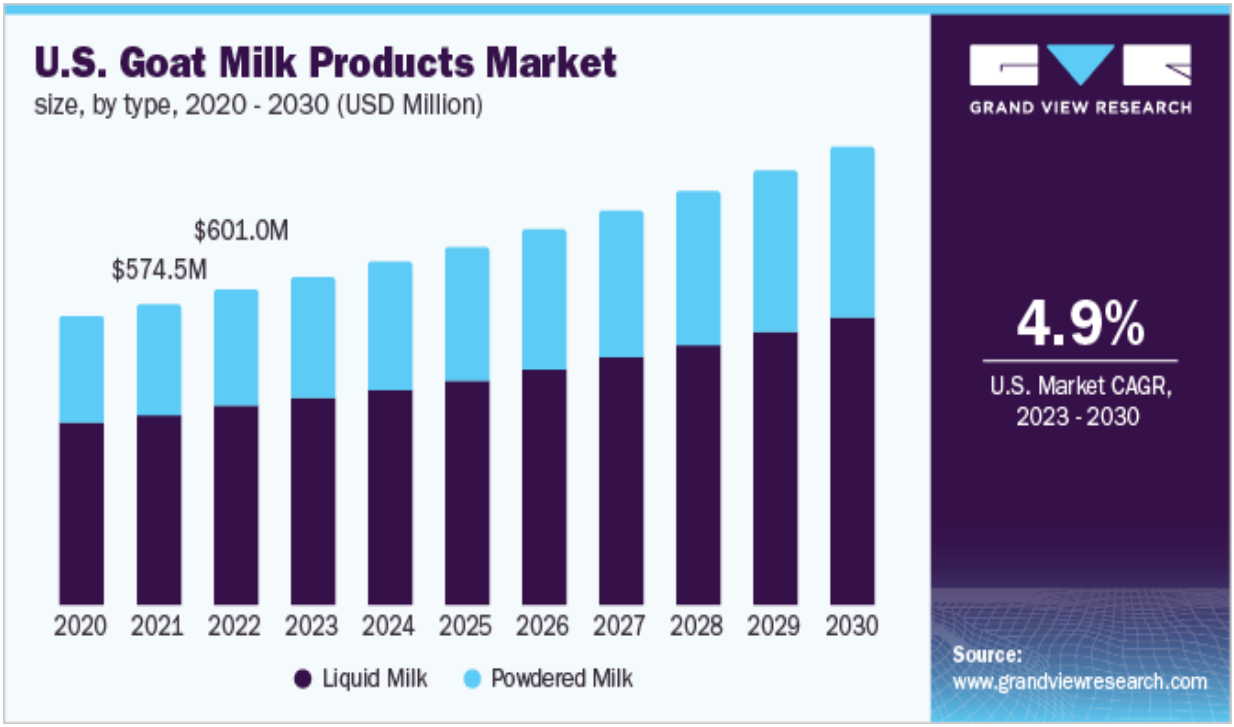
Goats, Milk Goats and Goat Milk Operations in the U.S. over Time (2007-2017)

	2007	2012	2017	2007-2017 % Change
U.S. Goats	3,140,529	2,621,514	2,698,636	-14.1%
U.S. Milk Goats	334,754	413,540	537,799	60.7%
U.S. Milk Goats as Percent of All Goats	**10.7%**	**15.8%**	**19.9%**	**86.0%**
U.S. Goat Milk Operations (With Inventory)	27,481	29,570	35,682	29.8%

Source: USDA Agricultural Census

- Between 2007 and 2017 the total number of goats in the U.S. declined about 14%.
- During the same period, the total number of milking goats increased by nearly 61%.
- Milk goats as a percentage of all goats increased from about 11% in 2007 to nearly 20% in 2017.
- The number of U.S. milk goat operations increased nearly 30% over the same ten-year period.

Projected trends in fluid and powdered goat milk

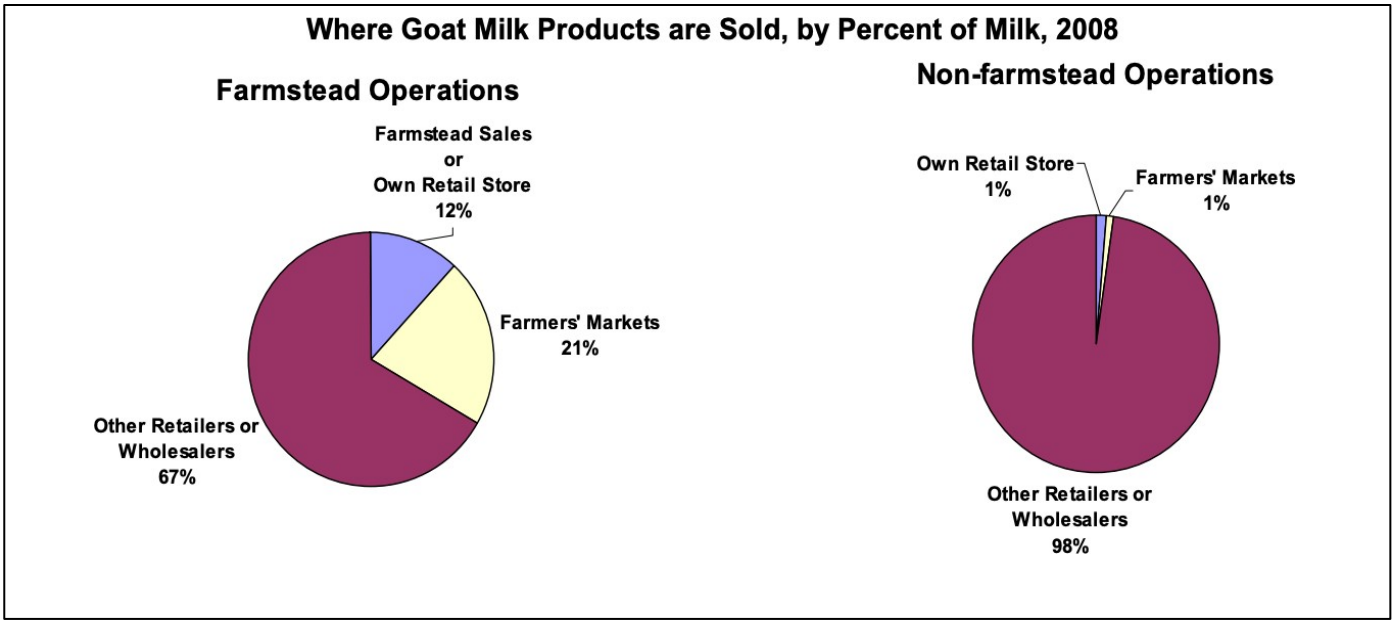


Demand for goat dairy products in the US is increasing (USDA, 2023). Between 2007 and 2017, the total number of milking goats in the U.S. increased by nearly 61% and the number of U.S. goat dairy operations increased nearly 30% over the same ten-year period. In the Northeast, consumers' preference among goat milk products is the strongest for goat yogurt, followed by goat milk. Goat cheese was the least preferred among goat dairy products.

Goat Milk and Value-added Products

Goat milk is known for its nutritional and physiological benefits with minerals such as calcium, magnesium, phosphorus and other vitamins found in greater percentages than in cow's milk. Market demand increases are being led by increased demand for a variety of value-added products including yogurts, cheeses, baby formulae, and health and beauty products (Arizton, 2022). Goat cheese appears to be the primary value-added driver, with new consumer preferences for flavored products being tested in the marketplace.

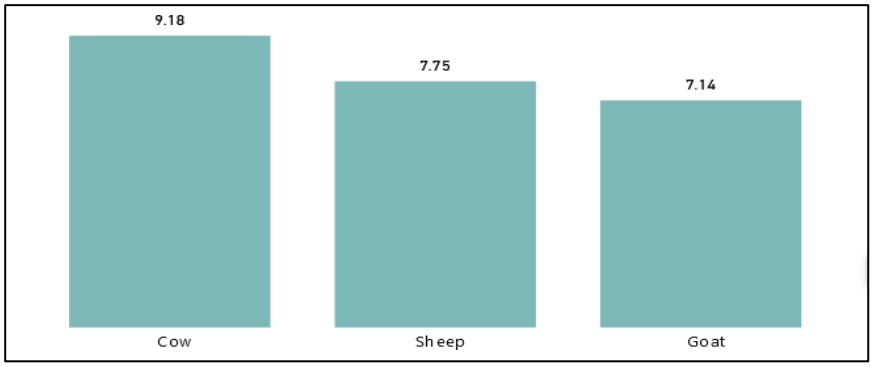
The United States Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) conducted a Goat Milk Processor Survey in 2008 and received 154 responses. At the time, processors reported that production of soft and semi-soft cheeses accounted for nearly 70% percent of production, followed by fluid milk at about a quarter (25%) of production. The remaining production was for value-added products like soaps, lotions, and confections like fudge and caramel.



Regional Dairy Preferences

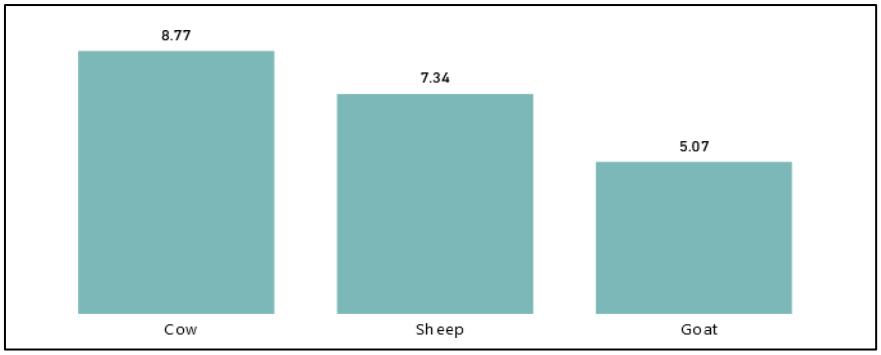
While there is a slow but steady increase in consumer demand in the U.S. for goat milk-based products, recent research conducted by the Atlantic Corporation for the Northeast Dairy Business Innovation Center shows that consumer preferences in the Northeast region of the U.S. (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont) continue to favor traditional cow dairy-based products to goat dairy-based products.

Consumer preferences for milk by type in the Northeast Region



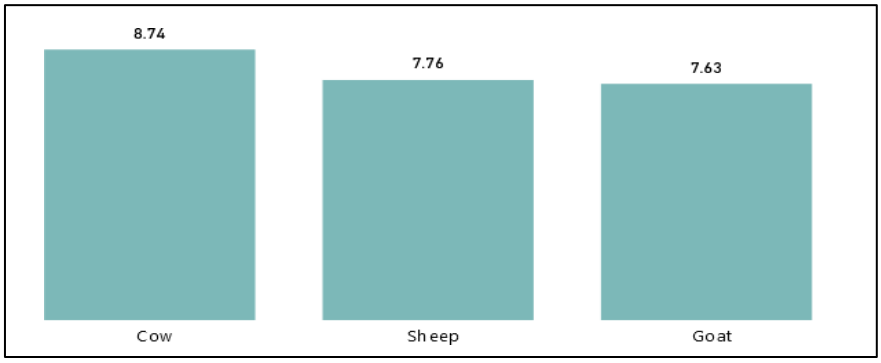
On a 1-10 scale where 1 is extremely dislike and 10 is extremely like…

Consumer preference for cheese by type in the Northeast Region



On a 1-10 scale where 1 is extremely dislike and 10 is extremely like…

Consumer preference for yogurt by type in the Northeast Region



On a 1-10 scale where 1 is extremely dislike and 10 is extremely like…

- Consumer preference for goat dairy milk, cheese and yogurt are all lower than for cow milk equivalents.
- Interestingly,
    - The difference in preference between cow and goat dairy products is smallest for yogurt compared to both milk and cheese preferences.
    - The difference is largest for cheese, with consumers expressing a strong preference for cow and sheep cheese compared to for goat cheese.

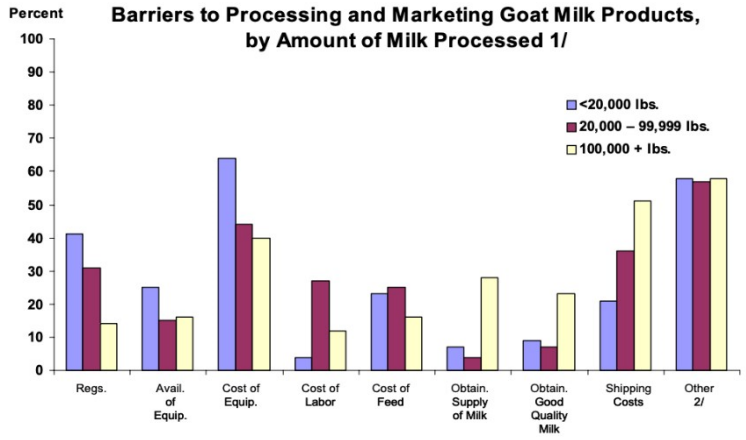
Goat Dairy Processing Barriers

The USDA's 2008 Goat Milk Processor Survey researched barriers to processing and marketing goat milk products. Cost of equipment, regulations and shipping costs were described as the greatest barriers to production in the USDA's 2008 research.

Barriers to Processing and Marketing Goat Milk Products, by Size of Plant 1/

Amount of milk processed	Regulations	Avail. of equip.	Cost of equip.	Cost of labor	Cost of feed	Obtaining a supply of milk	Obtaining good quality milk	Shipping costs	Other 2/
					Percent				
<20,000 lbs.	41	25	64	4	23	7	9	21	58
20,000 – 99,999 lbs.	31	15	44	27	25	4	7	36	57
100,000 + lbs.	14	16	40	12	16	28	23	51	58
Total	30	19	50	14	22	12	12	35	58

1/ Each respondent chose up to 3 factors. 2/ Includes competition from other countries, low demand, finding a distributor, and any other concerns.



