VERMONT
AGENCY OF AGRICULTURE, FOOD & MARKETS

Mobile Individual Quick Freeze Request for Proposals

FISCAL YEAR 2015 REQUEST FOR PROPOSALS

The Vermont Agency of Agriculture, Food & Markets announces the availability of a mobile individual quick freeze (IQF) unit to be awarded at no cost to an eligible entity within Vermont. This unit, designed to flash freeze produce and originally valued at approximately $40,000, will be transferred to a successful applicant for the purpose of promoting sustainable economic development in underserved Vermont communities and supporting small and emerging agricultural businesses. The unit will be awarded through a competitive review process informed by industry, nonprofit and government stakeholders. Due to restrictions on the funding used to build the unit, for profit businesses are not eligible to apply.

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I. Overview

Opportunity Description

Background

In 2008, Vermont Agency of Agriculture, Food & Markets (VAAFM) acquired one of the nation's first mobile individual quick freeze (IQF) units with grant funding from USDA Rural Development and the Vermont Department of Tourism & Marketing. Brian Norder—then of the Vermont Food Venture Center—designed the unit, which was built by Randy Cadieux of Georgia, Vermont.

VAAFM organized construction of the IQF unit for the purpose of increasing sales opportunities for Vermont farmers and specialty food producers by expanding year-round availability of Vermont produce. Originally valued at approximately $40,000, the unit fits inside an 8 by 18 foot trailer and is designed to flash freeze berries—although it can also be used for other types of processed (blanched, chopped and/or bagged) or unprocessed (whole) produce. It can freeze up to 600 pounds of berries per hour and includes storage space for up to 800 pounds of frozen berries.

After its initial construction, VAAFM staff transported the unit for use on farms throughout Vermont, including Blueberry Ridge (North Troy), Cerridwen Farm at Green Mountain College (Poultney), Champlain Orchards (Shoreham), and Pete's Greens (Craftsbury Center).

From 2011 to 2013, the unit was leased to Green Mountain College (GMC), which partnered with Rutland Area Farm and Food Link and the Poultney-Mettowee Natural Resources Conservation District to conduct a pilot study of the unit as a stationary resource paired with a commercial kitchen and develop best practices for its future use.

The team conducted research in the following areas over three growing seasons:

- Logistics of freezing raw product
- Testing viable markets
- Cost effectiveness of adding value to fruits and vegetables
- Potential for minimizing second-quality/gleaned product loss
- Capability for freezing volume and appropriate product varieties
- Potential for fostering development of new businesses and markets

In addition, the team undertook the following activities:

- Froze product for area farmers using a modest free structure designed to encourage participation
- Promoted the unit's availability and use to producers in Vermont and the New England region
- Partnered with area organizations to freeze gleaned product for donation to area food shelves and community organizations
- Collaborated with schools and institutions to freeze product for school food service
- Educated students on issues related to agriculture, food systems, food preservation, business planning, and marketing and offered opportunities for students to engage in harvesting and freezing of product

A report on GMC's partnerships and activities is available in **Appendix C**.

No-Cost Transfer

Through this RFP, VAAFM will conduct a no cost transfer of the IQF unit to an eligible entity within Vermont. The unit will be transferred to an awardee for the purpose of promoting sustainable economic development in rural Vermont communities and supporting small and emerging agricultural businesses. The successful applicant will demonstrate sufficient resources to operate the unit and explain how the proposed use of the unit will benefit multiple Vermont businesses.

Upon transfer of the unit, the awardee will enter into an agreement with USDA Rural Development (RD) and be obligated to submit an annual project report to RD as a requirement of transferred ownership of the unit. See **Section II: Eligibility & Requirements** for further details on eligibility.

While stationed within a mobile trailer, the IQF works best as a temporary/stationary unit paired with a commercial kitchen or processing space. The unit can serve as an opportunity for businesses to test the market for flash frozen products before scaling up to permanent infrastructure.

Application Review & Award Information

The mobile individual quick freeze unit will be awarded through a competitive review process to an eligible entity. Due to restrictions on the funding used to build the unit, for profit businesses are **not** eligible to apply.

A committee comprised of Vermont agricultural and small business stakeholders, as well as representatives from USDA Rural Development, the Vermont Department of Buildings & General

Services, and the Vermont Department of Tourism & Marketing, will review all applications and make recommendations to VAAFM. VAAFM will complete the transfer of the unit to the successful applicant in July 2015.

We encourage applicants to review the **goals and indicators for strengthening Vermont's food system** identified in the *Farm to Plate Strategic Plan* (published by the Vermont Farm to Plate Network and the Vermont Sustainable Jobs Fund) when preparing their applications. Find these goals at **http://bit.ly/1MxZ5hJ**.

Application Deadline

All applicants must submit a complete application to VAAFM by **June 22, 2015 at 4:30 pm**. Instructions for submitting your application are provided in **Section III, Application Instructions**. Please review **Section IV, Scoring Criteria**, carefully to ensure that your application addresses all areas that will be evaluated by the review committee.

Timeline

June 1, 2015	**VAAFM releases request for proposals**
June 8 & 11, 2015	VAAFM hosts open house to show unit
June 22, 2015	**Application Deadline**
July 6, 2015	VAAFM awards unit
July 2015	Awardee collects documentation necessary to complete transfer
July 2015	VAAFM transfers title to awardee
July 2015	Awardee moves unit

II. Eligibility & Requirements

Eligible Applicants

- Eligible applicants include nonprofits, municipalities, development corporations, and state agencies. Due to restrictions on the funding used to build the unit, for profit businesses are **not** eligible to apply. Nonprofits must be registered with the United States Internal Revenue Service (IRS) as a 501(c)(3) or 501(c)(4) organization.
- The unit must remain in Vermont and serve small and emerging agricultural businesses.
- Applicants should demonstrate sufficient resources to operate the unit and explain how their proposed use of the unit will benefit multiple Vermont businesses.
- Applicants should acknowledge the unit's limitations and be prepared to address those limitations over time.
- Applicants should demonstrate evidence of successful experience in food production, food processing, and business development.
- VAAFM encourages applications that prioritize and expand projects that are supported by and address the needs of small and emerging agricultural businesses in Vermont.
- Upon transfer of the unit, the awardee will enter into an agreement with USDA Rural Development (RD) and be obligated to submit an annual project report to RD as a requirement of transferred ownership of the unit.

Technical Requirements

See **Appendix A, Unit Specifications** and **Appendix D, Operations Manual**, for further detail on technical specifications.

- **Electricity**: The trailer unit requires both a 120 volt, 30 Amp outlet and a 230 volt, 5 Amp outlet single phase feed. The unit comes with 50 foot power cords.
- **Water**: The trailer has cold and hot water inlets with garden hose connectors for the hand washing sink and a dump valve for gray water. Produce must be washed in potable water.
- **Commercial Kitchen/Processing Space**: The unit should ideally be paired with a commercial kitchen and/or processing space. (Sites without access to additional processing facilities can use the IQF to freeze berries and other types of produce that do not require preparation, such as blanching.)
- **Storage**: The trailer requires wintertime storage that is covered to protect the condenser on top. (Total height is 11'6".)

III. Application Instructions

Your application must be submitted electronically at **http://bit.ly/vtfreezeapp** by Monday, June 22, 2015 at 4:30 PM. To prepare your application, follow the instructions below:

1) Review this document—*Vermont Mobile IQF FY 2015 Request for Proposals*—in its entirety.

