

iVario



**Multifunctional
appliances for boiling,
frying and deep-frying.**

An introduction.

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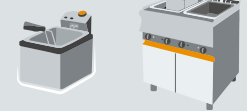
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Boiling, pan-frying and deep-frying.

Technology compared.

The cooking methods of boiling, pan-frying and deep-frying are used daily in all professional kitchens. The equipment required for this, such as pots, pans, tilting pans, boiling pans, pressure braising pans and deep-fat fryers are conventional cooking appliances that have hardly seen any technical advancement until now. These appliances use a lot of resources. This means that they need a long time to preheat and require constant monitoring by the chef in order to ensure the cooking result. Conventional technology is now replaced with a multifunctional cooking appliance which combines multiple cooking methods in a single appliance (see table). This also saves space and energy.

Definition of cooking method	Conventional technology	Multifunctional technology
Cooking Cooking food in liquid at temperatures up to boiling point		
Pressure cooking Boiling at temperatures above boiling point ¹		
Frying Cooking food using dry contact heat at high temperatures		
Deep-frying Cooking food in oil at high temperatures		

¹ Boiling point: Temperature at which a substance (e.g. water) changes from a liquid to a gaseous state (e.g. steam)

What is multifunctional cooking technology?

Multifunctional cooking appliances replace individual appliances such as pots, pans, tilting pans, boiling pans, deep-fat fryers, pressure braising pans, sous-vide cookers and pasta boilers.

What benefits do multifunctional cooking appliances offer?

The fact that many cooking methods can be undertaken in a single appliance means that fewer appliances need to be purchased and that less space in the kitchen is required.

A large number of different cooking appliances usually means different modes of operation. The complexity entails a significant risk in daily food production.

A multifunctional cooking appliance can reduce this risk. Once one appliance has been mastered, all appliances have been mastered.

Multifunctional cooking appliances also increase the flexibility for chefs, since they are not restricted to a single cooking method. So, for example, chefs can decide for themselves whether they want to boil, pan fry, steam, pressure cook or even deep-fry potatoes, because it is all possible in a single appliance.

When using conventional cooking appliances, food production can usually only take place in parallel – multifunctional cooking appliances, however, offer two solutions. For example, if a boiling pan is replaced by a multifunctional cooking appliance, the same production tasks can be undertaken. In addition, because they are often quicker, other preparations such as braising, pressure cooking, frying or even deep-frying can also be performed.

This increases production and eliminates bottlenecks. Another option is to redesign the production process, whereby conventional appliances are almost completely replaced with multifunctional cooking appliances, or they are used to handle production peaks.



Multifunctional cooking appliances are equipped with different heating technologies.

What are the benefits of modern (heating) technology?

Modern (heating) technology offers consistent and precise heat distribution to the degree through powerful heating elements as well as intelligent temperature regulation.

For the chef, this provides the following benefits:

- › Extremely short preheating times (approx. 2 min. for frying at 200 °C)
- › Higher productivity as a result
- › Faster cooling
- › Products do not stick or boil over
- › Perfect and easy to reproduce cooking results
- › Efficient working and time gains as well as resource savings (electricity, water, raw materials)
- › Improved food quality
- › No need to constantly monitor cooking process

Conventional (heating) technologies are characterised by slow reactions, such as long heating and cooling as well as high power consumption. This unnecessarily extends production times and increases the work pressure in the kitchen, which can be reflected in the quality of work.

Multifunctional cooking technology and its significance for the environment.

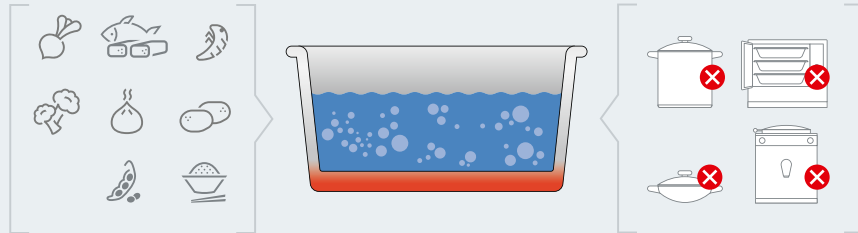
Requirements in terms of more efficient use of resources in day-to-day kitchen routines are continually increasing. From the perspective of sustainability, kitchen processes need to become more efficient. This means that the space requirement, water and energy consumption as well as the use of raw materials must be reduced. In parallel, cost pressure and the demands of guests are increasing.

Modern (heating) technologies in combination with multifunctional cooking appliances provide the best way to meet these requirements.

The three main applications of a multifunctional cooking appliance.



Temperature for boiling: from 30 °C to boiling temperature



Functionality:

A container is heated from the outside, whereby a liquid (and the food in that liquid) is heated up

Supporting functions:

- › Raising and lowering mechanism (automatic lowering and raising of boiling baskets in and out of the cooking liquid)
- › Integrated water drain
- › Precise water supply to the litre
- › Precise temperature measurement
 - of the liquid
 - of the food by means of the core probe
- › Timer for portion baskets

Preparation methods:

- › Blanching + pressure cooking (< boiling temperature)
- › Poaching (70-90 °C)
- › Sous-vide (30-90 °C)
- › iZone Control

Benefits of modern technology:

- › Reduced preheating and cooling time
- › Fast reheating time for high food quality
- › Possible to cook different products within a single appliance
- › Time saving due to less monitoring
- › Lower water consumption

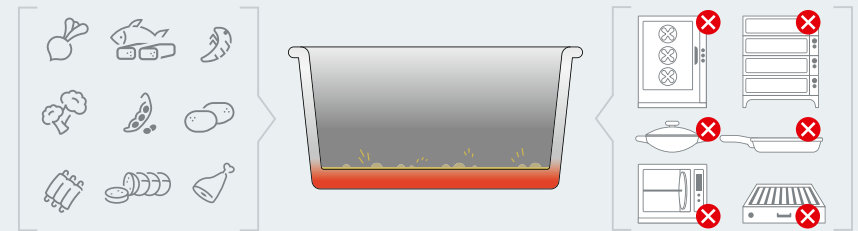
Food such as fish, meat, poultry, eggs, vegetables, pasta and potatoes as well as milk and desserts, soups and sauces are boiled.

