Produce Processing Toolkit:

A Guide for Gleaned, Surplus, or Donated Fresh Crops

A partnership project of Salvation Farms and Meals on Wheels of Lamoille County

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INTRODUCTION

Salvation Farms (SF) and other partners across Vermont have identified a major gap in the state's food system: meal sites or food rescue organizations seeking to utilize fresh, local food face barriers in efficiently gathering produce and consuming or storing it quickly enough. Community meal sites and agencies often lack a combination of infrastructure and labor needed to process and preserve donated local produce, limiting the amount of fresh food they can receive. SF seeks to increase the capacity for local agencies to accept, minimally process and preserve donated fresh local produce to increase food sustainability and meet nutrition requirements.

Minimally Process (or lightly process): Engaging with fresh food in a way that does not substantially change it from its raw form but sustains viability and nutrient content, i.e. washing, cutting, freezing, or lightly blanching (brief application of heat)

SF has been lightly processing Vermont crops since 2012. Having organized processing pilots in a variety of commercial kitchens with varying equipment and utensils, SF has compiled procedures for minimal processing agency scale volumes of produce. Through these pilots, SF has gathered extensive product feedback in order to create desired low cost, high quality products from surplus produce.

Through a partnership with Meals on Wheels of Lamoille County (MOWLC) in 2015-2016, SF has worked to specifically identify crop types, volume, end products, and equipment needed to increase the volume of local donated produce and ability to process in the MOWLC kitchen. SF and MOWLC have analyzed minimal processing methods, equipment needs, food safety implications, and overhead costs to determine the best crops for processing.

This document is a compilation of best practices that can be implemented at various agencies to increase their use of local, fresh foods. It offers recommendations for integrating fresh produce, including minimal processing methods, food safety procedures, identifying nutrition contents of various crops, and inputs needed such as tools, labor, and crop volumes.

By creating systems for processing and preserving donations of surplus crops from community farmers, meal programs and other agencies can decrease reliance on purchased food from out of state and increase food sustainability and community engagement. Local produce will ensure high quality meals that meet nutritional goals, making it possible for agencies to utilize surplus food from within their own communities.

Surplus crops (or gleaned crops): fruits and vegetables that farmers are unable to send to market for various reasons (not enough labor to pick, slight blemishes, overabundance) and are left in the field or farm's pack house

SAFETY FIRST

This section is designed to outline very basic food safety considerations when handling and processing products. Commercial kitchens generally have a set of procedures which are best to follow. For kitchens that do not have food safety procedures in place, these suggestions can help set a foundation for creating a safe food handling environment. For managers leading minimal processing, an accredited food handlers' training, such as ServSafe, and a 1st Aid/CPR courses are strongly recommended to ensure both food and worker safety.

First Things First

- Personal belongings should be stored away from processing area
- Remove all jewelry or loose items
- Eating, drinking, smoking, or chewing gum should not be done in food preparation areas
- Know where the first aid kit is and how to properly clean up blood; ask for help as needed
- Ensure knives are sharp to avoid cuts

Personal hygiene

- Food preparers should maintain personal cleanliness while working with food
- Wash hands when entering the kitchen, before handling food, and when switching to a new crop or after you touch your face, take out the trash, use the restroom, or do any activity that can introduce new contaminants to the produce; the best practice is to wash hands thoroughly for 20 seconds under running water with soap, clean nails with a nail brush, dry hands with a single-use towel, and then shut off water with a paper towel
- Post signs in bathrooms reminding people to wash their hands after using the bathroom; be sure bathrooms are supplied with soap and single use paper towels
- If gloves are used when handling ready-to-eat foods, they must be changed with each new task, ie switching to another crop or taking out the trash; cut-resistant gloves are best
- Hair nets must be worn when prepping and handling food
- Food handlers should wear clean clothing, closed toe and slip-resistant shoes
- Avoid nail polish
- Aprons must be worn at all times during food prep and removed before entering non-processing areas

Work space

- A large, tall table is the best workspace for volunteer comfort
- Stainless steel surfaces and containers and non-porous cutting boards (not wooden) are best in the prevention of food-borne illness, as they are easier to clean and sanitize. It is helpful to distinguish colored cutting boards to use red for meat and green for vegetables to limit any cross-contamination
- Avoid using glass containers to eliminate chance of breakage
- Common safety concerns are small cuts or slipping on water or food on the floor; be sure to know your surroundings and quickly pick up any scraps on the floor
- Heavy lifting, pushing, or standing in one position for too long can cause neck or back strain; be sure to provide assistance for lifting heavy items or check in with workers about if they are comfortable at their station
- Do not leave knives on edges of tables or in sinks; use a designated spot beside the sink
- Have wet floor signs available and use them as needed

Storage

Prior to processing, fresh produce should be received and properly stored –see Appendix 2 for a sampling of diverse storage needs. Once processed and frozen, produce should be kept at 0°F or below until ready to use.

Food Allergens

Extra care should be taken to ensure common food allergens do not come into contact with fresh produce during cleaning or preparation. For example, do not store diced onions in a peanut butter jar or use a knife that has also been used for shellfish to dice said onions. Additionally, if people take a meal or snack break, be sure they understand to do so away from the processing area and to wash their hands before handling food again.

Safe Food Preparation

There are a number of factors to consider when safely handling food to prevent contamination, food-borne illness, and pathogens from developing.

Pathogen: Microorganism (a bacterium, virus, or fungus) which causes disease foodborne illness (food poisoning)

Washing all produce prior to processing is an important element to ensure safety; it is best to cut off rotten or brown spots during this stage as well. If this is not possible before processing day,

add a wash station as the first step. A large salad spinner works well to remove excess moisture from greens and other produce.

Thawing

The safest and most reliable method to thaw is in a refrigerator that is 40°F or cooler. As this method may take multiple days to thaw depending on volumes, you can also safety thaw product by placing the product in a container in a bay sink and running a small stream of cold water (70°F or lower) over the product in a sealed package. When using this method, ensure the food is in a leak-proof package or plastic bag and once the product is thawed, the food should be cooked immediately. Food products should never be thawed at room temperature, as this may allow for conditions that promote food-borne pathogen growth.

Anaerobic: Requiring an absence of free oxygen
Aerobic: Requiring free oxygen

Product that is frozen and vacuum-sealed should be taken out of its bag and placed in a food-safe container, before thawing to avoid any potential pathogens from producing toxins.

Cooling

Pathogens grow quickly on foods that are within the temperature range of 40°F and 140°F – this is often referred to as the "danger zone." Cooked foods should be cooled to 41°F or below within 4 hours and then stored in a refrigerator in order to reduce the growth of pathogens.

Cooking

Depending on the desired end product and cooking process, produce can be cooked in a wide range of methods for short or extended periods of time. Fruits, vegetables, legumes, & grains must be cooked to a minimum of 135°F for 15 seconds to ensure proper internal temperatures.

EQUIPMENT

Equipment involved with light processing depends on the desired end product and volume of produce but there are a few general items that are often useful. With varying available funds, agencies may have to rely on current existing equipment. Every kitchen is different; with this variability, it can be helpful to be creative (but still safe) with the equipment and utensils that are available.

Basic Useful Equipment

- Tables: large, tall tables are best so that individuals can stand while they work, although sitting is also a good option
- Paring and other knives
- Peeler
- Apple corer
- Gloves – various sizes
- Aprons
- Sheet pans
- Hotel pans
- Cloths/towels
- Cutting boards
- Food grade plastic bins, various sizes
- Large pan or bowl
- 5 gallon buckets (for compost)
- Labels
- Data tracking sheet for traceability – see Appendix 1
- Food storage bags or containers appropriate for scale of operation, i.e. 1 pound bags for single family, 5 pound bags for meal site depending on the site's operation, scale, and primary service to clientele
- Food processor or a mixer with an attachment for grinding, shredding, or slicing

Labels

Labels are important to ensure product identification, allergen information, and product shelf-life. This station can either include hand-written labels or a machine. Generally, labels should consist of:

- Crop and form of end product, i.e. cubed, diced, pureed
- Farm source
- Location of processing
- Additional ingredients, i.e. salt, spices, lemon juice (as a preservative)
- Lot number for traceability – see Appendix 1 for example
- Allergens
- Date of preparation
- Who processed
- Suggested uses

Product labels should also include important instructions for safe food handling. For example, a frozen product should include a statement such as: KEEP FROZEN UNTIL READY TO USE.

Nutritional content may also be added to the label for end users with dietary needs. As we are primarily working with produce, listing the vitamin/nutrients of the fruit or vegetable will be

important. The USDA offers a standard National Nutrient Database, which allows you to search by crop to see a full list of nutrient content for any food or crop. This can be found at https://ndb.nal.usda.gov/ndb/search.

Engaging with Volunteers

Volunteer labor is a great asset but it is important that they uphold food safety guidelines and standard processes in the kitchen. Below are some tips:

Before the Processing Day:

- Maintain a list of volunteer names and contact information
- For larger volumes, it may be helpful to schedule two separate shifts throughout the day
- Volunteers that are older or have arthritis may have trouble doing fine knife work; it's best to offer a brief note on the difficulty level of the knife work when recruiting volunteers
- Instruct the volunteers to wear closed-toed shoes, pull back long hair, and remove jewelry; even if volunteers have come before, it's helpful to remind each time
- Make sure the organizer knows first aid procedure in case someone gets hurt
- Reach out to local culinary programs for their students to assist for volunteer hours

Orientation:

- Ask volunteers to fill out a waiver and emergency contact information. If you will be taking pictures, ask volunteers to sign a photo release as well.
- Provide any relevant promotional material for your organization or project
- Wait until all volunteers have arrived to orient them
- Ensure workers have long hair pulled back, jewelry removed and that they are wearing clean clothes and closed-toed shoes
- Workers must wash hands and wear gloves and hair nets
- Offer a protocol for beverage or snack breaks separate from the food processing area to ensure food safety
- It takes about 15 minutes to orient the volunteers once everyone arrives. It is important to explain the entire process before volunteers begin.
- It's helpful to explain to volunteers where the crop came from, why there is a need for processing, and what its eventual use will be

- Assign workers at each station. It is helpful to ask which station a worker feels most comfortable with or what tools they prefer

During Processing:

- It is helpful to have both standing and sitting options
- Check in with volunteers to make sure they are staying on track, comfortable with their station, and maintaining quality of the product

ADDITIONAL CONSIDERATIONS

- Organized program staff are vital to accomplishing successful processings
- It is helpful to keep detailed records of the fresh or processed produce brought in, how it is used, and tips for your particular kitchen for future staff reference
- It's best to schedule this work during the normal business day, if space and management capacity allows, to reduce overhead costs
- Offering standard cut sizes as references can help achieve uniformity as the day progresses or volunteers switch stations.