   We encourage applicants to also review the **goals and indicators for strengthening Vermont's food system** identified in the *Farm to Plate Strategic Plan* (published by the Vermont Farm to Plate Network and the Vermont Sustainable Jobs Fund). Find these goals at **http://bit.ly/1MxZ5hJ**.
2) Draft responses to application questions in a word processor or text editor (e.g., Google Docs, Microsoft Word, or Notepad), and be prepared to enter your responses in the online form at **http://bit.ly/vtfreezeapp**. Application questions are listed below.
3) Prepare an estimated operational budget in a spreadsheet or table and be prepared to upload it to the online application. (See **Estimated Operational Budget** below.)
4) Obtain and attach at least one letter of support from a partner organization or business that will benefit from the IQF. **Indicate any number of jobs that may be created/saved.**

Please be sure to review **Section IV, Scoring Criteria**, before completing your application.

Application Questions

Organization Type

Be prepared to identify your organization type. Eligible applicants include nonprofits, municipalities, development corporations, and state agencies. If your organization is a nonprofit, it must be registered with the United States Internal Revenue Service (IRS) as a 501(c)(3) or 501(c)(4) organization. Due to restrictions on the funding used to build the unit, for profit businesses are **not** eligible to apply.

Partnership & Plan

Up to 250 words

- List all businesses and/or partner organizations that will participate with you in use of the IQF.
- How will you use the IQF to (a) serve small and emerging agricultural businesses and (b) promote sustainable economic development in rural Vermont communities?
- Using the information in the appendices of this RFP, identify at least one limitation of the IQF and describe how you will overcome this limitation.

Resources & Experience

Up to 300 words

- Describe the physical resources you will pair with the IQF. Make sure to address the following **technical requirements**: electricity, water, commercial kitchen/processing space, and storage.

- Describe the staff resources you will pair with the IQF. Consider number of staff, full time/part time, and skills and qualifications.
- Describe your previous relevant experience and explain how this experience prepares you for success with the IQF.
- Does your proposed use of the IQF build on previous work undertaken by your organization or partner organizations? In what ways?

Impact & Innovation

Up to 250 words

- Describe how your operation of the IQF will impact Vermont's food system. (Review **goals for strengthening Vermont's food system by 2020** in the *Farm to Plate Strategic Plan* at **http://bit.ly/1MxZ5hJ**.)
- Describe your strategy for long term sustainable use of the IQF.

Outreach & Evaluation

Up to 250 words

- Describe your outreach plan for (a) generating interest in use of the IQF and (b) disseminating knowledge produced through use of the IQF.
- Describe how you will evaluate successful use of the IQF. Provide at least one distinct, quantifiable, and measurable project outcome that demonstrates how the IQF will benefit Vermont agricultural businesses.

Acknowledgment of USDA Rural Development Agreement

Upon transfer of the unit, the awardee will be required to enter into an agreement with USDA Rural Development (RD) and be obligated to submit an annual project report to RD as a requirement of transferred ownership of the unit. Be prepared to indicate that should you be awarded the unit, your organization will be responsible for entering into an agreement with USDA Rural Development.

Letter(s) of Support

Obtain and attach at least one letter of support from a partner organization or business that will benefit from the IQF. Indicate any number of jobs that may be created/saved.

Estimated Operational Budget

- Be prepared to upload an operational budget in a table using the template below. Review the Green Mountain College Pilot Report in **Appendix C** for examples of costs typically associated with use of the unit.
- Consider costs for personnel, repairs/renovations, trailer hauling, mileage reimbursement, Department of Motor Vehicles fees, and supplies. Supply needs may include items such as cleaning supplies, processing supplies, linen service, floor mats, storage shelving, vacuum sealer(s), and packaging.
- If committed funds do not meet annual estimated costs for operating the IQF, describe your fundraising strategy.

Category	Description of Use of Funds	Estimated Cost	Committed Funds	Funding Source
Personnel				
Travel				
Equipment				
Building/ Infrastructure				
Supplies				
Contractual/ Consultant				
Administrative				
Other (Specify)				
TOTAL				

IV. Scoring Criteria

Partnership & Plan

Applicant identifies businesses and/or partner organizations that will participate in use of the IQF. Applicant explains how the IQF unit will be used to (a) serve small and emerging agricultural businesses and (b) promote sustainable economic development in rural Vermont communities. Proposed use of the IQF will impact a significant number of beneficiaries. Application includes letter(s) of support by at least one partner organization and/or business. Written evidence provided is unique in nature and specific as to the jobs and description of businesses being supported, not repetitive or canned.
Up to 25 points

Resources & Experience

Applicant has appropriate physical resources to pair with the IQF. Applicant has appropriate staff resources to pair with the IQF. Operational budget is realistic. Applicant has accumulated sufficient funds or organizational support, as indicated in operational budget, necessary to move the project forward. Applicant has a proven track record of successful food production/processing and/or business development experience as proposed in the application. Proposed activity builds on previous work conducted by applicant or partner organizations.
Up to 25 points

Impact & Innovation

Proposed use of the IQF unit will have a significant and positive impact on Vermont's food system. Project will impact locally produced/locally manufactured food networks and/or distribution systems. Applicant provides evidence that the project is consistent with, and does not duplicate, economic development activities for the project area under an existing community or economic development plan covering the project area. Project is innovative and develops new knowledge that can strengthen the operations of Vermont agricultural businesses. Applicant describes how the IQF will help to fulfill one or more **goal(s) for strengthening Vermont's food system by 2020**. (See the *Farm to Plate Strategic Plan* at **http://bit.ly/1MxZ5hJ**.)
Up to 25 points

Outreach & Evaluation

Applicant includes a strong outreach/information dissemination plan to ensure (a) interest in use of the IQF unit and (b) the dissemination of knowledge produced through use of the IQF. Project includes a strong monitoring and evaluation plan and clearly explains how outcomes will be measured. Applicant provides at least one distinct, quantifiable, and measurable project outcome that demonstrates how the IQF will benefit Vermont agricultural businesses. Applicant acknowledges the responsibility of entering into an agreement with USDA Rural Development (RD), and the requirement of submitting an annual project report to RD, upon transferred ownership of the unit.
Up to 25 points

Appendix A: Unit Specifications

Prepared in 2014 by Melissa Moon, Vermont Agency of Agriculture, Food & Markets.

Mobile/Individual Quick Freeze (IQF) Unit Specifications

Mission

The mobile quick freeze unit will address increased utilization of Vermont fruit and vegetables by Vermont Food companies and Vermont schools. Accomplishment of these goals will increase market opportunities for Vermont Growers and increase utilization of local produce in Vermont processed foods and by Vermont schools. (Text from MOU with the Dept. of Tourism)

Funding

RBEG Grant – Obligation date: 6-27-07 signed by Anson Tebbits. Seven year term. Per David Robinson, USDA Rural Development, the seven year term of the grant expires June 30, 2014.

Initial funding

- $19,908 - From USDA RBEG grant – 7 year life span, began FFY'07 will end June 30, 2014
- $20,000 - From ACCD Dept of Tourism – MOU signed by Steven Cook

  $39,908 - **Total cash funds for physical unit**

- $ 5,500- In-kind matching from VAAFM

  $45,408 - **Total costs related to the unit**

Notes

- The initial USDA RBEG grant did not provide funding for research into "possible final operational structures for the IQF."
- Most of the issues regarding use of the IQF related to lack of suitable electrical outlets, preparatory or post-freezing logistics, or minimal freezer storage capacity within the unit itself.
- Institutions with sufficient walk in freezer space were able to accomplish tasks without use of the IQF.
- Dave Robinson/USDA RD appears to be amenable with VAAFM executing a no-cost transfer of the unit (and thus the RBEG grant) to a statewide non-profit via a competitive RFP.
- He has also mentioned the possibility of USDA funds being available to upgrade the unit.
- Steve Cook, deputy commissioner, Dept of Tourism, is also agreeable to a no-cost transfer of the unit to a statewide non-profit via a competitive RFP. If there were a sale, they would want a percentage of the sales.

