Bundesinstitut für Risikobewertung

FAQ

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Pre-cooking for several days: What should I bear in mind?

"Meal prep" means preparing or pre-cooking meals for several days. Meal prep is the short term for meal preparation. Whether using ingredients from your own garden, from the market or from the supermarket - preparing meals for several days or even a week is popular. The advantages are obvious: you know which ingredients are included and can choose the meals yourself without having to cook every day. It also saves time and money.

However, there are some health issues to consider. Storing prepared food for longer increases the risk of microbial contamination and thus foodborne diseases. For some people, the body's immune system may be impaired against foodborne infections due to pregnancy, old age or pre-existing medical conditions. Meal prep is less suitable for them.

Below, the German Federal Institute for Risk Assessment (BfR) has compiled questions and answers on the prevention of foodborne diseases so that the prepared meals remain digestible and do not pose a risk to health.

What do I need to consider when preparing meal prep components?

Hygiene deficiencies when handling food are a major cause of foodborne infections and intoxications. They are mainly caused by pathogens that are found on or in animal food products such as meat, fish, milk or eggs that are eaten raw or not heated sufficiently before consumption. In addition, eating raw fruit, vegetables (especially sprouts), leafy salads or fresh herbs can also lead to infections. Consumers should therefore comply with the general hygiene rules when storing, preparing and heating meal prep components. This also includes personal hygiene, as pathogens can also be transferred to food via the hands.

Detailed information on kitchen hygiene and the prevention of foodborne infections can be found in the FAQ "Foodborne infections in private households - identifying sources and avoiding risks" (https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/foodborne-infections-in-private-households-identifying-sources-and-avoiding-risks/).

As many components of the prepared food should be stored chilled, it also makes sense to check in advance how much space you have available for this, for example in the fridge or freezer. You should also keep an eye on the cooling options at the place of consumption (e.g. at work) and transport the food containers in a cool bag.

What do I need to consider when preparing different meal prep components?

Fruit, vegetables and fresh herbs should be washed carefully during preparation or before consumption, preferably under running drinking water. The risk of infection can also be minimised by peeling some vegetables that grow close to the ground (e.g. cucumbers and carrots). Raw meat and poultry should not be washed, if possible, as this can spread microorganisms in the kitchen. It is better to clean them by dabbing them dry with kitchen paper.

To avoid the contamination of food with pathogens in your own kitchen, it is important to prevent microorganisms from being transferred from (usually raw) food to other food. This form of germ transmission is called "cross contamination". Microorganisms can pass directly from one food to another if they come into contact with each other without packaging. However, indirect transmission via hands, equipment, work surfaces, knives or other kitchen utensils is also possible.

If sufficient cooling capacity is available for perishable food, the following order of food preparation is recommended to protect against cross contamination:

- first prepare food that is not heated before consumption (e.g. desserts, raw vegetables or salads)
- then food that is heated during preparation.

If this order cannot be adhered to for organisational reasons, it is necessary to thoroughly clean work surfaces, equipment and hands between the individual work steps.

Detailed information on the prevention of cross contamination can be found in the FAQ "Foodborne infections in private households - identifying sources and avoiding risks" (https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/foodborne-infections-in-private-households-identifying-sources-and-avoiding-risks/).

Dishes that are heated during preparation are more suitable for Meal-Prep, as most microorganisms are killed at product temperatures of 70 °C to 100 °C. Both during preparation and reheating, the prepared food should therefore be heated sufficiently (to at least 70 °C for two minutes at all points of the food). If you want to protect yourself from illness, you should not only heat raw animal food, but also raw sprouts and frozen berries sufficiently before eating them.

In the case of certain types of bacteria, however, permanent forms (so-called spores) germinate instead of being killed off by cooking. Surviving bacteria and bacteria that have entered the food after heating can multiply between 10 °C and 60 °C. Some types of bacteria produce heat-stable toxins as they multiply. These toxins can cause illness even if the food is still sufficiently cooked after infestation. For this reason, the temperature range at which bacteria multiply must be avoided when keeping food hot and passed through as quickly as possible when cooling it.
Detailed information on the prevention of bacterial food poisoning can be found in the BfR consumer tips "Protection against food-borne diseases caused by bacterial toxins"

(https://www.bfr.bund.de/en/publication/protection-against-food-borne-diseases-caused-by-bacterial-toxins/).

Which containers should be used to store the Meal Prep components?

Any food container that closes airtight can be used for storage. In addition, the containers should be labelled with the glass fork symbol. This symbol indicates that the containers are suitable for contact with food. It is also important that the containers are thoroughly cleaned before filling. The size is also important, as each container should not contain more than you want to eat at one meal. This prevents leftovers of heated food, which then have to be cooled again for further storage.

What is the best way to store Meal Prep components?

To avoid food contamination during storage, it should be kept in closed containers or completely covered. For raw Meal-Prep components such as fruit, vegetables and leafy salads, it is particularly important that they are packaged separately from other components (e.g. cooked pulses, sauces, dressings) due to their high germ content. For reasons of flavour, it can also make sense to pack different meal prep components (e.g. cooked pasta and sauce) in separate containers.