1/ Each respondent chose up to 3 factors. 2/ Includes competition from other countries, low demand, finding a distributor, and any other concerns.

In addition to goat cheese, milk, and yogurt, there are also some data available for goat milk powder and goat meat. According to a 2021 market analysis published by Arizton Advisory and Intelligence, goat milk powder global sales are expected to increase from $3.5 billion in 2021 to $5.7 billion in 2027, or about 8.5% annually over that period. Goat milk powder is used in the production of other value-added products including baby formulae and goat cheeses.

Sheep and goat meat is the fourth-most consumed meat in the U.S., following pork, poultry, and beef (Penn State, Ag. Extension). A 2012 report by the USDA found that growth in the US goat meat industry was among the fastest growing livestock production sectors in the US. Demand for goat meat is driven by immigrant communities where goat meat is central to the cultural traditions and cuisine, as well as by growing markets that seek out goat meat for its flavor or health benefits. USDA concluded that it expects these factors will continue to drive growth in demand for goat meat.

Local Trends

Quantitative goat dairy data for Vermont are limited in time and depth and are nearly entirely limited to the USDA's Agricultural Census data. Goat dairy data was only recently separated from goat and sheep dairy data by the USDA, and goat dairy data products are severely limited in scope. The data below represent the extent of available quantitative data for Vermont's goat dairy sector. Note that interviews and analysis of goat dairy milk processors are included in a later section of this report.

As noted earlier, NASS data for "farm operations" are inclusive of diversified farm operations reporting multiple livestock types on farms. This means that enumerated "goat dairy operations" include those where goat dairy is not the primary function of the farm operation. The result of this inclusive approach to enumeration is an overcount of farms identified as "goat dairy operations". The total number of goats and trends in "goat dairy operations" and total goat numbers remain useful proxies for understanding supply-side analyses as a proxy for trends in consumer demand for goat dairy products.

When comparing Vermont and national goat milk trend data one striking difference emerges: Vermont has a much higher percentage of milk goats compared to overall goats than the country as a whole. In 2017, over 80% of Vermont goats were milk goats while in the U.S. overall, just 20% of all goats were milk goats.

Statewide Production Trends

Goats, Milk Goats and Goat Milk Operations in Vermont over Time (2007-2017)

	2007	2012	2017	2007-2017 % Change
VT Goats	6,593	10,589	9,801	48.7%
VT Milk Goats	4,480	8,547	8,032	79.3%
VT Milk Goats as Percent of All Goats	68.0%	80.7%	82.0%	20.6%
VT Goat Milk Operations (With Inventory)	197	277	270	37.1%

Source: USDA Agricultural Census

County Production Trends

Goat Milk Operations with Inventory Over Time by County

	2017 USDA Ag. Census	% of USDA Ag Census Total	Project Data	Project data as % of USDA Data
Addison	31	11%	4	13%
Bennington	10	4%	3	30%
Caledonia	35	13%	2	6%
Chittenden	17	6%	1	6%
Essex	3	1%	0	0%
Franklin	17	6%	4	24%
Grand Isle	4	1%	0	0%
Lamoille	20	7%	2	10%
Orange	14	5%	2	14%
Orleans	20	7%	4	20%
Rutland	23	9%	2	9%
Washington	9	3%	0	0%
Windham	38	14%	3	8%
Windsor	29	11%	4	14%
Total	270	100.0%	31	12%

Sources: USDA Agricultural Census, A Vermont bulk fluid milk processor, and Vermont Agency of Agriculture Food and Markets (VAAFM)

Research Findings

Key Findings and Recommendations

Expanding Supply of Bulk Fluid Goat Milk

Finding:

In the near term, the best option for increasing the supply of bulk fluid goat milk is to assist existing fluid goat milk producers to increase production. Current producers want to expand.

Seven out of nine (78%) producers we interviewed who are currently shipping fluid milk to a processor said they want to increase their herd size. One wants to maintain their herd size, and one is transitioning to retirement. These are producers who understand the fluid milk production process, economics, and herd management issues necessary to produce and ship fluid milk. Several will need infrastructure to accomplish this expansion, but their experience and interest in growing production makes this the most viable option for increasing fluid milk production in the near future.

Recommendations:

Barriers to increasing production should be addressed to allow for expansion consistent with the market:

- Improve bi-directional communication between bulk goat milk buyers and farmers. Large processors should designate a farm liaison with goat dairy expertise for producers to contact with questions and ideas.

- In our interviews, 7 of the 9 producers shipping milk to a single processor brought up their desire for better communication with the processor, including having a farmer liaison with goat dairy expertise.

- Address pricing structures to support growth among suppliers, specifically quota systems used to manage milk supply and demand that may inadvertently penalize producers' growth.

In our interviews, 56% (5/9) of producers shipping fluid milk brought up milk price, primarily that what they're paid was not consistent with recent increases in costs (feed, fuel, bedding, milk replacer, equipment, etc.)

Finding:

Bulk goat milk producers appreciate having a stable market.

When asked about marketing, only 17% of fluid milk producers prioritized technical assistance with marketing, compared to 50% of farmstead producers. At least one processor has committed to buying all the milk produced by their farm suppliers.

Recommendations:

Processors should promote the stability of bulk milk sales to new producers and cow dairies considering transition

Some bulk milk processors currently commit to purchase 100% of their Vermont goat milk suppliers' production.

Finding:

There is a tension between the demand for fluid milk and the supply of fluid milk. Large processors use tools, such as quotas, to incentivize production to meet demand. One large processor shared that their consumer demand is high between October through March, while for farmers the easier and less costly kidding season, and associated higher milk production, occurs early Spring through Summer.

Recommendation:

Increase communication to producers about the seasonality of consumer demand for products and the utility of incentives.

Farmer perspectives:

"We're very appreciative of the milk pay increase that [our buyer] provided to the farmers. It does not offset the operating costs that we're paying now. But it does not go unnoticed. In reality, if we hadn't received that and operating costs stay what they are, we would really be looking at a transition plan. And if grain prices stay where they are right now, we might still be looking at decisions. But that's not our goal. We didn't set this up with that in mind. But if grain could go back to where it was 2-3 years ago, life would be a lot easier."

Processor perspective

At a recent meeting of a processor and farmers where the processor explained in detail the reasoning behind their pricing structure, farmers said how much they appreciated the explanation and that it would be helpful to have had that explanation earlier. The processor also expressed understanding that this is not an ideal system, only the best they have available at this point.

Assist processors to find markets for periods of high seasonal production during periods when processors currently experience lower consumer demand.

Finding:

Bulk fluid goat milk dairies have concerns about cost of production relative to milk price.

In our interviews, 56% (5/9) of producers shipping fluid milk brought up milk price, primarily that what they're paid was not consistent with recent increases in costs (feed, fuel, bedding, milk replacer, equipment, etc.)

Recommendations:

- **VAAFM and/or the NE-DBIC should fund a full cost of production study for goat dairies in Vermont.**

For an example of a comprehensive and regional goat dairy cost of production study conducted over three years, see the report developed by MNP for the Ontario Ministry of Agriculture, Food and Rural Affairs in 2021: *Dairy Goat COP Study.*

"[Processor] should get rid of the quota system. You make so much milk, and the following year you make more milk, but you're penalized even though [processor] says they want more milk."

"Especially if [processor] is looking to get new producers, or cow dairies switching to goats, they need to do something about the quota. There are a few herds that have said, 'I would expand, but I'll get penalized.'"

-Work with buyers to maintain milk prices at levels that yield a sustainable income to producers.

-UVM, VAAFM and DBIC seek to support further research into the effect of imported frozen curd on domestic goat milk and curd price

There are many factors that influence the price of commodity goat milk, including market factors that may be beyond the control of the one large buyer in Vermont, or state or regional agencies. Two well-established goat dairy farms that we interviewed pointed to the importation of frozen curd by large goat dairy processors as a factor that leads to the undervaluing of commodity goat milk. This milk price depression due to importing frozen curd was also cited by the owner of a well-established milk processing plant at one of the goat dairy site visits, in the context of discussing why they see on-farm value-added processing as necessary to capture an adequate milk price for goat dairy farm enterprises. The relationship between the importation of frozen curd and commodity goat milk prices is an area requiring further investigation.

> *"The short answer is no [we would not want to ship to bulk fluid milk], because it's not profitable at the given price point now. There's a lack of value of goat milk in America because of imported curd. And New England is no exception."*

- Explore extended lactations to reduce production costs.

Seven of the 20 farms we interviewed are practicing or experimenting with using extended lactations for all or part of their herds. Four of these producers ship fluid milk, and the other 3 have farmstead creamery operations.

Breeding for extended lactations in dairy goats, in which goats are bred and freshen every 2-3 years, instead of annually, is not yet the dominant practice in Vermont, but has the potential to offer significant benefits to goat dairy producers, including:

- Fewer transition periods (drying off and peri-parturition) for the does, which are times of stress and reduced immunity

- Fewer youngstock and dry does that must be fed and housed (increased expense) when they are not contributing to milk production (income)

- More milk and a smaller dry window over a given period: 2 months dry every 24-36 months, as opposed to 2 months dry every 12 months

- Fewer kidding seasons, which are incredibly demanding in terms of time and labor

- Fewer kids to find markets for. Finding a buyer for kids in Vermont is challenging, with producers often cobbling together personal connections with buyers across the Northeast, which can also be time and labor intensive.

"We firmly believe that long lactations are the key to profitability on a goat dairy."

"...Our genetic work has been focused on breeding for long lactations: milking for 2-3 years straight through without kidding...The majority of losses take place at the time of freshening, so if you can reduce that by a third by milking goats for 3 years straight, you're going to avoid a lot of heartache."

Finding:

There is concern among fluid milk producers about the dependence on a single, primary bulk fluid goat milk buyer.

Organic farmers in Vermont and the Northeast are still recovering from the economic and emotional damage wrought by Danone and Horizon Organic in their 2021 decision to pull out of New England, leaving 89 organic cow dairy farmers, including 28 in Vermont to find new markets within a year.

While other companies, as well as the State of Vermont, worked to minimize the impact of the Danone decision, it remains a recent, well-publicized and troubling memory among Vermont farmers. In interviews for this project four producers independently brought up their concerns about the risk of having only one large buyer of fluid goat milk in the state.

"Thank goodness we have [the large processor] to sell the milk [to], but it would be nice if there were competitors in the industry, because competition makes for a better industry overall. [The large processor] does fantastic cheese, no doubt about it. But they're the only business out there. What would we do without them? This is a big question for anyone getting into the business."

Recommendations:

- Address the risk of dependence on a single buyer:

- Strengthen the commitment of processors to Vermont's producers by committing to remain in the state over a period of time into the future.

- Support the expansion and development of other fluid milk buyers in the state and region.

A review of fluid goat milk processors in Vermont found 4 processors who purchase goat milk to make their products. These range from processors who buy substantial quantities of milk year-round from producers with up to 800 milkers, to small processors who buy milk from farms with less than 100 milking goats.

- Vermont's goat milk processors could consider allowing farmers to sell milk to other processors as well

Three of the producers we interviewed described how, if a large processor were to allow their suppliers to ship milk to other (generally smaller) processors as well, it would benefit all involved. The producers would have a diversified income stream, and the smaller processors would have a local source of fluid goat milk to meet their processing demands.

> *"What's hard for [producers who are not shipping to the large processor] is that [the large processor] ... is very strict with their producers—they are not allowed to sell to anyone but [the large processor] ... To sell fluid milk you have to be at scale, and if you are, you're selling to [the large processor] ... In some ways, I feel like [the large processor] does themselves a disservice by putting so much "no- compete" on their dairies. Small creameries can pay more for fluid milk, and they wouldn't be taking that much, in the bigger picture. It could be more of a shared resource, and it wouldn't hurt anybody."*

Finding

Start-up goat milk producers face challenges obtaining financing without a history of production.

Vermont agricultural lenders report hesitancy to lend to new goat dairies in Vermont, given the current financial information these lenders have about goat dairy operations in the state.

Recommendation:

VAAFM and processors should educate and work with agricultural lenders to evaluate new producers and ease access to credit for viable new goat milk producers.

Finding:

Farmstead goat dairies are unlikely to become a significant source of fluid milk shipped off-farm. Their scale, business models and infrastructure are geared toward farmstead production and processing, not bulk milk shipment.

Nine out of 11 (82%) of the farmstead creameries interviewed said they are not interested in shipping bulk milk to a processor. Two were undecided.

Why not? The most common reason cited (64%) was milk price and profitability. Two farmstead creameries explained that they could capture over double the price per pound for their milk by processing on farm, compared with the current milk price paid by a large Vermont goat milk processor.

Milk price and profitability were not the only reasons farmstead creamery producers cited for their lack of interest in shipping fluid milk. Some producers described their love of cheesemaking as a part of their operation. Others said that they wanted to maintain a smaller herd size that was incompatible with the scale required to be profitable if shipping milk. For some, this smaller herd size better matched their infrastructure, land capacity (especially for those who graze their herds), herd health management, and lifestyle goals.

> *"I can't say it enough: we would not be here doing this [goat dairy farming] if there wasn't a value- added product attached to it. Mainly because we set out for that because I knew the finances of our industry, and that selling commercial commodity milk... was essentially a break-even proposition, at best."*

Recommendation:

Continue to support farmstead creameries with technical assistance related to marketing and distribution.

Half (50%) of farmstead producers said they would like additional education on marketing, substantially higher than the 17% of fluid milk producers who said they wanted to understand marketing.

In a study done by Karen Karp & Partners for DBIC, they found a few businesses were critical connections between Vermont farmstead cheese manufacturers and the out-of-state markets that help these businesses thrive. Assisting new and existing producers understand how to connect and succeed in working with these distributors is an essential element in expansion of this sector.

Finding:

Substantial transition from cow dairies to goat dairy is unlikely in the near term.