PROCESSING RECIPES

When planning to lightly process fresh produce, it is important to first determine the desired end product size, quantity needed, and preferred end use. It is helpful to know your recipe prior to processing so you can estimate how much you need to process. Below are a few helpful tips:

- Approximately ½ cup of cooked food = 1 serving
- 10 pounds of product fits approximately into 2 gallon bags
- If you have enough stainless steel hotel pans and will use the product relatively quickly, you can simply freeze the product in large hotel pans to then put directly into the streamer; this will reduce your use of plastic bags and speed up the process

With versatile crops such as winter squash, you will want to determine how you plan to use the product; for example, to use as a side dish, you may want to cube and steam or if soup is the desired product, pureeing may be the preferred process. The quality, size, and shape of the incoming produce can also affect the type of preparation involved. While this toolkit provides guidance on best practices and expectations, it is important to tailor processings to fit the need of your particular kitchen and organization.

APPLES – SLICED (RAW)

250 pounds requires:
6-8 Workers
4-6 Hours

Processing Guide
Depending on the use once thawed, apples should usually be peeled, de-seeded and sliced.

Key Considerations – Reference page 8
Since apple slices turn brown when exposed to the air, it is important to bag and freeze them as quickly as possible. If you prefer, you can quickly soak them in water mixed with a small amount of lemon juice before freezing. This will make them soggier when they thaw, which is best for saucing. If you want to include this step, you can dry them before bagging.

For best quality, apples should be stored in the fridge or walk-in and be used within 2 weeks of picking – see Appendix 2 for more details.

Nutritional Contents
A cup of sliced apple provides 12% of daily recommended fiber and 9% of daily recommended Vitamin C.

Available Fresh in the Northeast
Apples are typically available fresh July through October and can be stored until late spring.

Tools
Having multiple small peelers or even automatic peelers are helpful, as some volunteers are not comfortable peeling with paring knives.

Input/Output
Depending on the quality of the incoming crop, an average of 40% of the weight will be composted with about 60% utilized through processing. The amount composted can be decreased with high attention to detail to peel very close to the skin without removing excess. This may require a bit more time but will yield more viable product and less compostable waste.

Preparation
Apples should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Peeling the apples – optional, depending on the use
2) Slicing them into quarters, cutting out the core

Nutrition Facts
Serving Size 1 cup (125g)

Amount Per Serving	
Calories 65	
	% Daily Values*
Total Fat 0.2g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 134mg	**4%**
Sodium 1mg	**0%**
Total Carbohydrate 17g	**6%**
Dietary Fiber 3g	**12%**
Sugars 13g	
Protein 0.3g	**1%**

Vitamin A 1% • Vitamin C 9%
Vitamin B6 5% • Magnesium 1%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

3) Slicing each quartered piece into thin slices (depending on the desired end product, this station may not be necessary or instead may be producing cubes instead of slices)
4) Put the product into bags, weigh, label, and freeze

The first three stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF (Individual Quick Freeze) is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the apples in the fridge or walk-in overnight. There may be excess water that can be drained or even utilized if the recipe calls for liquid.

Use

Apples can be used for a variety of different breakfasts, snacks, and desserts. Most common is apple pie, which would call for large slices. If making apple crisp, apple oatmeal bars, or applesauce, smaller cubes may be more appropriate.

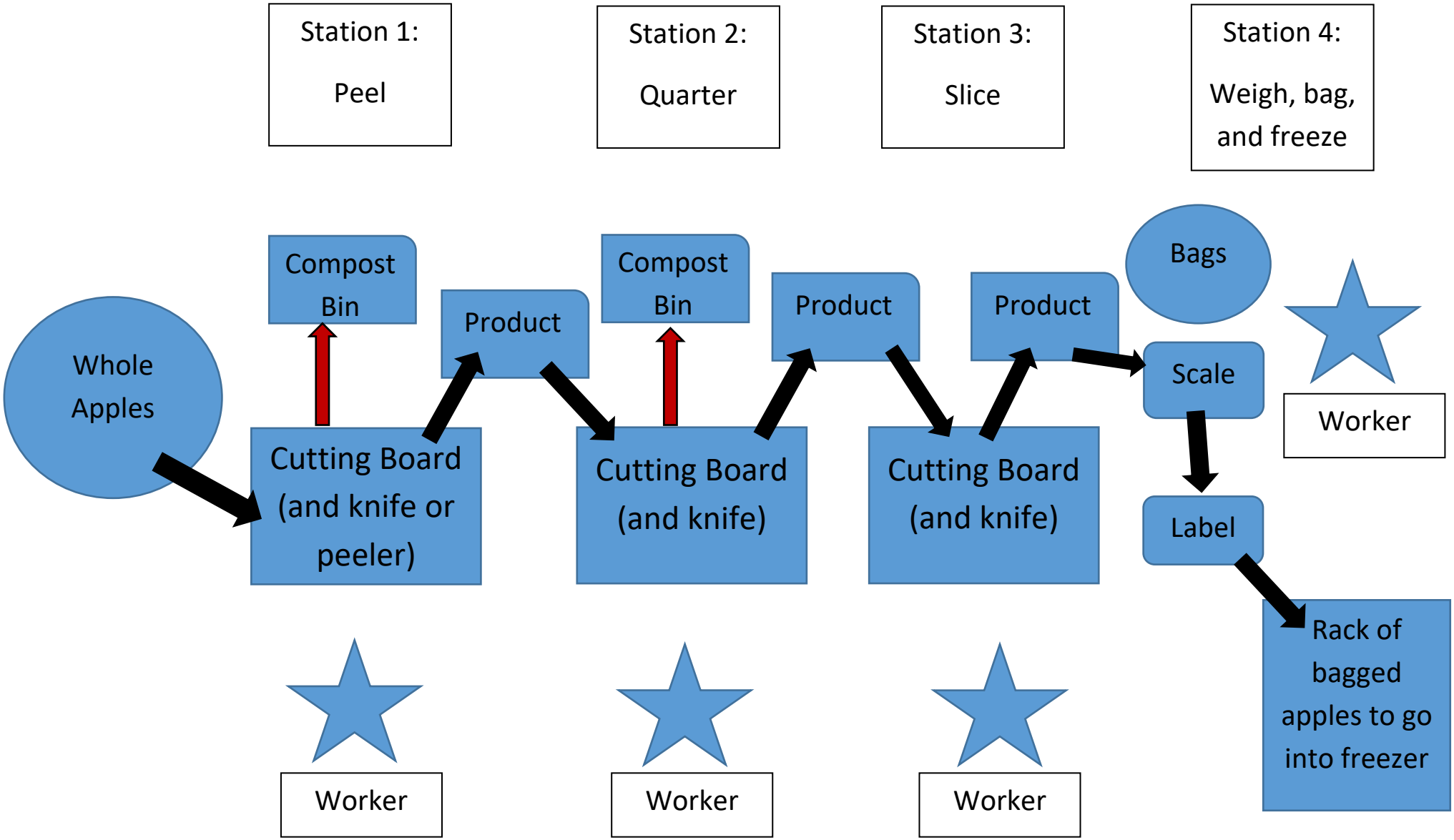
Food Safety

Slight bruising is OK but cut out any large bruising or brown spots.

Flow Diagram

See next page.

Apple Process Flow Diagram



BEETS – SLICED

Processing Guide

Beets should be peeled and sliced. If beets are especially dirty, they can be washed and dried prior to processing. The processing time will depend on the size of the beets.

135 pounds requires:
5-7 Workers
13-17 Hours

Key Considerations – Reference page 8

Since beets are so hard, it's best to steam them for 45 minutes to an hour and cooling them in a cold water or ice bath before proceeding to peel and slice them. It may be helpful to split the work into two processing days – one to cook and cool and the other to peel and slice – if you have enough refrigeration room to store.

For best quality, beets should be stored in the fridge or walk-in and be used within 3 weeks of picking – see Appendix 2 for more details.

Nutritional Contents

A cup of sliced beets provides 15% of daily recommended fiber and 11% of daily recommended Vitamin C.

Available Fresh in the Northeast

Beets are typically available fresh July through October and can be stored until early spring.

Tools

Having multiple small peelers are helpful, as some volunteers are not comfortable peeling with paring knives.

Input/Output

Depending on the quality of the incoming crop, an average of 15% of the weight will be composted with about 85% utilized through processing. The amount composted can be decreased with high attention to detail to peel very close to the skin without removing excess. This may require a bit more time but will yield more viable product and less compostable waste.

Preparation

Beet processing can be broken into two stages, with each taking about 15 minutes to set up the stations, which include:

Nutrition Facts

Serving Size 1 cup (136g)

Amount Per Serving	
Calories 59	
	% Daily Values*
Total Fat 0.2g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 442mg	**13%**
Sodium 106mg	**4%**
Total Carbohydrate 13g	**4%**
Dietary Fiber 3.8g	**15%**
Sugars 9g	
Protein 2.2g	**4%**

Vitamin C 11%	•	Calcium 2%
Iron 6%	•	Vitamin B6 5%
Magnesium 7%		

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

1st stage:

1) Cut ends
2) Steam or boil until soft
3) Soak in cold water or ice bath briefly
4) Drain and store in a food-safe container

The first station requires a cutting board and knife while the second station requires a steamer or stovetop.