IQF Unit Details

- VIN: #40LWB18208P152227, bearing VT Registration: A025
- Freezing equipment sits inside an 8 x 18' cargo trailer.
- Sites *without* access to additional processing facilities can use the IQF to freeze berries and other produce which do not requiring preparation (such as blanching). Freezing unit can be paired with kitchens or other processing space to expand what is frozen.
- The freezer is flexible in the size of product it can handle, although the original design was for berries.
- Freezing unit is designed to process 600 pounds of berries per hour. Larger products take longer to freeze.
- Trailer includes freezer room to store approximately 800 pounds of berries; on-trailer space is considered only temporary. The amount of berries stored may reduce the hourly freezing capacity due to space limitations.
- User provides the power source for the IQF. A 120 volt, 30 A. and a 230 v., 50 A. single phase feed are needed. Trailer comes with 50' power cords. If the user *does not* have appropriate plugs, an electrician can install them.
- Trailer has cold and hot water inlets with garden hose connectors for the hand washing sink and a dump valve for gray water. Note: product must be washed in *potable* water

Mobile Individual Quick Freeze Unit Specifications

Trailer

8'x18' cargo trailer, tandem axle, rear door ramp with standard side door and portable ramp and reinforced roof for compressor units.
Walls and ceiling, 090 FRP panels, 2" foam insulation panels with foil vapor barrier
Antibacterial strip doors
Air curtain units one 48", one 36"
Floor—stock plywood with DH floor enamel and floor drains, esp. under drying area

Lighting and Electrical

All fixtures, outlets and connections NEMA type rated
Washdown fluorescent fixtures, 4
Freezer lights with shields, 2
Washdown drying fans, 2
Demand hot water heater for hand sink
Breaker panel, power pigtails cable, outlets and conduit

Fixtures and Equipment

Floor mount, knee operated hand sink
Drying rack with slides for screens
Rubbermaid tray dollies, proserve system with locking bars, 8
Poly trays for drying, 24
Custom drying-freezing racks, eg. type 304SS, 120
First aid kit and fire extinguisher
Boot dips, 2
Washdown hose and faucet with vacuum breaker
Water inlet hookup

Refrigeration

Cooler compressor and fan coil unit, installed
Freezer, compressor, condensing unit and vertical high velocity fan coil unit, installed
Sliding freezer door

Appendix B: Unit Successes & Limitations

Prepared in 2014 by Melissa Moon, Vermont Agency of Agriculture, Food & Markets.

Mobile Quick Freeze Unit – Successes

Initial Use of Unit

- 2008 Season – The IQF made stops at:
  - Blueberry Ridge (North Troy, VT)
  - Green Mountain College (Poultney, VT)
  - Champlain Orchards (Shoreham, VT)
  - Pete's Greens (Craftsbury Center, VT)

Green Mountain College

Overview

- 15-20 producers and organizations expressed interest in using the unit in 2010.
- Over 10,000 lbs of produce was frozen using the flash freeze unit during the 2011 growing season.
- Unit was used on and off site by:
  - GMC and farm-to-school partners for inclusion in their food service,
  - Local farmers for inclusion in their CSA shares or for sale at local farmers markets,
  - Community gleaning initiatives for donation into the charitable food system,
  - Correctional department inmates for use in their cafeterias, and
  - Private company interested in co-packing produce to sell to coops and small supermarkets.

Details

- University of Vermont Extension, Windham County Local Food Network
  - 3 public schools, froze 525 lbs of with student volunteer labor
- University of Vermont Extension, -VT Dept of Corrections
  - Two VT Community High Schools
  - 2,000 lbs of prison-grown produce processed
- Sunrise Orchards/VT Refrigerated Storage partnership
  - 2,000 lbs of blueberries frozen for the Neighboring Food Co-ops Association Farm to Freezer program.
- Kilpatrick Family Farm, Maple Wind Farm, Amee Farm
  - Frozen product for farms' CSA programs
- Charitable Food System: Rutland Area Farm & Food Link (RAFFL) (as part of their 'Grow a Row' program), Salvation Farms (as part o their 'Vermont Commodities' project)
  - Twenty local farms participated
  - 14,000 lbs of produce processed
  - 13,000 lbs distributed to 13 charitable food sites
  - 1,000 lbs processed by private entity for product testing
- Green Mtn College "Center of the Plate" initiative
  - Two local farms participated
  - 800 lbs zucchini/summer squash
  - 300 lbs broccoli
  - 250 lbs cauliflower
- College-Grown produce for Green Mtn College Dining Hall
  - 2011 – 1,946 lbs of tomatoes processed

  2012 – 3,053 lbs of produce (tomatoes, kale, mustard greens, chard, salsa, pesto) processed

Green Mtn College findings

- The unit's true utility lies in its function as a temporary-stationary unit. The unit may be used for two or three consecutive growing seasons to jumpstart a pilot project, but it is not suitable for established or larger-scale endeavors.
- The unit is not ideal for highway travel due to the heavy compressor being placed atop the trailer. Ideally the compressor, the trailer's single heaviest component, would be placed lower, perhaps near the trailer hitch to allow for easier, safer and more efficient hauling.
- The unit is not adequately insulated, as demonstrated by the excessive condensation which accumulates on the outside of the freezer section of the unit when in-use. With adequate insulation, the unit would prove more effective by dropping to and subsequently maintaining a lower and more consistent temperature, regardless of outside conditions.
- A poorly placed internal wall presents a physical challenge as there is neither an easy nor effective way to move racks of produce from outside to inside the unit and vice versa. This impedes the flow of product through stages of processing, freezing and packaging.
- The unit's roller conveyor, intended to bring produce into the unit, is problematic. Because the unit sits on wheels about sixteen inches above the ground when extended, the belt reaches a height of about four-feet outside the unit. The conveyor has proven too inconvenient and uncomfortable to use when loading any significant amount of produce.
- The fan inside the unit is poorly placed at the end of the conveyor. The fan could prove useful, but its placement means that trays need to be loaded incredibly slowly into the unit and require at least one person at each end of the belt loading the trays, with subsequent loading onto racks.

Lessons Learned (from Helen Jordan's final notes, May 2010)

- Farmers must be properly consulted before any building is done when developing a similar project. There must be extensive feasibility studies to determine what makes the most sense for farmers.
- Most involved believe the IQF will work best as a stationary unit located at a central place that has infrastructure to provide space for preparation and perhaps long-term storage, as well as some labor.
- Potential locations include food venture centers, food banks, institutions, warehouses, and organizations like LACE in Barre, VT.
- A stationary unit is not as convenient to farmers, but once it's in place it can be more easily adapted.
- Mr. Norder believes that ideally there will be about six units set up around the state for producers to use. Multiple units will also help ease demand during peak harvesting weeks.
- The food-processing scene in Vermont is changing very rapidly. It is radically different today than two years ago; it is difficult to project into the future.
- There are not many of producers interested in producing fruit for the processing market, and not many able to produce a continuous supply at high enough quantities, but there is a lot of potential.
- Any future units should be more versatile, with blanching or canning capabilities as well.
- Brian Norder noted that if he could re-design the unit he would add a mounting compressor and an on board generator.