Transitioning from cow to goat dairy requires significant changes to infrastructure (housing, parlors, etc.). Goats require careful management and have herd health requirements that are significant and unique from cows.

UVM's Center for Rural Studies used an online survey and in-person interviews to contact cow dairy farmers. 34 cow dairy farmers responded to outreach. Of those 34, about one third indicated some interest in "learning more about transitioning all or part of your cow dairy operation to goat dairy operation." Even among those that responded, interest was weak. Of the 34, only 2 requested additional information about the transition to goat dairy.

On the positive side, one producer who was interested in exploring a transition from cow to goat said:

"Third generation at this farm and looking for opportunities to keep the farm going."

Producers who were not interested in exploring a transition from cow to goat said:

"We're stuck with cows."

"Money. Profit making on cow's milk & set-up is good with cows."

"Don't know much about it."

"Doesn't fit in our business. We're at max capacity."

"Not going to work. Just not."

"We've been in dairy for over 80 years, goats never entered our wheelhouse. We have a pretty good market for our production now."

Recommendation:

Improve understanding of costs and benefits for the transition from cow to goat dairy. Disseminate technical and financial requirements for transition to cow dairy farmers.

Existing goat dairy producers stated repeatedly that "goats are not little cows" and have unique management and herd health requirements.

"We were not prepared for CL, CAE, and Johne's. I have a cow background and was not prepared for these goat issues."

Strengths and Challenges Shared by the Goat Dairy Sub-sectors: Fluid Milk and Farmstead Production

Finding:

Bulk fluid goat milk producers and farmstead goat dairies differ significantly in scale, production levels and marketing issues. There are also important areas where strengths and needs overlap between these two types of dairy goat operations.

This table highlights the differences in scale, production, and milk components reported by the Vermont producers we interviewed.

Production Metric	Fluid Milk Producers Mean (Avg)	Fluid Milk Producers Median	Farmstead Mean (Avg)	Farmstead Median
Total number of goats	424	380	101	60
Avg annual milk production/milking doe (lbs milk/doe/year)	1,592	1,614	2,028	2,000
Average protein count (%)	3.16	3.00	3.36	2.92
Estimated total pounds of milk produced in the last 12 months (lbs)	326,229	274,208	136,735	40,250

Note: According to a 2012 APHIS study, the average annual milk production per doe for goat dairy operations with 10 or more goats was 1399 lbs. milk/doe/year. 45% of these operations had an annual milk production per doe of 1,500 lbs. or more

*Source: Animal and Plant Health Inspection Service Veterinary Services. (2012). *US Dairy Goat Operations Info Sheet* (Report #639.0312). USDA-APHIS-VS-CEAH. https://www.aphis.usda.gov/animal_health/nahms/goats/downloads/goat09/Goat09_is_DairyGoatOps_1.pdf

Examples of areas of common interest include herd health and disease management and certain educational topics. For example, more than 50% of both farmstead and fluid milk producers are interested or very interested in additional training on farm management and accounting.

In other areas we find significant differences. For example, 67% of fluid milk producers had sufficient access to a nutritionist, compared to only 36% of farmstead producers.

Recommendations:

Develop resources that meet common needs between farmstead and fluid milk producers.

Develop resources that meet the unique needs of each dairy goat sub-sector.

Finding:

Bulk producers and farmstead producers interact through sales of high-quality goats. Smaller farmstead herds provide genetics to bulk producers that improve health and yields for sales of fluid milk and income for farmstead producers. Conversely, some established and experienced bulk producers have experience that contributes to the development of farmstead producers.

Interest in networking was high among all producers, expressed by 50% of fluid milk producers and 47% of farmstead producers.

Recommendation:

Facilitate forums and develop events that promote communication, collaboration, and information sharing between bulk milk and farmstead producers.

Finding:

Herd health issues were a primary concern of both fluid milk and farmstead producers.

Herd health issues were a common challenge, mentioned by 17 out of 20 farms. Farmers told us repeatedly, “goats are not just little cows”; they have unique management and herd health concerns, including management of CAE, CL, Johne's, and internal parasites.

Herd health challenges were compounded by a lack of farm service providers with commercial goat dairy expertise. While nearly all interviewees reported having reliable access to their veterinarian, they noted that “vets need more training in goat medicine” and they also wanted better access to other providers including nutritionists and reproduction and genetics specialists.

"I think goat farming largely, it's disease management, it's not disease eradication. I mean I work towards disease eradication always, but for most farmers I think they need to be more realistic with that."

"There's no nutritionist that specializes in goats, it's all cow dairy and horses."

"We have decreased [the size of our herd] because of health issues in the herd. We had to do heavy culling to get back into good shape. We had internal and external parasite issues. We changed the pasture rotation. We changed how we treat for parasites. And we keep does with parasite resistance and cull those who had to be constantly re-treated."

Recommendations:

- Increase technical assistance and educational materials to assist producers managing dairy goat health, including expanding availability of veterinarians, nutritionists, and genetics specialists with goat dairy expertise.

Interest in additional education and assistance with herd health was nearly universal among farmstead producers, with 91% reporting that would be useful or extremely useful. Among fluid milk producers interest was high as well, with 78% responding the same.

Eighty-two percent (82%) of respondents indicated the need for more access to specialists in genetics and reproduction. This offers an educational opportunity that could benefit producers of all production models and herd sizes.

- Establish a Vermont state service to provide free or reduced-cost disease testing and management services for diseases such as CAE, CL, and Johne's

"Vermont has a lot of support for farmers and I don't want to sound ungrateful, but Vermont is one of the only states that doesn't pay for disease management [for diseases like CAE and Johne's]. It might be good information for the state of Vermont to know what percent of goats in Vermont have CAE. Vermont should offer a free round of testing. Testing is a huge expense for a farmer. CAE testing for 250 goats is $1,300. CAE is why we use AI. We will never buy a buck. Most people don't test, or don't continue testing. [We] test annually.
People may test once and claim that they're CAE-free for everyone. Quebec has a certification program: test a random 10% of every herd annually."

Finding:

Farm labor was identified as one of the greatest challenges facing farms. Data indicates labor is a somewhat greater challenge for farmstead producers.

When asked "What is the greatest challenge facing your farm in the future?", labor was the most-cited concern. Labor challenges include not being able to find employees; not having enough money to pay additional employees, even when necessary; farm owners not having enough money to pay themselves and needing to support the farm with off-farm jobs; and simply having too much work for the time in the day.

"We have paid off our initial investment on this farm in terms of buildings and infrastructure. For years we both worked without pay. I had other jobs off-farm and [they] had other income. It's becoming more important for me to draw an income and to pay our employee a reasonable wage. Any profitability we've had has disappeared."

"We can't possibly work any more hours. We work 24 hours a day, 7 days a week without a vacation in 12 years. There is no more time to give. I work a full-time off-farm job in order to survive. It's not that the business won't sustain itself, but we can't pay the mortgage and bills and live on just the farm income."

"We're profitable. Is it enough to pay us a decent salary? No. We're profitable, but not in a sustainable way. So, yeah. Can the farm pay for all the labor it needs? I think so. If we had 5 people, we'd be able to produce a lot more. I never advertise and we sell everything we make without much effort. We're constrained by labor. You can't do more without more people. Two people can only do so much. Yes, I think it can be profitable, but making that leap... It's almost a moot point because you can't find people! Find me 5 people and I will tell you with certainty that we can be profitable."

"Milking [this many] goats, I can have [farm co-owner] working full-time on the farm. I can't pay [them] what [they] deserve to be paid, not what any farmers deserve to be paid. We're at that point where it's becoming too much work to not have somebody here full-time."

Recommendation:

Shortage of farm labor is a major limitation to expanding goat dairy production. Engage with other farm labor initiatives to increase the availability of labor by addressing misconceptions about farm work, increase benefits, improve human resource management and create a legal visa program for migrant farmworkers.

Necessary Infrastructure for Expansion of Vermont's Goat Dairy Sector

Finding:

Institutional infrastructure needs to be developed to provide more technical support for goat dairies in the areas of health, nutrition, genetics, and extended lactations.

Recommendation/Strategy:

UVM, AAFM and private industry collaborate to ensure technical services are available to producers Fund UVM Extension to develop courses and on-line materials to provide an overview of critical issues and resources for new and existing goat dairies.

Finding:

Eighty-two percent of farms surveyed state they do not have sufficient access to a reproductive/genetics specialist.

Forty-four percent state they do not have adequate access to an animal nutritionist specialist.

Farmers described the need for more veterinarians to become familiar with the specific needs of goats as livestock to further support the industry in Vermont.

Recommendation:

Educational resources should be directed to specialized infrastructure in support of the goat dairy sector. Veterinarians, reproductive specialists and nutritionists should be incentivized to address the specific needs of small ruminants in Vermont.

Finding:

A major concern for nearly all dairy goat producers at scales larger than a few animals is finding markets for newborn bucklings.

Finding a buyer for kids in Vermont is challenging, with producers often cobbling together personal connections with buyers across the Northeast, which can be time and labor intensive. For farms that opt to sell all their bucklings and culls at auction have limited options. A review of 14 regional auctions found that 8 sell goats and none of those are in Vermont.

Recommendations:

- Develop a resource guide for marketing bucklings within and outside of Vermont.

- Work with existing Vermont consignment auctions to include buckling and cull goat sales.

- Build markets for Vermont goat meat that increase the profitability of raising bucklings for meat and for sales of cull goats.

Vermont Dairy Goat Operations Data

Finding:

Data on dairy goat operations collected by NASS and that commonly utilized in Vermont diverge substantially and cause confusion.

While in many parts of the world, goats are a primary component of agricultural production and consumption patterns, this is not the case in the United States. Data collected by the National Agricultural Statistics Service (NASS) about goats and goat dairies in the U.S. has only recently been separated from what had been a "goat and sheep" category. This means that little longitudinal data exists to bolster the available short-term data. Additionally, what data we do have pertaining directly to goat dairy are relatively limited in breadth.

NASS data for "farm operations" are inclusive of all farm operations, including for diversified farm operations reporting multiple livestock types on farms. This means that enumerated "goat dairy operations" include those where goat dairy is not the primary function of the farm operation. This results in NASS dairy goat operations that are significantly greater number of dairy goat operations in NASS than what is commonly understood to be the numbers among Vermont agencies and service providers. For example, NASS data on dairy goat operations with inventory counts 270 operations in Vermont, while our project database counts only 31 "Grade A" goat dairies and 39 goat dairies in total, including those selling raw milk. Even this larger number amounts to just over 14% of the NASS count.

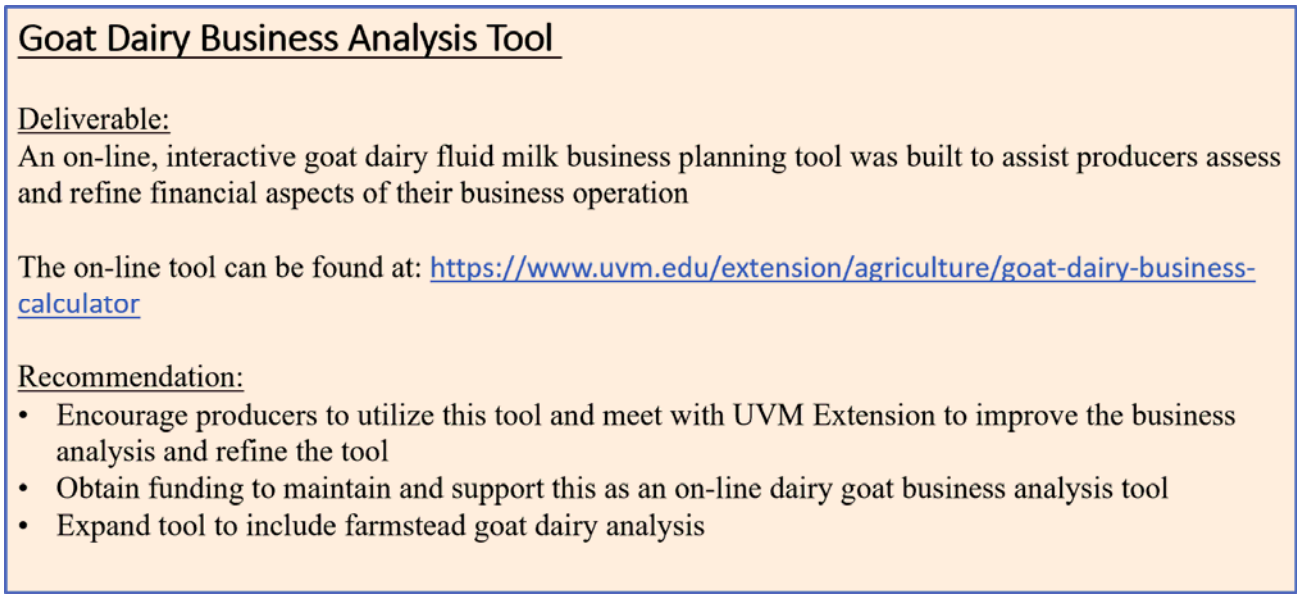
Recommendation:

- VAAFM should develop a standard definition of a Vermont goat dairy operation that is meaningful for establishing a database of producers

- VAAFM should develop and maintain a database of Vermont goat dairy operations similar to that for cow dairies

Goat Dairy Business Analysis Tool

Goat Dairy Business Analysis Tool



Goat Dairy Business Analysis Tool

Deliverable:
An on-line, interactive goat dairy fluid milk business planning tool was built to assist producers assess and refine financial aspects of their business operation

The on-line tool can be found at: https://www.uvm.edu/extension/agriculture/goat-dairy-business-calculator

Recommendation:
- Encourage producers to utilize this tool and meet with UVM Extension to improve the business analysis and refine the tool
- Obtain funding to maintain and support this as an on-line dairy goat business analysis tool
- Expand tool to include farmstead goat dairy analysis

Overview

The goat dairy business analysis tool was developed to support new and existing goat dairy farmers who sell fluid milk to a processor. The tool has a variety of pre- developed assumptions based on production levels and expense categories that were compiled from a variety of academic, industry, and farmer sources. These assumptions provide information for criteria that, when calculated with the tool, will compute production levels, monthly revenue from buyers, monthly counts of herd size and composition, other revenue streams, and expenses. Users can also input their own fixed costs including mortgages, leases, equipment, and other overhead. Outputs include a modified 12-month profit and loss statement, a register for necessary capital investments, and a modified cash flow statement that displays the effects of the enterprise on a farm's finances.