2nd stage:

1) Peel
2) Slice
3) Put the product into bags, weigh, label, and freeze

The first two stations each require a peeler, cutting board, and strong, sharp knife. The last station should be equipped with a scale, bags, and labels.

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the beets in the fridge or walk-in overnight. There may be excess water that can be drained or even utilized if the recipe calls for liquid.

Use

Beets make a great side dish or can be incorporated into a stew or stir fry. Beet greens are also a great side and can be cleaned and sautéed as you would kale or other greens.

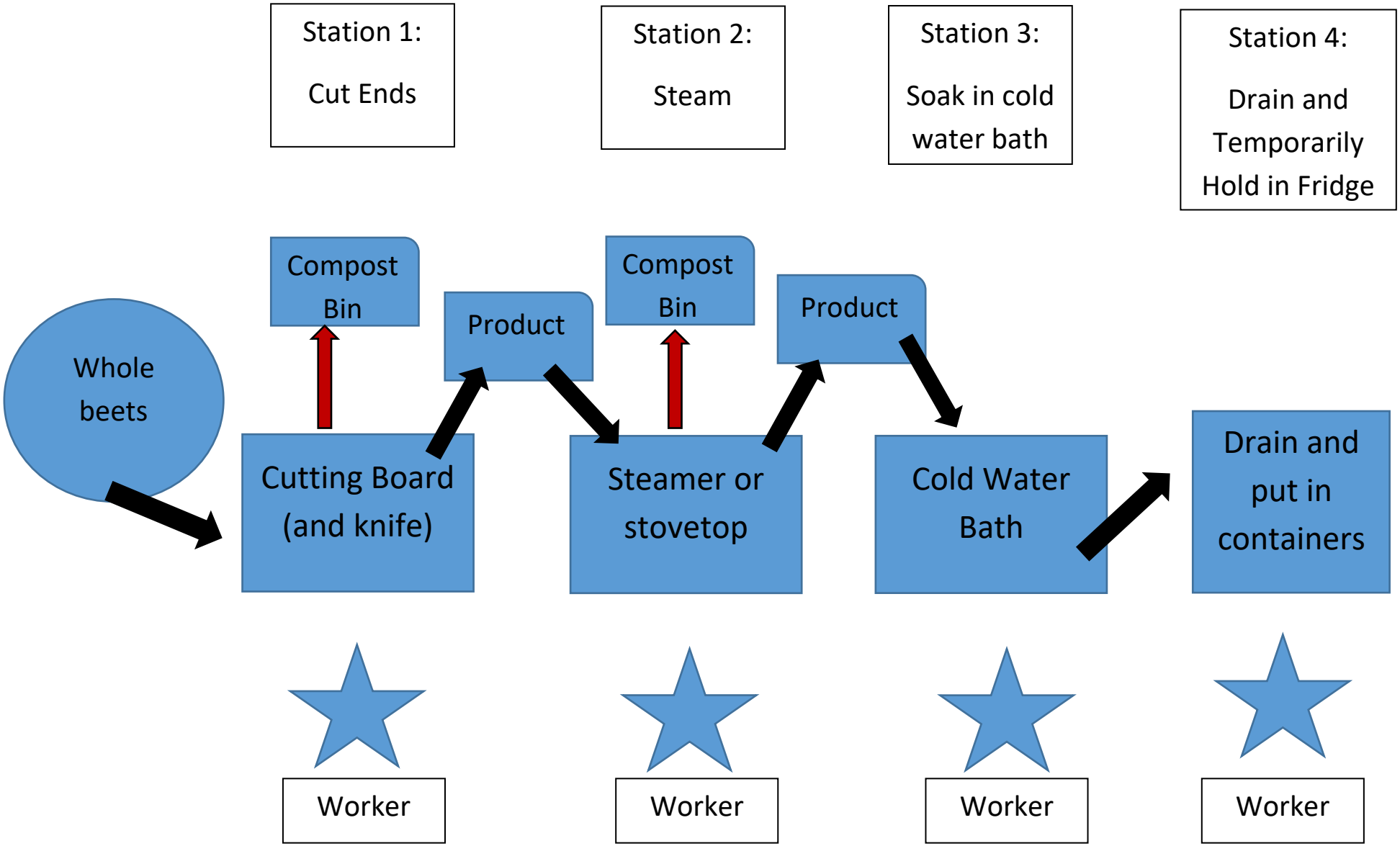
Food Safety

Slight bruising is OK but cut out any large bruising or brown spots.

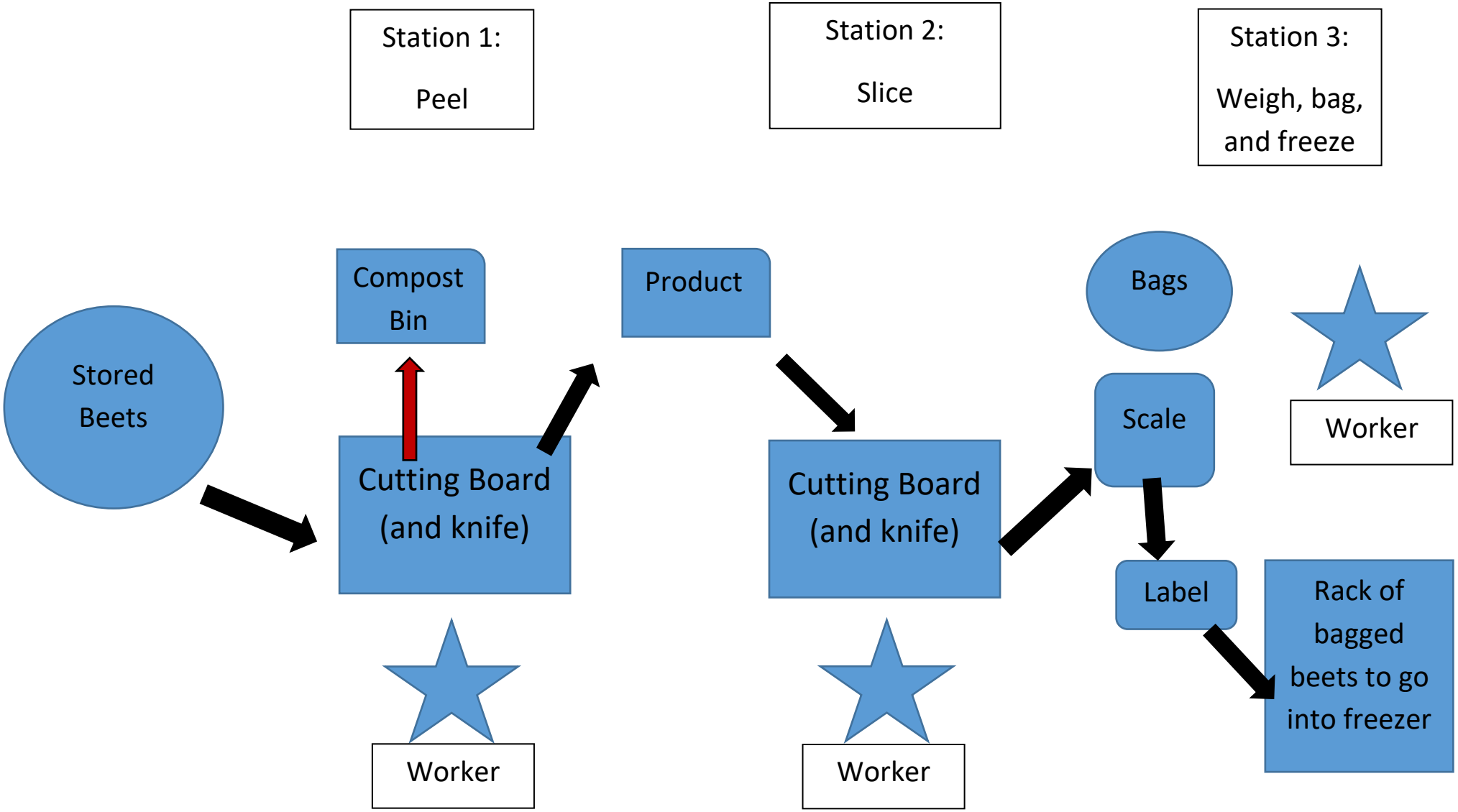
Flow Diagram

See next page

Beet Process Flow Diagram Stage 1



Beet Flow Diagram Stage 2



CARROTS – SLICED (RAW)

Processing Guide

Depending on the use once thawed, carrots can be long, thin slices, sliced into circles, or grated.

100 pounds requires:
1-3 Workers
2-4 Hours

Key Considerations – Reference page 8

It's best to peel carrots as surface dirt can remain in crevasses, even after washing. Carrots can then be cut by hand or in a food processor. Carrots may be blanched as well.

For best quality, carrots should be stored in the fridge or walk-in and be used within 3 weeks of picking – see Appendix 2 for more details.

Nutritional Contents

A cup of sliced apple provides 6% of daily recommended fiber and 203% of daily recommended Vitamin A.

Available Fresh in the Northeast

Carrots are typically available fresh July through November and can be stored until early spring.

Tools

Having multiple small peelers or even automatic peelers are helpful, as some volunteers are not comfortable peeling with paring knives.

Input/Output

Depending on the quality of the incoming crop, an average of 15% of the weight will be composted with about 85% utilized through processing.

Preparation

Carrots should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Peel
2) Cut off ends
3) Slice to desired size
4) Put the product into bags, weigh, label, and freeze

The first station requires a peeler while the second and third require a knife. The last station should be equipped with a scale, bags, and labels.

Nutrition Facts

Serving Size 1 cup (122g)

Amount Per Serving	
Calories 50	
	% Daily Values*
Total Fat 0.3g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 390mg	**11%**
Sodium 84mg	**4%**
Total Carbohydrate 12g	**4%**
Dietary Fiber 3.4g	**14%**
Sugars 6g	
Protein 1.1g	**2%**

Vitamin A 407%	•	Vitamin C 12%
Calcium 4%	•	Iron 2%
Vitamin B6 10%	•	Magnesium 3%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. If composting the excess, include a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.
If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the carrots in the fridge or walk-in overnight. There may be excess water that can be drained or even utilized if the recipe calls for liquid.