As refrigeration slows down or even stops the growth of most bacteria, prepared or pre-cooked meals should be kept in the fridge until consumption.

Pre-cooked meals can also be frozen to extend their shelf life. It is important that the food has cooled down before it is placed in the freezer.

How long can Meal Prep components be stored?

No generalised information can be given on the shelf life of prepared meals. However, the lower the germ content (e.g. due to sufficient heating) and the colder the fridge, the longer they will be edible. To avoid foodborne diseases, it is advisable to consume heated meals within 2-3 days or freeze them. Meals with raw ingredients should be consumed no later than one day after preparation.

The BfR recommends a maximum refrigerator temperature of 7 °C, 5 °C would be better. However, the temperature in the fridge is not evenly distributed. It therefore makes sense to check the temperatures in different places. The lower domain close to the back wall is usually best for storing prepared meals for several days, as this is where it is coldest in most refrigerators.

Further information on correct refrigeration:
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/correct-cooling-frequently-asked-questions-on-refrigerating-foods-in-private-households/

What needs to be considered when freezing?

Meal prep components should be individually packaged in portions and frozen. Freezer burn occurs when food dries out during freezing due to contact with air. To prevent this, the containers should contain as little air as possible.

To keep an overview, the date of storage should be labelled on the frozen food containers next to the name of the food, as not all foods can be kept frozen for the same length of time.

This is how long the different types of food can be stored at - 18 °C:

- Beef and pork: 3-6 months
- Poultry: 3 months
- Fish: 6 months
- Vegetables and fruit: 6-12 months, if cooked or blanched up to 12 months

What is the best way to reheat chilled and frozen food?

As bacteria can multiply particularly well between 10 °C and 60 °C, it is important that frozen food is defrosted in the refrigerator, for example overnight, so that it does not reach this temperature range.

Various microorganisms and pathogens cannot be seen with the naked eye and also withstand the odour test. Therefore, when reheating, the food should be heated so intensely and evenly that it has a temperature of over 70 °C in all parts for at least 2 minutes. Frozen berries should be heated even more, to around 90 °C, in order to inactivate heat-resistant viruses.

How do I know if the food is edible?

The rule of thumb "look, smell, taste" is a popular guideline for assessing the edibility of food. However, it does not take into account possible contamination with zoonotic pathogens such as *Salmonella* or Campylobacter. Zoonotic pathogens are pathogens (e.g. bacteria, viruses, parasites) that can be transmitted from animals to humans or vice versa. They also occur in clinically healthy animals and are not recognisable in food because their presence does not change its smell or taste. Only careful hygiene and heating can prevent a foodborne infection.

If the food is mouldy or small gas bubbles have formed in it, it should be disposed of in any case.

Particularly vulnerable groups of people - who are they and what should they consider?

Particularly vulnerable groups include people whose body's immune system is impaired against foodborne infections due to pregnancy, old age or pre-existing medical conditions or is not yet fully developed (young children under the age of five). Meal prep is therefore less suitable for them.

Particularly sensitive people should avoid raw animal food products as far as possible. In addition, immunocompromised people and pregnant women should avoid eating pre-cut and packaged salads as a precaution and instead prepare their own salads and raw vegetables from fresh ingredients that have been thoroughly washed just before consumption. (Link to Resistant bacteria. Wash uncooked vegetables and lettuce thoroughly and prepare them fresh by yourself, https://www.bfr.bund.de/en/opinions/resistant-bacteria-wash-uncooked-vegetables-and-lettuce-thoroughly-and-prepare-them-fresh-by-yourself//)

Further information on the BfR website on the topics of kitchen hygiene and food hygiene

BfR fact sheets for consumers https://www.bfr.bund.de/en/publications/leaflets/

Consumer advice: Protection against foodborne infections in private households https://www.bfr.bund.de/en/publication/consumer-advice-protection-against-foodborne-infections-in-privatehouseholds/

Campylobacter: The diarrhoea pathogen is often found on poultry meat https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/campylobacter-the-diarrhoea-pathogen-is-often-found-on-poultry-meat/

FAQ Botulism
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/rare-but-avoidable-questions-and-answers-about-botulism/FAQ Moulds in food

FAQ Mould in foods
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/mould-in-foods-health-risks-and-how-to-avoid-them/

FAQ Correct cooling
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/correct-cooling-frequently-asked-questions-on-refrigerating-foods-in-private-households/

FAQ Materials for food contact
https://www.bfr.bund.de/en/service/frequently-asked-questions/topic/frequently-asked-questions-and-answers-concerning-the-bfr-recommendations-on-food-contact-materials/

Podcast
Underestimated risk: bacteria in the kitchen, only in German
https://podcast.bfr.bund.de/6-unterschatztes-risiko-keime-in-der-kuche-006

Videos
Educational videos on kitchen hygiene
https://www.bfr.bund.de/en/publications/educational-resources/

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent
independent institution within the portfolio of the Federal Ministry for Agriculture, Nutrition and Home Affairs (BMLEH). It advises the Federal Government and the German federal states ("Laender") on issues of food, chemical and product safety. The BfR conducts its own research on topics that are closely related to its assessment tasks.

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