Methods

This tool was developed utilizing input from several Vermont goat dairy farms that dedicated their time to review and share detailed production, income, and expense records. We also reviewed several publications for reference (see References). The outputs on the "12 Month Production and CF (Cash Flow)" tab are based on several variable criteria. All these criteria can be changed based on the users' preferences in the "Assumptions" sheet. All fields that are highlighted in yellow can be adjusted. The following sections include example clips from the tool. An additional worksheet in the tool but not included here summarizes the assumptions and sources.

Utility/Application

The calculator is available through UVM Extension's Agricultural Business Webpage to be freely downloaded by the public for farmers and service providers to use while planning for a dairy goat enterprise: https://www.uvm.edu/extension/agriculture/goat-dairy-business-calculator

Modified Production and Profit and Loss Statement

Production Section

Production						
Milking Does	400	450	500	500	500	500
Avg. LBS/Day	5	6	6.2	6.3	6.6	6.8
Avg. LBS/Herd/Day	2000	2700	3100	3150	3300	3400
Days in Month	31	28	31	30	31	30
LBS/Month	62000	75600	96100	94500	102300	102000
CWT/Month	620	756	961	945	1023	1020
LBS/Doe	155	168	192.2	189	204.6	204
Avg. (Daily)Protein Production/ Goat	0.030	0.030	0.028	0.029	0.029	0.029
Avg. (Daily)Protein Production/ Herd	60	81	86.8	91.35	95.7	98.6
Total Protein Production (lbs)	1860	2268	2690.8	2740.5	2966.7	2958
Protein CWT	18.6	22.68	26.908	27.405	29.667	29.58
Avg. (Daily)Protein Production (%)	3	3	2.8	3	2.9	2.9
Base Price (per CWT)	$ 15.50	$ 15.50	$ 15.50	$ 15.50	$ 15.50	$ 15.50
Monthly Quality Bonus	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00
Price/cwt	$ 48.50	$ 48.50	$ 45.40	$ 48.50	$ 46.95	$ 46.95
Winter Bonus						
Monthly Check	$ 30,070.00	$36,666.00	$43,629.40	$ 45,832.50	$48,029.85	$47,889.00

This section shows all production levels for the milking herd. Users will be able to view daily, monthly, and yearly production levels and calculate what their milk checks would look like based on a per hundredweight (cwt) contract with a buyer.

- Milking Does Head Count – The main basis for all projections in the tool. Users can adjust based on their goals.
- Avg. Lbs./Day – Herd production varies. These production levels are based on a milking herd that is bred once per year.
- Avg. Daily Protein Production/Goat (%) – In many cases with a cheesemaking buyer, suppliers' base prices are based on this criterion.
- Base Price (per cwt) and Monthly Quality Bonus – Can be adjusted based on contracts with buyers.
- Winter Bonus – Has not been applied to this tool.
- Experience with interviewing current Vermont dairy farmers shows that production levels (average pounds per day per goat and average daily protein production) vary greatly across the state.

Herd Changes

Herd Changes							
Kids (1.7 kid/goat)			340	510			
Cull Bucking #			162	242			
Cull Doeling #			112	167			
Cull Doe # (25% replacement rate)			50	75			
Replacement Does added to herd			50	75			
Replacement Does (total count)			50	125	125	125	125
Kid Mortalities (10%)			34	51			

- The calculator is based on the milking herd being bred once per year, kidding in February and March. Assumptions are detailed in the line items.
    - 1.7 kids per goat
    - All bucklings are culled and sold at $10/head
    - 25% milking herd replacement rate
    - Culled does sell for $50/head
    - Culled doelings sell for $25/head
    - Kid mortality rate is 10%
- Experience with interviewing current Vermont dairy farmers shows that kid mortality rates are much higher among the farms we consulted with than in the studies that were reviewed. We left 10% as a goal for an ideal farm.

Feed Consumption

Feed Consumption							
Grain- Milkers (lbs)		54250	49000	54250	52500	54250	52500
Grain- Replacements (lbs)		0	2100	5813	5625	5813	5625
Hay (lbs)		38750	35000	38750	37500	38750	37500
Minerals (lbs)		484	438	484	469	484	469
Milk replacer (lbs)		0	4200	11625	11250	11625	11250

- Feed consumption assumes that all grain, hay, minerals, and milk replacer for kids will be purchased by the farm (not produced on farm).

Revenue

Revenue							
Buyer							
Bulk goat milk account		$ 30,070.00	$36,666.00	$43,629.40	$ 45,832.50	$48,029.85	$47,889.00
Culled doe sales (@$50/head)			$ 2,500.00	$ 3,750.00			
Kid sales							
Doelings (@$25/head)			$ 2,787.50	$ 4,181.25			
Bucklings (@$10/head)			$ 1,615.00	$ 2,422.50			
Other cash receipts							
TOTAL CASH INCOME		$ 30,070.00	$43,568.50	$53,983.15	$ 45,832.50	$48,029.85	$47,889.00

- Revenue is based on a contract with one buyer. Quotas are not considered. Base price (per cwt), monthly bonuses, and winter bonuses can be adjusted in the calculator.
- Culled does are considered to be healthy and saleable to other farms at $50/head, a conservative price. “Cull doelings” are sales of healthy doelings considering that the farmers do not aim to grow the herd head count. “Cull bucklings” are based on prices that current farmers in Vermont receive from an out- of-state buyer. A major concern that has been expressed by farmers and service providers is what markets would be available for excess bucklings should the goat dairy industry grow in Vermont.

Expenses

Expenses							
Variable Expenses							
Milk hauling							
Stop charge		500	500	500	500	500	500
Milk Replacer for Kids		$ -	$ 1,995.00	$ 5,521.88	$ 5,343.75	$ 5,521.88	$ 5,343.75
Purchased hay (consumed)		$ 4,146	$ 3,745	$ 4,146	$ 4,013	$ 4,146	$ 4,013
Purchased grain (consumed)		$ 13,888.00	$13,081.60	$15,376.00	$ 14,880.00	$15,376.00	$14,880.00
Minerals		$ 290.63	$ 262.50	$ 290.63	$ 281.25	$ 290.63	$ 281.25
Bedding		$ 200.00	$ 220.00	$ 250.00	$ 250.00	$ 250.00	$ 250.00

This section lays out many variable expense assumptions that are based upon the head count of the herd. These assumptions were based on several reports from around the United States as well as feedback from several current Vermont goat dairies. Some variable expenses and all "Fixed Expenses" are left blank. The amount of variation in the situations of Vermont farms makes it difficult to create universal assumptions for these expenses. Users can enter their farm-specific information into the calculator, or simply leave it out. By leaving out fixed expenses, the user can get a closer look at what effect the goat dairy enterprise would have on an existing farm's operational earnings.

Capital Investment Calculator

Livestock		$137,500		Bred doe	$275	per doe		
Machinery								
	Tractor							
	Tedder							
	Mower							
	Rake							
	Baler							
	Wagon							
	Total	$ -						
Milker Housing Requirements								
	Air per goat (cubic ft)		247	500	123500	total cubic feet		
	Space per goat (sq ft)		20	500	10000	total square feet		
	Bunkline space per goat (ft)		1.1	500	550	total feet		
	Alley space per goat (ft)		6.56	500	3280	total feet		
						Estimate for 500 goats	$	113,000.00
						Total	$	113,000.00
Kid & Doeling Housing Requirements								
	Space per doeling including kids (sq ft)		10.7	510	5457	total square feet		
	Bunkline space per doeling (ft)		1	510	510	total feet		
	Alley space per doeling (ft)		6	510	3060	total feet		
						Estimate for 500 goats	$	55,000.00
						Total	$	55,000.00
	Useable Life of Building (years)		20					
Parlor & Equipment Requirements								
	Double 12							
	Bulk tank	Gallons (for 100 goats)	500	gallons needed				
		Gallons (for 200 goats)	1000	gallons needed				
		Gallons (for 500 goats)	2000	gallons needed				
	Other							
					Estimate for 500 goats	$ 99,000.00		
					Total	$ 99,000.00		

This calculator helps farmers estimate all of the major investments that would be needed in order to start a goat dairy. As with many variable operational expenses such as feed, many of these costs have been highly volatile during the recent economic period in the United States. Costs for buying a herd, machinery acquisitions, housing, equipment, and milking parlor costs are all considered. It is difficult to assume prices for these items, given that farmers may buy these items new, buy them used, or already own them.

Requirements for housing, equipment, and milking parlors are based on recommendations from industry experts. The totals are based on herd head count. Users will also be able to add cost information if they desire to get "real life" quotes from service providers.

The total costs (investments) in this calculator are added to the next sheet, the "Changes to Cash Flow Statement."

Changes to Cash Flow Statement.

THE UNIVERSITY OF VERMONT EXTENSION

CHANGES TO CASH FLOW STATEMENT

FARM NAME		Year	202X
	Cash In	Cash Out	Net Cash Flow
Cash farm income and expenses (operating)			
Cash received from operations	$ 503,865.92	xxx	
Cash paid for operating expenses	xxx	$398,025	
Cash paid for interest	xxx	$0	
			$ 105,840.45
Capital assets (investing)			
Sales of capital assets	$0	xxx	
Cost of breeding livestock purchases	xxx	$137,500	
Cost of mach. & equip. purchases	xxx	$99,000	
Cost of building purchases	xxx	$168,000	
			($404,500)
Loans (financing)			
New borrowings	$0	xxx	
Principal repaid	xxx	$0	$0
Nonfarm			
Nonfarm income invested in the farm business	$0	xxx	
Cash withdrawn from the farm for living, taxes, savings, etc.	xxx	$0	$0
Cash on hand (balance in farm checking, savings accounts)			
Beginning of year	$0	xxx	$0
Total cash in and cash out	**$503,866**	**$802,525**	-$298,660

***Income taxes not included

This section gathers information about all operating and investing activities and allows the user to add information from financing activities, off farm income, and personal activities. Annual estimated loan payments can be added in the yellow boxes for producers who want to account for these expenses. The main purpose of this section is to provide the user with a visual representation of how cash will flow into and out of the business during the year.

Results and Challenges

Production

Many factors influence milk production per goat and milk protein content, including genetics, breed, nutrition, and management.

Our interview findings and financial consultations indicate that farms in the startup phase and newer farms tended to have lower milk production per goat than more established farms. As one farmer we interviewed said, “You can put down on paper that you’ll be making 8lbs milk/goat, but that’s not in line with the reality of things. 5.5 lbs. milk/goat is more realistic. I know there are farms that do better than that but starting out that’s the range.”

More established farms tended to prioritize high levels of milk production per goat (along with overall livestock health), which they achieved by focusing on genetics improvements (selective breeding), nutrition, and overall herd management. These farms emphasized that achieving high levels of milk production per goat is essential to a goat dairy’s profitability.

Average pounds of milk produced per doe per day (Avg. Lbs./day)
The current production levels that are preloaded into the calculator are considered to be ideal levels for a dairy with a mature milking herd, meaning that most of the herd has entered at least its second lactation. Upon review of several Vermont dairies, it became clear that production levels varied significantly among farms, and, in some cases, farms were producing much less than the levels assumed in the calculator.

Average Protein Production
Like average pounds of milk/doe/day, protein levels in the calculator are based on ideal levels drawn from national data, as well as from levels reported by a well-managed, experienced Vermont goat dairy. Given that the protein counts reported in Vermont were lower than those found in national data, we decided to preload the calculator with a protein content below the "national ideal" level. It appears that the preloaded levels have been accurate with the Vermont farms that have tested the tool.

Revenue and Expenses

Base Price (per cwt) and Rising Feed Costs
Feed costs have risen sharply in recent years. For example, prior to the COVID-19 pandemic, the price of a goat dairy pellet from Poulin Grain was about $350 per ton. Today, that grain is now $512 per ton. In the interviews we conducted, farmers also highlighted sharp increases in other input costs, including milk replacer, hay, bedding, and equipment.

According to our interviews with producers who ship milk to a local processor, that processor's pay price remained unchanged from 2018 to September of 2022, when the processor raised the price paid per pound of milk protein by 5%.

As one of these producers put it, "Pay price was increased this past fall but not commensurate with inflation [and rising input costs] so ultimately, we are working with a pay cut in 2023."

One processor said that they recognize the importance of ensuring the milk price balances the needs of both the producer and the processor. They noted that the margins on cheese are extremely compressed by competitive pressure from larger scale domestic and international cheesemakers who purchase milk from larger scale goat dairies; and therefore, processors need to find ways to command higher profit margins on their cheese in order to pass through a higher milk price. From the processor's perspective this is critical in order to create sustainable financial health for Vermont's goat dairy industry.

Head Count Scenarios

Optimum Head Count
According to the calculator, and the given assumptions made for milk production per goat, protein count, and costs, milking 100 goats would lead to negative operating returns. A dairy milking 250 head would come close to operating at break-even. A dairy milking 500 head would come close to achieving an operating profit of $100,000. This operating profit assumes almost all costs involved with producing and shipping milk to a buyer, but does not account for overhead costs such as mortgage, vehicles, etc. Interviews with several producers suggested that even at 500 goats or above, costs of production currently exceed the price they are receiving for their milk.