Multifunctional cooking appliances can therefore replace the following appliances:

- › Steamer
- › Cooking pot/boiling kettle
- › Pasta boiler
- › Sous-vide cooker
- › Pressure cooker
- › Wok



Temperature for pan-frying: from 30 °C to 250 °C



Functionality:

- › A frying surface is heated from below and the food to be cooked is placed directly on top

Supporting functions:

- › Integrated water drain
- › Water supply for deglazing
- › Precise temperature measurement
 - of the frying surface
 - of the food by means of the core probe
- › Individual timers for different areas of the pan
- › Area heating

Preparation methods:

- › Fry
- › Braise

Benefits of modern technology:

- › Reduced preheating and cooling time

- › Precise temperature regulation for the best cooking results and product quality
- › Searing large quantities without a drop in performance (no leaching out when searing meat)
- › Time saving by searing large quantities without any temperature loss
- › Even distribution of heat

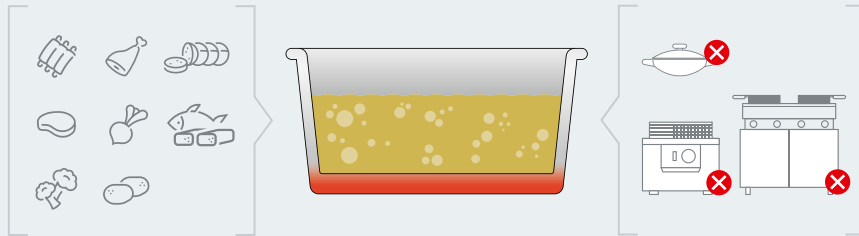
Foods such as fish, meat, poultry, eggs, vegetables, side dishes and desserts can be fried in this way

Multifunctional cooking appliances can therefore replace the following appliances:

- › Convection oven
- › Plancha/griddle plate
- › Tilting pan
- › Frying pan
- › Wok



Temperature for deep-frying: 30 °C to 180 °C



Functionality:

A container is heated from the inside or outside, whereby a liquid (and the food in that liquid) is heated up

Supporting functions:

- › Raising and lowering mechanism (automatic lowering and raising of frying baskets in and out of the cooking liquid)
- › Integrated water drain
- › Precise water supply to the litre
- › Precise temperature measurement
 - of the liquid
 - of the food by means of the core probe
- › Timer for portion baskets

Preparation methods:

- › Deep-frying (140-180 °C)
- › Blanching (< 140 °C)
- › Confit (40-90 °C)

Benefits of modern technology:

- › Fast (re)heating times
- › High-quality cooking results thanks to maximum crispiness of vegetables, poultry, meat and fish
- › Oil can be utilised for longer (gentle heating due to large heat exchange surface)
- › Precise temperature regulation to the degree for best cooking results

Food such as fish, meat, poultry, vegetables and potatoes as well as desserts and baked goods are deep-fried, confit or blanched.

Multifunctional cooking appliances can therefore replace the following appliances:

Deep-fat fryer
High performance deep-fat fryer
Wok

The functionality of multifunctional cooking appliances.

Chefs always want to impress their customers with perfectly cooked foods. To do this, they not only need knowledge and experience, but also the supporting technology.

Boiling is made much simpler by using modern cooking technologies: The important preheating is automatically started as soon as the appliance is switched on and the temperature can be set with extreme precision unless an automatic cooking path has been selected.

These intelligent cooking paths provide a modern cooking support, which is available to the chef on demand in some multifunctional cooking appliances. This can be used to automatically regulate certain cooking processes.

Take boiling milk as an example, where the risk of boiling over is avoided with the help of an automatic cooking process.

The sensitive and accurate temperature regulation prevents products from sticking, burning or boiling over.

With the precision and reliability of such intelligent cooking paths, the chef gains crucial time for other tasks.

On the following pages, we will look at the basic settings of a multifunctional cooking appliance.

Temperature and cooking time.

Key questions:

What temperature must be set? What is the required cooking time?

What do the appliance settings depend on?

e.g.

Risotto = experience

Pasta = experience, specified cooking time

Pan-fried dishes = experience

Sous-vide = experience

When using conventional pots, pans and other cooking appliances, the chef needs a wide repertoire of experience and a lot of practice to estimate the temperature and time exactly.

A multifunctional cooking appliance today features programs or saved intelligent and self-regulating cooking paths. These allow the chef to deliver consistently high cooking results.

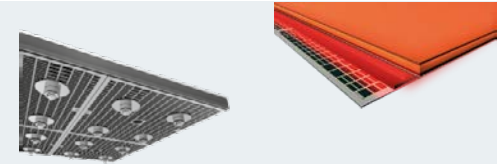
Because in day-to-day kitchen routines, the production quantities, unit sizes and quality of products vary greatly, the temperature and time often need to be adjusted. The modern multifunctional cooking appliance of today has the ability to make these individual adjustments automatically (see also chapter 7: Difference between a program and a cooking path).

If you want to ensure consistent quality in all production quantities and unit sizes, additional monitoring of the core temperature of meat and fish etc. is an advantage. But here too, the chef needs to have some experience in order to know which core temperature leads to which cooking result. This takes a little practice in the beginning. Once enough experience has been gained, it becomes so easy to cook a perfect steak, for example. For this reason, the core temperature probe is an important aid to ensure cooking quality.

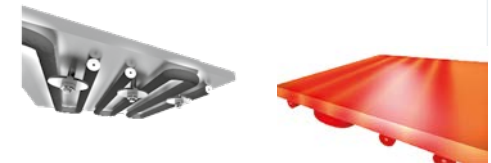
Perfect temperature regulation with a modern heating system.

Multifunctional cooking appliances are heated by different heating systems:

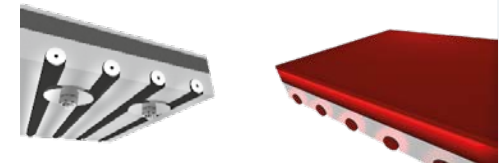
Modern heating technology is more efficient with top efficiency rates. Precise regulation, uniform heat distribution and high power have a positive impact on the cooking result.



Conventional heating systems with thin bases become hot relatively quickly, but the temperature is not distributed evenly.



Conventional heating systems with a thick base are slow and take longer to heat up, but have a more consistent temperature.



The following topics were explained on previous pages:

- › Fast heating up and cooling
- › The associated time factor
- › The precise regulation and consistency of temperatures and their significance.

In summary, using modern multifunctional cooking appliances provides the chef with the following significant production benefits:

- › Maximum precision in cooking
- › Higher production capacity
- › Increased time gains

Benefits of the modern heating system

Today's generation of multifunctional cooking appliances, which are equipped with modern heating technology, makes kitchen tasks much easier:

- › No sticking or burning on the pan base
- › Quicker cleaning
- › Short production times
- › Short preheating and cooling times
- › High searing capacity, even with large batches
- › Diverse preparation options

The range of benefits offered by multifunctional cooking appliances leads to a rapid spread of these types of appliance in kitchens.