Use

Carrots can be great in any soup, stew, or stir fry. They can also be great flavor additions to roasted meat or pureed into a mash, bisque, or side dish.

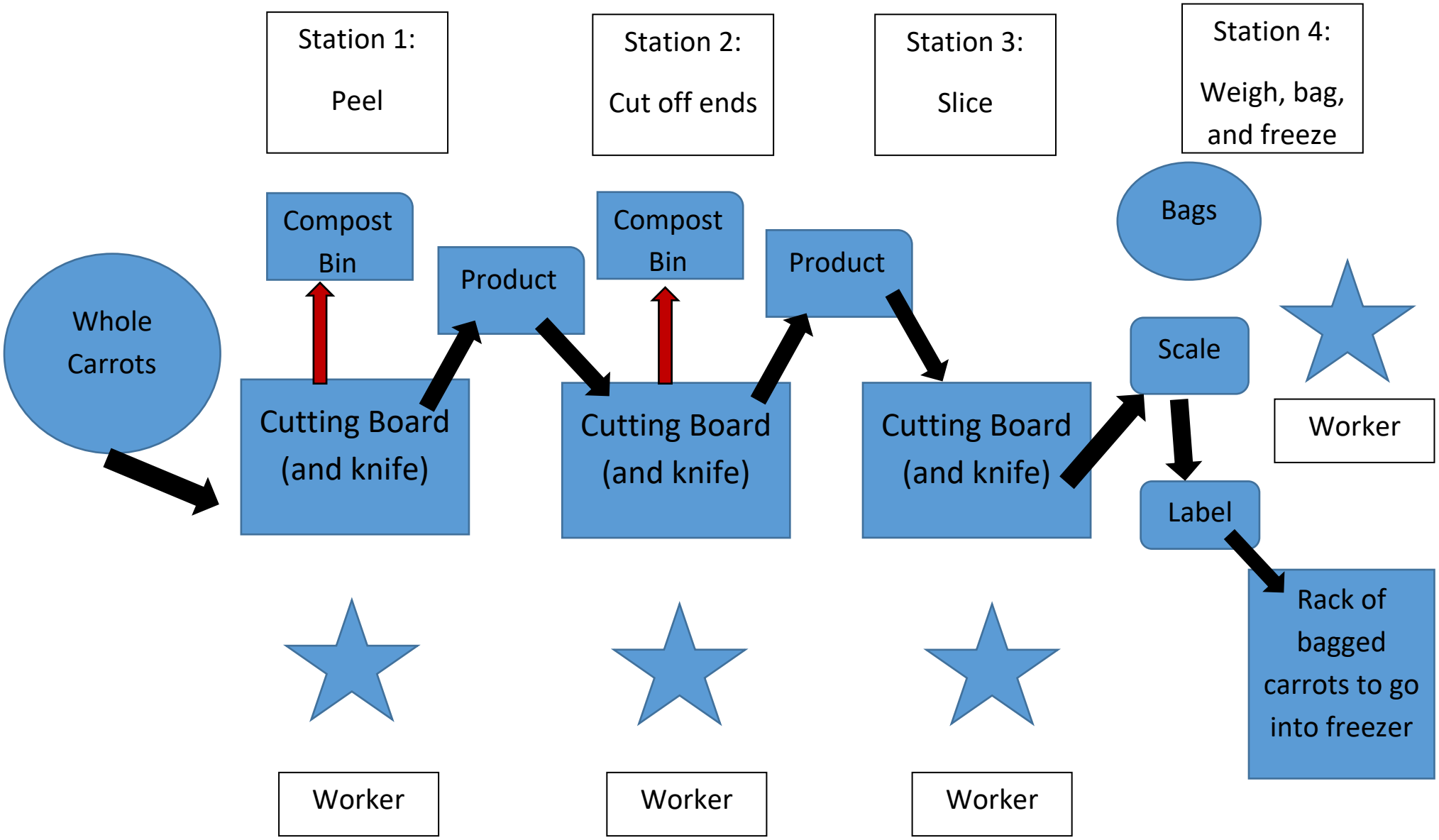
Food Safety

Slight bruising is OK but cut out any large bruising or brown spots.

Flow Diagram

See next page.

Carrot Flow Diagram



STRING BEANS – WHOLE AND/OR CUT (RAW)

Processing Guide

String beans are best consumed with their stems removed and can either be eaten whole as a side dish or cut into smaller pieces to use in recipes. Beans are most commonly green or yellow, but can sometimes be purple or white.

150 pounds requires:
4-6 Workers
3-5 Hours

Key Considerations – Reference page 8

Beans are relatively easy to process with small percentages of material composted.

For best quality, string beans should be stored in the fridge or walk-in and be used within 3 days of picking – see Appendix 2 for more details.

Nutritional Contents

1 cup of string beans provides 27% of daily recommended Vitamin C and 13% of daily recommended fiber.

Available Fresh in the Northeast

String beans are typically available fresh July through September.

Tools

Small pairing knives are best for cutting off stems, although some people snip off the stems with their hands. If you are chopping into smaller pieces, a larger knife can be beneficial.

Input/Output

Depending on the quality of the incoming crop, an average of only 8% of the weight will be composted with about 92% utilized through processing.

Preparation

Green beans should be washed and dried prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Slicing off the ends/stems
2) Cutting into smaller sizes (optional)
3) Put the product into bags; weigh, label, and freeze

The first two stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Nutrition Facts

Serving Size 1 cup (100g)

Amount Per Serving	
Calories 31	
	% Daily Values*
Total Fat 0.1g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 209mg	**6%**
Sodium 6mg	**0%**
Total Carbohydrate 7g	**2%**
Dietary Fiber 3.4g	**14%**
Sugars 0g	
Protein 1.8g	**4%**

Vitamin A 2%	•	Vitamin C 27%
Calcium 3%	•	Iron 5%
Vitamin B6 5%	•	Magnesium 6%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Each station should have a large pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the string beans in the fridge or walk-in overnight and drain any excess.

Use

String beans are great either as a side dish or can be used in a variety of dishes, such as soups, casseroles, or vegetable stir fry.

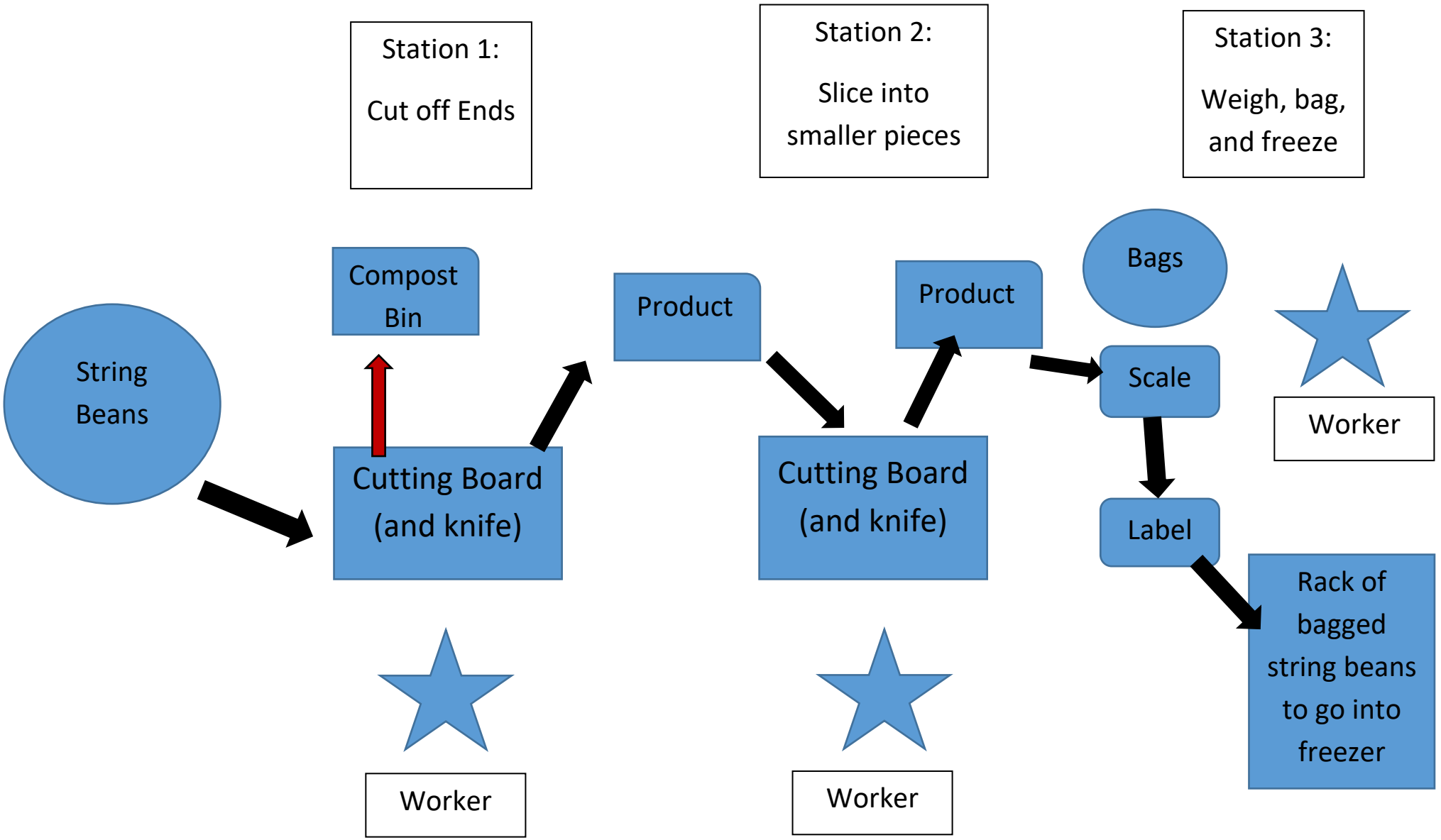
Food Safety

Very small brown spots are usually OK, but be sure to cut off any significant spots. The longer they are stored, the more likely you are to see “rust” spots. Additionally watch for rot if leaves and other plant matter is mixed with the raw string beans. Compost any beans that have rotted.