Capital Expenditures and Financing

Herd, Housing, and Equipment

Purchasing a herd with 500 milking head would require significant initial capital expenditures, given the cost of the herd, livestock housing, a milking parlor, milkhouse, and equipment. To establish a brand-new goat dairy with 500 head milking, infrastructure, and equipment, we estimate nearly $400,000 would be required for capital expenditures. It is worth noting that many Vermont farms could retrofit existing farm infrastructure and/or purchase used equipment. We are unable to make universal assumptions about the costs of these items, given the significant variations among different farming scenarios.

Limitations

This tool was designed with current and historical data from both national studies and consultations with existing Vermont goat dairy producers. As with any financial forecasting too, the calculator is accurate insofar as its assumptions remain valid. Given that the calculator is the first of its kind, it is recommended that key data points be revisited annually or biannually to create Vermont-specific benchmarks.

Educational Needs Assessment

Educational Needs Assessment

The assessment of educational needs of goat dairies in Vermont identified areas where additional training would help the sector. Investment in farmer education in the areas of animal health, nutrition and genetics would benefit producers across the scales and types of marketed output. Most farms have a business plan to some extent, suggesting that targeted training programs, for example grant writing, accounting and utilization of social media would be used by producers.

Key Findings

Educational options must account for differentiation to meet the needs of Vermont's diverse operational models mix.

- Seventy percent of responding farms indicated they currently have a business plan.
- Eighty-two percent of farms surveyed state they do not have sufficient access to a reproductive/genetics specialist.
- Forty-four percent state they do not have adequate access to an animal nutritionist specialist.
- Forty-five percent of farms surveyed were interested in receiving a free consultation with UVM Extension's Agricultural Business Program.
- Business management training topics considered most useful include:
    - Grant-writing, accounting, overall farm management, business plan development & website/media development.
- Animal and product safety training topics considered most useful include:
    - Animal nutrition and health, and genetics and breeding.
- In addition to training and education options for farmers themselves, most farmers described the need for more veterinarians to become familiar with the specific needs of goats as livestock- to further support the industry in Vermont.
- Access to a farmer liaison and/or technical specialists to provide hands-on technical assistance was repeatedly emphasized by interview respondents contracting with a Vermont bulk fluid milk processor.

Training Modes

- Goat dairy farmers prefer applied learning opportunities including tours of existing farms and hands-on workshops.
- Farmers seek to engage in peer networking to solicit each other's expertise in genetics, nutrition, and other farming topics.
- Farmers state they would most like to receive trainings utilizing online or hybrid in-person/online methods.
- Farmers expressed interest in having hands-on trainings recorded and posted online so they could access those recordings at their convenience.
- January and February are the best times of year to avoid kidding season and engage in hands-on training opportunities.
- Avoiding kidding seasons is absolutely necessary.

Educational Resources and Models

While goat dairy farming may be characterized as a niche dairy activity by the USDA, many local, regional, national and international organizations (including the USDA) support research and development of goat dairy farming. The following list is not comprehensive- but does represent a broad range of resources supporting goat dairying.

Vermont Agricultural Business Planning Services

- VT Housing and Conservation Board- Farm and Forest Viability Program
- Intervale Center- Beginning Farmer Business Planning and Coaching
- Northeast Organic Farming Association of VT- Business and Transfer Planning Services
- Center for an Agricultural Economy- Farm and Food Business Advising
- UVM Extension- Agricultural Business Services Suite

Goat Dairy Resource and Research Organizations

- Vermont Sheep and Goat Association
- Southern Vermont Dairy Goat Association
- Cornell University Goat Program
- Penn State Ag. Extension Goat Dairy Resources
- University of Maryland Extension Small Ruminant Website
- The University of Rhode Island Northeast Small Ruminant Parasite Control
- Iowa State University Extension Dairy Goats and Sheep Resources
- Canadian National Goat Federation
- American Dairy Goat Association
- American Association of Small Ruminant Practitioners
- American Cheese Society
- American Goat Federation
- USDA Animal and Plant Health Inspection Service (APHIS) Sheep and Goat Health
- USDA Agricultural Marketing Service (AMS) Goat Reports
- USDA Food Safety and Inspection Service (FSIS) Goat from Farm to Table
- USDA National Animal Health Monitoring System (NAHMS) Goat Studies
- International Goat Association

Photo by Avers Brook Goat Dairy

Goat Dairy Processor Data

Goat Dairy Processors

Methodology

With little goat dairy market data available through existing sources, the project team sought to collect its own primary data by surveying goat dairy processors in Vermont and across the U.S. to learn from their qualitative, experience-based perspectives on goat dairy market trends and processing challenges. We returned to our list of Vermont-based goat dairies and reached out to several farmstead processor operations. Vermont currently has a range of processors that buy bulk milk, with one relatively large buyer, one medium scale and several small- scale processors. Through internet research we also compiled a list of larger-scale processors across the United States that purchase fluid milk for processing similar to Vermont's largest bulk fluid milk processor. We reached out to both these lists via phone and/or email where available, and the website contact form where not, to ask them to participate in the survey either online or over the phone. We heard from seven total goat dairy processors: four Vermont farmstead processors and three processors that purchase in milk in other parts of the United States. All seven respondents made cheese; two sold milk; one made kefir; and two made other goat dairy-based products. Three respondents completed the survey over the phone and four completed the survey online in Qualtrics.

Processors' Demand Trends

We asked respondents if demand for their products had increased, decreased, or stayed the same over the past 2- 3 years, and, if they had been in operation for long enough, over the last decade. For goat cheese, which all seven respondents processed, one reported a decrease in demand over the past few years, three felt demand had stayed the same, and three said it had increased. Five of the processors we surveyed have been in operation for more than 10 years. Three of these said demand for goat cheese had increased over the last decade, one said it had stayed the same, and one said it had decreased. Interestingly, the three respondents who reported an increase in demand in both time periods were the three larger-scale processors from outside of Vermont. The Vermont farmstead processors all reported either no change or a decrease in demand.

We also asked respondents what they thought had contributed to a change in demand for goat cheese. The Vermont farmstead cheesemaker who said that demand had decreased over the past few years reported losing restaurant clients during the COVID-19 pandemic. One of the larger-scale processors attributed the increase in demand to gaining new wholesale clients, including a restaurant chain and two grocery store chains. Both the other larger-scale processors felt that goat cheese was becoming "a more widely accepted consumer product" in the United States. One also mentioned that some people who cannot tolerate cow's milk can consume goat dairy products.

The two processors who sold goat milk both felt that demand had increased over the past 2-3 years. One of these had been in operation for over a decade and felt that demand had also increased over this longer period of time. One of the goat milk vendors attributed the increase in demand to a combination of rebranding and an increase in awareness about the higher digestibility of goat milk compared to cow milk. The other increased sales by selling goat milk to another processor making a different value-added product. The processor who made kefir felt that demand for their product had remained steady both over the past few years and over the last 10 years.

Goat Dairy Processors Challenges & Strengths

While there is very little data available describing the challenges faced by Vermont and U.S. goat dairy processors, the processors outreach survey distributed by the Center for Rural Studies in the spring of 2023 collected some additional information about challenges.

The three large-scale processors we talked to, defined as those that only purchase milk and do not produce their own, all cited sourcing as a challenge. As one said, “Getting enough producers, milk supply, is tough. It's liquid gold.” Another was dedicated to conducting lots of testing to source high-quality milk, which amplified the challenge. They sourced their milk from three hours away, which was expensive, but they could not find a closer supplier. All three processors turned to farmer networks to try to address the challenge of sourcing. One worked with a cooperative so that they could source milk from multiple farms at once. Another focused on building strong relationships with their existing suppliers, who in turn may be able to convince other farmers currently milking cows to transition over to goats. The third also centered their existing suppliers but did not see an existing solution to the supply problem: “We try to support our farmers as much as possible and work on contingencies. But it's hard because there's not much supply out there.”

The four Vermont farmstead processors each expressed different challenges. One noted that “restaurants are still hurting” in the aftermath of the COVID-19 pandemic and had tried to identify new markets in the meantime. Another noted that because of the small size of most goat dairies and the predominance of cows in Vermont, goat dairies tended to “slip through the cracks with regard to funding and support” from both state and federal governments. The third had trouble finding labor and profitable distribution paths. The fourth also struggled with distribution: because Vermont is a small market, they needed to sell out of state to be profitable, but they struggled to find a distribution company that knew how to work with small producers. They also wanted to scale up their processing operation and had thought about purchasing milk from other farmers but decided instead to grow their own herd to have more control over milk quality.

We closed the survey by asking what strengths contributed to the success of their processing operations. Our seven respondents described a wide range of strengths. One had plans to build a new receiving bay that would allow them to expand their product line. Another celebrated their company’s employees. One attributed their success to a “small and nimble scale which does not rely on dairy for survival.” There were a few common themes in the responses to the question. Two cited their long experience in the business, and four attributed their success to having a high-quality and/or unique product.

Farm Visits and Outreach

Goat Dairy Farm Visits

Photos from a farm visit at Tup's Crossing Farm

Overview

In the early spring of 2023, UVM Extension reached out to goat dairies across Vermont to see if they would be interested in hosting a public farm visit later in the spring. We reached out to those who said yes, making sure to include both producers that ship fluid milk and farmstead creameries, farms of different scales, and a mix of confinement and grazing operations. Five farm visits were held in April and May 2023.

Farm Visits Details

Farm Name	County	Sales Model	Feed Model	Herd Size (total goats)	Notes	Attendees
Joneslan Farm	Lamoille	Ships fluid milk to a Vermont processor	Confinement	1,200	The only commercial dairy farm in Vermont so far to transition from cows to goats. Largest goat dairy in the state.	22
Bridgman Hill Farm	Caledonia	Farmstead creamery and ships to a cheesemaker	Confinement with outdoor access	500	Farmstead creamery that produces their own line of bottled goats' milk and ships some milk to a processor.	27
Tup's Crossing Farm	Addison	Ships fluid milk to a Vermont processor	Transitioning to more grazing	380	Has shipped milk to a Vermont processor since 2019. Owners chose to start a goat dairy after working on an organic cow dairy that shipped fluid milk.	31
Ayers Brook Goat Dairy	Orange	Ships fluid milk to a Vermont processor	Confinement	412	Established in 2012 by a Vermont fluid milk processor to be a catalyst for Vermont's goat dairy industry. Now independently owned, the farm supplies milk to that processor.	34
Blue Ledge Farm	Addison	Farmstead creamery	Grazing	160	Established in 2000, Blue Ledge is a first generation, family owned and run goat dairy and farmstead cheese-making operation.	18

Farm Visit Participation by Role

Participant Description	Ayers Brook	Blue Ledge	Bridgman Hill	Joneslan	Tup's Crossing	Total of all 5 Tours	% of all 5 Tours
Goat Dairy Farmers	7	4	10	8	4	33	25.0%
Cow Dairy Farmers	0	0	0	2	0	2	1.5%
Farmer-other	1	2	2	1	5	11	8.3%
Agricultural Service Provider	11	2	8	5	7	33	25.0%
Other	15	10	7	6	15	53	40.2%
Total participants	34	18	27	22	31	132	100.0%

- The participant description "other" included interested members of the general public and many involved in agriculture or related industries who do not consider themselves "service providers".

Farm Visits Participant Feedback

A voluntary participant feedback form was administered to farm visit attendees at the end of each visit. The purpose of which was to both gauge impact and elicit feedback for future outreach. Participants were asked to assess their learning about the following subjects:

As a result of attending this event, did your understanding of any of the following improve?

	Percent "Yes"
Goat dairy infrastructure (barn, parlor design)	98%
Goat dairy herd health considerations	84%
Goat dairy financials	57%
Assistance programs (e.g., technical assistance, financial assistance, etc.)	37%

- Two respondents additionally reported changes to their understanding of genomics and general goat husbandry.

Respondents were also asked: As a result of what you learned, do you intend to make a change on your farm or in how you advise farmers? Sixty-eight percent of applicable respondents stated they would be making changes, with some of those describing those changes specifically.

What do you plan to do differently on your own farm or in your consulting?

I would love to change the way we feed the kids
Concentrate feeding—different perspectives
Shade/pasture considerations. Aged vs. Fresh cheese
Discuss efficiency in operations
Rebranding/sales expansion
Infrastructure design, program access (financial)
Possibly look into the grant for dairies
Look at feeding systems
Advise more research and data
Planning for better infrastructure
Spend more time on health matters such as hooves, etc.
Continue biosecurity practices
Start discussions
Housing management
Improved education for our team to work with our farmers

Finally, respondents were asked about future topics of interest to assist UVM Extension staff in future efforts to directly meet the needs of the goat dairy sector in Vermont. Their responses were categorized and are detailed below by general subject area.

Are there any topics addressed today that you would like to learn more about, or topics not included today that you would like to be addressed in future workshops?

	Number	Percent of Responses
Financials (costs, grants, transition from cow to goat, etc.)	8	30%
Husbandry (Kidding, bucklings, etc.)	4	15%
Markets (Sales, Value-added, etc.)	4	15%
Infrastructure	2	7%
Nutrition	2	7%
Start-up	2	7%
Disease	2	7%

Dissemination of Project Activities & Findings

One objective of this project is dissemination of the information learned in our research. During the project period, information about project activities was provided to the Vermont Senate Agriculture Committee in two presentations by team members. The project team prepared informational materials and staffed a table at the 2023 Vermont Dairy Conference. An Across the Fence television segment about the project, filmed at one of the farm site visits, has been recorded and will air within a few weeks. The Goat Dairy Business Analysis Tool will be hosted on the UVM Extension website provided funding is available. Five well-attended farm tours highlighted the project to farmers, processors, agricultural service providers, and consumers. The farm tours also facilitated farmer-to-farmer knowledge and resource sharing. Finally, the project team presented results at the annual meeting of one of Vermont's large bulk fluid milk processors. Following submission of this report the UVM team and the Northeast Dairy Business Innovation Center will discuss further dissemination of this report and related publications.