Comparison to preparation with conventional appliances.

We usually distinguish between the following common preparation methods:

- › Boiling
- › Frying/pan-frying
- › Deep-fry
- › Braise
- › Pressure cooking
- › Confit
- › Sous-vide

The resource-saving use of a multifunctional cooking appliance combines most classic cooking methods and replaces conventional appliances completely.

The ergonomic and user-friendly handling make it significantly easier to work with multifunctional cooking appliances, which is also due to appropriate accessory solutions.

Below you will find an overview of the most common cooking methods, each compared to conventional methods.

Even after the first steps using a multifunctional cooking appliance, it becomes clear:

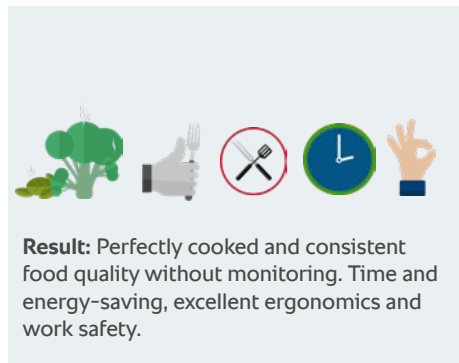
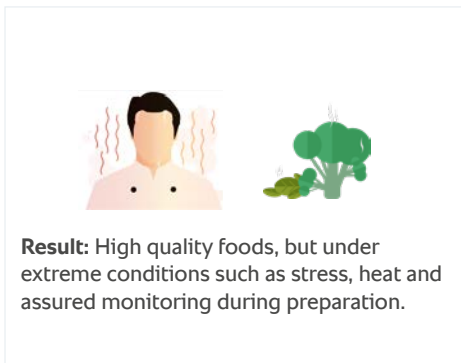
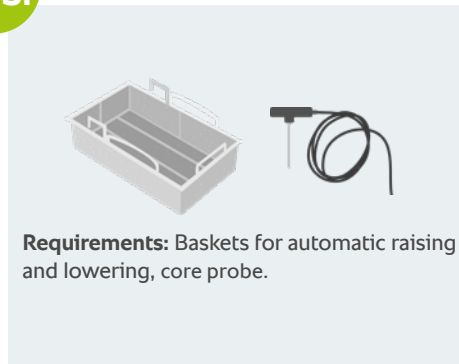
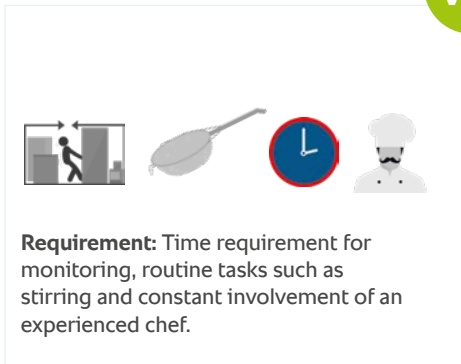
Using the integrated modern cooking intelligence, chefs benefit from optimised product management as well as excellent food quality.

Boiling.

Conventional vs. multifunctional cooking appliances.



v/s.

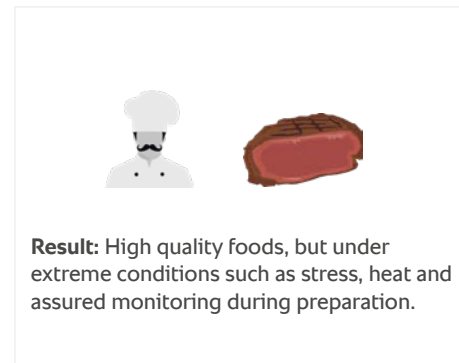
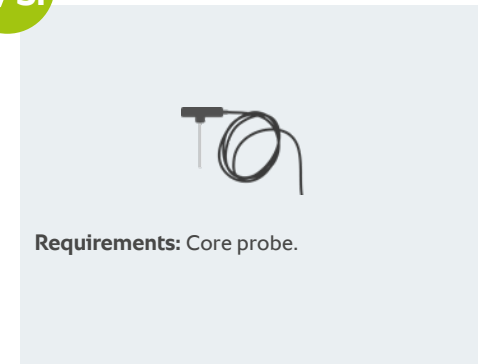
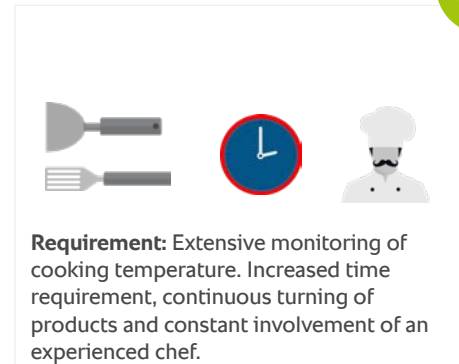


Frying.

Conventional vs. multifunctional cooking appliances.



v/s.

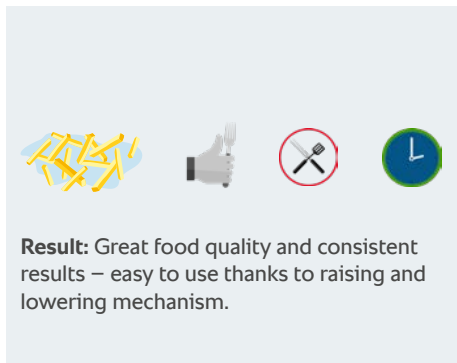
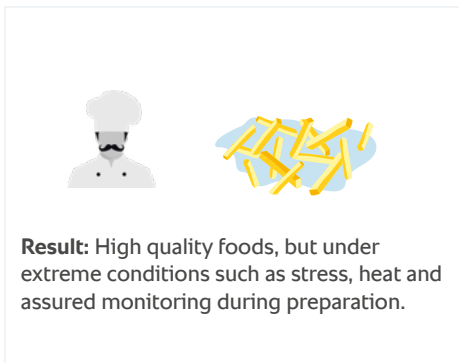
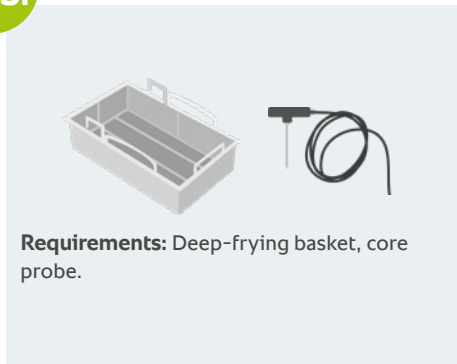
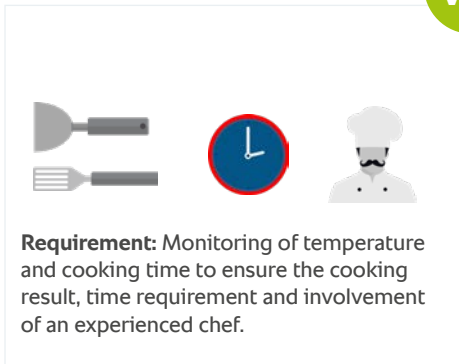


Deep-frying.

Conventional vs. multifunctional cooking appliances.



v/s.

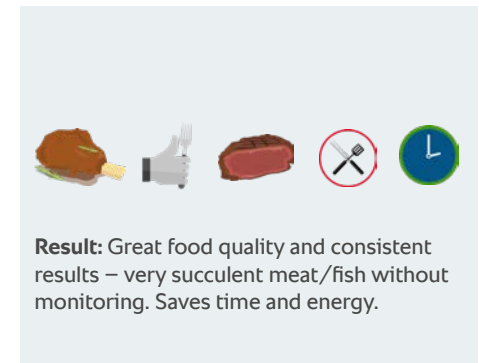
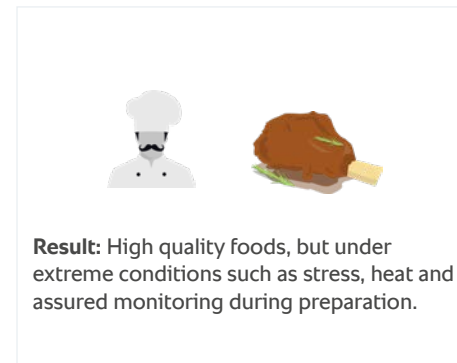
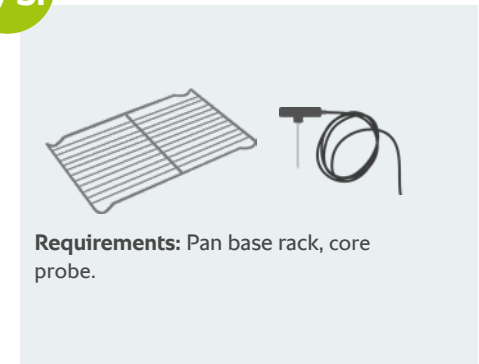
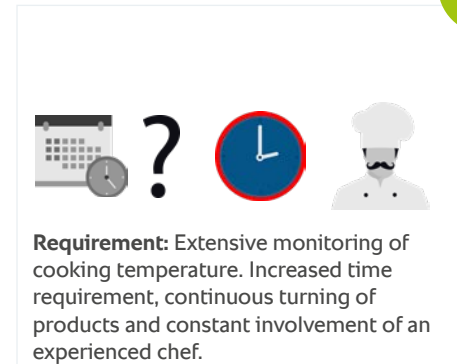


Braising.

Conventional vs. multifunctional cooking appliances.

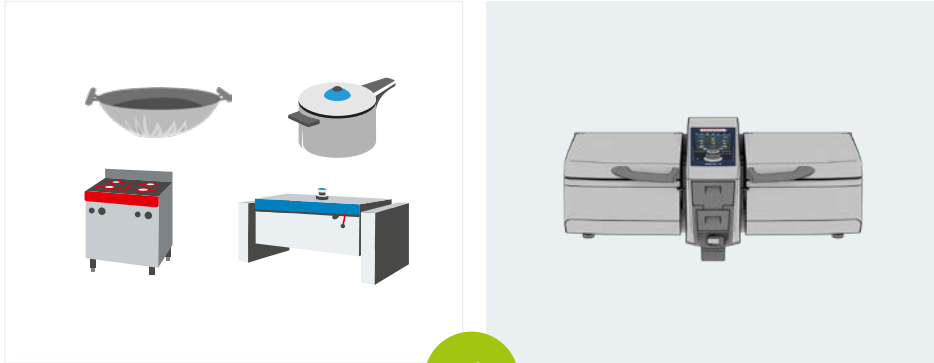


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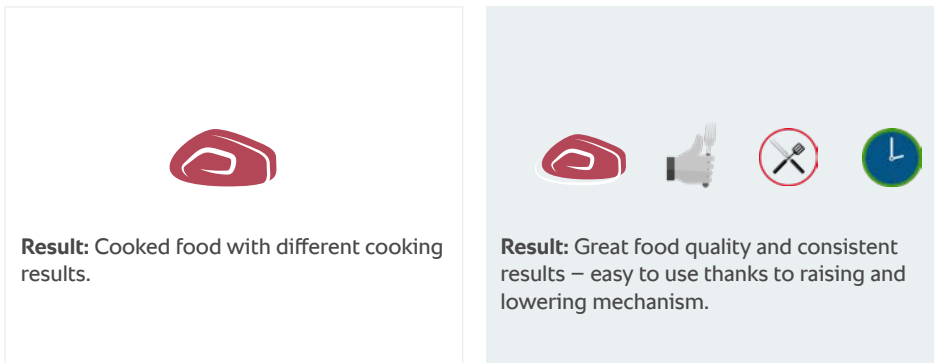
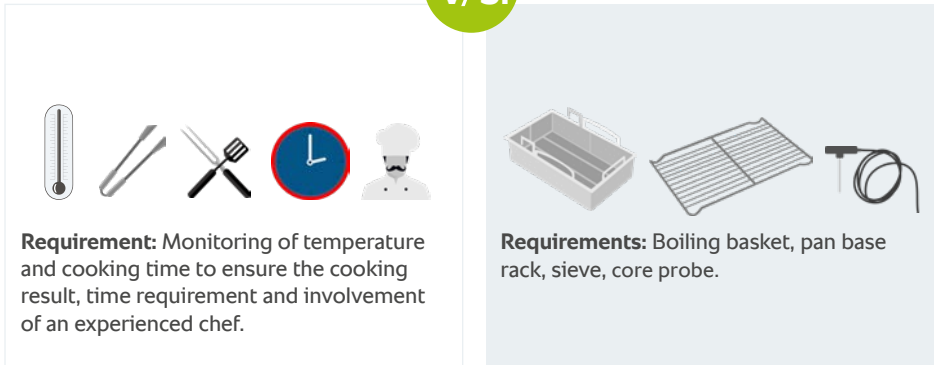


Pressure cooking.

Conventional vs. multifunctional cooking appliances.

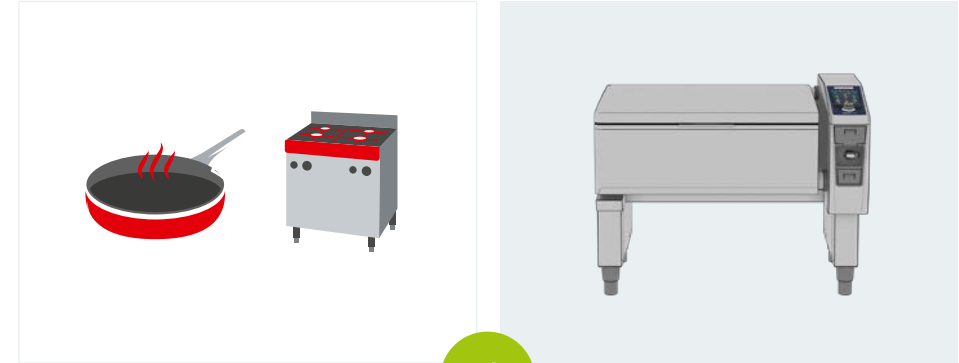


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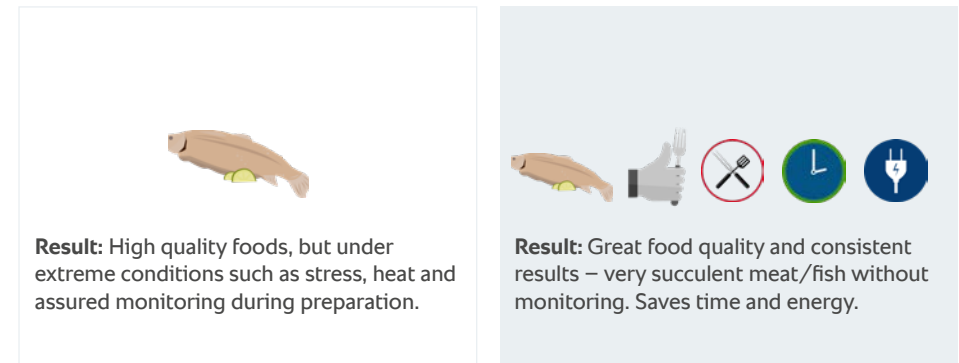
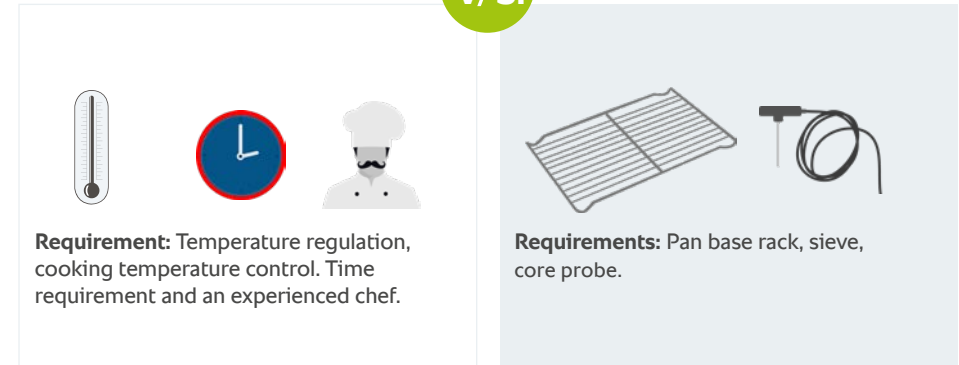


Confit.

Conventional vs. multifunctional cooking appliances.

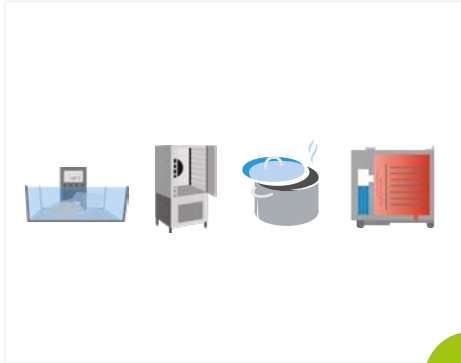


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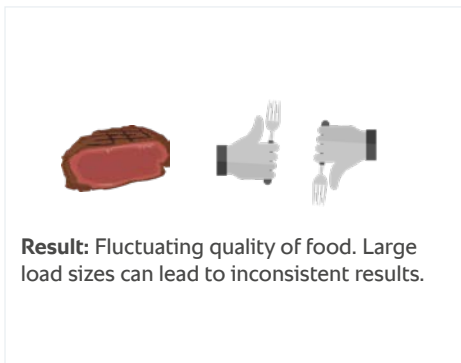
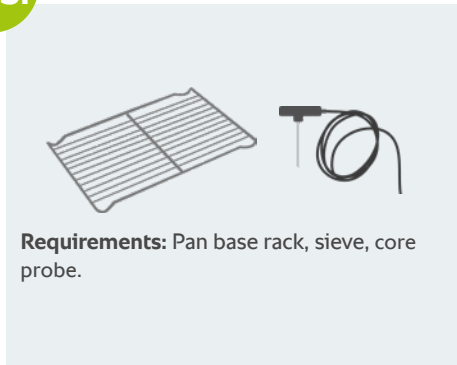
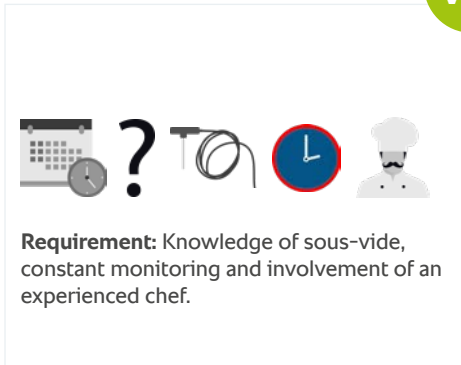


Sous-vide cooking.

Conventional vs. multifunctional cooking appliances.



v/s.



Healthy nutrition and multifunctional cooking appliances.

The intake and consumption of food not only serves to supply the body with important nutrients, but it is also always associated with enjoyment. The sensory properties and the biomarkers, or the vitamin and mineral content, of food are therefore very important qualities.

It is only through cooking that some foods develop their typical aromatic flavour and smell (e.g. Maillard reaction when searing) and change their consistency. Some foods can only be eaten if cooked, e.g. kidney beans.

In order to retain as many nutrients as possible when heating food, it is important to choose the right cooking methods for the relevant food.

The choice of cooking method also has a crucial impact on the colour, shape, flavour and texture of food, and on the sensory quality during consumption.

“Approach love and cooking with reckless abandon”

Dalai Lama



How do you evaluate food quality? The eight dimensions of food quality:

1. Nutritional quality

- › Energy content
- › Nutrient content
- › Salubriousness
- › Digestibility
- › Hygienic properties
- › Range and quantity of prepared food covers the short, medium and long-term requirements in macro- and micronutrients in the body...

2. Hygiene quality

Foods are free of harmful bacteria, viruses, toxins, chemicals and heavy metals.

3. Sensory quality

Food preparation corresponds to the personal culinary expectations in terms of smell, sound, appearance and texture.

4. Cultural/social quality

The range of food and the collective consumption builds identity, community, connects people and is appealing (business lunch, state banquet).

5. Environmental quality

- › Sustainable production, securing own production and the supply of subsequent generations, minimising emissions and waste.
- › Fair products, fair prices and wages.

6. Technological quality

The suitability value defines the technical/ physical quality of the product and comprises the processing suitability or kitchen technology suitability of raw materials.

7. Economic quality

The product is suitable for marketing and for the operation of a profitable enterprise.

8. Psychological quality

Food conveys an appetizing impression and consists of ingredients generally associated with the dishes. It does not generate rejection or disgust.

Healthy and of the highest quality:

Healthy nutrition does not only depend on the high quality and nutritious aspect of food, but also on the food being prepared correctly.



How can the dimensions of food quality be positively influenced?

When **pan-frying**, food is browned in the pan with a little or without any fat and then cooked at a lower temperature.

Low-temperature cooking refers to gentle slow cooking with minor temperature differences between the cooking liquid and the desired core temperature of the food. This becomes particularly succulent and also only produces a minor loss of weight.

With gentle **braising**, cheaper cuts of meat retain most of their weight and the collagen fibres are broken down, which makes the food much more easily digestible and succulent.

In **steaming**, food is cooked in a little water. It is the cooking method that protects nutrients the most, therefore particularly suitable for vegetables.

Pressure cooking refers to boiling or steaming in a firmly closed pot/appliance. Here, constant pressure and a smooth pressure build up and reduction must be ensured. This protects the cell structure for an optimal cooking result.

Sous-vide cooking means cooking things like vegetables, fish or meat, that are vacuum-packed in a bag, in water. This prevents oxidation and the evaporation of unpleasant aromas. Due to the low temperature, the product is cooked gently and important nutrients are preserved.

The various cooking processes have both desired and undesired effects on the food.

The desired effects include the formation of roasted flavours and aromas when cooking, which not only colour the food, but also increase its enjoyment value.

The undesired effects include the destruction of the cell structure (overcooking) in pressure cooking and in boiling, and the production of acrylamide with excessive searing and deep-frying for too long.

In addition, an exact core temperature control can have a positive effect on the quality of food: Using precise temperature regulation, products such as beef can reach the desired cooking level and colour.

High-risk types of meat (such as poultry) are brought to a hygienically safe temperature.

Other factors that can guarantee or improve the food quality:

- › Preservation of secondary plant substances
- › Preservation of minerals
- › Preservation of vitamins

Intelligent multifunctional cooking appliances and their benefits.

A modern multifunctional cooking appliance can significantly reduce stressful kitchen situations. Through the selection of preset cooking paths alone, the appliance recognises the product properties and adjusts the cooking path accordingly. This minimises the time the chef needs to spend for monitoring and acting.

Some manufacturers have been working on this idea for a number of years. They are continually developing and improving intelligent cooking paths.

This cooking intelligence, which is sometimes integrated, continuously controls temperatures in the pan and adjusts them where needed. This ensures that the food is always consistent and cooked according to the user's wishes.

Why are productivity, speed and sustainability so important?

The long heating and cooling phases often result in unnecessarily protracted kitchen processes. The resulting lack of time is in turn reflected in the quality of the cooked product. The modern heating technologies of multifunctional cooking appliances work more quickly and guarantee high quality.

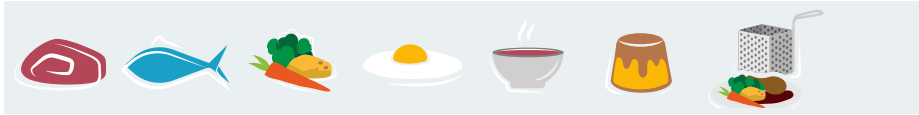
The basic design requirement is the robustness of the appliances. Day-to-day kitchen routines also require high corrosion resistance and scratch-resistant surfaces of the pan base. The requirements in terms of temperature stability and excellent thermal conductivity are only a few examples of what heating system today have to handle.

Requirements in terms of more efficient use of resources in day-to-day kitchen routines are continually increasing.

From the perspective of sustainability, kitchen processes also need to become more efficient. This also means that space requirements, water and energy consumption as well as the use of raw materials need to be reduced. In parallel, cost pressure and the demands of guests are increasing.

A study by Zurich University has shown that in kitchens where multifunctional appliances are used, up to 34 % less energy and 53 % less water are consumed.





The appliance reliably guides the user through every step of intelligent cooking:

Step 1

Select the group by pressing a symbol, e.g. Meat, side dishes or dessert.

Step 2

Select the cooking path or the cooking method, e.g. boiling, frying, deep-frying, overnight cooking etc.

Step 3

If applicable, select any personal settings such as browning level, time and core temperature etc. Depending on the food group and cooking method, the personal settings may vary,

from the selection of the browning level of foods to the selection of the desired cooking level (e.g. medium). So, for example, in the "roast meat plain + breaded" cooking path, the height/thickness of the food is selected: "thin" (less than 2 cm) or "thick" (more than 2 cm). The browning level can also be determined.

If the setting "thick" was previously selected, the cooking level must still be selected in the form of core temperature. If the setting "thin" was previously selected, the cooking time must be set.

For cooking paths that use the cooking method boiling, the settings change accordingly. Here, the setting "time" can be set, but there is of course no browning level to set.

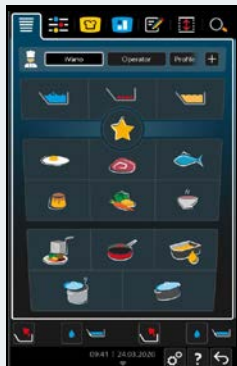
What happens in the pan?

- › Once the cooking path is selected, the pan base or the cooking medium, e.g. water or oil, is preheated. The user is then prompted to load the food into the pan.
- › Immediately upon loading, the intelligent multifunctional cooking appliances recognise the product properties.
- › The necessary cooking parameters to achieve the desired result are adjusted and the residual time determined.

Intelligent cooking is based on a complex temperature/-time-cooking medium-combination. In this combination, the intelligence controls the conditions based on real time data. The other cooking parameters are automatically adjusted.

The processes in the background seem complex, but allow for easy operation, which helps chefs prepare food to a very high quality without any stress.

Below you will find an example of an intelligent cooking path:



1



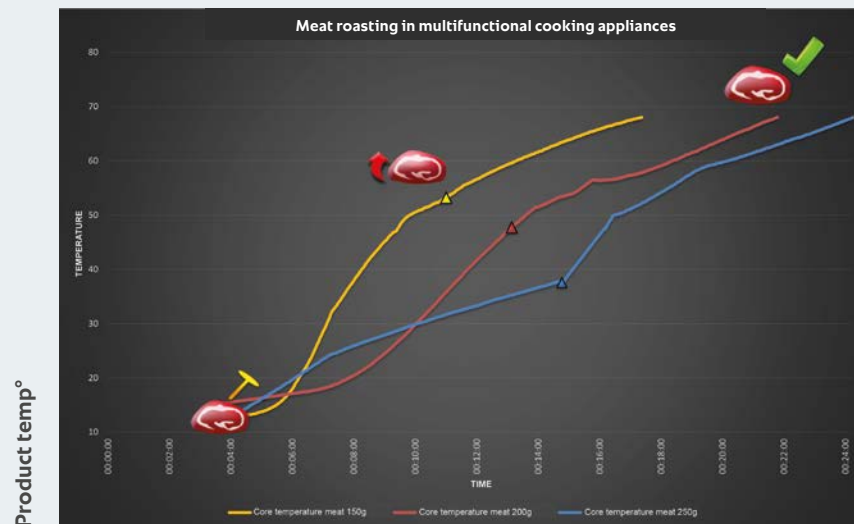
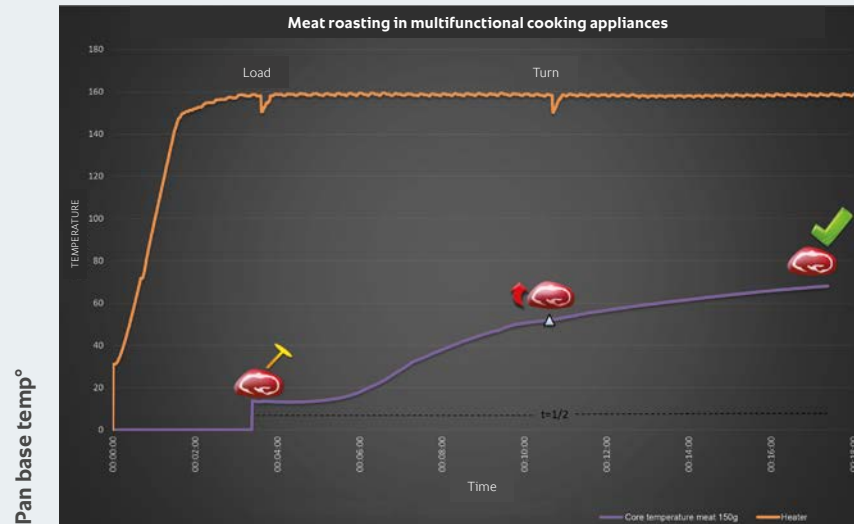
2



3

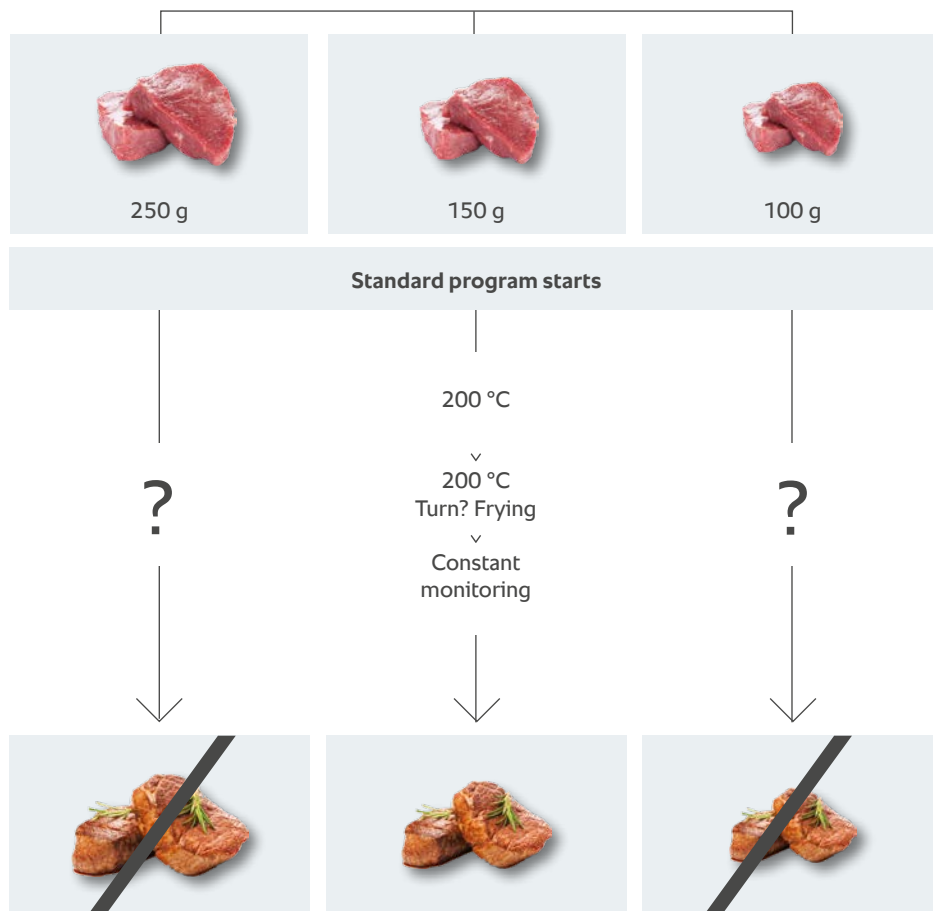


Explanation of an intelligent cooking path “Frying meat plain + breaded”

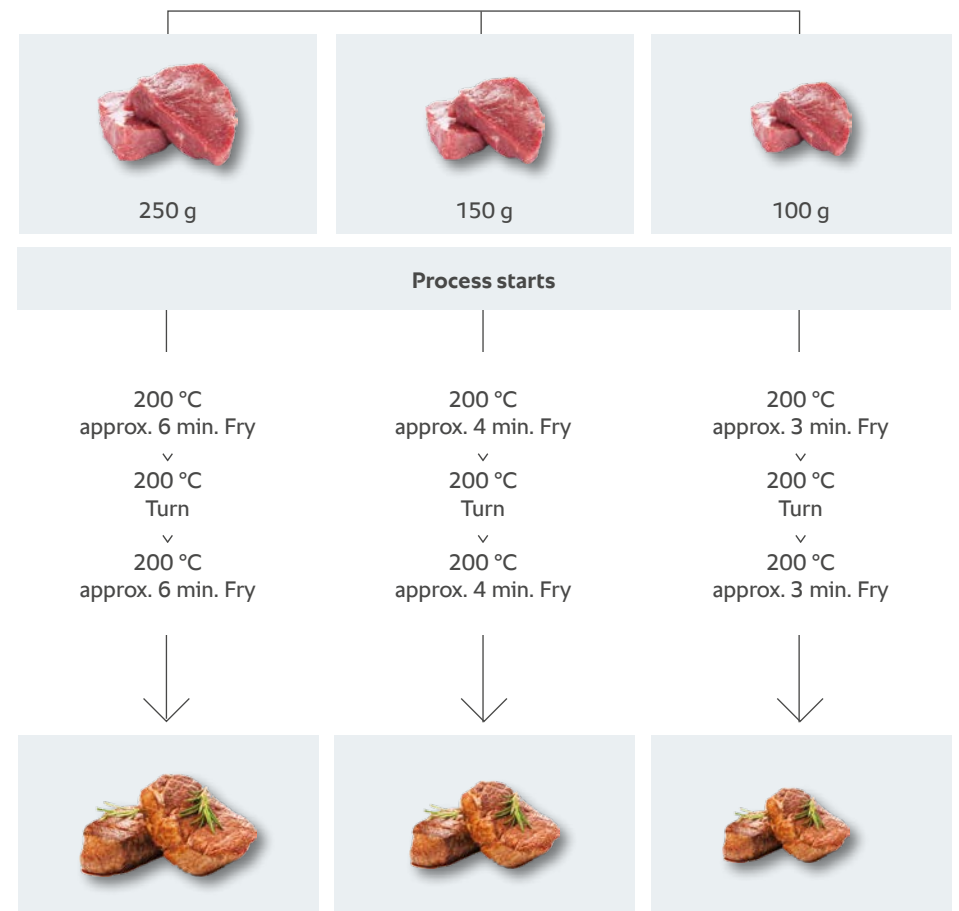


- › The orange line in figure 1 shows the pan base temperature when frying.
- › In minute 3, the preheating phase is complete. The appliance asks the user to load. This prevents resources from being wasted unnecessarily.
- › The food is now loaded into the pan. Since the pan base has several heating elements, the appliance only heats the areas in which it registers a temperature drop.
- › From minute 3, the cooking intelligence starts to make all the calculations based on the product composition and cooks the bottom side of the product.
- › By minute 10, the intelligent cooking appliance recognises the perfect time to turn the product and prompts the user to do so.
- › After the confirmation, the steak is browned between the 10th and 14th minute on the second side, until the desired core temperature is reached.
- › Once this is the case, both sides of the steak have exactly the same degree of browning.
- › Conclusion: The intelligent cooking paths automatically adjust the cooking times and temperatures to the relevant product. The cooking quality is reproducible and independent of the user's experience. Also, the setting is made for the user irrespective of the single or full load, since the temperature is regulated intelligently by the multifunctional cooking appliance and the cooking time is adjusted (see figure 2).

Standard program (no intelligence)



Process (cooking intelligence)



Saving cooking paths and its benefits.

Today's generation of multifunctional cooking appliances are highly developed thermal cooking appliances for commercial kitchens.

They offer maximum benefits to those preparing hot food in large and commercial kitchens. Saving cooking paths in multifunctional cooking appliances not only facilitates cooking, but also provides consistently good results in daily workflows.

In general, programming multifunctional cooking appliances has the following benefits:

- › Daily monotonous tasks can be facilitated with little effort.
- › The programs control the cooking process and as such provide consistent results and quality at all times.
- › Planning and standardisation of tasks can be defined in advance. Production can be adapted to the appliance and as such minimise set-up times.
- › The chef can concentrate on other important tasks. Production can be changed quickly and the appliance stays ready to use at all times.



Saving processes allows the chef to standardise his preparation methods. The newly achieved quality in the preparation of ragouts can now be prepared by anyone in his kitchen.

Example: Ragout preparation

A chef in a busy staff restaurant fries large quantities of meat every day for all kinds of ragout dishes. These are the most popular dishes on his menu.

But their preparation requires a lot of skill and time from the chef. There are long waiting times for heating up and then for searing, the chef has to make sure constantly that the meat receives the right colour. This is very strenuous.

Also, he cannot always estimate the demand exactly. So sometimes he could make too many portions.

Recently, the chef has been receiving many compliments on his dishes. Many customers have also given positive feedback about the new salad bar and the changed dessert presentation. A lot has improved in the last few weeks.

He proudly tells his customers how he managed to improve the quality. The fact that he no longer needs to hold food for long periods, such as the ragout, and that he has finally been able to deal with the salad bar he had long wanted to refresh. Due to his many years of experience in the kitchen, the chef quickly recognised how he had to organise himself to meet the requirements.

Using the intelligent cooking path for meat and the preparation of ragout and diced meat dishes here, he immediately noticed the shorter heating-up time. The entire production time had reduced by more than half. This led him to decide to prepare the popular ragout only a few minutes before the start of service.

He now uses the time gained for a better dessert presentation. With his operations manager, he calculated the potential savings and together they decided to make the investment in the new salad bar.

24 hours with an intelligent multifunctional cooking appliance.

Left pan.

02:00
End of service



06:30
Breakfast



10:10
Prepare a curry coconut sauce



10:30
Sear meat



12:00
À la carte pan frying



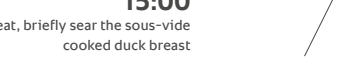
15:00
Fry meat, briefly sear the sous-vide cooked duck breast



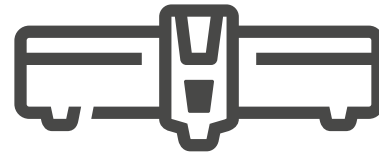
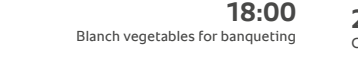
18:00
Blanch vegetables for banqueting



20:00
Cooking pasta



23:30
Braised dishes overnight



02:00
Overnight braising



Right pan.

06:30
Breakfast



10:10
Ragout



10:30
Boil pasta



12:00
Boil à la carte



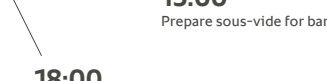
15:00
Prepare sous-vide for banqueting



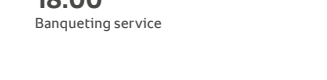
18:00
Banqueting service



20:00
Sear meat



23:30
Overnight boiling of jus



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