Sous-vide cooking, pasteurising, semi-preserves.

Application manual for iCombi® Pro.

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The sous-vide and pasteurisation probe

The USB core probe in sous-vide and pasteurisation version opens up new possibilities in food production. It streamlines your operation, optimises the organisation of work processes and maintains food quality at a constantly high level.

The core probe is plugged into the USB interface via the USB port. Once the sous-vide and pasteurisation probe is plugged in, additional pasteurisation cooking paths will be activated for you (more on this in the "Pasteurisation" chapter). Compared to the standard core probe, the sous-vide and pasteurisation probe is thinner and only has one measuring point at the tip of the probe. When inserting the sous-vide and pasteurisation probe, make sure that the tip of the probe reaches the centre of the food in order to achieve an optimal cooking result.

Connecting the sous-vide and pasteurisation probe.

› If you have fitted the externally attachable core probe and switch on the cooking system, a message will appear stating that the core probe has been detected. Please note that the core probe integrated in the cooking system will be deactivated.
› Insert the sous-vide and pasteurisation probe into the food so that the tip of the probe is at the centre of the food and place this product in one of the middle racks of your cooking system.
› For further information on connection, please refer to the instructions for use.

Sous-vide cooking.

In sous-vide (vacuum cooking), the food is prepared (seasoned, marinated or seared), vacuum-packed in a plastic bag, then cooked and immediately cooled. Before the food is served, it is heated in a plastic bag, taken out of the bag and finished depending on the dish.

Sous-Vide is an extension of the well-established low-temperature cooking method. Sous-vide cooking maintains the positive characteristics of the method while avoiding any disadvantages. With sous-vide cooking, the temperature never exceeds 100 degrees, the heat has a more direct and therefore more effective effect thanks to the humidity. Packed in the vacuum pouch, the food is in very close contact with the heating medium - the heat transfer to the inside is very fast and can be controlled more precisely than with any other method thanks to the iCombi's precision to the degree. The seared flavours required for many products (e.g. steaks) is obtained by searing or grilling the food briefly at very hot temperatures after the end of sous-vide cooking.

2.1. Benefits and applications.

How you benefit at a glance.
- Excellent food quality with significantly extended shelf life.
- Preservation of intense inherent flavours, natural colours and valuable vitamins and minerals.
- Reduction of cooking losses thanks to gentle cooking.
- Efficiency through pre-production and optimisation of daily processes.
- Reproducible food quality.

The positive effects of sous-vide cooking go far beyond the precise control of the cooking level by the iCombi: Numerous tests have shown that with this cooking method, the food retains much more of the juices than with classic cooking methods. Sous-vide is therefore a beneficial option for all high-quality products - be it meat, seafood, vegetables or fruit. When you spend a lot of money on high-quality products for your guests, you generally want to achieve the best possible result - without taking any risks.

Another positive secondary effect is that sauces and other ingredients cannot escape or evaporate. The consistency remains at the desired level throughout. This preserves the aroma and the flavours are much more intense after cooking. The result, for example, is particularly tender and succulent meat.

Preparation with this cooking method is also much healthier in many cases, as minerals and vitamins are also preserved. Many chefs also take advantage of the higher aromatic intensity by adding tasty herbs, spices, sauces and marinades to the vacuum bag.

Sous-vide can also be used to create new flavours that will enrich your range of culinary offerings taking them to a new level. There are also advantages in terms of storage. The gentle preparation method in the vacuum bag means that the goods have a longer shelf life after cooking.

Using sous-vide cooking allows you to rethink processes and expand the range of dishes for your guests. Sous-vide is perfect for producing your products in a central production kitchen and then delivering them to satellite kitchens for further processing. This avoids expensive overproduction, as you only finish the amount of food you actually need in the satellite kitchens.

For room service, individual components or entire dishes can be produced, chilled and then finished in individual portions to order. This means, for example, that reception and service staff can cater for your guests 24 hours a day.

Due to the gentle and healthy preparation, sous-vide is ideally suited for special diets and light cooking. The products taste naturally rich even without adding salt, which allows them to capture aromatics and preserve natural flavours.

2.2. Preparation of products.

› Place the raw or seared products chilled well (max. 6 °C) with spices, marinades and flavourings in a vacuum, sous-vide or shrink bag.
› Raw onions, leek or garlic should be steamed or seared before vacuum-packing. Alcohol must be boiled and cooled again.
› Sear roasts and braised dishes in advance and produce the braising base. Vacuum seal the meat together with the braising base.
› Vacuum seal your products so that there is no air left in the vacuum bag (approx. 90% - 99%).

ⓘ
› Since most undesirable bacteria are located on the outside of the meat, we recommend briefly steaming or searing the food before vacuum-packing.
› When selecting the target temperature, adhere to the HACCP regulations of your country.

2.3. Further processing and shelf life after sous-vide cooking.

Shelf life after sous-vide cooking.
If you do not want to consume the cooked food immediately, it must be chilled immediately as otherwise harmful germs can multiply unhindered. You then have the option of storing the food for the short or long term.

Cooling.
› To prevent the spread of harmful germs, the cooked food must be cooled to a maximum temperature of +3 °C within 90 minutes after sous-vide cooking is complete.
› This can be achieved by cooling in a bain marie with ice cubes or by using a blast chiller.
› Cooling down food in the refrigerator or freezer is not suitable, as these appliances cannot perform a fast cooling process. A spread of harmful germs cannot therefore be avoided. Only use the recommended measures to cool down your food.

2.4. Sous-vide cooking methods.

The range of cooking paths in the iCombi Pro offers various options for implementing the various sous-vide methods. The objective of all processes is to achieve the desired core temperature as precisely as possible or to maintain it for a calculated period of time. There are generally two variants:

The low-low method.
Low cooking medium temperature and low product temperature.

In the low-low method, the cooking cabinet temperature is only slightly above the desired core temperature. This is particularly suited to the boiling cooking path. Example: Boiled ham at 56 °C. With a delta of 5 °C, the cooking cabinet temperature is 5 °C higher than the actual core temperature. If the core temperature rises by one degree Celsius, the cooking cabinet temperature increases by one degree Celsius in parallel. If the actual temperature approaches the target temperature, the delta is reduced accordingly. This means that the core temperature is reached very quickly without the outer layers of the food in the bag ever reaching a higher temperature than the target temperature.

The high-low method.
High cooking medium temperature and low product temperature

In the high-low method, the cooking cabinet temperature is significantly above the selected core temperature. The cooking cabinet temperature is between the actual core temperature and the boiling point until the desired core temperature of 58 °C - 68 °C is reached, for example. In that case, when the target core temperature is reached, the bags must be removed immediately and cooled or served. The steaming cooking path is suitable for products that are cooked directly for serving or for products that are cooked at a higher temperature 80 °C - 85 °C using a time input, e.g. fruit, vegetables and desserts.

Loading products.
- For hygiene reasons, make sure that your products are always well chilled (max. 6 °C).
- Attach the foam rubber strip* where you would like to place the sous-vide and pasteurisation probe. Make sure that the bag is well cleaned at the attachment point.
- Insert the sous-vide and pasteurisation probe through the foam rubber band and with the probe tip at the thickest point of the food.

Hygienic safety.
- The foam rubber strip seals the insertion point during cooking and maintains the vacuum in the bag. After removing the sous-vide and pasteurisation probe, air may be drawn through the puncture opening. Therefore, always use up this bag promptly, as hygienic safety cannot be guaranteed by doing so.
- However, special accessories with membrane solution can be used, which also permanently seal the bag in which the probe is positioned. The SYV valve from ORVED is an example of such a product.

Ask our ChefLine for suppliers of foam rubber and sous-vide bags.
For example, you can obtain self-adhesive foam rubber strips at the hardware store.

2

2.5. Sous-vide compatible cooking paths in the iCookingSuite.

These four special sous-vide cooking paths are available when using the original RATIONAL sous-vide and pasteurisation kit:

Poultry sous-vide	Meat sous-vide	Seafood sous-vide	Side dishes sous-vide

Furthermore, the following cooking paths of the iCookingSuite can also be used with the USB core probe:

Poultry › Cook › Steam	Meat › Blanch and simmer › Cook	Fish › Steam › Octopus › Chinese-style steamed dishes	Egg dishes › Steam dessert	Side dishes › Steam › Steam rice › Preserve › Dumplings

2.5.1 Sous-vide cooking paths after commissioning the sous-vide probe on the USB port.

The sous-vide core probe symbol is displayed when the USB probe is plugged into the USB port of the iCombi Pro. After selecting the sous-vide probe icon, you will be taken to the specific sous-vide and pasteurisation cooking paths.

These four smart sous-vide cooking paths are perfect for making sous-vide cooked food. The cooking intelligence of the iCombi Pro supports you here and guides you intuitively through the menu to your perfect desired result.

The focus of sous-vide cooking is on culinary excellence in terms of optimal flavour, colour and consistency. The perfect cooking point is directly related to the desired core temperature.

The sous-vide core probe can be placed in the products so these can be cooked to the desired core temperature.

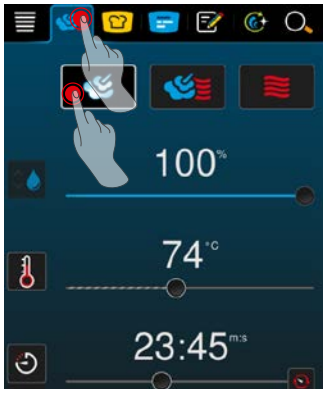
You also have the option of cooking your products using a time and temperature ratio. You can achieve this by selecting "without" core probe.

Guideline values and examples of this can be found in the following chapter.

2.6. Application examples and cooking tables inmanual mode.

The following information refers to a combination of cooking cabinet temperature in conjunction with the respective cooking time or core temperature, which can be measured with the sous vide and pasteurisation probe. These times and core temperatures are guidelines only. We recommend that you test the products for the respective application in advance.

To do this, you can work with the RATIONAL iCombi Pro using the following basic settings:



Accessories: Perforated container

If you want to measure the core temperature of your product in a vacuum bag, we recommend using the sous-vide and pasteurisation kit in combination with a foam rubber band/foam rubber adhesive. (see also 2.3 Tips & Tricks).

The cooking tables listed below refer to practical empirical values and must be evaluated in each individual case depending on the core temperature, and prepared or used as soon as possible. The manufacturer or distributor is responsible for the shelf life.

2.6.1. Meat.

Preparation of meat.
› Tender meat requires a low cooking temperature.
› Fatty and tough meat needs a higher cooking temperature and a longer holding time to become tender.

Beef

Food	Cooking level	Cooking cabinet temperature	Cooking time (hh:mm)	Core temperature
Brisket/breast	–	78 °C	8	–
Entrecôte/roast beef (approx. 250 g steaks)	Rare	64 °C	–	54 °C
	Medium	68 °C	–	58 °C
	Well done	75 °C	–	65 °C
Fillet	Rare	64 °C	–	54 °C
	Medium	68 °C	–	58 °C
	Well done	75 °C	–	65 °C
Veal shank	–	68 °C	16:00	–
Ribs	–	68 °C	16:00	–
Prime boiled beef	–	74°C	04:00	–

Pork meat

Food	Cooking level	Cooking cabinet temperature	Cooking time (hh:mm)	Core temperature
Belly	–	74 °C	06:00	–
Fillet, whole	Medium	68 °C	–	58 °C
	Well done	75 °C	–	65 °C
Cured pork	–	68 °C	–	60 °C
Pulled pork, neck	–	78 °C	08:00	–
Pork neck	–	72 °C	10:00	–
Spare ribs	–	78 °C	05:00	–

Lamb

Food	Cooking cabinet temperature	Cooking time (hh:mm)	Core temperature
Fillet, approx. 20 mm	65 °C	–	55 °C
Knuckle	74°C	14:00	–
Leg approx. 40 mm	68 °C	–	58 °C
Cutlet	58 °C	02:00	–
Saddle	65 °C	–	58 °C
Shoulder	72 °C	16:00	–

Sensitivity of game meat.
Game meat is more delicate than other types of meat and can overcook. The consistency becomes mushy instead of tender. Pay attention to the cooking time in order to avoid overcooking.

Game

Food	Cooking level	Cooking cabinet temperature	Cooking time (hh:mm)	Core temperature
Venison fillet	Medium rare	60 °C	–	54 °C
	Medium	65 °C	–	58 °C
	Well done	75 °C	–	65 °C
Leg of venison	Medium	65 °C	–	58 °C
	Well done	75 °C	–	65 °C
Saddle of venison	Medium rare	60 °C	–	54 °C
	Medium	65 °C	–	58 °C
	Well done	75 °C	–	65 °C
Venison steak	Medium rare	60 °C	–	54 °C
	Medium	65 °C	–	58 °C
	Well done	75 °C	–	65 °C
Venison loin, medium	2–3 cm thick	65 °C	–	58 °C
Roe venison fillet	2–3 cm thick	65 °C	–	58 °C
Saddle of boar	3 cm thick	65 °C	–	60 °C

2.6.2. Poultry.

Take special care when working with poultry.
› To avoid salmonella poisoning, poultry should always be cooked through. The specific minimum temperatures for poultry according to country-specific or internal company specifications (HACCP specifications) must be observed.
› An exception is duck, which can also be eaten medium.

Poultry

Food	Cooking level	Cooking cabinet temperature	Cooking time (hh:mm)	Core temperature
Duck breast	Medium	65 °C	–	60 °C
	Well done	75 °C	–	65 °C
Goose breast	–	65 °C	–	60 °C
Chicken breast	–	82 °C	–	72 °C
Chicken legs	–	85 °C	–	75 °C
Turkey breast	–	75 °C	–	65 °C
Turkey legs	–	82 °C	–	72 °C

2.6.3. Fish.

Preparation of fish.
› Only use freshly caught seafood, as germs cannot be sufficiently killed at low temperatures.
› To obtain roast aromas, the fish can be seared again after cooking in the sous-vide bath. This is particularly recommended for seafood with skin.

Fish

Food	Cabinet temperature	Cooking time (hh:mm)
Trout 20–30 mm	50 °C	00:20
Halibut 25 mm	59 °C	00:15
Cod 25 mm	60 °C	00:14
Salmon 20–30 mm	55 °C	00:18
Mackerel 20–30 mm	52 °C	00:12
Red snapper 20–30 mm	58 °C	00:25
Char 20–30 mm.	50 °C	00:20
Sole 20–30 mm	52 °C	00:15
Turbot 20–30 mm	52 °C	00:20
Tuna 30–40 mm	58 °C	00:45
Sea bass 25–30 mm	52 °C	00:15
Zander 20–30 mm	52 °C	00:15

2.6.4. Vegetables.

Temperature and cooking time of vegetables.
› Vegetables require a cooking temperature of over 85 °C to cook.
› The cooking time is based on the size and quality of the vegetables.
› Root vegetables retain their shape in sous-vide cooking. Perfect for grilling or searing after cooking.
› Perfect purees are obtained by cooking soft vegetables sous-vide. This preserves the colour and flavour particularly well.
› Beans and pulses should be soaked overnight before cooking.

Vegetables

Food	Cooking cabinet temperature / core temperature	Cooking time (hh:mm)
Beans and pulses*	85 °C	06:00 to 24:00
Green vegetables	85 °C	00:05 to 00:20
Soft vegetables	85 °C	00:45
Root vegetables	85 °C	01:00
Artichokes	85 °C	00:50
Cauliflower	85 °C	00:50
Chicory	85 °C	01:00
Carrots	85 °C	01:00
Diced potatoes	85 °C	01:30
Kohlrabi	85 °C	01:00
Pumpkin	85 °C	01:00
Rhubarb	72 °C	00:30
Beetroot	85 °C	01:00
Red cabbage	85 °C	01:30

Vegetables

Food	Cooking cabinet temperature / core temperature	Cooking time (hh:mm)
Celeriac	85 °C	01:30
White asparagus	85 °C	00:45
Sweet potato	85 °C	01:00
Jerusalem artichokes	85 °C	01:15

2.6.5. Eggs.

Preparation of eggs.
› Take the eggs out of the refrigerator at least half an hour before the start of the cooking time. They should be at room temperature when placed in a bain marie.
› After cooking, rinse the eggs in ice water to stop the cooking process.

Eggs

Food	Cooking cabinet temperature / core temperature	Cooking time (hh:mm)
Raw, pasteurised	57 °C	02:00 to 04:00
Liquid, milky	60 °C	00:35
Liquid, white	63 °C	00:35
Liquid, soft	65 °C	00:35
Soft-boiled	68 °C	00:35
Hard-boiled	72 °C	00:40

2.6.6. Fruit.

The sous-vide cooking process gives fruit a vibrant colour. Hard or unripe fruit turn into delicious desserts by adding a little sugar.

Fruit		
Food	**Cooking cabinet temperature / core temperature**	**Cooking time (hh:mm)**
Pineapple	85 °C	01:00
Apple (halved)	85 °C	00:30
Apricots	85 °C	00:20
Pear	85 °C	00:30
Pear purée	85 °C	00:45
Strawberries	65 °C	00:15
Honey melon	60 °C	00:15
Kiwi	80 °C	00:20
Nectarines	75 °C	00:20
Peach	65 °C	00:20
Plums	65 °C	00:30
Grapes	75 °C	00:20

2.6.7. Ready-made meals.

In addition to individual components, complete dishes can also be cooked in the sous-vide cooking process. Depending on the recipe, individual ingredients may need to be prepared before vacuuming, for example by searing.

Preparation and hygiene.
A hygienic environment and work tools in the production of sous-vide foods increase the shelf life of the products.

Ready-made meals		
Food	**Cooking cabinet temperature / core temperature**	**Cooking time (hh:mm)**
Bolognese	85 °C	03:00
Carbonara	63 °C	01:00
Raspberry jam	90 °C	02:00
Casserole	75 °C	12:00
Yoghurt	43 °C	05:00
Cherry jam	90 °C	02:00
Quinoa	82 °C	01:00
Risotto	90 °C	01:00

Pasteurising.

Pasteurisation is a method of heating food in a way that reduces bacteria and extends the shelf life of food. The principle of pasteurisation was first described in Louis Pasteur's researchsome time ago and is now widely used in the food industry. For example, it is used to pasteurise fresh milk for sale or to manufacture cheese.

The following cooking paths are available to achieve a reliable pasteurisation effect and thus produce microbiologically safe products:

› Finishing Pasteurise containers
› Pasteurise meat
› Pasteurise convenience food
› Pasteurise poultry
› Pasteurise chicken eggs

Pasteurisation is a very gentle heat treatment of food. The primary aim is to reliably eliminate most food spoilage bacteria (e.g. lactic acid bacteria and yeasts) and many pathogenic bacteria (e.g. salmonellae) through low temperatures.

Due to the low temperatures used, the nutritional content, taste and consistency of the pasteurised products remain almost the same.

However, the method of pasteurisation must not be confused with a sterilisation process, as pasteurisation can significantly reduce bacteria, but cannot achieve total sterility. Therefore, pasteurised food must usually be stored refrigerated.

With sterilisation, which kills even heat-resistant bacterial spores at temperatures above 100 °C, food can be stored considerably longer and unrefrigerated. It should be noted that these lose more of their nutritional value and flavour when heated.

By using the P-value method, microorganisms can be inactivated with different time and temperature combinations, and the same pasteurisation effect can be achieved no matter what core temperature setpoints are set in the adjustable range (>55 °C/131 °F).

P-value method.
This method is based on the hypothesis that the inactivation of microorganisms is a relationship between temperature and time and that there are therefore different temperature/time combinations that produce the same pasteurisation effect.

3.1. Benefits and applications.

The issue of food safety continues to be of great importance, as a high number of people still fall ill with foodborne intestinal diseases. There are also challenges in the hospitality industry resulting from the steady increase in customer requirements for a wide selection of dishes around the clock, combined with very good cooking quality.

3.1.1. Food safety.

With the pasteurisation cooking paths, you can produce hygienically safe food for your guests. Due to the reproducible consistent processes, you get hygienically safe cooking results and therefore safe products regardless of which chef or even shift is on duty. You therefore have more security for sensitive meal participants in the following target groups:

› Nursing homes/hospitals
› Schools and nurseries
› Company restaurants and catering

It is also easy to expand your range or menu to include sensitive products, such as raw egg products or medium-cooked protein products. The products produced can be perfectly processed in a pasteurised state.

3.1.2. Quality improvements for your products.

With the help of the available pasteurisation cooking paths - especially for meat and poultry products - it is possible to prepare your products to a lower core temperature in the range of 55° C - 64° C. As a result, the products remain significantly more succulent after further processing or even after finishing than with conventional cooking methods.

Cooking losses are minimised by the gentle pasteurisation of the products. By using vacuum bags during the sous-vide process, products can also be pasteurised marinated. You can also use the pasteurisation cooking paths to prepare your products for night or public holiday service. This means they always deliver the same, safe cooking quality, even if the kitchen crew is not personally on site.

3.1.3. Cost savings, sustainability and flexibility.

In addition to food safety, the minimum shelf life of the packaged, pasteurised food is also increased, which significantly extends the storage period.

› This gives you the possibility to use seasonal products beyond the actual season by pasteurising them and subsequently processing them as needed.
› Or you can buy larger quantities of food when it is on sale and take advantage of it for longer by extending the shelf life.
› Save yourself recurring production cycles by cleverly producing food in advance, which saves money and time.

There is also no need for an additional pasteurisation unit, which takes up space and is expensive to purchase and maintain. Use your existing iCombi Pro to pasteurise your products according to your requirements.

3.2. Main microbiological, chemical and physical hazards.

3.2.1. Microbiological hazards.

A variety of microorganisms, including pathogenic ones, can be present on vegetables, meat and other ingredients. Here is a list of the most important microorganisms:

1. Listeria monocytogenes
2. Salmonellae
3. Clostridium botulinum
4. Staphylococcus aureus
5. E. coli (EHEC/VTEC, serotype 0157:H7)
6. Clostridium perfringens (Toxin C and Toxin A)

3.2.2. Chemical hazards.

Among the chemical hazards, pesticide residues are frequently mentioned, but hardly constitute a hazard because the dose is too low.

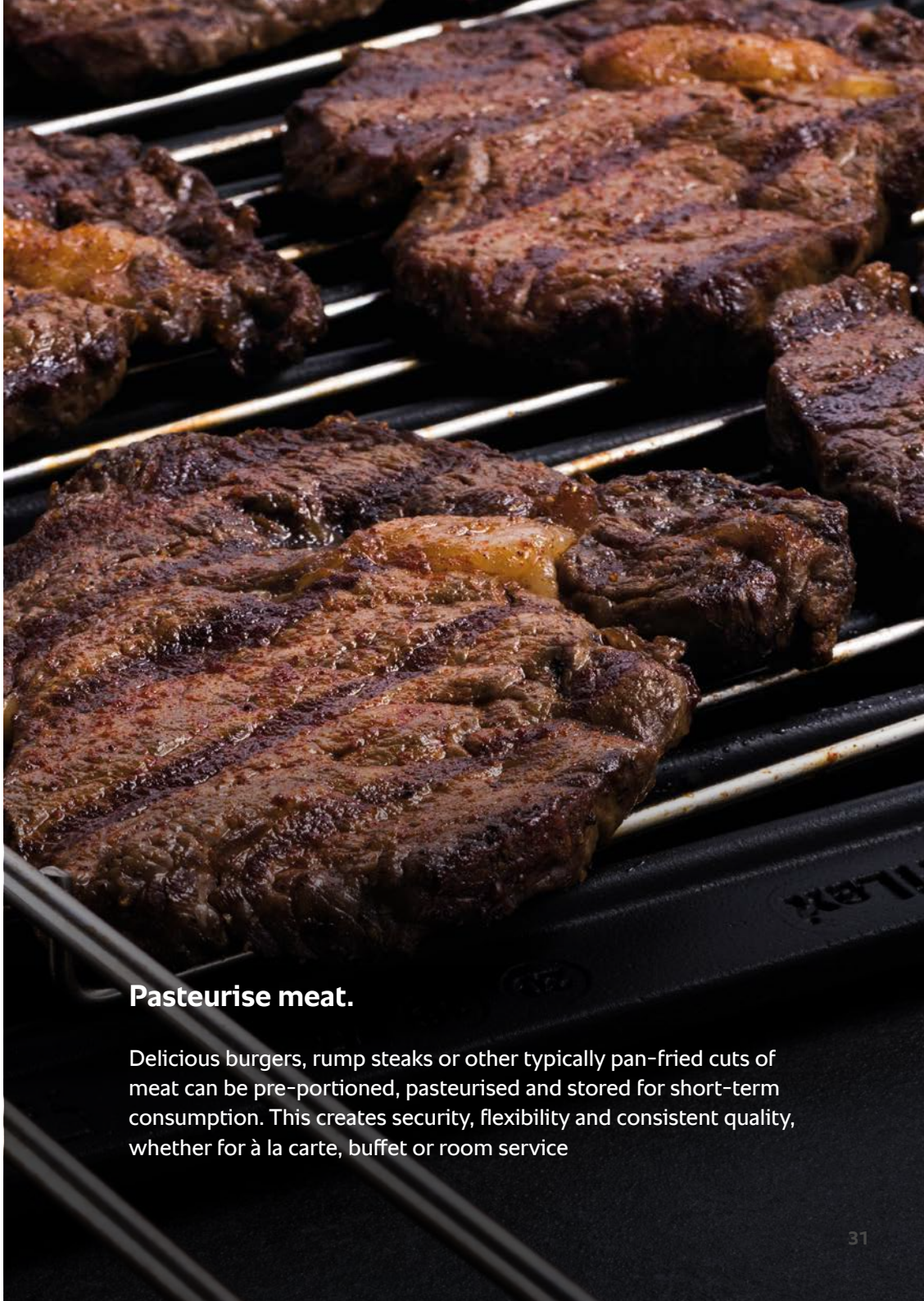
Of course, pesticides and agents against stored pests (rodent poison etc.) must not be stored or applied in the kitchen or storage rooms.

Another group of hazards that could also be counted among the chemical-toxicological hazards are allergens. For the purposes of the law (Regulation [EU] 1169/2011), this includes not only the actual allergens in the medical sense, but also food intolerances such as coeliac disease and lactose intolerance.

3.2.3. Physical hazards.

Typical hazards are small stones, metal parts in food or glass or bone splinters.

3.3. Recipes and possible settings.



Pasteurise meat.

Delicious burgers, rump steaks or other typically pan-fried cuts of meat can be pre-portioned, pasteurised and stored for short-term consumption. This creates security, flexibility and consistent quality, whether for à la carte, buffet or room service

It is always advisable to think about the size of the container or portion size to be used later before each production run. This prevents unnecessary repackaging or pasteurisation.

Burger patties made from minced meat.

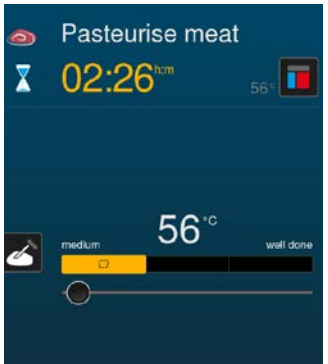
Create delicious burger variations from home-made pasteurised burger patties. Easy to store without the hassle of using raw minced meat. Pasteurised burger patties can be grilled directly from cold storage and used to make tasty burgers.

Ingredients
for 16 portions

- 2.5 kg lightly cooked minced beef
- 35 g salt
- 7 g pepper
- 1 garlic clove, grated

Instructions
Mix the minced beef with the spices and form approx. 150 g portions of minced meat into patties. Vacuum pack them in containers that are convenient for you.

Settings



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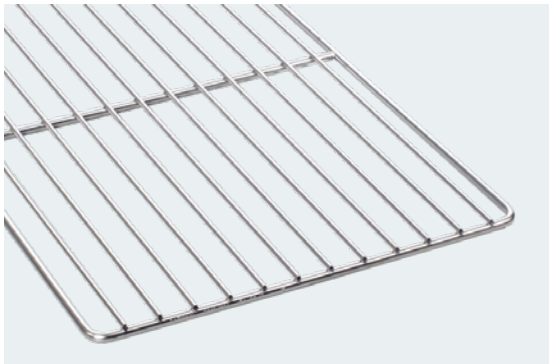


Rump steak.

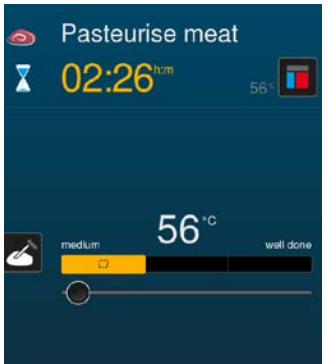
Pasteurised steak varieties have the advantage of being pre-cooked to the right cooking level. This is perfect for removing the steaks on order and finalising them by briefly searing or grilling them.

Ingredients
for 4 servings

- 4 beef rump steaks, 250 g each, cut from the beef rump

Instructions
Vacuum-seal the steaks individually or the entire quantity. Add spices or cleaned herbs as desired.

Settings



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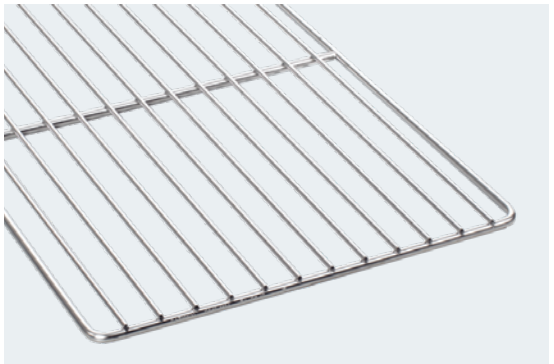


Whole roast beef.

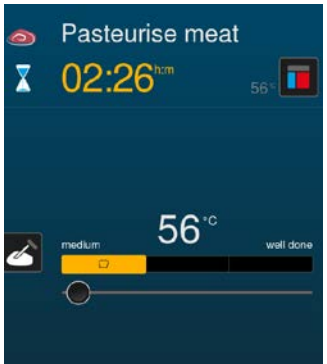
Storable medium roast beef, ideal for cold roasts or sandwiches. Minimal cooking losses and good preservation of delicate roasts.

Ingredients
for 20 servings

› 2 kg beef roast beef

Instructions
Trim the meat, season and sear to any intensity. After cooling, vacuum and prepare for pasteurisation.

Settings



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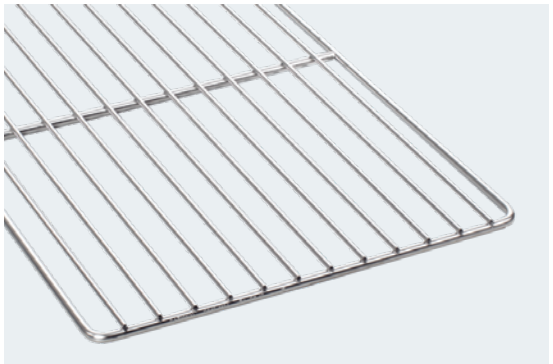
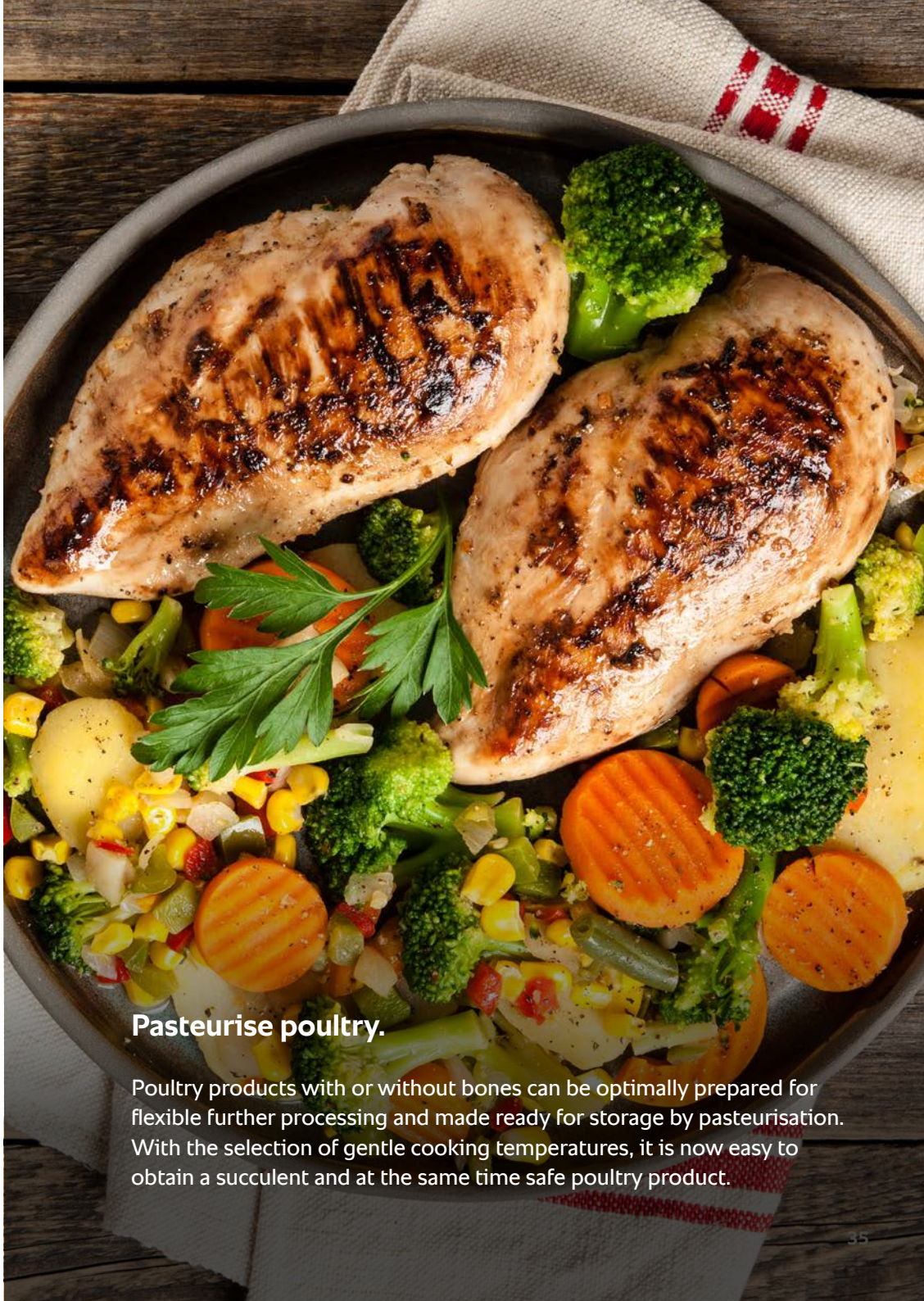




Pasteurise poultry.

Poultry products with or without bones can be optimally prepared for flexible further processing and made ready for storage by pasteurisation. With the selection of gentle cooking temperatures, it is now easy to obtain a succulent and at the same time safe poultry product.

Chicken breast with/without skin.

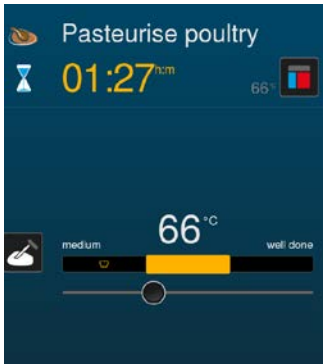
Producing succulent and tender chicken breasts is very easy with the pasteurise poultry cooking path. A significantly lower core temperature than is normally the case is sufficient to produce a hygienically safe product. The chicken breasts produced are perfect for further processing, into pan-fried, grilled and steamed products, but also in salads and poultry cocktails.

Ingredients
for 8 servings

› 8 chicken breasts, 200 g each

Instructions
Vacuum-seal the chicken breasts individually or the entire quantity. Add spices or cleaned herbs as desired.

Settings



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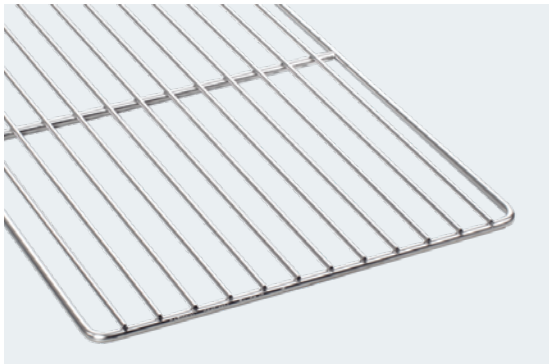
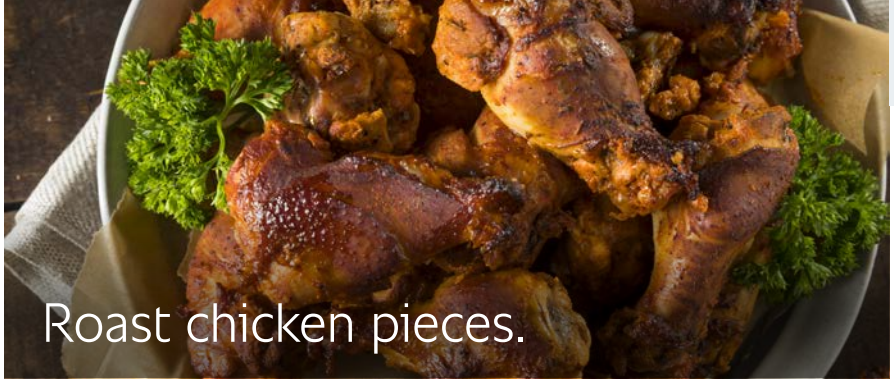




Roast chicken pieces.

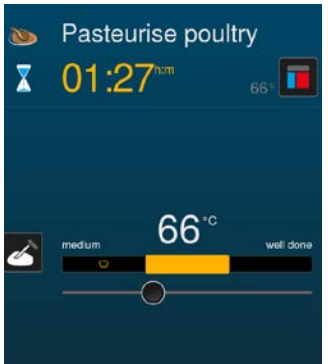
Chicken pieces such as drumsticks, chicken wings and chicken legs can conveniently be pasteurised with bones and pre-produced for optimal storage. The pasteurised cuts are ideal for further processing into spicy chicken wings or breaded and fried chicken, for example.

Ingredients
for 8 servings

› Chicken thighs, 200 g each

Instructions
Vacuum-seal the chicken thighs individually or the entire quantity. Marinate with spices and cleaned herbs as desired.

Settings



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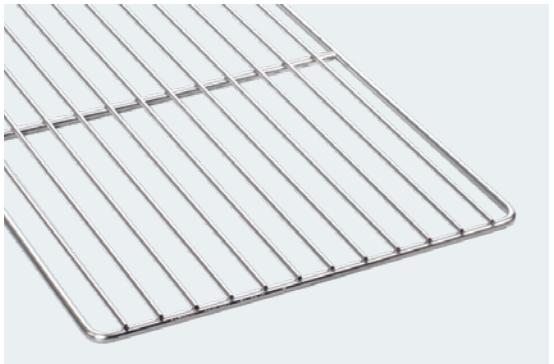
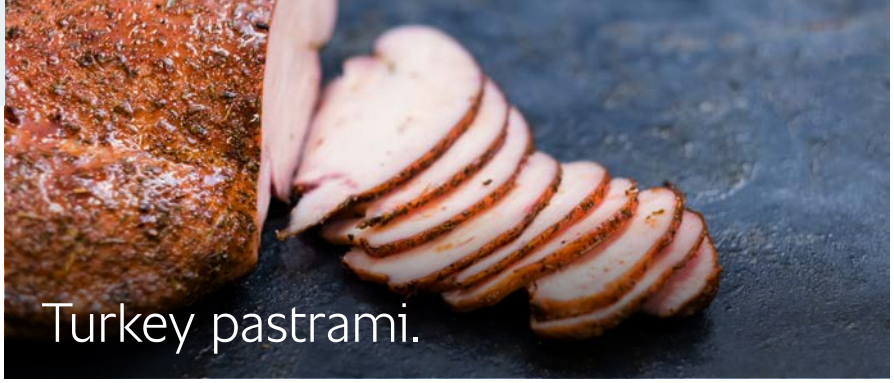




Turkey pastrami.

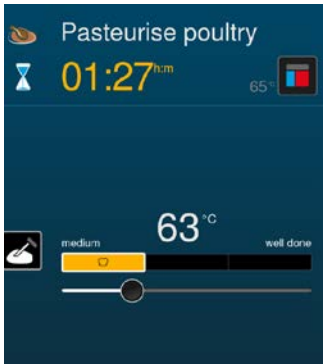
You can cure whole turkey breasts and turkey pieces or not cured as a delicious pasteurised form of pastrami. You can then use these as delicious cold cuts on your bagels and sandwiches as required.

Ingredients
for 30 servings

- 1 turkey breast, 2.5 kg each
- 5% pickling salt brine:
  - 250 g nitrite pickling salt
  - 4.75 l water

Instructions
Place the turkey breast in the brine for approx. 10 days. Then place the turkey breast in clear water for one day. After soaking, dry the meat well and vacuum-seal in plastic bags.

Settings



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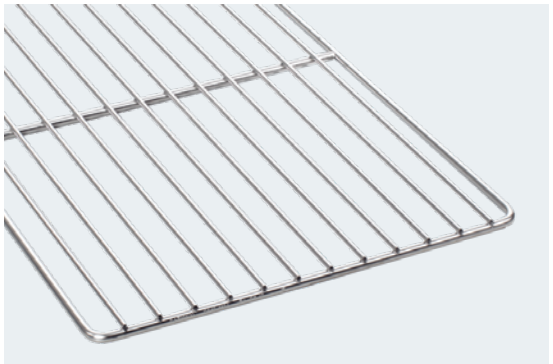


Pasteurise convenience food.

You can easily pasteurise your own convenience products in the Pasteurise convenience food cooking path. Typical products such as spaetzle, filled pasta or vegetable side dishes can be produced in larger quantities, vacuumed, pasteurised and consumed gradually. This ensures more flexibility in availability and saves you time and costs.

Cabbage roll.

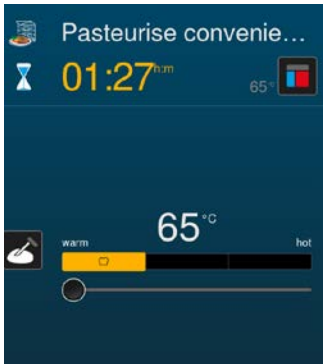
Make fresh cabbage rolls as desired and pasteurise vacuum-sealed after searing. For optimal savings of resources and cost of goods, it is best to produce in large quantities and store pasteurised.

Ingredients
for 12 portions

- 1.5 kg mixed minced meat
- 2 bread rolls (from the previous day)
- 2 onions
- 4 eggs
- 2 heads of white cabbage

Instructions
Steam white cabbage so that the outer leaves can loosen. These these leavesle Make a mince mixture from the remaining ingredients and twist off patties. Place one patty on each of the cabbage leaves, roll up into a roll and tie with kitchen string. Sear the cabbage roulades vigorously and make a sauce base from them. Vacuum the cabbage rolls with the sauce base and pasteurise in the iCombi Pro.

Settings



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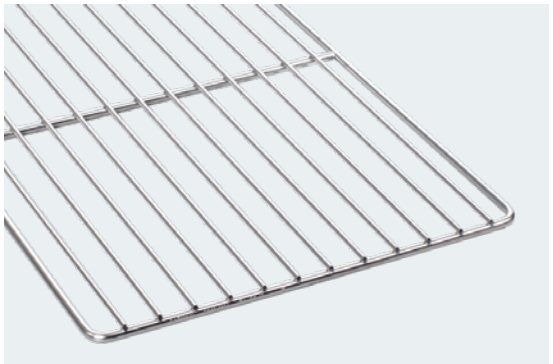


Spaetzle.

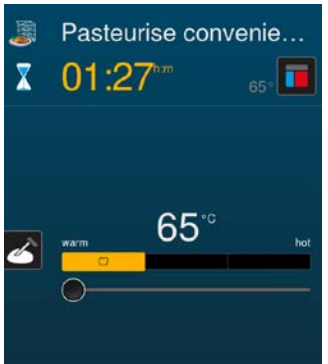
Spaetzle can also be pre-produced in larger quantities. Make spaetzle as usual and after poaching, cool quickly and pasteurise in vacuum packs of your choice.

Ingredients
for 30 servings

- 2.5 kg flour
- 20 eggs
- 50 ml water
- 3 teaspoons salt
- 5 pinches of nutmeg

Instructions
For the spaetzle dough, mix the eggs, water, salt and nutmeg with a wooden spoon, then gradually add the flour. Beat the dough with a wooden spoon or by hand until the dough is nice and smooth. Then scrape the spaetzle into the boiling water with the help of a spaetzle slicer and skim off with a slotted spoon after about 2-4 minutes when they float to the surface. Rinse the spaetzle with cold water, vacuum and pasteurise.

Settings



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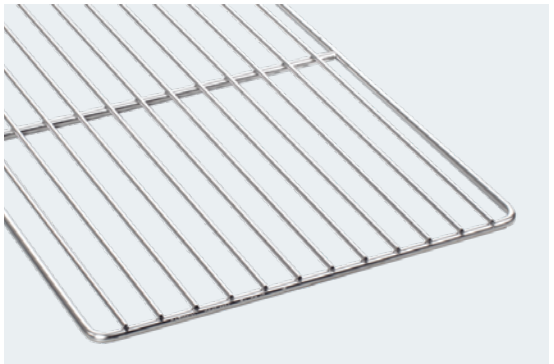


Home-made red cabbage side dishes with fresh ingredients taste best. Keeping a stock of this pasteurised product, even in small containers, saves you having to make many more.

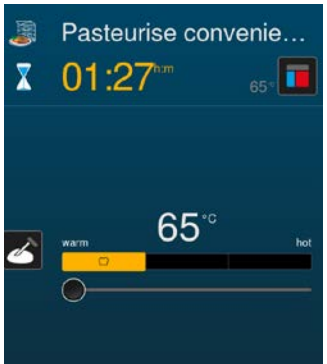
Ingredients
for 20 servings

- 5 kg red cabbage
- 5 apples
- 5 onions
- 100 ml apple cider vinegar
- Bay leaves, cloves
- 100 g clarified butter

Instructions
Finely dice the red cabbage into 3 - 5 mm strips along with the apple and onion. Heat the clarified butter and sauté the onions and apple in it.. Then add the red cabbage strips and the apple cider vinegar. Also add approx. 1 litre of water, the bay leaves and cloves and steam, covered, until soft.

Tip: The cooking path Steaming side dishes can also be used for the steaming process.

Settings



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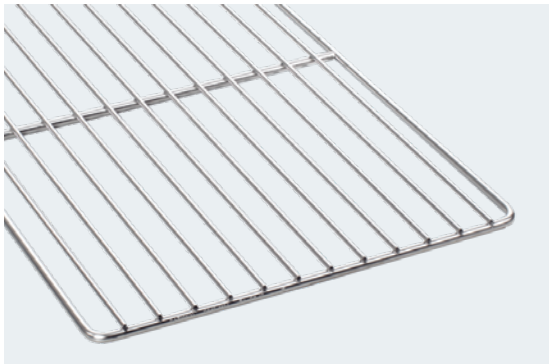


Pasteurise chicken eggs.

Due to the increased risk of salmonella, fresh eggs are often banned from kitchens or must be served cooked through. By using the Pasteurise chicken eggs cooking path, you can pasteurise your eggs and use them like fresh eggs. The original texture and consistency of the egg are retained, so that dishes such as whipped sauces, desserts or even soft breakfast eggs can be prepared and served. The quality of your egg products is reproducible and hygienically safe day after day. Complete HACCP documentation is of course available in iCombi Pro.

Eggs, sizes S – L.

Eggs can be pasteurised in the EU-wide mandatory weight classes S – L in the cooking path Pasteurise chicken eggs for further use. To do this, you can leave the eggs directly on plastic egg layers or optionally use RATIONAL accessories.

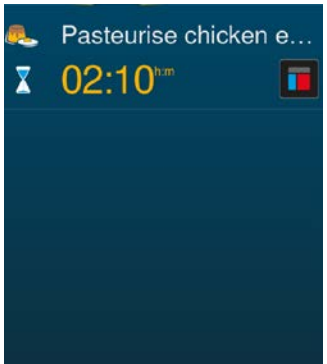
Ingredients
for 30 servings

› 30 eggs or one layer

Instructions
Carefully layer the eggs in the selected cooking accessory.

Tip: For optimum heat transfer, do not stack eggs on top of each other.
Please note that no core probe needs to be inserted for this cooking path.

Settings



Accessories: Perforated container

Pasteurise containers.

Products in the container can be heated pasteurised for service. However, as these are not packed airtight, i.e. not vacuum-packed, they must be consumed or served immediately.

Potato gratin.

Potato gratin can be stored and divided particularly well in the 1/1, 40 mm granite-enamelled container. You can divide the gratin into even, square or rectangular pieces as a side dish portion and serve it without any cutting losses. This form of pasteurisation acts as a further stage of food safety before serving the food during the reheating or holding phase.

Ingredients
for 40 servings

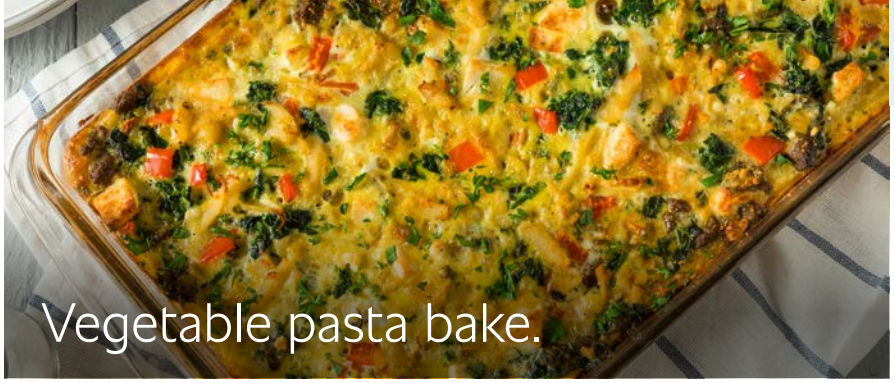
- 5 kg potatoes
- 1 l cream
- 0.5 kg cheese, grated
- Spices
- 1 kg pre-cooked pasta
- 0.5 kg diced onion
- 1 tbsp garlic paste
- 2 litres cream
- 4 kg vegetables
- 1 litre vegetable stock
- 1 kg cheese, grated

Instructions
Layer the sliced potatoes in the container. Season cream with salt, pepper and nutmeg and pour over the potatoes. Sprinkle with grated cheese. On the iCombi Pro, select the side dishes/potato gratin mode and enter the desired browning. After preheating, load the potato gratin. Set the core probe using the positioning aid provided.

The finished gratin remains in the container for the pasteurisation process.

Settings

Accessories: (Granite-enamelled) container



Vegetable pasta bake.

The vegetable pasta bake is also a dish which is produced in a 1/1 container or 1/1 granite-enamelled container in a standardised size. Here, a vegetarian dish can be made with simple means, which can be served very well in square or rectangular pieces without any cutting losses. This form of pasteurisation acts as a further stage of food safety before serving the food during the reheating or holding phase.

Ingredients
for 20 servings

- 2 kg lasagne sheets
- 4 litres tomato sauce
- 0.8 kg grated parmesan
- 1 kg mozzarella
- 2.5 kg minced beef
- 2 tbsp garlic paste
- 0.1 l olive oil
- 1 l bechamel
- Basil, rosemary
- Salt, pepper

Instructions
Wash, peel and slice the vegetables for the cooking process. Mix the pre-cooked pasta with the vegetables, onions, garlic and cream and season with salt, pepper and nutmeg. Pour the finished mixture into the RATIONAL container and cover with grated cheese. Pour in the vegetable stock as required. After preheating, cook in the Vegetables/side dishes cooking mode under the "Savoury bakes" cooking path. The cooked bake remains in the container for the pasteurisation process.

Settings

Accessories: (Granite-enamelled) container

Lasagne.

Commonly, classic lasagne is a layered bake of pasta sheets, Bolognese sauce, bechamel sauce and grated Parmesan. This is baked in the iCombi Pro. You can divide the lasagne into even, square or rectangular pieces and serve without any cutting losses. This form of pasteurisation acts as a further stage of food safety before serving the food during the reheating or holding phase. Variations of lasagne as a vegetarian version such as with spinach and gorgonzola are also common.

Ingredients
for 20 servings

- 2 kg lasagne sheets
- 4 l tomato sauce
- 0.8 kg grated parmesan
- 1 kg mozzarella
- 2.5 kg minced beef
- 2 tbsp garlic paste
- 0.1 l olive oil
- 1 l bechamel
- Basil, rosemary
- Salt, pepper

Instructions
First prepare a minced meat sauce from the minced beef, garlic and tomato sauce, as well as the herbs. This is now placed in the container in layers together with the bechamel sauce, Parmesan cheese and the pasta sheets. Place the mozzarella on the top layer. To bake the lasagne on the iCombi Pro, select the Vegetables/Side dishes/Savoury bake/Brown 3/with core probe cooking mode.

The cooked lasagne remains in the container for the pasteurisation process.

Settings

Accessories: (Granite-enamelled) container

Semi-preserves/preserves.

In contrast to canned food, semi-preserved food, also called preserved food, is only preserved temporarily by heating to very high core temperatures in the absence of air. **Semi-preserves must be stored chilled.**

P value: Measure of the sum of all killing effects acting on a microorganism population in the course of a sterilisation process (sterilisation).

4.1. Benefits of semi-preserves.

› Additional business by selling to guests/customers
› Establishment of own brand; USP
› Reduction of food waste
› Quick dishes in times of lower occupancy

4.2. Notes on labelling for sale and reuse.

Select this cooking path if you are using meat, for example if you would like to make boiled and cooked sausages, ragout or goulash semi-preserves. To make semi-preserves safely, you need a reference container with a lid.

1. Provide a lid of a reference container with a hole the size of the core probe integrated in the cooking system.
2. Put the food into the desired containers and close them with their lids.
3. Start the cooking path and load the unit.
4. Insert the integrated standard core probe through the hole in the lid of your reference container.

› For this application, use the standard core probe integrated in the cooking system. Please note that the sous-vide and pasteurisation probe must not be used for this.
› The semi-preserve cooking path regulates to an F value of 0.3. The semi-preserves produced in this way have a shelf life of up to 6 months at a storage temperature of less than 10 °C if handled correctly.

4.3. General sequence.

1 **Preparation of ingredients.**
› Clean and hygienic preparation of the components
› Meticulous separation of pure and impure during preparation

2 **Cooking process and preparation of the basic dish.**
› pre-cooking the dish in terms of consistency, appearance and flavour
› the longer the upstream cooking process lasts, the fewer microorganisms there are

3 **Preparation before filling.**
› Thicken the liquid at the end of the cooking process and boil for another 5 minutes at least.
› **Tip:** Strain the meat beforehand so that it can be weighed more accurately afterwards (e.g. goulash, ragout, etc. ...).

4 **Fill hot and seal.**
› **Tip:** Use boiled or steamed jars! Minimisation of germ contamination in the containers.
› **Tip:** also boil or steam lid

5 **Heat through thoroughly.**
› Select the cooking mode: Meat cooking path: Semi-preserves
› Use of integrated core probe and a reference container
› Place the core probe integrated in the cooking system in the centre of the lid

6 **Cool down and store.**
› Cool the core temperature to <+ 20° C within 12 hrs
› An optimal cooling result is achieved by using a blast chiller
› Cool through and store at max. +4 °C

4.4. Main microbiological, chemical and physical hazards.

4.4.1. Microbiological hazards.

A variety of microorganisms, including pathogenic (disease-causing) microorganisms, can be present on vegetables, meat and other ingredients. Here is a list of the most important microorganisms:

1. Listeria monocytogenes
2. Salmonellae
3. Clostridium botulinum
4. Staphylococcus aureus
5. E. coli (EHEC/VTEC, serotype 0157:H7)
6. Clostridium perfringens (Toxin C and Toxin A)

4.4.2. Chemical hazards.

Among the chemical hazards, pesticide residues are frequently mentioned, but hardly constitute a hazard because the dose is too low.

Of course, pesticides and agents against stored pests (pest control etc.) must not be stored or applied in the kitchen or storage rooms.

Another group of hazards that could also be counted among the chemical-toxicological hazards are allergens. For the purposes of the law (Regulation [EU] 1169/2011), this includes not only the actual allergens in the medical sense, but also food intolerances such as coeliac disease and lactose intolerance.

4.4.3. Physical hazards.

Typical hazards are small stones, metal parts in food or glass or bone splinters.

4.5. Notes on general hygienic issues.

4.5.1. Upstream cooking process.

An upstream cooking process over a longer period of time leads to the death of the vegetative forms of microorganisms in the product. In combination with compliance with general kitchen hygiene, food safety is guaranteed.

4.5.2. Filling.

Jars and containers must not be damaged, as impurities such as glass splinters, other foreign bodies (small stones, wood splinters, insects) in the product can lead to serious health problems for the consumer. This must be checked before filling. Containers are ideally sterilised directly before filling at 100 °C steam for 10 minutes.

4.5.3. Storage.

The basic requirement for optimal storage is a clean, pest-free warehouse. The semi-preserves produced must be stored hygienically at +4 °C. The temperature of the storeage area should be checked on a random basis.

General information on labelling

for sale and for reuse.

§

- The information provided regarding the labelling obligation has been shortened in this user manual and can be looked up in detail in the respective EU legal text.
- There is a statutory labelling obligation as soon as the manufactured product is resold commercially to third parties. [European Food Information Regulation (LMIV) (EU) No 1169/2011]
- **Legibility of mandatory information:** Important: the mandatory information on a packaging must be displayed in a clearly visible place and must be indelible. The best way to achieve this is to laminate the packaging. The font must be at least 1.2 mm.

Summary of the most important information.

- **Description of the food:** Also called a product name or sales description. This should be clearly stated.
- **List of ingredients:** All ingredients contained in the packaged food must be listed in descending order of proportion, including flavourings.
- **Allergen labelling:** The 14 main allergens (the most common causes of allergies) must be highlighted in the ingredients list, such as with a colour background or printed in bold (e.g. nuts or milk products).
- **Net quantity:** The net quantity contained must be stated by weight, volume or quantity.
- **Best before date:** If the shelf life is dependent on certain conditions, e.g. storage temperature, this must be indicated on the label.
  - If the shelf life of the food is less than three months, the expiry date must be indicated together with the day and month.
  - If the shelf life is 3 - 18 months, the month and year must be indicated.
- **Company address:** The name and address of the responsible food business operator shall appear on the packaging.
- **Designation of origin:** Is the origin of primary ingredients not the same as the country of origin of the food? Then this must also be marked on the packaging.
- **Nutritional labelling:** The nutrition declaration must be indicated in grams or millilitres. It must include: Energy value, amounts of fat, saturates, carbohydrate, sugars, protein and salt
- **Imitation:** Not all cheese is the same. If an imitation, such as cheese analogue, is used in the manufacture of the food, the term food imitation must appear in close proximity to the product name.
- **Shelf life of pasteurised food:** Taking into account the points mentioned from 3, a shelf life of up to 3 months at constant cooling of <+3 °C is considered realistic if pasteurised food is handled properly. However, these factors depend on the strictest hygienic requirements.

4.7. Shelf life.

In consideration of point 4.2., a shelf life of up to 6 months at constant cooling of <+7 °C is considered realistic if semi-preserves are handled correctly. However, these factors depend on the strictest hygienic requirements. The font must be at least 1.2 mm.

4.8. Examples for semi-preserves.

› The information provided regarding the labelling obligation has been shortened in this user manual and can be looked up in detail in the respective EU legal text.
› There is a statutory labelling obligation as soon as the manufactured product is resold commercially to third parties. [European Food Information Regulation (LMIV) (EU) No 1169/2011]
› **Legibility of the mandatory information:**
Important:the mandatory information on a packaging must be displayed in a clearly visible place and must be indelible. The best way to achieve this is to laminate the packaging. The font must be at least 1.2 mm.

Meat and sauces with meat.
› Chilli con carne
› Goulash (beef, pork, poultry)
› Bolognese
› Beef roulades in sauce
› Stews with meat
› Beef or pork cheeks in sauce
› Game casserole

Sausage products - Cooked sausage in a jar.
› Blood sausage
› Liver sausage
› Headcheese
› Meatloaf in a jar
› Ground pork in a jar

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