Next Steps and Conclusion

Conclusion

This research interviewed actors across the spectrum of goat dairies in Vermont, ranging from small farmstead creameries to larger fluid milk producers and goat milk processors. The aim was to understand the concerns and needs of the goat dairy sector and to identify initiatives that could help grow the sector into the future.

The outcomes were substantial. Upon receiving preliminary findings specific to its business, and particularly feedback from its farmer suppliers, one processor made addressing those issues the central feature of their annual business meeting. Farmers at that meeting noted that they had been waiting years to understand the pricing model used by the processor, and that the ensuing discussion was helpful to them as farmers seeking to sustain their businesses.

The research also identified strategies to expand the supply of fluid goat milk, which is essential for processors seeking to support larger out-of-state markets. Our study found that existing fluid goat milk producers want to expand and need avenues cleared to allow them to do so.

One question of particular interest was whether existing cow dairies would be interested in transitioning to goat dairy production. We did not find this to be likely in the near term because of limited interest and knowledge about goats by cow farmers, as well as concerns about whether goat dairy offers sufficient economic incentives to warrant the work and risks of conversion.

The economics of goat dairy requires more focused study. In this project we developed a financial tool that can assist individual farms with their business decisions. This tool is a first step toward understanding the cost and returns of goat dairy production. At present it is oriented toward fluid milk producers and could be modified in the future to meet the needs of cheese producers. With sufficient input and follow-up interviews this tool could be used to inform a much-needed cost of production study. This will improve understanding about the costs and benefits to farmers evaluating a new goat dairy enterprise and assist farmers assessing the impact of transitioning a cow dairy to goats or increasing the scale of an existing goat dairy.

We found significant needs for the sector. Experienced technical assistance specific to goat dairy is lacking in the state and should be increased. Developing markets for bucklings can reduce stress and workload of farmers while also increasing income for these businesses. Regionally and nationally, the market for goat meat is strong, however the link between these buyers and Vermont goat producers needs significant development.

Our conclusion is that there is a future for goat dairy in Vermont, both for farmstead creameries and dairies interested in shipping bulk fluid milk. Finding strategies that increase returns to fluid milk producers, whether through increasing milk price, reducing costs, or some combination of the two is critical for growing this sector. Better communication, dialogue, and understanding between processors and their farmer suppliers will be key to this initiative.

Appendices

Appendix 1: Goat Dairy Farmers Interview Report

Key Findings

- Goat dairy farmers are solidly focused on either shipping fluid milk to a processor, or producing value-added products on-farm to achieve profitability.
  - 60% of respondents indicated they want to increase the size of their goat dairy herd in the future.
    - Most of these respondents seek to do so primarily to become more profitable.
    - About half of respondents indicated they have increased their herd size in the last five years.
  - 60% of respondents also indicated they were not interested in the bulk milk wholesale market.
    - Producing a value-added product on-farm allows these producers to capture a higher value for their milk than shipping bulk milk.
    - Producers who expressed interest in shipping more bulk milk to a processor also indicated profitability as the primary motive.

- 82% of respondents indicated the need for more access to specialists in genetics and reproduction. This offers an educational opportunity that could benefit producers of all production models and herd sizes.

- Farmers indicated that profitability on the farm, as well as time commitment, are the most significant challenges to growing the herd. Finding adequate labor is also a limiting factor and major challenge for expansion.Interviewees described research in genetics and demand for the product as the greatest opportunities for their farms in the future.

Introduction

One component of this research included direct outreach to goat dairies across the state to help better understand the composition of the goat dairy sector in the state and factors that goat dairies consider in their business decision-making processes.

During the winter of 2023, the University of Vermont's Agricultural Extension Service conducted a series of 20 interviews with goat dairy farms across Vermont. The Center for Rural Studies analyzed the results of these interviews, and our findings are presented below.

Methodology

UVM Extension's outreach and education staff collaborated with research staff from the Center for Rural Studies to develop an interview template for Vermont goat dairy farm interviews. We designed the template to collect demographic data about the interviewee operations and to explore themes focusing on operation scale, decision-making factors, and production opportunities and challenges. The full text of this template is provided as an appendix at the end of this report.

UVM Extension staff reached out to goat dairy operations from around the state until 20 interviewees were identified. Interviewees represent both large- and small-scale operations (within the Vermont context) and include farms that ship bulk milk to a processor and farmstead creameries that process their milk into value-added products on-farm. Of the 20 farms interviewed, nine ship milk to a Vermont fluid milk processor and eleven are farmstead creameries. Farms that opted to be interviewed were compensated with a stipend to account for their time. They were also guaranteed complete confidentiality in all reporting.
Once interviews were completed, the qualitative and quantitative data were aggregated, analyzed and

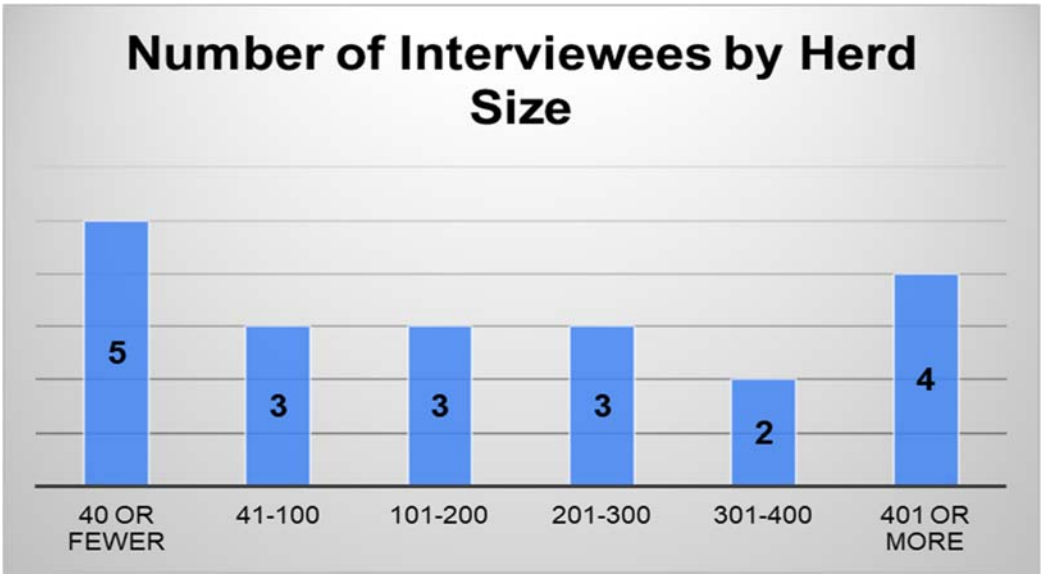
reported by UVM Extension and the Center for Rural Studies. This process included extensive qualitative data thematic coding utilizing a multi-coder reliability process. This iterative process ensured that themes generated by the analysts were congruent and cross-checked by the original interviewer.

Demographics

We interviewed 20 Vermont goat dairy farmers. The 9 farms (45%) we interviewed who ship milk to a Vermont bulk fluid milk processor sell only bulk wholesale milk. Four farms (20%) sell farmstead-made cheese only, and the remaining 7 farms (35%) sell one or more of the following value-added products: cheese, yogurt, kefir, gelato, caramel, raw milk, lotion, and/or soap. Half of the farms we interviewed (10/20) sell breeding stock or replacements. All farms make some money from selling bucklings and culls.

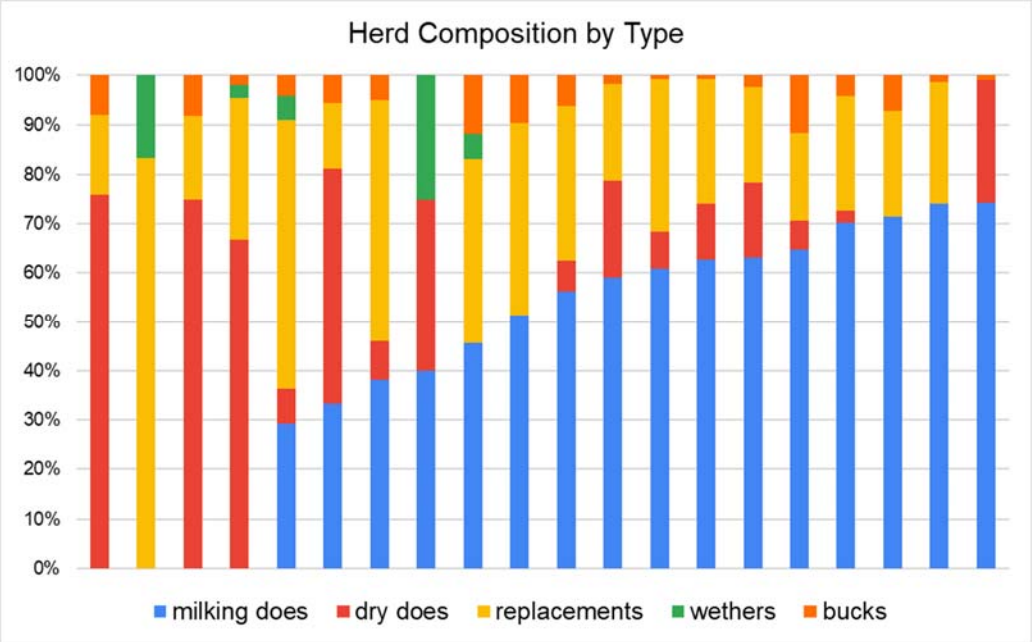
Product Sales

Herd Size



- Interviews were conducted with farms ranging in size from about a dozen or more goats to farms with hundreds of goats.

Herd Composition at Time of Interview*



- *Interviews were conducted between October 31, 2022, and February 17, 2023
- Four farms did not have any milking does at the time of interview due to seasonal dry-off or growing their herds from youngstock.

Replacement Rate

- The average herd replacement rate for respondents was 33%.
- Replacement rates ranged from 3% to 100%.

Herd Size

	Mean	Minimum	Maximum	Observations
Milk production (pounds milk/doe/year)	1,854	662	3,759	18
Protein (%)	3.25	2.75	5.15	17
Total pounds of milk produced per year	200,608	9,930	832,200	14

Feed Purchases

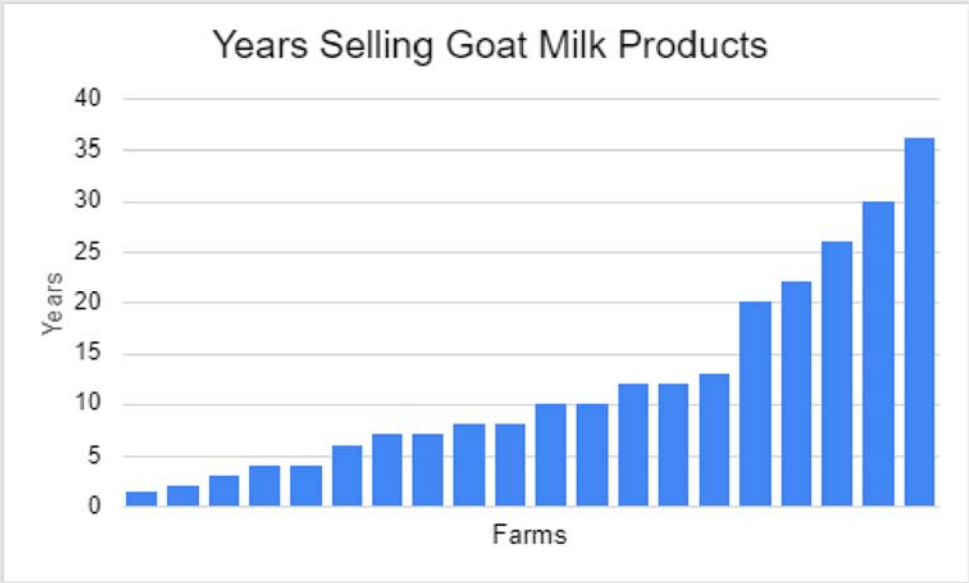
About what percentage of your stored forages (hay) do you purchase?	Frequency	Percent
0%	4	21
5-25%	4	21
100%	11	58
Total	**19**	**100.0**

- More than half of the farmers interviewed purchase 100% of their feed (hay, grain, and minerals)

Acres Utilized as Part of Goat Dairy Operation

- Nine farms owned acreage they used for goat hay production.
  - Owned hay acreage ranged from 5 to 225 acres with an average of 50 acres.
- Four farms leased acreage for goat hay production.
  - Leased hay acreage ranged from 10 to 190 acres with an average of 63 acres.
- Twelve farms owned pasture acreage for goat production.
  - Owned pasture acreage ranged from 3 to 50 acres with an average of 17 owned pasture acres.
- Three farms leased pasture acreage for goat production.
  - Leased pasture acreage ranged from 7 to 50 acres with an average of 36 leased pasture acres.

Number of Years in the Goat Dairy Marketplace



- Interviewees had been selling goat milk products from their current farms for between 2 and 36 years.
- The average interviewee had been selling goat milk products from their current farm for 12 years.

