



THE FOODSERVICE INDUSTRY'S GUIDE TO COOK-CHILL

BY
VICTORY REFRIGERATION



WHAT IS COOK/CHILL?

Cook/chill is a simple, controlled system of food preparation designed to provide more flexibility in food service. The technique involves the full cooking of food, followed by rapid chilling and storage at controlled temperatures (for up to five days). When required, the food must be reheated thoroughly before service. The production system itself is simple to operate if well managed, and completely safe provided the HACCP (Hazard Analysis and Critical Control Point) Guidelines on temperature control are followed.



Who uses cook/chill?

Thousands of establishments of all types and sizes currently use cook/chill systems. Anyone who has eaten at a top restaurant or hotel, at a banquet or reception, or on an airplane or ship is likely to have eaten a cook/chill meal.

Will my business benefit from cook/chill?

While cook/chill is commonly associated with larger institutional foodservice operations, new compact quick chill equipment designs have put quick chill systems within the realm of all types and sizes of foodservice operations.

**HOTELS ● RESTAURANTS ● FAST FOOD RESTAURANTS ● HOSPITALS/
NURSING HOMES ● CONTRACT CATERERS ● BAKERYS ● CORPORATE
CAFETERIAS ● INSTITUTIONAL CATERERS ● CAFE/BISTROS ● TRAVEL
CATERERS ● MEALS ON WHEELS ● PIZZERIAS ● IN-FLIGHT CATERING**

For large and small establishments the principles and advantages of the system are the same. The only difference is that small to medium sized operations do not have to invest in equipment design to deal with volume.

For the simplest cook/chill system, all that is required in addition to the existing cooking equipment is a blast chiller, adequate cold storage and an understanding of the recommended safety procedures.



Why do foodservice establishments use blast chillers?

The principle feature of blast chillers and blast freezers is that they are capable of rapidly reducing the temperature of hot foods to low, safe temperatures (see page 6). Therefore, they make it easier for foodservice establishments to comply with Food Safety and Temperature Control legislation. In fact, many establishments are using them solely for that purpose, and in doing so are actually performing a very basic cook/chill operation. Using a blast chiller solely to cool cooked food rapidly for immediate or same day service is not utilizing all the benefits that a blast chiller can potentially offer.



How quickly will I be able to recover my investment?

Naturally, business with a large meal turnover will recover the capital cost of the equipment very rapidly. However, small business can also immediately recover the capital cost of the equipment as they can immediately recover a proportion of their labor costs. The resulting efficiency and increased capacity pave the way for increased meal turnover, thereby accelerating the cost recovery process.



THE TRUTH BEHIND COOK/CHILL

By utilizing cook/chill technology, meals can be prepared, cooked, chilled and rethermalized with little or no nutritional loss and without altering its appearance, or taste.

There are several misconceptions concerning cook/chill:

Myth - Cook/chill is only for large institutions.

It is not: Many nursing homes, function caterers, hotels, independent restaurants, fast food restaurants and bakers are already reaping the positive benefits of the cook/chill method.

Myth - Cook/chill requires special recipes.

Not true: You can use most of your favorite recipes without adaptation. What's more, you can try out new and more exotic ideas because blast chillers give you more time allowing you to store meals for up to five days.

Myth - The equipment is large and expensive.

Not necessarily: The equipment required by hospitals, prisons and schools, which produce large volumes of food, is large and can therefore be costly. But this is not the case for small or medium sized establishments. Many of these operators will already have suitable ovens and storage facilities, so they will only need to acquire a blast chiller. **A chiller capable of handling over 250 meals a day can be purchased for about twice the price of a reach-in refrigerator.**

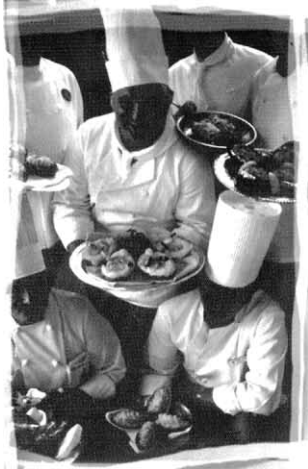
Myth - Cook/chill limits the professional chef.

On the contrary: Cook/chill allows you more time to utilize creative skills than any other method. Instead of spending valuable time on boring tasks, the professional operator can use that time to improve presentation, create new dishes and attend to all the other detail that makes a successful foodservice business.