Recommendations

Management: The ideal management of the IQF would be conducted by an independent entrepreneur willing to develop contacts with producers and processors for efficient operation of the equipment. If that is not possible the next best model would be to award management to a non-profit organization with close contacts to producers and an identified need for frozen food. (Helen Jordan's summary document)

Appendix C: Green Mountain College Pilot Report (Abridged)

Prepared in 2013 by Garland Mason, Green Mountain College. Download the complete report at http://bit.ly/vtflashfreeze.

Final Report Submitted to Jane's Trust

Program Name: Farm & Food Project
Grant Amount: $100,000
Period that this report covers: August 2011–January 2013

Through our research project, Flash-Freeze Project for Institutional and Charitable Food System Use, we have made several new discoveries about small-scale food processing, freezing of local produce, and distribution in Vermont. We progressed toward our goals despite having encountered several challenges that required us to alter our original implementation plan.

In our project proposal, we outlined three main areas of research:

- Processing gleaned and donated products for donation into the charitable food system.
- Conducting product testing to determine appropriate crops and package sizes for use in institutions, the charitable food system, and within the retail market.
- Determining "price points" for particular products.

We have addressed these areas of research through multiple research projects that involved several farm and food partners:

University of Vermont-Extension Partnership

- **Partner(s)**: Hans Estrin, UVM Local Food Network Coordinator
- **Project(s)**: Windham County Farm-to-School, Community High School Processing Pilot
- **Grant Goal(s) Met**: Test frozen products for use in schools and prisons

We began our research with a project in Windham County, Vermont, spearheaded by University of Vermont (UVM) Extension's Local Food Network Coordinator Hans Estrin. **This endeavor, described in our mid-term report, succeeded in freezing over 2,500 pounds of local produce for use in public school and prison cafeterias.** Through this work, Hans and Garland Mason, flash-freeze specialist, worked with three public schools in Southern Vermont to process and freeze 525 pounds of locally sourced food using only student-volunteer labor. This work capitalized on the schools' desire to incorporate more local foods into their cafeteria and the schools' requirement that students complete a set number of community service hours in order to graduate. Through our work with three Windham County public schools we involved fourteen student volunteers and five adult volunteers.

We also learned an important lesson about the utility of the mobile flash-freeze unit:

- We initially intended to process and freeze local foods with at least five public schools but quickly discovered that for certain schools, using the flash-freeze unit was not the most practical or efficient option.
- A few of the local schools did not have the necessary 220-volt power supply, had the wrong type of electrical outlet, or had a kitchen set-up that was not conducive to using the flash-freeze unit.
- With these schools, we were able to work with their pre-existing infrastructure, rather than with the mobile unit, and in doing so greatly reduced the majority of the logistical challenges we faced. At these schools, we were able to freeze the produce on trays in the schools' walk-in freezers instead of moving processed produce in and out of the flash-freeze unit. They then packaged and stored the produce, as they would have using the flash-freeze unit.

Working with Hans and UVM-Extension, we were also able to partner with the Vermont Department of Corrections to conduct a similar project in two Vermont Community High Schools. Community High Schools in Vermont serve incarcerated youths under 23 who have not yet received a high school diploma or a GED, as well as any inmate over 23 who elects to finish a high school degree or receive supplemental training in a specific field. Training is offered in many different fields, including horticulture and culinary arts. The horticulture program operates large and productive vegetable gardens at two of the schools, one of which also houses a culinary training program where inmates are highly skilled in the culinary arts. These two Community High Schools were natural collaborators on this project.

In the fall of 2011 the mobile flash-freeze unit traveled to the Community High School in Springfield, Vermont and then on to the Community High School in Swanson, Vermont, just south of the Canadian border. **At these sites, fifteen inmates processed over 2,000 pounds of prison-grown produce with the support of nine prison staff.**

Although the flash-freeze unit was integral to generating interest and enthusiasm for the project, the unit was not essential to the process. Through this project, we learned that the schools and prisons already have the infrastructure in place to continue this project annually on their own, avoiding some of the logistical challenges presented by the mobile freezer. In the future, schools will continue this project independently using their walk-in freezers. At least one Community High School in the state is exploring the option of installing a permanent stationary flash-freezer on site in order to scale up light processing and freezing.

Sunrise Orchards/Vermont Refrigerated Storage Partnership

- **Partner(s)**: David Dolginow, Sales, Development & Technology Staff at Sunrise Orchard
- **Project(s)**: Neighboring Food Co-ops Association Farm-to-Freezer Program
- **Grant goal(s) met**: Test product and package sizes for flash frozen products for use in regional food co-ops; determine price points for particular crops

Through this partnership, the mobile flash-freeze unit was used to freeze 2,000 pounds of blueberries for the Neighboring Food Co-ops Association Farm-to-Freezer Program. The use of the flash-freeze unit represents a segment of a larger research project conducted by Sunrise Orchards & Vermont Refrigerated Storage in partnership with the Neighboring Food Co-ops Association.

The scale and efficiency of the mobile unit was put to the test while working on this project:

- The unit was run for 37 hours within two days, and it was found that the unit was not an efficient means of freezing this volume in such a short amount of time.
- The mobile unit also lacks packaging equipment and Sunrise Orchards found it necessary to bring their frozen product in bulk to Rhino Foods forty miles away in Burlington, Vermont to be packaged.

Sunrise Orchards continued their Farm-to-Freezer program during the 2012 growing season and used Farm-to-Table Co-Packers based in Kingston, New York, to process and freeze their blueberries. Farm-to-Table has a liquid nitrogen-based individual quick freeze tunnel. The co-packer also has a completely automated filling and packing line. Because of these major pieces of infrastructure, Farm-to-Table Co-Packer is better suited to meet the needs of Sunrise Orchards' project.

Sunrise Orchards has extensively tested the retail market within regional food co-ops and has shared their findings with us. They have also tested the institutional food market by establishing relationships with institutions such as Fletcher Allen Hospital and Sodexo Dining Services which serves the University of Vermont. Key findings including a detailed financial summary and price points are described on pages 25–28 of Green Mountain College MBA student, Jessica DeMatteo's capstone project, which is described below under the heading Freezing Local Produce for Sale to Institutions.

Freezing Local Produce for Sale to Institutions

- **Partner(s)**: Jessica DeMatteo, Green Mountain College MBA Student
- **Project(s)**: Feasibility Analysis in New England
- **Grant goal(s) met**: Determine price points for particular products for sale to institutions

Green Mountain College MBA student Jessica DeMatteo collaborated on our research to complete her capstone project. Jessica identified the need of farmers in Vermont to maximize their saleable harvest in the short growing season. She also recognized that an increasing number of institutions interested in serving local food had a need to procure and serve produce from farmers beyond the summer and early fall harvest. Jessica then completed a feasibility study that investigates whether freezing local produce is an economically viable solution to addressing the needs of both farmers and institutions in terms of local purchasing. Through her research Jessica was able to identify the primary barriers and enablers to success.

The primary barrier Jessica found that impedes the success of the frozen local food industry is cost. She notes that "the price institutions were willing to pay, the actual costs associated with processing, or the price at which local farmers were willing to sell their produce, all ranked at the top of perceived barriers to success" (p 52). She identified the key indicators for success of the industry as demand for the product and the existence of a strong "local food culture" (p 52). Jessica also created lists of areas of further research and potential strategies which can be found on pages 53 and 54 of her report.

Jessica's thesis represents the most comprehensive information available on this topic in New England.

Mobile Flash-Freeze Unit Use on Farms

- **Partner(s):** Kilpatrick Family Farm, Maple Wind Farm, Amee Farm
- **Project(s):** Freezing for CSA and retail markets
- **Grant goal(s) met:** Test demand for flash frozen products in farmers markets and CSA

In proposing the original grant we anticipated that travelling with the unit and using it on farms would be a major component of our research. **Our experience proved that the flash-freezer, as a mobile unit, is generally not well suited for use on farms due to logistical challenges**. Farmers are generally reluctant to use the unit due to the presumed risk of limited marketing opportunities, storage concerns, and a booming, unsaturated market for fresh produce. Ultimately, it proved difficult to recruit and incentivize farmers to use the freezer unit either on-farm or as a stationary unit parked adjacent to the College's Community Commercial Kitchen.

The farmers that were able to take advantage of the unit either on their farm or on site at Green Mountain College had mixed reviews. All expressed some degree of surprise at how long their produce took to freeze and most expressed some concern over the lack of flexibility the unit offers in terms of product flow. The farmers were generally happy with the quality of the finished product and were able to distribute it throughout the winter to their shareholders in Community Supported Agriculture (CSA).

During the 2012 season we did not actively recruit farmers to trial the unit and instead turned our focus to farm-to-institution projects with fewer barriers to success.

Assessing Cold Storage Options and Strategies within the Region

- **Partners(s):** Ruth Hazzard, University of Massachusetts-Extension; Vern Grubinger,
- University of Vermont-Extension
- **Project(s):** Assessing cold storage options and strategies within the region

In March of 2012 Garland Mason undertook a research study on existing cold storage infrastructure throughout the region. Through this study Garland visited eleven farms, one food processor, and one co-operatively managed aggregation and distribution site. Garland compiled her findings in a comprehensive report entitled *Cold Storage Options for Small-Scale Diversified Farms in the Northeast*. The report examines the types of infrastructure that are in place for long-term crop storage and their effectiveness. Although the report does not focus entirely on frozen vegetables, a farmer's ability to efficiently and effectively store and market produce through the winter greatly affects the need and incentive for farmers to freeze produce in order to provide marketable products year-round.

This research has spurred increased interest in learning more about the cold storage options available to farmers. UVM-Extension will continue to build on this segment of our research.

Freezing College-Grown Produce for the Dining Hall

- **Partner(s)**: Green Mountain College's Cerridwen Farm, Chartwells Dining Services
- **Project(s)**: Freezing College-grown produce for use in the College Dining Hall

- **Grant goal(s) met**: Test products and package sizes for use in the College dining hall; Determine price points for particular products for sale to institutions

Green Mountain College's Cerridwen Farm has benefitted from the proximity of the mobile flash-freeze unit to the farm's operations since the unit arrived on site in July of 2010. Use of the freezer unit has greatly expanded the College's ability to make produce grown on the campus farm available in the dining hall. In 2011 the College froze 1,946 pounds of tomatoes for use in the dining hall at a total value of $1,779.40.

In 2012 the farm's sales of processed products to the dining hall doubled to $3,631.63 with 3,053 pounds of College-grown produce processed. Value-added frozen products sold to the dining hall in 2012 were comprised of cored tomatoes, kale, mustard greens, chard, salsa and pesto. Over twenty students helped process the crops. This provided a valuable applied learning component for summer coursework.

Kenneth Mulder, Cerridwen Farm Manager, noted that identifying appropriate crops with the intention of freezing rather than marketing fresh proved more cost-effective than freezing a surplus of high value crops:

- To illustrate this he used the example of tomatoes: "high tunnel tomatoes sell fresh wholesale for $2 per pound. The field tomatoes [sell] for $1 a pound. They have the same value of $0.70 per pound frozen and the field tomatoes tasted better."
- Kenneth also found that "greens, when harvested in large quantity and efficiently processed were very worthwhile." He noted that at Cerridwen Farm, these greens (kale, mustard greens and chard) are easy to grow and often produce a bumper crop at certain times of year. These factors made them natural candidates for processing.
- The farm found that salsa generated the highest net profit overall, netting $1.75 per pound for vegetables that normally would have sold for $0.70 to $1.00 per pound. They also found the pesto and greens to be "high-impact," meaning that in the dining hall "a little went a long ways."

Through use of the flash-freeze unit, the College has been able to greatly expand the amount of food from the College farm that is served in the dining hall. A forthcoming plan of action will allow the College farm to continue to increase sales of lightly processed frozen foods to the dining hall following the return of the flash-freeze unit to the Vermont Agency of Agriculture.

Center of the Plate Initiative

1. **Partner(s)**: Chartwells Dining Services
2. **Project(s)**: Incorporating more local food into the dining hall and boosting student involvement
3. **Grant goal(s) met**: Test products for use in the College dining hall

As outlined in the goals of the Sustainable Purchasing Initiative adopted by the College in 2006, increasing the amount of local food served in the College dining hall is a priority. In October of 2012, Chartwells launched the "Center of the Plate" Initiative. This program will slowly change the type of food available in the College dining hall and will incorporate more local and responsibly sourced foods

with the goal of incorporating at least 30% local and sustainable ingredients into the menu. This will occur, in part, by serving less meat, sourcing more produce from local farms and by incorporating volunteer student labor to reduce the cost of lightly processed local foods. In the fall of 2012 a group of committed students proposed a new club called the "Center of the Plate Club" to help process and freeze local produce for the dining hall. Students helped source, process and freeze 800 pounds of zucchini and summer squash, 300 pounds of broccoli, and 250 pounds of cauliflower in partnership with two local farms. Over twenty-students were engaged in this project. Through this activity we found that squash was not versatile enough as a coined product but did prove useful in shredded form. The cauliflower and broccoli did prove to be popular menu items.

Next year, without the use of the flash-freeze unit, students will use walk-in coolers and freezers and will explore processing for dehydration and for use as fresh processed product. The students will continue to process broccoli and cauliflower and will create new products from a variety of other crops for the dining hall to trial in its menu.

Grow-a-Row and the Development of the Vermont Commodities Program

- **Partner**: Rutland Area Farm & Food Link; Salvation Farms
- **Project(s)**: Processing and freezing gleaned and donated produce, creating and testing a line of lightly processed frozen products for the charitable food system
- **Grant goal(s) met**: Process gleaned produce for the charitable food system; Test products and package sizes for use in the charitable food system

During the 2012 growing season, the focus of our research shifted to the role of the flash-freeze unit within the charitable food system. To coordinate our research efforts we partnered with two non-profit organizations, the Rutland Area Farm and Food Link (RAFFL) and Salvation Farms. RAFFL was an obvious partner, having had a long and fruitful relationship with the College and having been an original collaborator in the proposal to lease the Vermont Flash-Freeze Unit. RAFFL's food access and gleaning program Grow-a-Row could provide all of the produce we would need to meet the grant goals of processing gleaned produce and testing products and package sizing for the charitable food system.

Salvation Farms, a new regional non-profit based in Morrisville, Vermont, was contracted as a partner in this project and provided both the expertise in maximizing the food access and gleaning program, as well as the broader statewide vision for the future of this endeavor.

Through these partnerships, we were able to glean and collect over 14,000 pounds of produce from over twenty local farms during the 2012 growing season (June through October). Of this, about 13,000 pounds were donated fresh to thirteen different charitable food sites while the remaining 1,000 pounds of produce were used to create a line of frozen local products. Six charitable food sites, consisting of four meal sites and two food shelves, tested each product and provided feedback on each. Recipients commented on everything from package sizing and versatility to palatability and aesthetics of the product. This information, as well as a detailed data set that ascribes price points to each product will be used by Salvation Farms to steer the Vermont Commodities Project.

In the future, the capture of surplus produce will be managed by a statewide gleaning collective under the direction of Salvation Farms. The collective will forge partnerships between established gleaning initiatives, including RAFFL's Grow-a-Row program, and in doing so will help to streamline the collection and distribution of surplus local produce in Vermont. Progress is currently being made to develop a labor sourcing relationship with the Department of Corrections' Offender Work Program with infrastructure provided by Vermont state prisons. The 2012 pilot in cooperation with Green Mountain College and the Rutland Area Farm and Food Link will provide the knowledge and background needed to move the Vermont Commodity Program forward.

Additional Funds

The Jane's Trust grant helped Green Mountain College's Farm and Food Program to leverage funds for related projects from four additional grant makers. Our research has also helped to leverage funds for a follow-up research project led by University of Vermont-Extension.

Windham Foundation, $10,000

We received an additional $10,000 to stock our Community Commercial Kitchen with the cookware and appliances necessary to meet the goals outlined in the grant proposal to Jane's Trust. The funding also served our institutional goal of creating a fully equipped commercial kitchen available for use by the community. Our kitchen is now a fully functional commercial space offered for use to community members and aspiring entrepreneurs.

Duke Energy Foundation, $25,000

The Jane's Trust funding for food and agriculture-related research provided leverage for funding for the Solar Harvest Center Garden-to-Table Project. This project includes the community in reviving the art of growing and preparing one's own food, sharing it with family and friends and discussing garden-to-table practices in a learning environment.

Pierson Family Foundation, $10,000

Matching funds for the Solar Harvest Center Garden-to-Table Project

Northeast Sustainable Agriculture Research and Education Program (NE-SARE), $15,000

University of Vermont Extension procured a grant from NE-SARE to fund research on cold-storage for diversified farmers and the development and implementation of a curriculum to educate farmers about cold-storage technology. This project builds on the cold-storage research completed through our Jane's Trust funding.

Results

Two intended outcomes were identified in the grant proposal. The first was the delivery of high nutritional value, flash-frozen food to more than 9,500 individuals in Southern Vermont. **Through our projects we have created approximately 12,000 pounds of high quality frozen product.** This product has subsequently been made available to: the student body of three public schools in Windham County; the inmate population of two Department of Corrections Community High Schools; the retail customers of thirty different food co-ops throughout New England; the CSA members of three different farms; the

entire student body of Green Mountain College; and the patrons of two food shelves and three charitable meal sites in Rutland County. **Although it is difficult to measure the exact number of individuals to whom our frozen products were made available, we can be sure that product was made available to several thousand consumers.**

In pursuing our first intended outcome, we made significant progress in achieving our second outcome: an assessment of the best logistical and economic methods for using flash-freezing in Vermont in order to extend the availability of healthy, local produce to a variety of markets and populations, with a keen focus on penetrating institutional markets and the charitable food systems. Through our research we have made a thorough assessment of flash-freezing and its potential role in the institutional and charitable food systems. Our research has informed the future of flash-freezing for institutional markets in Vermont and may have invigorated the market itself. It is evident that our endeavors, coupled with an increasing awareness of local food culture, has helped to increase the demand for local produce year round. Our work within the charitable food system has set the stage for the future of the Vermont Commodities Program spearheaded by Salvation Farms. This program will build on our work by continuing to provide flash-frozen local produce to the charitable food system.

Unexpected Difficulties

We encountered significantly less farmer interest in the flash-freeze unit than we had anticipated. This lack of interest can be attributed to a number of barriers previously described under the heading Mobile Flash-Freeze Unit Use on Farms. After discovering the lack of interest and significant barriers, we focused our attention on utilizing the unit in cooperation with institutions and as a stationary unit on the Green Mountain College campus.

Through this unexpected challenge we have discovered an opportunity—the unit's true utility lies in its function as a temporary-stationary unit. The unit may be used for two or three consecutive growing seasons to jumpstart a pilot project, but it is not suitable for established or larger-scale endeavors. We have had great success using the flash-freeze unit as a stationary unit on campus to support the Salvation Farms pilot project as well as our own farm-to-campus dining hall programs. After having used the unit with success we are now able to make an informed decision regarding our future plans as both endeavors have outgrown the mobile-unit.

Salvation Farms plans to scale up the Vermont Commodities Project in partnership with the Vermont Department of Corrections. In scaling up, infrastructure improvements will be informed by the perspectives gained from using the mobile unit with its complex advantages and challenges. For Green Mountain College and Cerridwen Farm, processing local produce for the campus dining hall would not have become such a major component of our farm-to-campus initiatives without the spark that the mobile unit provided. With the momentum provided by the flash-freeze unit, the College will continue to process and freeze produce for the dining hall and plans to make infrastructure improvements that will facilitate these activities.

By using the unit as a temporary-stationary flash-freezer, we have found that the unit is effective at providing the initial infrastructure needed to pilot a project. It is also a learning tool to find what types of infrastructure are needed to continue with and expand the initial project.

Impact

This grant and its associated projects have contributed greatly to the culture of collaboration between a number of local and regional organizations working in small-scale food processing. The research funded by Jane's Trust has helped Green Mountain College forge partnerships and connections between the Rutland Area Farm and Food Link, UVM Extension, the Vermont Department of Corrections, Salvation Farms, Sunrise Orchards/Vermont Refrigerated Storage, the Vermont Food Bank, the Vermont Agency of Agriculture, and the thirty-plus local farmers who have provided produce for one of our many grant-related projects or who have utilized the unit itself.

Through this grant, the Green Mountain College Farm and Food Project has been able to prove itself as a resource to our local agricultural community. The grant has enabled the Farm and Food Project to strengthen the existing partnership with the Rutland Area Farm and Food Link and in doing so has secured a place as another agriculture service provider to our community. Green Mountain College has also made progress towards the goal of contributing to a sustainable regional food system through this project.

Revisions to Project

As explained in the letter sent to Jane's Trust in June 2012, we made revisions to our original implementation plan and budget based on our findings during the 2011 growing season. These budget changes allowed us to provide more staffing to the project during the 2012 season. As described in the letter, we originally allotted $15,000 to cover transportation and transportation-related expenses for the two growing seasons. However, we transported the unit to fewer sites than anticipated and did more of the processing in centralized commercial kitchens than we expected. We then used the remaining funds to provide compensation to our key partner, Salvation Farms, who provided the expertise and long-term vision needed to develop the pilot for the Vermont Commodities Program, our major project for the 2012 season. We were also able to hire an assistant who coordinated the procurement of produce for the project and also provided labor in processing the produce to create the end-products. The success of this partnership is outlined in more detail under the heading Grow-a-Row and the Development of the Vermont Commodities Program.

Lessons Learned

We have gained many insights into the feasibility of small-scale light-processing of locally grown produce and have much to share with others. Areas of interest for other farmers, small-scale processors and potential purveyors of these products (including retailers, institutions and charitable food sites) include food safety, findings pertaining to particular crops including methods, packaging and viability of products, and costs of production. We have also gained many insights into the logistics of the mobile freezer unit and flash-freezing technologies.

Our research resulted in a better understanding of commercial kitchen operations, management, food processing and handling procedures that have changed the way our kitchen operates. The processing project we completed in collaboration with Salvation Farms, whose end product is served to the most vulnerable populations, heightened our awareness of food safety standards. This research prompted the creation of a strict set of policies and procedures which guide kitchen use and promote food safety.

By trialing a great diversity of crops, we have collected hard data regarding labor and inputs for specific crops and processing methods. Certain crops and the products we have created from them are not often processed on a small scale. Products such as frozen corn kernels and frozen green beans are generally processed at a very large scale using highly-specialized machinery. **We have compiled a report that evaluates the cost-effectiveness and efficiency of processing each crop and product based on data we collected during processing.** The report details the process used to preserve each trial crop as well as the cost associated with the raw product, labor and energy inputs and supplies (gloves, packaging, etc). Each crop is accompanied by two price points—one that includes labor costs and one that does not. These details will prove to be extremely helpful to individuals hoping to replicate our work in other regions. We also have synthesized qualitative data from feedback received from sites whose clients taste-tested the products.

Product price points were established for the product line we created in partnership with Salvation Farms. Because the products created are distributed free of charge these price points assign a theoretical value to the products. By analyzing data gathered during processing, and evaluating crop values assigned by market value, as well as the cost of inputs (bags, labels, transportation, and cooking fuel) we were able to identify the true cost for each product. This information will help Salvation Farms choose which crops to continue to pursue and which crops to either process differently, or not process at all within the Vermont Commodities Project.

Sunrise Orchards has also collected specific retail price point information for each crop. Although some of this information is proprietary, Sunrise Orchards has shared that their products are valued at 150% of the cost of their conventional counterparts (e.g. Birdseye brand), yet evidence supports that a significant and growing market for both organic and conventional frozen-local products exists.

Through using the mobile flash-freeze unit for two full growing seasons, we have come to understand the intricacies and challenges of its logistics. **By utilizing the unit in various settings and for a great diversity of products we have come to realize that the unit itself presents a number of challenges in its design alone**:

- The unit is not ideal for highway travel due to the heavy compressor being placed atop the trailer. Ideally the compressor, the trailer's single heaviest component would be placed lower, perhaps near the trailer hitch to allow for easier, safer and more efficient hauling.
- The unit is not adequately insulated as demonstrated by the excessive condensation that accumulates on the outside of the freezer section of the unit when in-use. With adequate insulation, the unit would prove more effective by dropping to and subsequently maintaining a lower and more consistent temperature regardless of outside conditions.

- A poorly placed wall inside the unit also presents a physical challenge as there is neither an easy nor effective way to move racks of produce from outside the unit to inside the unit and vice versa. This impedes the flow of product through stages of processing, freezing and packaging.
- The unit's roller conveyor, intended for bringing produce into the unit, is also problematic. Because the unit sits on wheels about sixteen inches from the ground, when extended, the belt reaches a height of about four-feet outside the unit. The conveyor has proven too inconvenient and uncomfortable to use when loading any significant amount of produce.
- The fan inside the unit is also poorly placed at the end of the conveyor. The fan could prove useful but its placement would mean that the trays would need to be loaded incredibly slowly into the unit and would require at least one person at each end of the belt loading the trays and subsequently loading them onto racks.

We ultimately found that the unit was a good starting point for our pilot projects but would prove to be extremely inefficient when used at capacity. During the grant period, about twenty individuals have called seeking advice in building a similar model. We have relayed our findings to each inquirer and have helped them lay out a superior unit.

One important lesson we have learned is that it may be equally efficient to use a walk-in freezer that has been set to at least negative 15 degrees Fahrenheit. When attempting to process and freeze any significant volume of a single crop for retail, it may be more effective to bring said product to a co-packing facility that has the appropriate infrastructure and knowledge to create a high quality product with maximum efficiency.

Recommendations

Based on the insights we have gained through our research we are well-positioned to advise the Vermont Agency of Agriculture on appropriate uses for the mobile flash-freeze unit after our lease has ended. We have recommended that the Agency of Agriculture release a call for proposals for creative business plans from farmers interested in exploring small-scale food processing for the retail market. This would allow a single mid-scale farmer, or a handful of small farms in close collaboration, **to effectively test the retail market for lightly-processed frozen products**.

Through our research, we found that many farmers have been reluctant to use the mobile flash-freeze unit on the Green Mountain College campus for a number of reasons. The primary reason has been concern regarding the longevity of the unit at our site. Small farmers are reluctant to invest their already scarce time, energy and resources to test the unproven retail market for lightly processed products without the assurance that they would be able to test the market over multiple growing seasons using the flash-freeze unit. The market for fresh produce in Rutland County is not yet satiated and as long as farmers are producing for an unsaturated market there is little incentive for them to produce for an untested and therefore risky market.

By leasing the mobile unit to a single farm (or a group of farms) as a stationary unit, farmers can be sure they will have the unit where they need it, when they need it. They may then be more motivated to grow produce specifically for processing and will be able to adequately test the retail market. After a period of

three growing seasons, a farmer may then make the decision regarding whether they want to invest in permanent infrastructure to continue processing, or whether this is a market they are not interested in pursuing.

In our original proposal we suggested that this could become a self-sustaining business model, bringing in enough revenue through rental of the unit and Green Mountain College's Community Commercial Kitchen to pay for part of the salary of the specialist position and collaboration with RAFFL. Through our research we have found that this is not the best use for the flash-freeze unit and that **the unit would be best suited to support pilot and start-up projects.** We have found that permanent infrastructure custom designed to improve synergy with our existing infrastructure will be the most effective way to expand upon our farm-to-dining hall work.

Communication Efforts

Over the span of the grant, we have answered questions and shared our insights with over thirty individuals and organizations that have inquired about the flash-freeze unit and our research. These inquiries have generally consisted of 30-60 minute phone conversations and follow-up emails. As a result of one of these inquiries, our work and findings have been highlighted in the Institute for Agriculture and Trade Policy's report *Frozen Local: Strategies for Freezing Locally Grown Produce for the K-12 Marketplace* published in December, 2012. Relevant sections of the report are included in Appendix H.

To share our knowledge, we have also partnered with Almost Blue Productions, a local filmmaking company, to create a short documentary film, *Glean, Freeze, Give*, on our work for the charitable food system. The documentary includes a synopsis of the history of the unit, our gleaning and food rescue work, and focuses on small-scale food processing and what we have learned through our use of the flash-freeze unit. The documentary can be viewed at http://www.almostblueproductions.com/?portfolio=glean-freeze-give.

Philip Ackerman-Leist will also include this research and its findings in presentations to other organizations (including colleges and universities) across the United States during his 2013–14 book tour to promote *Rebuilding the Foodshed: How to Create Local, Sustainable, and Secure Food Systems*, a new book released in 2013 that prominently features this flash-freezing research project alongside other innovations in community-based food system efforts throughout the country (http://www.amazon.com/Rebuilding-Foodshed-Sustainable-Community-Resilience/dp/1603584234).

Final Report Submitted to the Windham Foundation

Name of Organization: Green Mountain College
Program Name: Farm and Food Project
Grant Amount: $10,000

Referring to the goals and objectives described in your original grant request (or any revisions submitted subsequent to the grant award), please indicate the following:

Two goals were identified in our original proposal. The long term goal of the Community Commercial Kitchen Project is to create new economic opportunity for farmers and food entrepreneurs and improve access to fresh local foods for all segments of the population in Rutland County. This goal is ongoing.

The short term goal of the proposal was to make the Community Commercial Kitchen fully operational for processing and training through the purchase of small wares and basic appliances. We have succeeded in meeting this goal.

The funding received from the Windham Foundation was instrumental to the creation of a fully equipped commercial kitchen available for rent by the community. With this funding we were able to purchase a complete set of stainless steel cookware, knives, mixing bowls, as well as certain essential small appliances such as a commercial scale food processor, stand mixer, and blender. The grant also provided the opportunity to make larger infrastructure improvements including the creation of a loading dock that facilitates the movement of large amounts of produce and other ingredients into the kitchen. We were also able to upgrade our cookware storage by creating a well-organized closet with several locking compartments. Additionally, we created an outdoor cob-oven that provides an alternate cooking and event space for those using the kitchen.

These purchases and infrastructure improvements have positioned us to successfully fulfill our long term goal of creating economic opportunity and accessibility to local food. We currently have one food entrepreneur who rents the kitchen on a weekly basis. We also have renters that use the kitchen to cater events and renters that come in to process produce during the height of the growing season. We will continue to recruit farmers and food entrepreneurs to use the kitchen and we anticipate an increase in the number of regular renters with the cookware and infrastructure now fully in place.

During the 2013 growing season over 4,200 pounds of local produce were processed in the community commercial kitchen. Of that produce about 3,500 pounds were for use in the College dining hall and 700 pounds were distributed to six charitable food sites in Rutland County.

Describe any setbacks encountered during the period of this grant.

In designing and stocking the commercial kitchen for multiple users and varied use, we discovered the need to streamline kitchen use and improve knowledge of food safe practices. We have ensured that all products produced in the shared space will be safe by creating and enforcing a set of protocols and procedures. These documents are included in this report. To further promote food safety, Green Mountain College hosted a two-day class taught by Londa Nwadike, University of Vermont-Extension Food Safety Specialist. This class will be taught on a regular basis and will be offered to the community as well as to Green Mountain College students.

Who else has funded this project (or your organization), and at what level? If total proposed budget amount was not raised, indicate if program goals were altered in any way.

The research funded by Jane's Trust, which was centered on the use of the Vermont Agency of Agriculture's flash-freeze unit, made use of the fully-equipped commercial kitchen as a central hub during the 2012 growing season. The kitchen hosted the pilot of the Vermont Commodities Program spearheaded by Salvation Farms. The pilot made use of the kitchen to process and freeze donated local produce to trial various products and package for use within the charitable food system. Following the pilot year, Salvation Farms will have outgrown our small kitchen but this space has proven to be an essential starting point to what will likely become a large statewide program in the future.

Jane's Trust funded the purchase of certain equipment needed for processing and packaging produce on a large scale. This included the purchase of a commercial vacuum sealing machine. Jane's Trust also provided the funding for the food safety course which made use of the commercial kitchen. Funding from that grant was also used to purchase cleaning supplies and to hire a linen service that provided a weekly delivery of aprons and dishcloths.

What steps are being made to ensure the sustainability of your project or organization beyond this grant period?

Following the end of the grant period, a part-time staff person will be hired to manage kitchen use and to maintain cleanliness. A food safety course and other relevant skill-building training will be offered on a regular basis and will be open to the community.

The installation of an edible landscape and teaching garden funded by a grant from Duke Energy will make use of the kitchen for community-oriented programming, teaching basic cooking skills and food preservation.

The kitchen manager will continue to work to promote the kitchen and to recruit renters. Rental income will provide enough revenue to make this project partially self-sustaining. It will provide the means to purchase the chemicals used in the three-bay sink and the dishwasher as well as to support the continuation of the linen service.

We will continue to strive towards fulfilling our long term goals of enhancing economic opportunity and increasing access to local foods.

Appendix D: Operations Manual

Fruit and Vegetable Freezer Trailer

Operations Manual

July 22, 2008

Brian Norder

Vermont Food Venture Center

Important Warnings

Vehicle Height 11'6"- Do not drive under low overhanging structures

For Safe Operation Read This Manual Prior to Use

A licensed electrician must be used to ensure that all connections are safe and according to code.

The roller assembly must be mounted on the tripod stands any time the back door is open to avoid a trip hazard.

The circuit breaker supplying the compressor on the left wall must be in the OFF position prior to plugging in the 208-240 volt power supply to avoid arcing and potential shock.

Overview

This unit has been designed for on-farm freezing of fruits and vegetables. It has an hourly freezing capacity of 600 pounds. To meet this capacity, fruits and vegetables should be as dry as possible prior to freezing as moisture and humidity can reduce the capacity.

The trailer is equipped with a roller assemble, air curtain, air conditioning, drying fan, drying trays and freezing trays and racks. These components act together to provide optimal freezing conditions.

Utility Hook-ups

Electrical

Initial electrical hook-ups must be done by a licensed electrician. The unit required a 30 Amp, 110 volt circuit with a standard RV type connection and a 50 Amp, single phase, 3 pole, 4 wire 208 to 240 volt connection suitable for outdoor use.

Operational load for the 110 v. circuit is @ 20 A. This circuit powers the air conditioning, lights, dryer fan and air curtain. Control voltage for the air conditioner is supplies by a 12V. deep cycle battery on the front of the trailer.

The 208-240 circuit powers the freezer itself. While starting amperage will be higher, the freezer unit draws aapproximately 20± A. during operation at 235V.

This circuit is equipped with a single phase line monitor designed to cut power to the compressor in event of high or low voltage condition. This monitor is set for a voltage of 225 with a 10% plus/minus range. If voltage exceeds or drops below the limit, the unit will shut down for five minutes and will automatically check at that time for suitable voltage.

Do not confuse shut down due to low voltage with normal operation of the defrost cycle described below.

The unit is equipped with a blower coil defrost that will activate every two hours and shut down the fan blowers. Compressor will run on a hot gas cycle during this defrost. Duration of defrost cycle will vary according to amount of product being frozen, ambient humidity and moisture remaining on fruit or vegetable but on average should be less than ten minutes.

Plumbing

The unit is equipped with a hand sink with hot and cold garden hose connections in the back of the trailer. Grey water from the sink can be directly drained through the drain hose connection on the back by keeping the gate valve under the sink open or you can use the 5 gallon holding tank by closing gate valve for later draining.

Operation

Controls

There are two circuit breaker panels. The 110 v panel is located within the freezer compartment. The 208-240 panel is along the left-hand wall if looking in from the rear door.

The circuit breaker panel for the 208-240 circuit is the ON/OFF control for the freezer compressor and coil. To prevent danger of electric shock and damage to the unit, this must be in the OFF position prior to hooking up power cable.

Lights and air conditioning switches are located by side door. The air curtain switch is located on the unit above the back door and the dryer fan plugs into the wall outlet.

An hour meter showing cumulative freezer run time is mounted on side of 208-240 V box.

Lights, AC and air curtain switches MUST be OFF and dryer fan unplugged before plugging in 110V supply.

Set Up

Freezer should be parked on well-drained, level ground. Open back door and mount conveyor roller onto the two tripods with the white wheels in the front. This unit is heavy and this mounting must be done by two people.

To avoid a trip hazard, conveyor must be mounted anytime back door is open.

Turn on compressor one hour prior to use to give ample time to pre-cool. The unit is set to run at -20F with rapid, high volume air movement. The air curtain provides a barrier to keep flies out and to help dry product.

The solid sheet pans are designed for the actual freezing and the perforated trays for drying prior to freezing.

Freezing

After the produce has been washed and drained outside of trailer, it is put onto drying screens and rolled through the air curtain, under the drying fan and onto sheet trays which are then put onto rolling racks. Once full, the racks are rolled into the freezer compartment.

After freezing, the berries can be boxed and can be stacked in freezer compartment for short-term storage.

Freezing time will vary according to the temperature of the fruit or vegetable prior to freezing and the amount of water remaining on the produce.

The air conditioning in the trailer is designed to help pre-chill product prior to freezing.