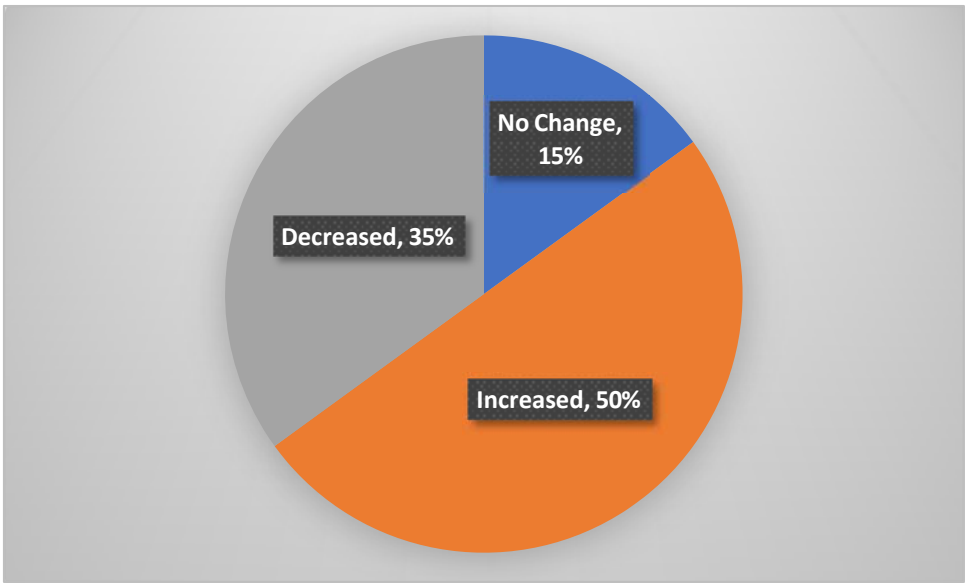
A Vermont bulk fluid milk processor Contract Status

Current contract with a Vermont bulk fluid milk processor?	Frequency	Percent
Yes	9	45%
No	11	55%
Total	20	100%

- The interviewees were split relatively evenly between farms currently contracted with a Vermont bulk fluid milk processor and those that were not currently contracted.

Factors of Farm Size Change

Change in Herd Size in the Past Five Years

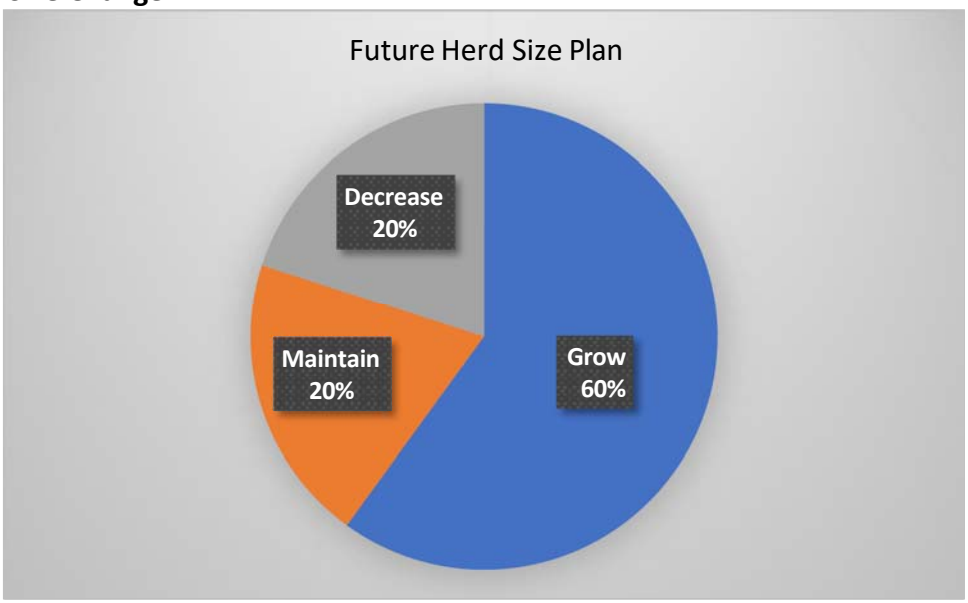


- Half of the farms interviewed stated they had increased herd size in the past five years.
  - Seventy percent of farms that reported increasing their herd size cited profitability as their main motive.
- About a third of farms reported decreasing their herd size in the past five years.
  - Reasons for decrease in herd size included herd health challenges and retirements/exits.
- Those who reported no change in their herd size said labor capacity was the main reason they had not increased.

Reasons for Five Year Herd Size Change by Type of Change

	No Change	Decreased	Increased	Total
Animal Welfare	-	-	1	1
Demand	-	-	1	1
Efficiency	-	1	-	1
Herd Health	-	3	-	3
Infrastructure Capacity	-	-	1	1
Labor Capacity	2	-	-	2
NA	1	-	-	1
Profitability	-	1	7	8
Retirement	-	2	-	2
Total	3	7	10	20

Future Herd Size Change

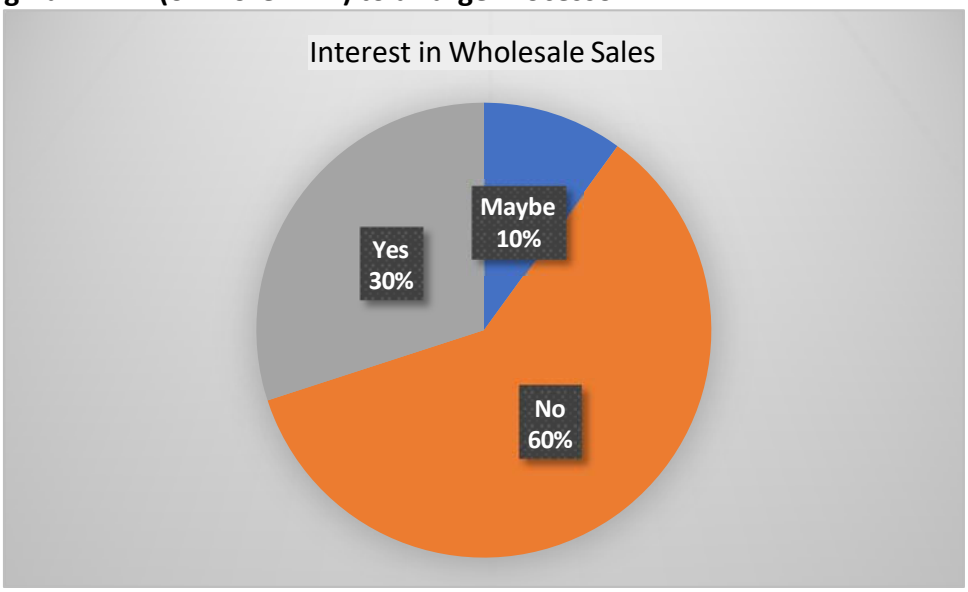


- Twelve of 20 interviewees (60%) wanted to increase their herd size in the future.
    - Of those who wanted to grow their herd, 75% were motivated by the goal of achieving profitability.
- Seventy-five percent of those who planned to maintain their herd size named labor or facilities capacities as the reason.
- Half of those who anticipated decreasing herd size planned to leave the goat dairy business.

Reasons for Future Herd Size Change by Type of Change

	Plans to Grow, Maintain, or Decrease			
Theme:	Decrease	Grow	Maintain	Total
Exit	1	-	-	1
Facilities Capacity	-	1	1	2
Labor Capacity	-	-	2	2
Market Demand for Product	1	2	1	4
Profitability	1	9	-	10
Retirement	1	-	-	1
Total	4	12	4	20

Interest in Shipping Bulk Milk (or More Milk) to a Large Processor



- Over half of farms interviewed (60%) stated they had no interest in entering into or expanding existing sales of bulk milk to a processor.
    - Of these, the majority cited profitability as the primary reason for their lack of interest in beginning or growing wholesale sales. Farmstead operators were able to capture higher profitability through their own value-added processing.
    - Of the 30% interested in going into or expanding wholesale, most also mentioned profitability as a factor.

Reasons for Interest in Shipping Milk, or More Milk, to a Large Processor

Theme:	Wholesale Interest			
	Maybe	No	Yes	Total
Exit (not retirement)	-	-	1	1
Herd health and disease	-	1	-	1
Infrastructure Capacity	1	-	-	1
Labor capacity	-	1	-	1
Profitability	1	6	5	12
Retirement	-	1	-	1
Value added life	-	2	-	2
Total	2	11	6	19

Challenges & Opportunities

Does your farm have sufficient access to the following farm service providers?

	No	Yes	Responses
Reproduction and genetics specialist	82%	18%	17
Grazing specialist	54%	46%	13
Agronomist (crops and soils specialist)	50%	50%	18
Nutritionist	44%	56%	18
Farm Succession Planning	36%	64%	11
Business Advising	35%	65%	20
Access to financing	32%	69%	19
Veterinarian	5%	95%	20

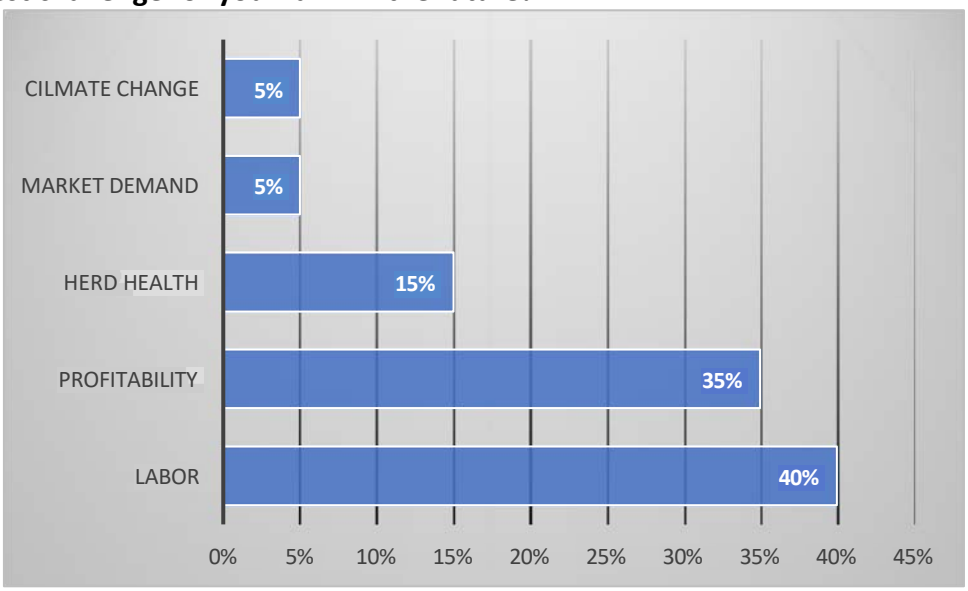
- 82% of Farmers indicated the need for more access to specialists in genetics and reproduction. This offers an educational opportunity that is beneficial to producers at all production levels and herd sizes.
- While over half of farmers answered "no" to the question of having sufficient access to a grazing specialist and/or agronomist, many of these farmers further explained that they do not need access to these providers because they are either not grazing, not managing forages or crops, and/or feel they have developed these skills themselves.

How much of a challenge do each of the following pose to your farm?

Five-point scale where 1 is "no challenge" and 5 is "extremely challenging"	Mean Response	Least Challenging
Regulatory issues (Specify, e.g., water quality, zoning, some other)	1.5	
Finding markets	1.6	↓
Healthcare	1.8	
Finding available land	2.2	
Financing	2.3	
Cost of land	2.4	
Access to labor/employees	2.7	
Cost of equipment	3.1	
Profitability	3.4	Most Challenging
Your own time as a limiting factor	3.7	

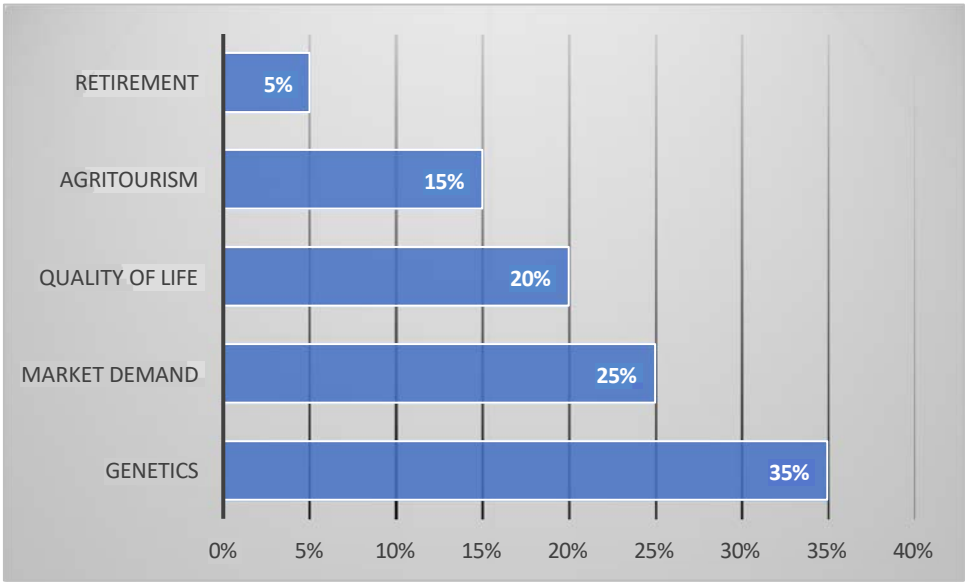
- The factors rated as most challenging included achieving profitability and labor or time.
- Least challenging factors included finding markets and navigating regulatory issues.

What is the greatest challenge for your farm in the future?



- Labor challenges include not being able to find employees; not having enough money to pay additional employees, even when necessary; farm owners not having enough money to pay themselves and needing to support the farm with off-farm jobs; and simply having too much work for the time in the day.
- Profitability challenges included milk price; recent sharp increases in the cost of inputs such as feed, milk replacer, bedding, and equipment; and cutting costs as much as possible to turn profits, which included the inability to hire more workers.

What is the greatest opportunity for your farm in the future?



- Interviewees described using genetic improvements to enhance profitability and herd health and demand for the product as the greatest opportunities for their farms in the future.
- Quality of life opportunities centered around the farming lifestyle and pride in providing quality agricultural products.