Cook/Chill Systems are:

- simple to operate,
- profitable,
- time saving,
- productive,
- flexible

Most importantly, blast chill technology can improve time saving and make it easier for operations to comply with food quality regulations.





ADVANTAGES OF COOK/CHILL

Suitable for most foodservice operations

The system can be utilized effectively by establishments of any size or type.

Effective time management

The system allows foodservice establishments to better organize their time. Prime cooking can take place when the business is quiet, leaving less to do when you have customers to attend to.

Effective resource management

Equipment can be used more energy efficiently while ingredients can be bought in larger quantities, providing economies of scale. You can also prepare meals for several establishments from one kitchen.



Menu extension

The flexibility of the system allows you to prepare a greater selection of dishes, offering your customers more choice while still maintaining or improving quality. In addition, since you are preparing meals in advance you can afford to experiment on a variety of different recipes.

No modification of recipes

A cook/chill system allows you to use most recipes without alteration.

Improvement in service

Because most food will be prepared in advance, the foodservice operator will have more time to improve on presentation and attend to customers.

Flexibility in service

Because all dishes simply have to be reheated before service, operators can serve a wide variety of food all day and can easily cope with the fluctuating numbers of customers throughout the day.

Reduced waste and improved portion control

Portions can be made up precisely and meals can be rethermalized as needed, eliminating waste.

Increased profitability

Cook/Chill can make your operation more efficient while offering customers greater choice and better service. You will be able to cope with larger numbers of customers and at short notice. This will result in increased turnover and profitability.

Fantastic opportunity for expansion

If the meal turnover of your business is limited by the number of meals you are presently able to cook and serve, cook/chill is a fast way to increase your capacity without necessarily expanding your kitchen or employing extra staff.





THE SYSTEM

What you will need

If you are already serving hot food, the only additional equipment you will require for a small to medium sized cook/chill operation is an appropriately sized blast chiller. You will also need a suitable reach-in or walk-in refrigerator for the storage of finished product.

As with any cooking operation, a cook/chill system requires care to ensure that food does not become exposed to harmful bacteria. Staff should, therefore, be given specific training on the cook/chill operation, in addition to basic food hygiene training. Your equipment supplier should be able to help you with this.

It is easiest to view a cook/chill system as a series of stages. Each of these should be regarded as equally important to guarantee food safety, and good quality dishes.

1. **Selection of raw materials**
2. **Storage of raw materials**
3. **Preparation**
4. **Cooking**
5. **Portioning**
6. **Blast Chilling**
7. **Storage of chilled foods**
8. **Distribution of chilled foods (if applicable)**
9. **Rethermalization/reheating of food**
10. **Service**



HOW IT WORKS

1. Selection of raw materials

If raw materials are below standard when you buy them, they are not going to improve with cooking. It is vital, therefore, that you check your supplies and, if necessary, check on your suppliers handling and distribution methods.

2. Storage of raw materials

Having purchased top quality raw materials, it makes sense to keep them in proper storage and in top condition before they are needed. This means following basic food safety principles, to ensure that the appropriate temperature and humidity levels are met.

3. Preparation

Again, basic food safety principles apply. Separate surfaces and separate utensils should be used for the preparation of raw fish, meat and poultry to prevent cross-contamination.

Ideally, food preparation should take place in an area separate from the cooking and post cooking.





If some raw materials arrive in a frozen condition, they should be thoroughly thawed out before use. We recommend a "Victory" controlled thawing cabinet for this purpose. Rapid high temperature thawing can encourage the growth of pathogens and may leave cold spots at the core of the food. For this reason we do not recommend thawing products with a microwave oven unless the oven is specifically designed to ensure thawing.

In order to make chilling more efficient after cooking, beef or packs of meat should not weigh more than 5.5 lbs, or measure more than 4" in thickness.

4. Cooking

Whatever the food product you are cooking and by whatever method, it is essential that the core temperature of the food reaches at least 160°F, and is held at this temperature for at least two minutes. This is to ensure that any pathogenic micro-organisms that may be present are destroyed. To check the core temperature of food use a probe thermometer. (Check the accuracy of this and any other thermometers used, every three months).

You will not find it necessary to modify your usual recipes for a cook/chill system.

5. Portioning

Once the food is cooked, the chilling process must start as soon as possible, and at most within thirty minutes. This leaves time for portioning prior to chilling. However, handling of food should be kept to a minimum. Meals can be portioned from individual components after chilling. Usually, the ideal containers for chilling food should be no more than 2 1/2" deep. Other containers may only be used if the blast chiller is capable of chilling the food to the required temperature in the required time. Note also that some containers are made of materials which can insulate the food, thereby affecting chilling times.

If disposable containers are used, it is essential that they have been stored under proper hygienic conditions.



6. Rapid Chilling

Whatever the type of blast chiller you use, it should be capable of chilling the food between 33°F and 38°F within 2 to 4 hours of placing the hot food in the blast chiller and commencing the blast chill cycle. This is not only to ensure safety, but also preserves the appearance, texture, flavor and nutritional value of the food. Your blast chiller should be equipped with a food probe or probes, with which you can monitor the temperature of the food during freezing.

Large pieces of meat, etc., may not chill as quickly as required. In this case, the meat should be portioned while hot and then chilled. Alternatively, the temperature of the meat must be reduced to 50°F or below within 150 minutes, and then portioned before final chilling to 33°F and 38°F.

The speed at which chilling takes place will be affected by the shape, size and density of the food, its moisture content, heat capacity and entry temperature. Therefore, placing lids on containers or stacking them on top of one another, will increase the chilling time. However, covering food can protect against contamination, and is thus sometimes appropriate as long as chilling can still be achieved within the time limits.

7. Storage of chilled foods

Blast Chilled food should be stored immediately in a chilled storage cabinet at a temperature between 33°F and 38°F, in order to control growth of micro-organisms.



Ideally, you should use a reach-in or walk-in cooler designed for chilled food storage, and use it solely for your cook/chill products. Refrigerators not capable of holding the chill food below 40°F are not suitable. Victory's storage cabinets feature alarms which will alert you if temperatures, for any reason, rise above the recommended levels.



Chilled food may be kept under the above conditions for up to five days. To ensure that products are not allowed to go over this time span (and are therefore not wasted), a system of stock rotation should be employed. The simplest method is perhaps to use color-coded labels, a different color for each day with a 'use by' date, production date and product description marked on each label. A 'first in, first out' policy should be used.

If, for any reason, the food (in store or during distribution) reaches a temperature over 40°F but not more than 50°F, the food should be consumed within 12 hours. Should any food in the store exceed its expiration date or reach a temperature over 50°F it should be thrown out as it will be unfit for consumption.

8. Distribution

If you intend to operate a cook/chill system in one location and supply one or more other locations, food must be transferred to the other site while still in their chilled state. The use of refrigerated vehicles is recommended, or at the very least, pre-chilled insulated containers for short journeys.

If chilled food is being transferred to other sites, it must not only be transported at the correct temperature, but on arrival, it must also be placed in appropriate refrigerated cabinets until required.

9. Reheating

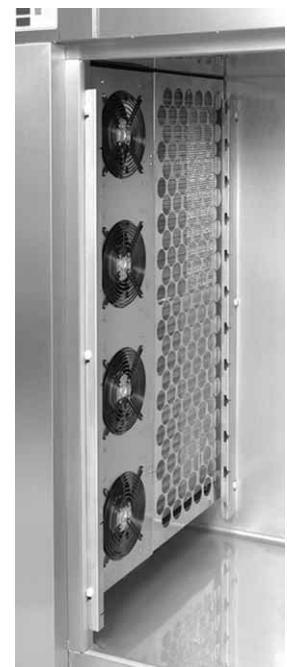
Cooked and chilled foods that are to be eaten cold or at room temperature, should be consumed within 30 minutes after removal from storage. If the food is to be reheated (rethermalized), this should start no more than 30 minutes after the food is removed from chilled storage. Reheating must take place close to the point of consumption.

Appropriate reheating equipment, includes forced air, steam convection ovens and special chill/reheat carts. Traditional types of hot-air ovens may be used, but care must be taken to ensure that exposed areas of food do not become dehydrated. Commercial microwave ovens may also be used, and we recommend these for the rethermalization of individual or small numbers of meals. Ideally, of course, it is preferable to install matching rethermalization equipment.

In order to ensure the destruction of any pathogens present, the core temperature of the food must reach at least 160°F, and be held at this temperature for at least two minutes. To check that this temperature has been reached, insert a probe thermometer into the slowest heating point (usually the center).

10. Service

Once food has been reheated to the required temperature, it should be consumed as soon as possible, and preferably within 15 minutes of reheating. The temperature of the food should not be allowed to fall below 150°F.

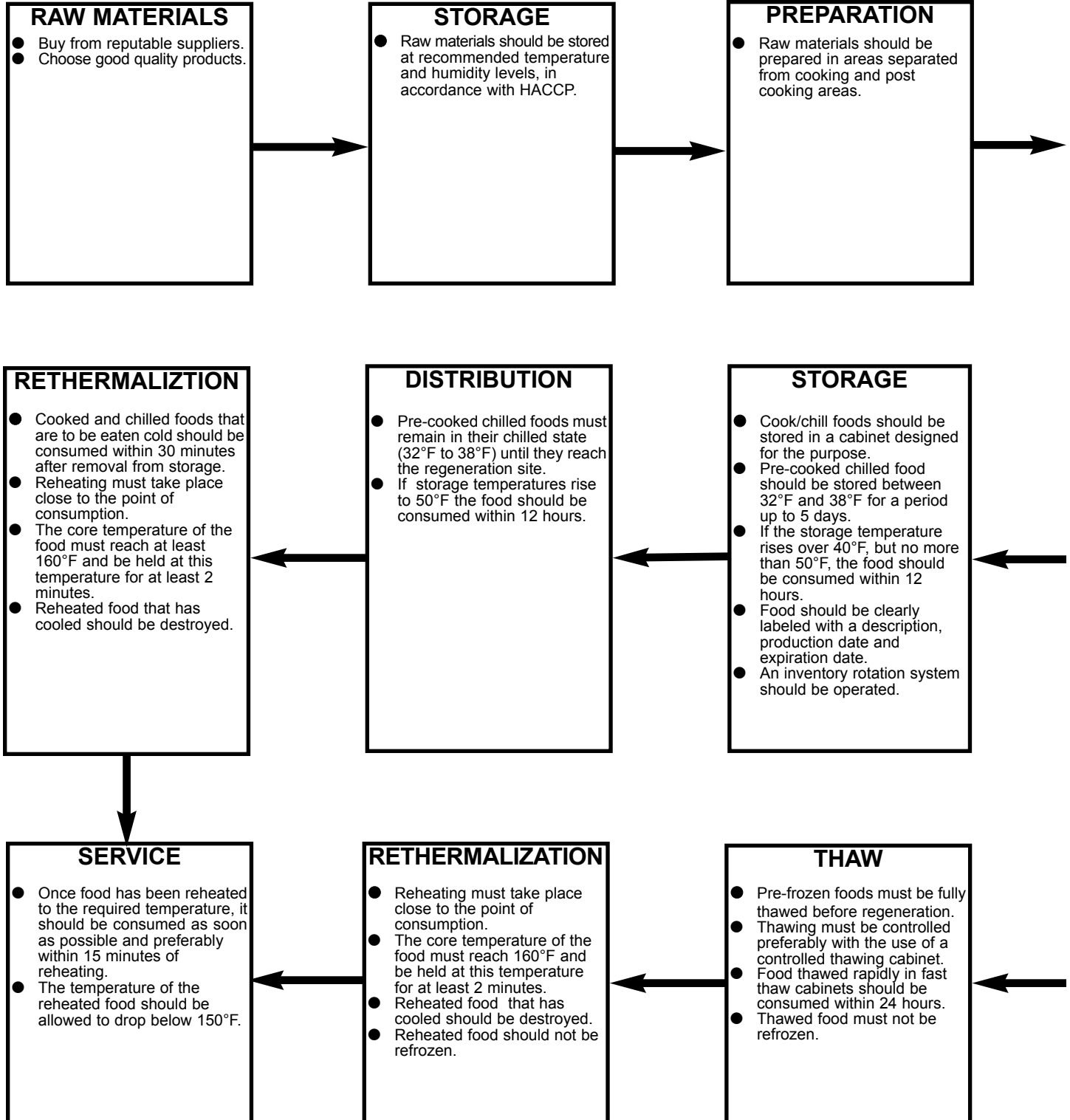




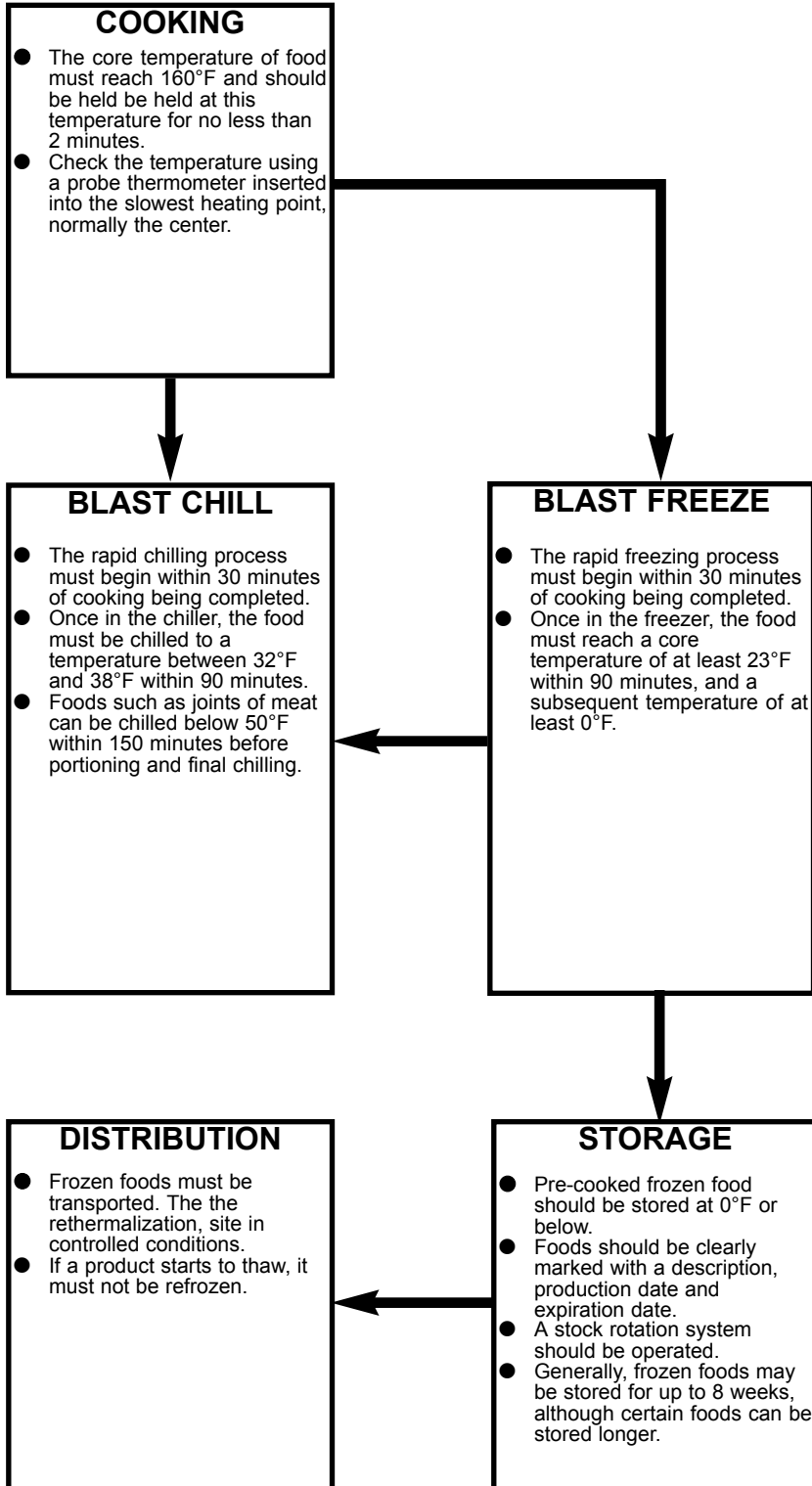
COOK/CHILL SYSTEM SUMMARY OF STAGES



SUMMARY



SUMMARY





EQUIPMENT

Equipment for rapid chilling

There are two common methods of rapid chilling.

- (1) Using a mechanical blast chiller, which recirculates low temperature air at a high velocity.
- (2) The immersion of packed products in a suitable refrigerated liquid.

Mechanical Chillers are by far the most widely used and convenient for food service operators. There are two common types of mechanical chillers:



Roll-In Models

These chillers are suitable for higher volume operations, and can accept one or more complete carts of food products.

Reach-In Models

These smaller blast chill models are suited to operate with space constraints, lower production requirements and to accommodate trays of food.

Features to look for

Whatever the type of blast chiller you choose, it must be capable of reducing the temperature of a 2" layer of food from 160°F between 33°F and 38°F within 2 to 4 hours, when fully loaded. It must also feature an accurate temperature display, preferably with a built-in food probe featuring digital display. Digital and audible timers are also useful features.

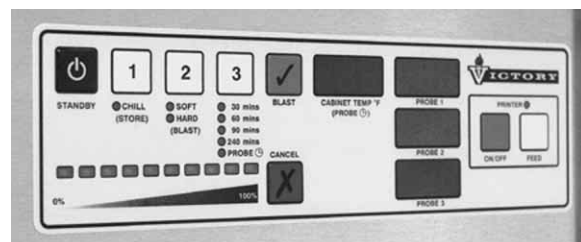
Upon completion of the blast chill cycle, the machine should automatically change over to a storage mode (33°F/38°F), until the blast mode cycle is required again. This enables the operator to put in one load before going home at night, and remove the chilled product first thing in the morning.



When selecting a blast chiller, be sure that its capacity is sufficient to match peak production requirements so that rapid chilling can begin within 30 minutes after cooking. For the same reason, the blast chiller must be located near enough to the cooking area to allow for this time limit to be met.

Make sure that the model you choose is compatible with the electrical supply you have.

The best equipment is usually made from stainless steel. You should also look for a good seal around the door. A poor seal is inefficient, causing the consumer to utilize excess energy. This will naturally generate costly electric bills.





Pay close attention to the design. It should be possible to have easy access to the evaporator compartment to permit cleaning. Look for removable shelf sides and racking. Cabinets with these features are easier to clean.

Automatic defrost and evaporation are recommended features to look for when choosing a machine.

Choosing the right blast chiller for your operation.

The table overleaf outlines the capabilities of the blast chillers available from Victory Refrigeration. To find out which model is the most suitable for your operation, consider the type of food you will be using the unit for, as well as the volume of food you need to produce. When calculating volumes remember that you may be producing meals for consumption over five days. It is also wise to allow a little extra capacity than you require at the present time, in order to allow for the expansion of your business.

Storage Refrigerator

The storage refrigerator used for holding pre-cooked chilled foods should be designed and used specifically for that purpose. Reach-In's equipped with tray slides are available to hold up to 400 meals. An ordinary commercial refrigerator that is in general use within the kitchen is not suitable.

Steps must be taken to ensure that possible cross contamination between raw foods or other cooked products and stored chilled food does not occur.

The store must be capable of holding products at a constant temperature of between 33°F and 38°F, and this should be indicated clearly by a visible temperature read-out. The unit could also feature an audible alarm which will alert you if the storage temperature reaches unacceptable levels, and a temperature recording device.

When selecting storage equipment, allow for sufficient capacity to cope with peak production, as well as capacity for an efficient stock rotation system.

Storage equipment will need to be located in an area that allows for easy access, and must be sufficiently close to the blast chiller to ensure that food arrives at the store - while still at the optimum chill temperature.

IMPORTANT! make sure your cooking, chilling and storage equipment are all compatible with the containers you use!



EXAMPLE

	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>	<i>Sunday</i>
Store	0	0	0	0	0	0	0
Cook	0	100	100	100	100	100	100
Serve	0	100	100	100	100	100	100
Balance	0	0	0	0	0	0	0

In this example, the owner of a business in a busy resort, serving 600 meals per week over six days (50 covers, two sittings and a turnover of one per sitting), realized that there was potential to operate at the same daily turnover on a seven day basis. However, the reputation of the business was due, in large, to the quality of the staff who were given Mondays off in lieu of weekends. The option of employing extra part-time staff for Mondays only would wipe out the advantage gained. In any case, skilled staff were almost impossible to find. Meanwhile potential customers were being turned away to the advantage of other establishments. There had to be another solution.

The restaurateur worked out that by installing a blast chiller capable of chilling 175 meals per day he could reward his staff by giving them weekends off, with meal preparation being done only 4 days per week. To add, the restaurateur also increases his meal turnover by 100 meals a week without incurring any additional staff or premises costs!

A production schedule (below) was drawn up based upon a turnover of 100 meals per day, cooking on four days. The machine he selected was an VBC- 75. The machine is actually capable of chilling 335 x 12 oz portions per day based on five 90 minute cycles of 50 lbs, per day. Of course, a greater number could be achieved if he machine were used more times per day.

	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>	<i>Sunday</i>
Store	0	75	150	50	125	200	100
Cook	175	175	0	175	175	0	0
Serve	100	100	100	100	100	100	100
Balance	75	150	50	125	200	100	0

The machine chosen has plenty of spare capacity to cope with the future expansion of the business, which may include extending the present restaurant or setting up an outside banqueting service to supply hotels and weddings in the area.

As a result of installing the blast chiller the restaurateur in question was able to achieve a 29% increase in **net** profit as illustrated by the following figures:

	<i>Before</i>	<i>After</i>	
Sales	\$668,000	\$780,000*	
Staff Wages	(\$98,200)	(\$98,200)	
Raw Materials	(\$223,000)	(\$260,000)	
Other Expenses	(\$94,000)	(\$95,700)**	
Gross Profit	\$252,800	\$326,100	
Less Tax	(\$83,424)	(\$107,613)	
Net Profit	\$169,376	\$218,487	+29%

* Average price of meal is \$22.25

** Extra \$1,700- is depreciation on a \$8,500 blast chiller written down over 5 years.

(The example assumes that the operator has sufficient existing cold storage for up to 400 meals. At approximately \$1155 per year).



COOK/FREEZE

A cook/freeze system involves the full cooking of food, followed by rapid freezing and storage of food in a frozen state, before thorough thawing and reheating prior to service.

For a cook/freeze system, therefore, you require a blast freezer, (rather than a blast chiller), suitable storage for frozen foods and, preferably, a controlled thawing cabinet.

Note: Frozen food storage cabinets are often loosely referred to as 'freezers', however their purpose is specifically to store pre-frozen food, not to freeze hot foods.

For details of the cook/freeze procedure, refer to the flow chart on page 8/9, which deals with cook/chill and cook/freeze.



NUTRITIONAL INFORMATION



Cooking food results in the loss of some nutrients, and there can be further steady loss while the food is kept chilled.

However, the HACCP Guidelines on cook/chill and cook/freeze procedures are followed closely, the loss of nutrients from food should be no greater than those from any other conventional catering system.

GLOSSARY

BLAST CHILLER - A mechanical unit designed to chill hot food rapidly. It works by recirculating low temperature air to high velocity.

BLAST FREEZER - A mechanical unit designed to freeze hot food rapidly.

CHILL CHAIN - The whole process of maintaining strict temperature control throughout receipt, preparation, processing, storage and distribution of food to control the growth of micro-organisms.

FOOD CORE - The temperature within an item of food or dish. Temperature taken at the slowest heating point, normally the center.

PATHOGENIC MICRO-ORGANISMS - All foods contain a certain level of organisms or bacteria which can carry disease if allowed to multiply to large numbers. Cooking food kills them, while keeping food below certain temperatures limits their growth. Consequently, a cook/chill system is a good way of maintaining food safety as it both kills bacteria and limits any further growth.

PROBE - A thermometer that is inserted into a food product to record the inner temperature.

RETHEMALIZATION - The technical term for the reheating of pre-cooked and chilled or frozen foods to 160°F.



FOR FURTHER INFORMATION

If you decide to set up either a cook/chill or a cook/freeze operation, you are advised to obtain the services of a foodservice consultant. Local environmental health department should also be involved at the planning stage, particularly for a larger scale operations. Contact Victory for a list of consultants in your area.

For details on basic hygiene recommendations consult the current FDA Food Code.

BLAST CHILLER TIMES

Approximate time taken to chill different foods by various Victory Blast Chillers

(Actual times will depend on thickness of product, type of container, actual entry temperature, and ambient temperature)

MODEL	VBC-35	VBC-75	VBC-100
MAXIMUM CAPACITY	35 lbs	75 lbs	100 lbs
AMOUNT OF FOOD	25 lbs	50 lbs	80 lbs
MEAT (Includes slice beef, pork, lamb & poultry pieces)	69 mins	50 mins	50 mins
FISH (Includes haddock, cod and plaice fillets, shellfish and others)	67 mins	49 mins	48 mins
VEGETABLES (Includes cabbage, broccoli, spinach, peas and all green vegetables)	79 mins	58 mins	52 mins
FRUIT (Includes stewed apples, apricots, cherries and all cooked fruits)	82 mins	58 mins	60 mins
DESSERTS (Includes fruit pies and others)	73 mins	53 mins	53 mins
SOUPS/SAUCES (Includes all types of soup, gravy, custard, and sweet & savory sauces)	86 mins	63 mins	70 mins
Portion Size: 6 oz	465	660	1125
Portion Size: 8 oz	350	505	855
Portion Size: 12 oz	230	335	565

CAPACITY IN MEALS PER DAY (based on 5 x 90 minute operating cycles per day)

(includes all types of soup, gravy custard, and sweet and savory sauces)



A SELECTION FROM VICTORY'S PRODUCT RANGE



VBC - 35

The smallest Victory blast chiller. Stainless steel construction with countertop work surface, approximately 35 lbs capacity within HACCP guidelines, digital thermometer, automatic defrost, high and low temperature alarms.



VBC - 75

Blast chiller capable of chilling approximately 75 lbs within HACCP guidelines. Stainless steel construction, automatic defrost, digital thermometer and timer, high and low temperature alarms, food probe, audible cycle complete alarm, temperature recorder with printer and chilled food storage mode.



VBC - 100

Blast chiller capable of chilling up to approximately 100 lbs within HACCP guidelines. Accepts 18" x 26" or 12" x 20" pans. Stainless steel construction, automatic defrost, digital thermometer and timer, food probe, audible cycle complete alarm, high and low alarms and chilled and frozen food storage modes.

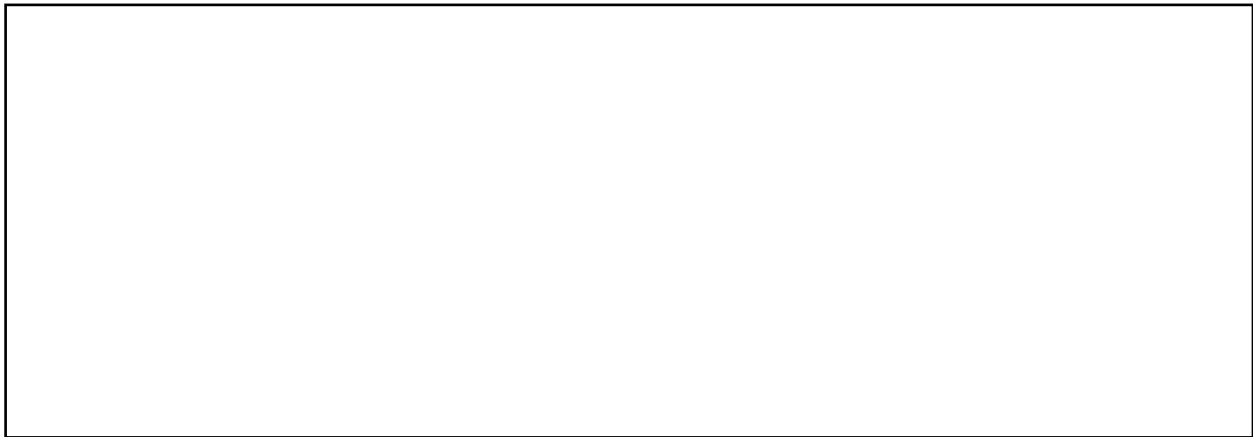


When you specify Victory Refrigeration equipment, you join an increasing number of satisfied customers from the smallest to some of the most prestigious hotel groups, restaurants, hospitals, schools and institutions.

All Victory products are backed by a 12 month warranty and an extensive dealer/service network who will service and support your investment.

Victory restaurant equipment is manufactured in Cherry Hill, NJ. Victory products enjoy a reputation for high performance and reliability. Consult your nearest Victory dealer, call us direct, or check out our website for the latest product information.

Your local dealer:



All product information is correct at the time of printing. Victory Refrigeration reserves the right to alter product specifications without notice. Advice on food safety legislation is intended as a guide only.



NOTES



VICTORY REFRIGERATION

**110 Woodcrest Road
Cherry Hill, NJ 08003**

Phone (856) 428-4200 Fax (856) 428-7299
Website: www.victory-refrig.com