Flow Diagram

See next page.

String Bean Flow Diagram



ONIONS –SLICED (RAW)

Processing Guide

Depending on the use when thawed, onions can be cut into chunks, long strips, or diced. Onions can be cut by hand or in a food processor. Processing time depends on the size of the onions.

20 pounds requires:
6-8 Workers
1-3 Hours

Key Considerations – Reference page 8

Onions can make your eyes water so be especially careful to not touch your face or eyes.

For best quality, onions should be stored in the fridge or walk-in and be used within 3 weeks of picking – see Appendix 2 for more details.

Nutritional Contents

A cup of diced onions provides 11% of daily recommended fiber and 20% of daily recommended Vitamin C.

Available Fresh in the Northeast

Onions are typically available fresh July through November and can be stored until early spring.

Tools

Depending on the end product, some folks may be more comfortable with pairing knives or larger chef's knives.

Input/Output

Depending on the quality of the incoming crop, an average of 20% of the weight will be composted with about 80% utilized through processing.

Preparation

It takes about 15 minutes to set up the stations, which include:

1) Peeling the onions and cut off ends
2) Slicing them into quarters
3) Slicing or dicing
4) Put the product into bags, weigh, label, and freeze

The second and third stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Nutrition Facts

Serving Size 1 cup (160g)

Amount Per Serving	
Calories 64	
	% Daily Values*
Total Fat 0.2g	**0%**
Saturated Fat 0.1g	**1%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Potassium 234mg	**7%**
Sodium 6mg	**0%**
Total Carbohydrate 15g	**5%**
Dietary Fiber 2.7g	**11%**
Sugars 7g	
Protein 1.8g	**4%**

Vitamin C 19%	•	Calcium 3%
Iron 1%	•	Vitamin B6 10%
Magnesium 4%		

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.
If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the frozen onions in the fridge or walk-in overnight.

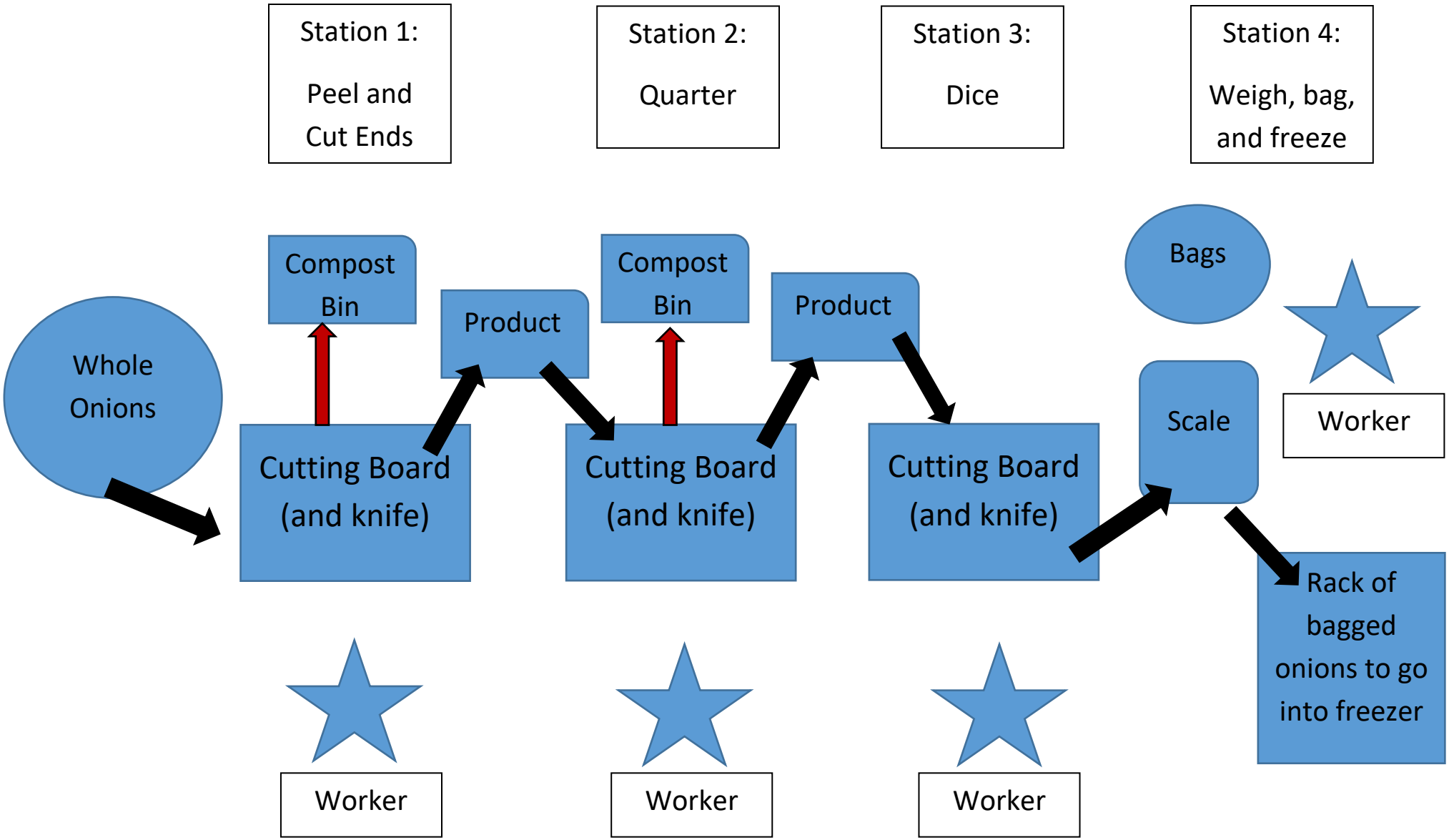
Use

Onions are a great addition to any soup, stew, casserole, or stir fry. Larger chunks can add flavor to meat roasting or vegetable side-dishes.

Flow Diagram

See next page.

Onion Process Flow Diagram



PEPPERS – HALVES, SLICES, AND/OR DICED (RAW)

Processing Guide

Depending on desired use, peppers can be in thin strips, diced, or halves.

135 pounds requires:
6-8 Workers
3-5 Hours

Key Considerations – Reference page 8

It is important to cut out all of the seeds and inside walls without wasting the edible parts of the pepper – *see food safety considerations below*. In this way, it may take longer than expected to process peppers and some volunteers may not be as comfortable doing such delicate knife work.

For best quality, peppers should be stored in the fridge or walk-in and be used within 5 days of picking – see Appendix 2 for more details.

Nutritional Contents

1 cup of chopped bell peppers contains 200% of daily recommended Vitamin C and 15% of Vitamin B-6.

Available Fresh in the Northeast

Peppers are typically available fresh from July through October.

Tools

Small pairing knives are best for cutting out seeds but larger knives may be helpful for slicing and dicing. A food processor can speed up the slicing or dicing process but this tends to produce a lot of liquid.

Input/Output

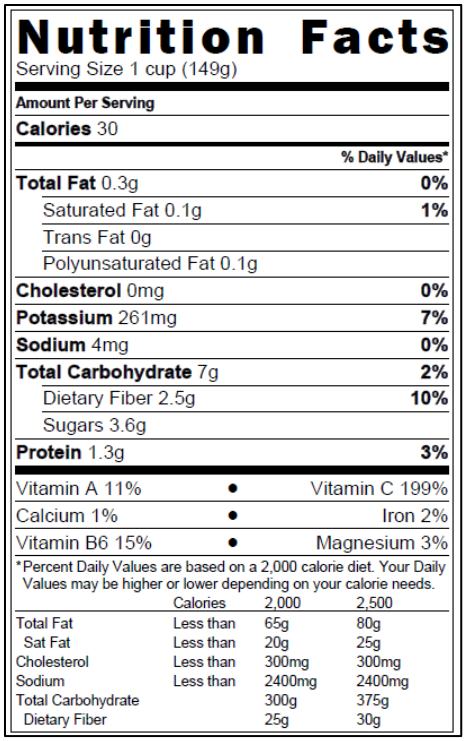
Depending on the quality of the incoming crop, an average of 25% of the weight will be composted with about 75% utilized through processing.

Preparation

Peppers should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Cutting the pepper in quarters and de-seeding
2) Slicing and/or dicing each quartered piece or using the food processor
3) Put the product into bags, weigh, label, and freeze



Nutrition Facts

Serving Size 1 cup (149g)

Amount Per Serving	
Calories 30	
	% Daily Values*
Total Fat 0.3g	**0%**
Saturated Fat 0.1g	**1%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 261mg	**7%**
Sodium 4mg	**0%**
Total Carbohydrate 7g	**2%**
Dietary Fiber 2.5g	**10%**
Sugars 3.6g	
Protein 1.3g	**3%**

Vitamin A 11%	•	Vitamin C 199%
Calcium 1%	•	Iron 2%
Vitamin B6 15%	•	Magnesium 3%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Cutting the peppers first into quarters and then de-seeding can help reduce the amount of viable product that is composted. However, if it is easier to cut the top off first and then de-seed, be sure to utilize the edible parts off of the top.

The first three stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the peppers in the fridge or walk-in overnight and drain any excess water.

Use

Peppers can be used in a variety of dishes, including vegetable stir fries, stews, casseroles, or pizza toppings. Peppers can also be halved to stuff with rice, vegetables, and meat.

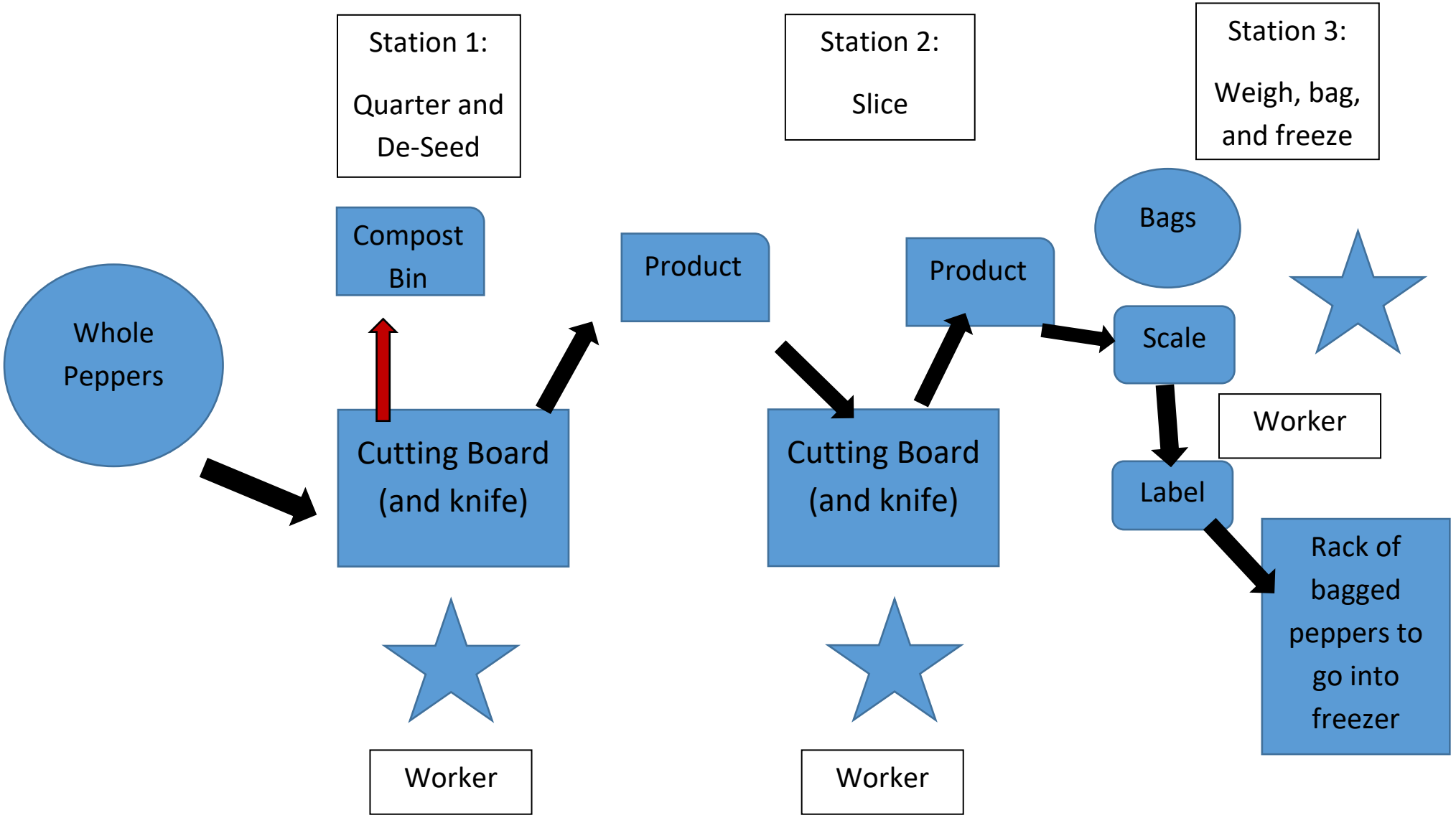
Food Safety

Pepper seeds can be dangerous to ingest so be sure to carefully remove all seeds as you go or wash and dry a second time to ensure safety.

Flow Diagram

See next page.

Pepper Flow Diagram



TOMATOES – WHOLE, HALVED AND/OR QUARTERED (RAW)

Processing Guide

Tomatoes can be cut into any size, depending on the eventual use. Tomatoes can also be pureed or frozen whole.

175 pounds requires:
5-7 Workers
1-2 Hours

Key Considerations – Reference page 8

Tomatoes are relatively easy to process with little waste. Since the size of tomatoes can vary greatly, it is especially helpful to know how the end product will be used to gauge what size cut is needed. The tomato juices are especially messy, so it's helpful to have rags available.

For best quality, tomatoes should be stored in a cool, dry place and be used within 1 week of picking, depending on the ripeness upon receiving – see Appendix 2 for more details.

Nutritional Contents

1 cup of chopped tomato contains 29% of daily recommended Vitamin A and 41% of daily recommended Vitamin C.

Available Fresh in the Northeast

Tomatoes are typically available fresh June through October, due to season extension and hydroponic growing.

Tools

Tomato corers are especially helpful for volunteers who are uncomfortable with pairing knives.

Input/Output

Depending on the quality of the incoming crop, an average of 8% of the weight will be composted with about 92% utilized through processing.

Preparation

Tomatoes should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Removing the stem and coring the tomatoes
2) Slicing the tomatoes
3) Put the product into bags, weigh, label, and freeze

The first two stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels. There is no need to peel the skin.

Nutrition Facts

Serving Size 1 cup (180g)

Amount Per Serving	
Calories 32	
	% Daily Values*
Total Fat 0.4g	**1%**
Saturated Fat 0.1g	**1%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Monounsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 427mg	**12%**
Sodium 9mg	**0%**
Total Carbohydrate 7g	**2%**
Dietary Fiber 2.2g	**9%**
Sugars 4.7g	
Protein 1.6g	**3%**

Vitamin A 29%	•	Vitamin C 41%
Calcium 1%	•	Iron 2%
Vitamin B6 5%	•	Magnesium 5%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the tomatoes in the fridge or walk-in overnight and drain any excess. To remove the skin, run under hot water while still frozen. The skin will easily rub off.

Use

Tomatoes can be used in a variety of dishes, including soups, vegetable stir fry, or marinara sauces.

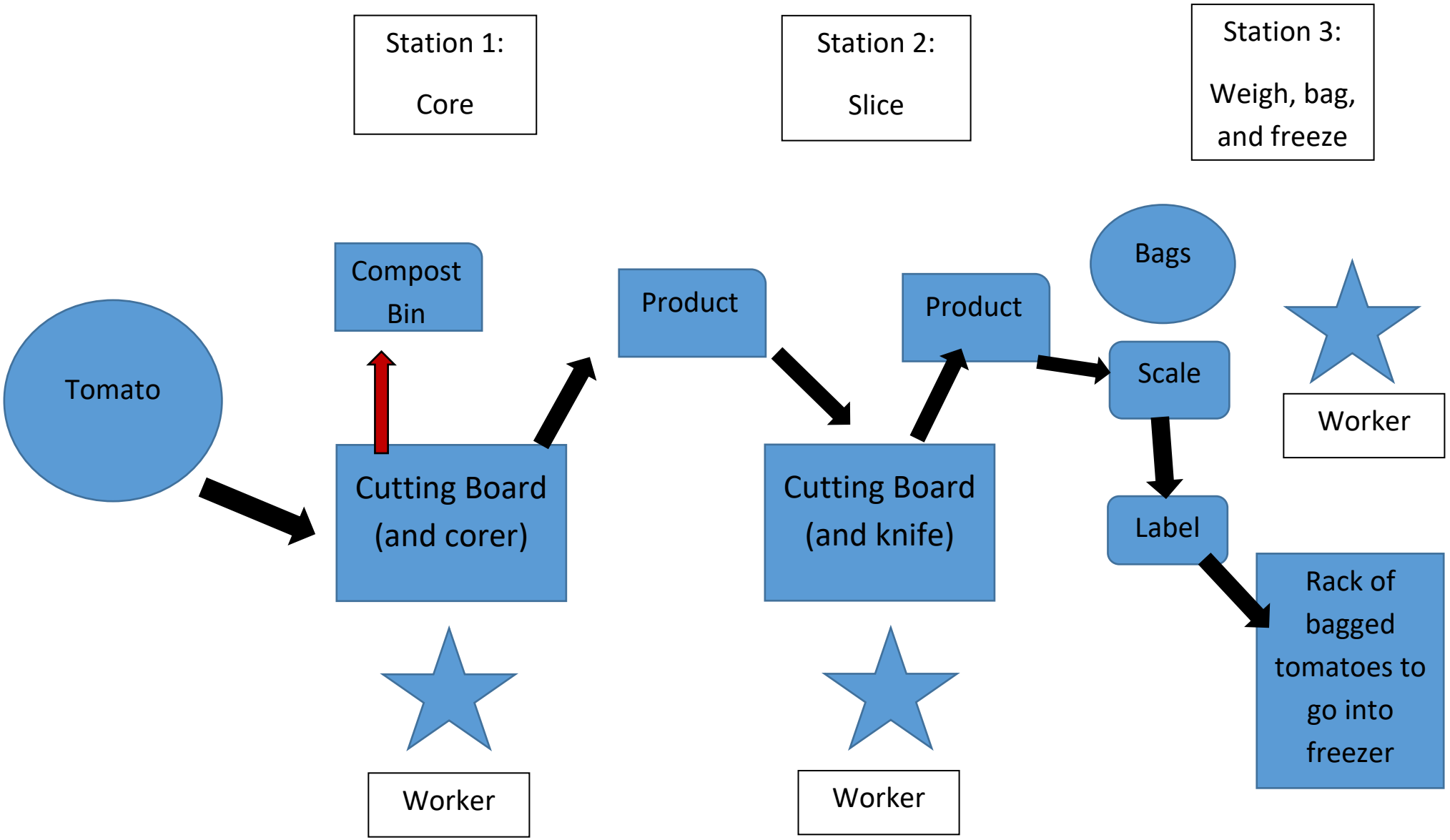
Food Safety

Slight bruising is OK but cut out any large bruising or brown spots.

Flow Diagram

See next page.

Tomato Flow Diagram



SUMMER SQUASH – COINS, CUBES/CHUNKS, SPEARS, GRATED (RAW)

Processing Guide

Summer squash includes yellow, green, and patty pan varieties, among others. The ends should be cut off.

120 pounds requires:
5-7 Workers
1-3 Hours

Key Considerations – Reference page 8

Summer squash is often in abundance during the peak season and has small percentages of waste compared to viable product. Large zucchini may have tougher skin and could be harder to chew.

For best quality, summer squash should be stored in the fridge or walk-in and be used within 1 week of picking – see Appendix 2 for more details.

Nutritional Contents

1 cup of sliced summer squash contains 32% of daily recommended Vitamin C and 10% of daily Vitamin B-6.

Available Fresh in the Northeast

Summer squash is typically available fresh July through September.

Tools

Workers may ask for small pairing or larger knives, depending on their station or preference. A food processor can speed up the slicing or dicing process but when grating this tends to produce a lot of liquid.

Input/Output

Depending on the quality of the incoming crop, an average of 7% of the weight will be composted with about 93% utilized through processing.

Preparation

Summer squash should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Cut off the ends
2) Cut into desired size or use a food processor
3) Put the product into bags, weigh, label, and freeze

The first two stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Nutrition Facts

Serving Size 1 cup (113g)

Amount Per Serving	
Calories 19	
	% Daily Values*
Total Fat 0.2g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 296mg	**8%**
Sodium 2mg	**0%**
Total Carbohydrate 3.8g	**1%**
Dietary Fiber 1.2g	**5%**
Sugars 2.5g	
Protein 1.4g	**3%**

Vitamin A 4%	•	Vitamin C 32%
Calcium 1%	•	Iron 2%
Vitamin B6 10%	•	Magnesium 4%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the summer squash in the fridge or walk-in overnight and drain any excess.

Use

Summer squash can be used in a variety of dishes, including as a side dish or in soups, vegetable stir fry, or casseroles.

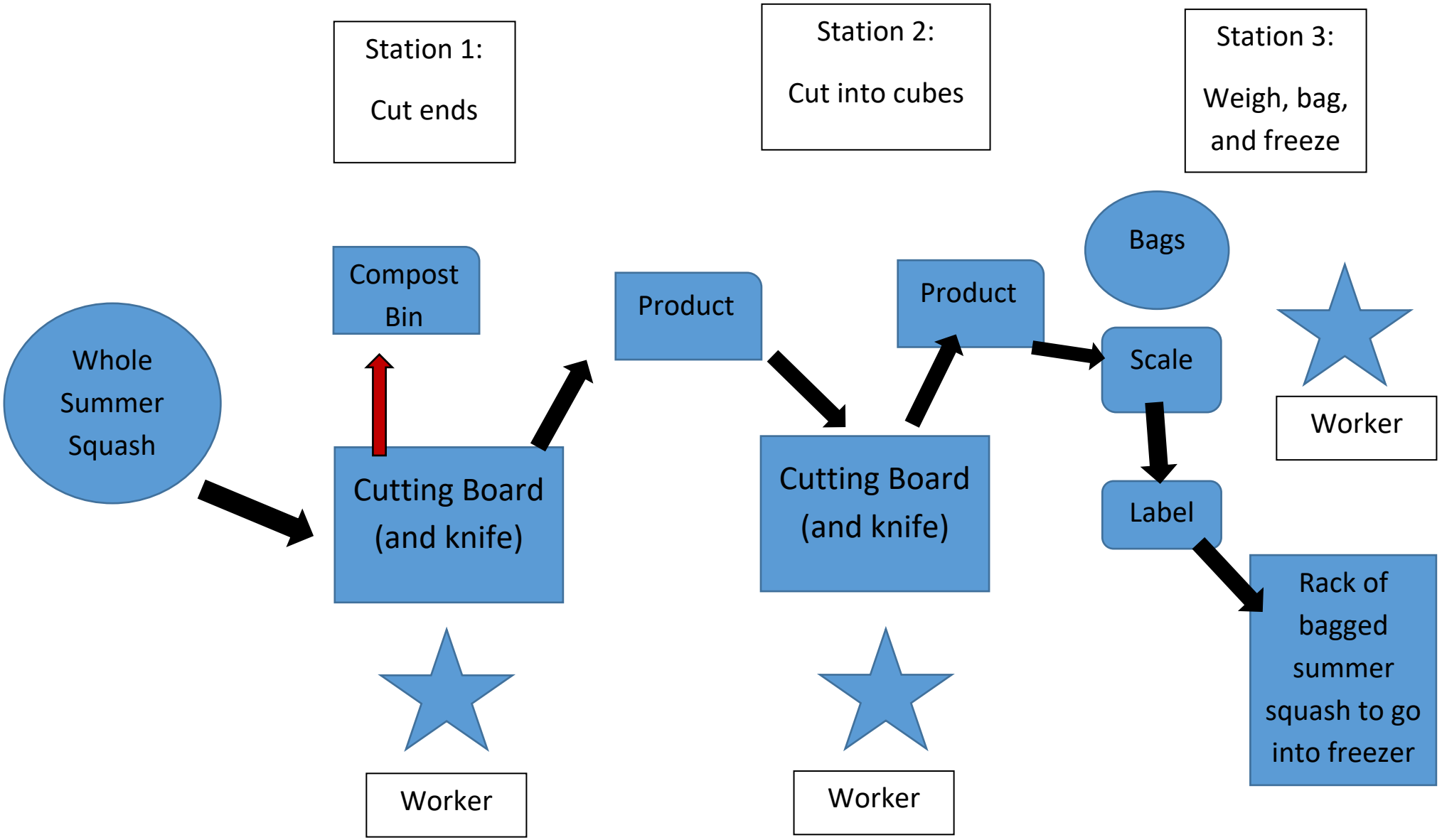
Food Safety

Slight bruising is OK but cut out any large bruising.

Flow Diagram

See next page.

Summer Squash Flow Diagram



WINTER SQUASH – CUBE, CHUNKS, MASH

Processing Guide

Winter squash can be mashed as a side dish or pureed for a bisque. It can also be cut into cubes and roasted as a side dish or put into a soup or casserole.

300 pounds requires:
5-7 Workers
6-8 Hours

Key Considerations – Reference page 8

Since winter squash can be difficult to peel, partially cooking and cooling the squash can make it easier to remove the skin. If you desire cubes, it is best to steam for about 30 minutes as the squash will still retain its shape. If you are making a mash or puree, baking for an hour is best.

For best quality, winter squash should be stored in a cool, dry place and be used within 1 week of picking – see Appendix 2 for more details.

Nutritional Contents

1 cup of cubed winter squash contains 31% of daily recommended Vitamin A and 23% of daily recommended Vitamin C.

Available Fresh in the Northeast

Winter Squash is typically available fresh September through December.

Tools

If there is not enough time to pre-cook the squash, peelers or small pairing knives are useful to peel off the skin. A large spoon may be helpful to scoop close to the skin.

Input/Output

Depending on the quality of the incoming crop, an average of 40% of the weight will be composted with about 60% utilized through processing. The amount composted can be decreased with high attention to detail to peel very close to the skin without removing excess. Often edible squash will stick to the peel as you remove it so take care to gather this extra; this may require a bit more time but will yield more pounds and less compostable waste.

Preparation

Winter squash should be washed prior to processing.

It takes about 15 minutes to set up the stations, which include:

1) Peeling the rind
2) Slice into smaller pieces
3) Put the product into bags, weigh, label, and freeze

Nutrition Facts
Serving Size 1 cup (116g)

Amount Per Serving	
Calories 40	
	% Daily Values*
Total Fat 0.2g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Polyunsaturated Fat 0.1g	
Cholesterol 0mg	**0%**
Potassium 406mg	**12%**
Sodium 5mg	**0%**
Total Carbohydrate 10g	**3%**
Dietary Fiber 1.7g	**7%**
Sugars 2.6g	
Protein 1.1g	**2%**

Vitamin A 31%	•	Vitamin C 23%
Calcium 3%	•	Iron 3%
Vitamin B6 10%	•	Magnesium 4%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

The first three stations require a cutting board and knife. The last station should be equipped with a scale, bags, and labels.

Each station should have a larger pan or bowl on one side that holds the product coming into the station and another pan or bowl that holds the product coming out of that station. There can be a compost bin at each station or a 5-gallon bucket on the floor between stations.

At the end, all bags should be sealed, labeled, and put directly into the freezer.

If an IQF is available, place produce on sheet pans and into the unit for freezing prior to bagging.

Thawing

If desired, thaw the winter squash in the fridge or walk-in overnight and drain any excess.

Use

Winter squash is great mashed or roasted as a side dish, pureed in soup, or cubed in casseroles or soups.

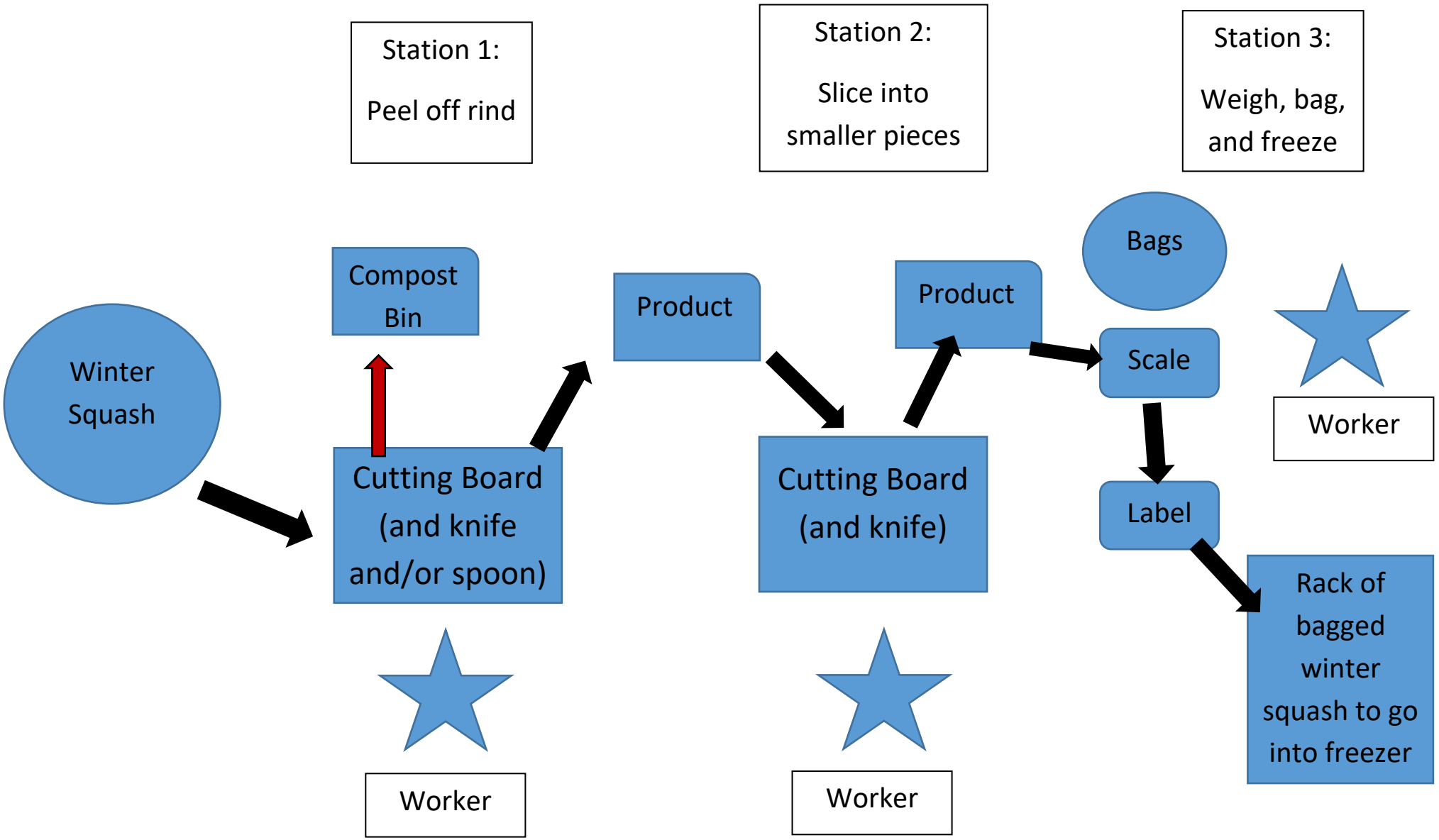
Food Safety

Slight bruising is OK but cut out any large bruising.

Flow Diagram

See next page.

Winter Squash Flow Diagram



APPENDIX 1: DATA TRACKING SHEET EXAMPLE

Process Data Collection Worksheet

Salvation Farms @ Meals on Wheels of Lamoille County 2015

Lot number includes date, farm source number, and process

Worksheet Completed By: _____

Lot # ___ ___ ___ - ___ - __
mo dy yr - s - p

Date: _____

Incoming Crop: _____

Quality: _____

_____

Source (s): _____

SOURCE LIST	
1 = High Mowing Organic Seeds	3 = Pete's Greens
2 = Riverside Farm	4 = Foote Brook Farm

Process (p): _____

PROCESS LIST	
A = raw w/out IQF	A1 = raw w/ IQF
B = blanch w/out IQF	B1 = blanch w/ IQF
C = blanch w/out IQF	C1 = blanch w/ IQF
D = puree w/out IQF	D1 = puree w/ IQF
E = stock w/out IQF	E1 = stock w/ IQF

End Product
(i.e. kernel, diced, coined, shred, etc.): _____

Product (raw weight): _____ (Start) - _____ (Compost) = _____ (Utilized)

Cooling Process *(i.e. ice bath, cooled overnight in walk-in)* : _____

_____

Package:

_____ Size *i.e. 10x16* | _____ Weight *i.e. 3 lbs.* | _____ Total | _____ Total

_____ Volume *i.e. cups* | _____ Total Processed cups

Labor:

	Number of Individuals	Hours	Notes:
SF Staff			
SF VISTA			
MOW Staff			
Volunteers			

Supplies Used:

Bags	
Labels	
Gloves (pairs)	
Hairnets	

Notes/Other:

Kitchen Use (Hourly):		Cost/Hour:		Total
Normal Operating Hours	x		=	
Non-Operating Hours	x		=	

Freezing Prior to Bagging:

Total Hours	
Hours to Freezing	
Number of Sheets	
Number of Racks	

Notes:

Date Entered into Database: _____

Data entered by: _____

APPENDIX 2: CROP STORAGE AND TURNOVER GUIDE

This guide was created by Salvation Farms and UVM Extension for the Member Organizations of the Vermont Gleaning Collective.

VEGETABLE/FRUIT	TEMP.	ºF	Moisture	RH (%)	Turnover	Notes
Apples	Refrigerate	30-40	Stems in H2O	>95	2 weeks	
Asparagus	Refrigerate	32-35	Moist	100	5 days	
Beans	Refrigerate	40-45	Moist	>95	3 days	
Beets	Refrigerate	32	Moist	>98	3 weeks	5 days w/ greens
Berries	Refrigerate	30-32	Moist	>95	3 days	ASAP for quality
Boc Choy/Pac Choy	Refrigerate	32	Moist	>98	5 days	
Broccoli	Refrigerate	32	Moist	>98	5 days	
Brussel Sprouts	Refrigerate	32	Moist	95	1 week	
Cabbage	Refrigerate	32	Moist	>98	2 weeks	
Carrots	Refrigerate	32	Moist	>98	3 weeks	
Cauliflower	Refrigerate	32	Moist	>98	5 days	
Celeriac	Refrigerate	32	Moist	98	3 weeks	
Celery	Refrigerate	32	Moist	>95	5 days	
Chinese Cabbage (Napa)	Refrigerate	32	Moist	>98	5 days	
Corn	Refrigerate	32	Moist	>98	5 days	ASAP for quality
Cucumber	Refrigerate	50-55	Moist	95	3-5 days	Watch for chill damage
Eggplant	Refrigerate	54	Moist	95	5 days	
Fennel	Refrigerate	32	Moist	95	5 days	
Garlic	Cool Room	32	Dry	65	2 weeks	
Garlic Scapes	Refrigerate	32	Moist	95	5 days	
Greens (arugula, beet greens, chard, collards, lettuce, kale, mizuna, mustard greens, spinach and more!)	Refrigerate	32	Plastic Bag	>95	3 days	Full size, thick greens like collards, chard, kale and lettuce can keep for 5 days
Herbs (cilantro, basil, dill, parsley, thyme)	Refrigerate	32	Moist	>95	3 days	
Kohlrabi	Refrigerate	32	Moist	>98	3 days	
Leeks	Refrigerate	32	Moist	>95	2 weeks	
Melons	Refrigerate	45-50	Moist	90-95	3-5 days	
Mushrooms	Cool Room	32	Paper Bag	>98	3 days	
Onions	Refrigerate	32	Dry/Dark	70	3 weeks	
Parsnips	Refrigerate	32	Moist	>98	3 weeks	
Peas	Refrigerate	32	Moist	>95	3 weeks	
Peppers	Refrigerate	45-55	Moist	95	5 days	

Potatoes	Cool Room	40-50	Dry	95	3 weeks	
Ramps	Refrigerate	32	Cool/Dry	>98	3 days	
Radishes	Refrigerate	32	Moist	95	3-5 days	3 weeks storage varieties
Rhubarb	Refrigerate	32	Moist	>95	3-5 days	
Rutabaga	Refrigerate	32	Moist	>98	3 weeks	
Scallions	Refrigerate	32	Moist	95	5 days	
Summer Sq./Zucchini	Refrigerate	41-50	Moist	95	3-5 days	
Sweet Potatoes	Room Temp.	55-60	Cool	90	1 week	Cold will cause spoilage
Tomatillos	Cool Room	55-60	Moist	90	1 week	
Tomatoes	Room Temp.	55-65	Dry	90	3 days	Refrigerate lower temp. if over ripe
Turnips	Refrigerate	32	Moist	>98	5 days w/ greens	3 weeks storage varieties
Winter Sq./Pumpkins	Room Temp.	50-55	Dry	50-70	1 week	Continuous quality evaluation

APPENDIX 3: PARTNERSHIP PROJECT TOTALS 2015-2016

Salvation Farms - Meals on Wheels of Lamoille County Partnership Project 2015-2016

	Crop	Raw Incoming #	Finished Product (Frozen)	Volume #	Total Volunteer Hrs
	Summer squash	120	cubed (raw)	112	8
	String beans	106	cut (raw)	97.5	8
	Tomatoes	171	halved (raw)	151	4
	Apples	255	sliced and cubed (raw)	157	28
	Peppers	133	halved and diced (raw)	107	16
	Winter Squash	294	steamed and cubed	149	8
	Onions	22	diced (raw)	18	0
	Beets	136	steamed or cooked and sliced	114	7
	Carrots	106	sliced (raw)	92.5	3
Totals	**9 Crops**	**1,342**		**998**	**82**

APPENDIX 4: ADDITIONAL RESOURCES

Food Safety:

- http://www.fns.usda.gov/food-safety/produce-safety-resources
- http://www.nfsmi.org
- http://www.mtu.edu/dining/pdf/food-handling.pdf
- http://www.idph.state.il.us/about/fdd/fdd_fs_foodservice.htm
- https://foodsafety.ces.ncsu.edu/food-pantries-and-food-banks/

Meals on Wheels of Lamoille County:

Lamoille County Senior Center, 24 Upper Main Street, Morrisville, VT 05661
http://www.mowlc.org/Meals_on_Wheels_of_Lamoille_County/Welcome.html
meals@mowlc.org
802-888-5011

Salvation Farms:

49 Portland Street, Morrisville, VT 05661
http://www.salvationfarms.org/
http://www.vermontgleaningcollective.org
info@salvationfarms.org
802-888-4360