Appendix 2- Research References and Additional Resources

Vermont Agricultural Business Planning Services

- VT Housing and Conservation Board- Farm and Forest Viability Program
- Intervale Center- Beginning Farmer Business Planning and Coaching
- Northeast Organic Farming Association of VT- Business and Transfer Planning Services
- Center for an Agricultural Economy- Farm and Food Business Advising
- UVM Extension- Agricultural Business Services Suite

Goat Dairy Research and Resource Organizations

- Vermont Sheep and Goat Association
- Southern Vermont Dairy Goat Association
- Cornell University Goat Program
- Penn State Ag. Extension Goat Dairy Resources
- University of Maryland Extension Small Ruminant Website
- The University of Rhode Island Northeast Small Ruminant Parasite Control
- Iowa State University Extension Dairy Goats and Sheep Resources
- Canadian National Goat Federation
- American Dairy Goat Association
- American Association of Small Ruminant Practitioners
- American Cheese Society
- American Goat Federation
- USDA Animal and Plant Health Inspection Service (APHIS) Sheep and Goat Health
- USDA Agricultural Marketing Service (AMS) Goat Reports
- USDA Food Safety and Inspection Service (FSIS) Goat from Farm to Table
- USDA National Animal Health Monitoring System (NAHMS) Goat Studies
- International Goat Association

Governmental and Commercial Goat Dairy Market Data Sources

- In 2021, the Northeast Dairy Business Innovation Center (hosted by the VT Agency of Agriculture, Food and Markets) contracted with the Atlantic Corporation out of Maine to produce a Goat and Sheep:
    - "Dairy Market Conditions and Consumer Research" report
    - "Goat and Sheep Dairy Product Dashboard"
- 2022 Arizton Advisory and Intelligence Report for Goat Milk
- 2022 Arizton Advisory and Intelligence Report for Goat Milk Powder
- Grand View Research Goat Milk Products Market Size, Share & Trends Analysis Report
- Current status, challenges and prospects for dairy goat production in the Americas
- Current Status of Global Dairy Goat Production: An Overview
- 2008 USDA NASS Goat Processor Survey Results
- 2012 USDA APHIS Report on U.S. Goat Dairy Operations
- USDA Goat Reports- Goat Auction and Slaughter data

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Appendix 3- Data Collection Materials

Vermont Goat Dairy Farmers Interview Instrument

Introduction

The following interview questions are designed to advance knowledge of the barriers and opportunities for increasing goat dairy production in Vermont. This research is funded through Vermont Creamery and is being implemented through University of Vermont (UVM) Extension and the Center for Rural Studies at UVM. The project's principal investigator is Roy Beckford- Dean of UVM's Extension Service.

Study Procedures

The questions in this interview center on aspects of your goat dairy farm operation.

This is a confidential interview. Researchers from UVM Extension and the Center for Rural Studies at UVM are the only people with access to interview documentation.

Results of this research will only ever be reported in aggregate with other interviews. Individual responses from farms will not be identified beyond the immediate research team. You may choose not to answer any of the questions, and you may stop the interview at any time.

We may record this interview to ensure all the responses are adequately captured. Is it okay with you if I record this interview? Yes _____ No _____

As a participant in this research study, there may be no direct benefit to you. The confidential information gathered from this study may benefit other people or organizations now or in the future. There is no cost to you for participating in this research study.

You are eligible to receive reimbursement of $100 for your time today. If you would like to receive reimbursement, provide your name, email or phone and mailing address when asked at the end of the interview. If you have any questions about this study now or in the future or wish to modify any of your responses you may contact the primary investigator- Roy Beckford- at 802-656-2990, or Roy.Beckford@uvm.edu. Roy's contact is on his business card for you to keep.

We'll begin with some questions about the Farm Demographics

In what town is the majority of your Goat Dairy farm operation? How

long has your farm been selling goat-milk products?

Currently, how many goats total are in your herd? And

what breed or breeds are in your herd?

And can you give me the approximate count within each of the following categories?

Milking does
Dry does
Replacement doelings
Meat goats/Wethers
Bucks

Have you increased or decreased the number of goats in your herd in the past five years? If so, why?

- ***Increased*** by how much and why?

- ***Decreased*** by how much and why?

About what percent of your sales are in each of the following categories?

	Direct to Consumer	To Retailers	For Wholesale
Raw milk			
Pasteurized milk			
Cheese			
Yogurt/Kefir			
Caramels or similar confections			
Health care products like soap, lotion, etc.			
Meat animals			
Meat cuts			
Breeding animals			
Other live sales			
Other (specify)			
Other (specify)			

Notes:

About how many acres do you utilize as part of your goat dairy operation in each of the following categories?

	Owned (acres)	Rented (acres)
Hay		
Pasture		
Annual forage crops (specify)		
Other (Specify)		

Notes:

And about what percentage of your goat dairy feed do you purchase? This

question is about your herd's milk production. What is your herd's…

Average annual milk production per goat (pounds milk/doe/year):	
Average protein count or protein range:	
Total pounds of milk produced in the last 12 months:	

During which season or seasons do you kid, and about what percentage of the milking herd kids at those times?

Kidding season	Percent of herd kidding at that time
Spring	
Summer	
Fall	
Winter	

What is the replacement rate of your herd?

Now we have some questions about your farm operation size.

Do you want to grow your herd size, maintain your herd size, or decrease your herd size, and why?

- Grow, Why?
- Maintain, Why?
- Decrease, Why?

Would you be interested in selling (more) milk to a wholesale processor? Why or why not?

Challenges

I'm going to read a list of common challenges you might need to address on your farm. Tell me on a scale of 1 through 5 with 1 being no challenge and 5 being extremely challenging, how much of a challenge each of these items are.

Access to labor/employees	
Is your own time a limiting factor to expanding your herd size?	
Healthcare	
Financing	
Profitability	
Finding available land	
Cost of land	
Cost of equipment	

Finding markets	
Regulatory issues (Specify, e.g., water quality, zoning, some other?)	
Something else? (Specify)	

<u>And now I have some questions about education related to your goat dairy operation</u>

Using another five-point scale where 1 means not at all useful and 5 means extremely useful, tell me how useful educational opportunities on each of the following business management subjects would be for you.

Business plan development	
Accounting and bookkeeping	
Grant-writing	
Direct to consumer marketing	
Business to business networking	
Website and media development	
Farm operation management (holistic running of the farm, overall management)	
Human resources and hiring	
Something else? (Specify)	

And please tell me how useful would trainings on each of the following animal and product safety subjects be for you. 1 being not at all useful and 5 being extremely useful.

Animal health and care	
Animal nutrition and feed	
Genetics and breeding	
Biosecurity and farm safety	
Milking parlor and barn design	
Equipment knowledge/operation	
State and Federal milk regulations	
Something else? (Specify)	

And on a 1 to 5 scale where 1 is not at all interested and 5 is absolutely interested, how interested would you be in receiving training the following ways?

One on one with a farm industry mentor	
Workshops with hands-on experience	
Website with comprehensive information	
Tours of existing farms	
Direct support from milk handlers and processors	
Formal classroom setting	
Some else? (Specify)	

And how interested would you be in trainings that took place… (1 to 5 scale again)

In-person during the week	
In-person evenings or weekends	
Hybrid (online and occasionally in person)	

Online live at a scheduled time on ZOOM or TEAMS, for example	
Online without a scheduled time (self-study)	
Something else? (Specify)	

When would it be best for you to participate in workshops or classes?

Preferred month or months	
Preferred day or days of the week	
Preferred time or times of day	
Preferred length of class time	

How much would you spend on a workshop or class?

Nothing ever, free resources only	
Up to $250	
Between $250-$500	
Between $500-$1000	
More than $1000	
Some other amount? (Specify)	

And now we have a couple questions about farm resources.

Do you have sufficient access to the following farm service providers? Yes or no?

Veterinarian	
Nutritionist	
Reproduction and genetics specialist	
Grazing specialist	
Agronomist (crops and soils specialist)	
Business Advising	
Farm Succession Planning	
Access to financing	
Other farm service?	

Notes:

Do you have a business plan for your farm?

Thinking about your goat dairy operation in general, what would you say is the greatest opportunity and greatest challenge for your farm in the future.

Greatest opportunity?

Greatest challenge?

UVM Extension has a team of business planning specialists that can come to your farm and further discuss your farm operation needs. Would you be interested in talking to a specialist about taking a deeper dive into your farm business plan and finances?

- Farm Business Planning - Yes or No

Would you be interested in hosting a farm site visit this spring? - Yes or No Finally,

do you have any feedback or additional comments?

If you would like to receive a participation reimbursement of $100, please provide your name, email or phone number and a mailing address.
Name:
Email or Phone: Mailing Address:

Interview date:
Interview mode:
Town:
A Vermont bulk fluid milk processor Farm (Y/N):
Interested in Ag Biz (Y/N):

Cow Dairy Farm Conversion Inquiry

The University of Vermont Extension Service is reaching out to cow dairy farms across the state to gauge your interest in transitioning all or part of your existing cow dairy operation over to a goat dairy operation.

Please take two minutes to answer just a few confidential questions below. If you are interested in learning more, you will be asked to provide contact info so that UVM Extension dairy and business management specialists can contact you with more information.

After speaking with a specialist, farmers that are interested in learning more will be invited to site visits of existing Vermont goat dairies in the spring of 2023 and will have the opportunity to learn more about how this transition could affect your particular farm business.

Are you currently shipping cow's milk? Yes
No

What is your current milking herd size?

How many months ago did you stop shipping milk?

Are you interested in learning more about transitioning all or part of your cow dairy operation to goat dairy operation?
Yes
No

Briefly, is there a specific reason why you are interested in learning more about making a full or partial transition from cow to goat dairy?

Briefly, is there a specific reason why you are not interested in learning more about making a full or partial transition from cow to goat dairy?

UVM Extension dairy management and business specialists will reach out to provide more information and answer any of your questions. Please provide the following information so they can reach out at a time that is best for you.
Your name
Your phone number Your email address
Best time(s) of day to reach you

Goat Dairy Processors Survey Instrument

The following survey is designed to advance understanding of long- and short-term trends in Goat Dairy consumer demand in the U.S.

This research is funded through the Northeast Dairy Business Innovation Center and is being implemented by University of Vermont (UVM) Extension and the Center for Rural Studies at UVM. The project's principal investigator is Roy Beckford- Dean of UVM's Extension Service.

This is a confidential survey. Researchers from the Center for Rural Studies at UVM are the only people with access to survey documentation.

Results of this research will only ever be reported in the aggregate with other surveys. Individual responses will not be identified. You may choose not to answer any of the questions, and you may stop the survey at any time.

As a participant in this research study, there may be no direct benefit to you. The confidential information gathered from this study may benefit other people or organizations now or in the future. There are no costs to you for participating in this research study.

If you have any questions about this study now or in the future or wish to modify any of your responses you may contact the primary investigator, Roy Beckford, at 802-656-2990, or Roy.Beckford@uvm.edu.

By clicking the green arrow below, you are agreeing to participate in the survey.

How many years has your company been processing goat milk?

And what goat milk-based products do you currently produce?
- Cheese
- Milk
- Yogurt or kefir
- Personal care products like soap, lotion, etc.
- Caramel or other confections
- Other goat milk-based Products

In the past 2-3 years, have you seen demand increase, decrease, or stay about the same for each product you make?

	Increased	Stayed about the same	Decreased	Don't know/ Unsure	Not applicable
Cheese					
Milk					
Yogurt or kefir					
Personal care products like soap, lotion, etc.					
Caramel or other confections					
Other product					

Now let's think about the long-term trends.

Compared to when you started processing goat milk, would you say that overall demand for goat milk-based products has

- Increased
- Decreased
- Stayed about the same

Compared to ten years ago, would you say that overall demand for goat milk-based products has

- Increased
- Decreased
- Stayed about the same

And specifically, compared to when you started processing goat milk, has demand increased, decreased, or stayed about the same for each product you make?

	Increased	Stayed about the same	Decreased	Don't know/ Unsure	Not applicable
Cheese	O	O	O	O	O
Milk	O	O	O	O	O
Yogurt or kefir	O	O	O	O	O
Personal care products like soap, lotion, etc.	O	O	O	O	O
Caramel or other confections	O	O	O	O	O
Other product	O	O	O	O	O
Other product	O	O	O	O	O

And specifically, compared to ten years ago, has demand increased, decreased, or stayed about the same for each product you make?

	Increased	Stayed about the same	Decreased	Don't know/ Unsure	Not applicable
Cheese	O	O	O	O	O
Milk	O	O	O	O	O
Yogurt or kefir	O	O	O	O	O
Personal care products like soap, lotion, etc.	O	O	O	O	O
Caramel or other confections	O	O	O	O	O
Other product	O	O	O	O	O
Other product	O	O	O	O	O

And what would you say has contributed to a change in demand for...

- Cheese
- Milk
- Yogurt or kefir
- Personal care products (soap, lotion, etc.)
- Caramel or other confections
- Other product(s)

Finally, we have some general questions about your experience as a goat dairy processor. For the questions below, please consider strengths and challenges related to supply and processing logistics as well as the market.

What challenges do you, as a processor, face in production of goat dairy

products? How have you addressed those challenges?

And what would you say are strengths that contribute to the success of your processing operation?

You have reached the end of the survey. Is there anything else you would like to add?

Goat Dairy Farm Visit- Participant Feedback Form

Thank you for attending the X Farm Tour. We appreciate your feedback; it helps us gain valuable insights to deliver high quality programming in the future.

1. As a result of attending this event, did your understanding of any of the following improve? (check all that apply) Goat dairy herd health considerations

Goat dairy infrastructure (barn, parlor design)

Transitioning from cow to goat dairy

Goat dairy financials

Assistance programs (e.g. technical assistance, financial assistance, etc.)

No changes in my understanding

Other (please specify):

2. As a result of what you learned, do you intend to make a change on your farm or in how you advise farmers? Yes

No Not applicable

If yes, what do you plan to do differently on your own farm or in your consulting?

3. Are there any topics addressed today that you would like to learn more about, or topics not included today that you would like to be addressed in future workshops?

4. If you would like to further discuss goat dairy financial planning with Zac Smith of the UVM Agricultural Business Team, please leave your name and email or phone number here: