



Handbook for reducing food waste

– for health care, schools and care services.



Livsmedelsverket

Swedish Food Agency

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Foreword

We need to cut global food waste per capita by half – both at the retail and consumer levels. We also need to reduce food waste along the entire food production chains. This includes post-harvest losses. This is the message of target 12.3 of the UN's Global Sustainability Goals and Agenda 2030. Municipal meal services have an important role to play as they have a great potential to reduce food waste. They can also serve as excellent role models.

Many municipal meal services are already working actively to reduce food waste. The Swedish Food Agency has produced this handbook to better support these kitchens and other food service providers that may not yet have made as much progress. The handbook builds on the Gothenburg Model for Cutting Food Waste¹, which has proven successful in helping meal services to cut their food waste by half².

The handbook for reducing food waste is based upon the Gothenburg Model, with the addition

of an extra section on "plate waste", ways of measuring food consumption, and the Swedish Food Agency's national method for measuring food waste.

The handbook has been reviewed by external experts and representatives of municipal meal services.

The Swedish Food Agency would like to thank the City of Gothenburg and all those that have shared information to help more municipalities and counties develop their efforts to reduce food waste.

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1. <https://goteborg.se/wps/wcm/connect/68eb3c1f-062d-49be-a38e-9b75bf6937ea/G%C3%B6teborgsmodellen+f%C3%B6r+mindre+matsvinn.pdf?MOD=AJPERES>
2. Karin Östergren and Elin Backlund (2019), A model for cutting food waste in municipal kitchens: The Gothenburg case study. Advances in Food Security and Sustainability, Volume 4 1st Edition

Together, we can reduce food waste!

No one wants to throw away food unnecessarily. Food waste has serious impacts on both the climate and the environment, and it costs money. Many municipal meal services around Sweden have already begun working to reduce the amount of food thrown away. Thanks to dedicated and knowledgeable staff, this work has excellent potential for continuing. We are joining efforts to further reduce food waste. Your and your colleagues' commitment are key to our success, but we also need good routines and tools.

The Handbook for Reducing Food Waste is a practical tool that illustrates how municipal kitchens can reduce food waste by following simple steps and changing routines. The handbook is intended for cooks, chefs, food service staff, and managers. It can be used in kitchens where food is prepared, received, and served. The handbook also supports people working where food is served – medical and health care professionals, childcare and adult care staff, and schools. The objective is for food to end up in our stomachs, not in the rubbish bin.

Efforts to reduce food waste vary between private restaurants and public canteens. Often in public canteens, too little of the prepared food is eaten. Reducing food waste is not primarily about preparing less food, rather, that the food prepared should be eaten. In private restaurants, the challenge is often the opposite – guests both take and eat more food than they need. **Efforts to reduce food waste in public canteens should never spark a fear of trying new types of dishes or lead to the guests taking too little food as a strategy to avoid throwing away food.**

Starting to measure waste is an important way of reducing food waste. We know what we measure. The Swedish Food Agency has produced a national measurement method, so that everyone can follow a standardised approach. The method is described in this handbook and on the Swedish Food Agency's website.

The handbook describes several measures for how facilities can reduce food waste in *kitchens*, when *serving diners*, and from what is thrown away from diners' *plates*. The measures are based upon experiences from public kitchens that have been successful in reducing food waste. The key is cooperation: between those responsible for preparing food and those present when food is served and eaten in preschools, schools, elderly care, hospitals and other facilities. It is important to communicate and involve all stakeholders.

Kitchen staff can contribute to reducing waste in food preparation and when served. Educators, teachers, care staff and medical staff can all contribute in reducing waste when food is served and from diners' plates. Begin by speaking with everyone concerned and informing them about why it is important to reduce food waste. Support of the staff is necessary for success.

Together, we can reduce food waste. Together, we can make a difference.



Why do we need to reduce food waste?

1. For the sake of the environment

Food production creates serious environmental problems around the world. Eutrophication, climate change, chemical pollution, destruction of the rain forests, and over-fishing are some examples. By taking better care of our food and throwing away less, we ensure that there is enough food for more people, and we can reduce our environmental impact. Even if food waste can be converted to biogas, it is much better³ for the environment if the food never had to be produced. Every kilo of food that is wasted has caused 1.6 kg of CO² emissions from its production^{4,5}.

2. For food to have the greatest benefit

Good meals contribute to both our health and well-being. The food that is eaten can both make it easier for us to learn and improve our physical abilities. In other words, food can contribute to improving the quality of many different types of organisations. Enjoyable meals and food that is well suited to various groups increases the chances that the food is consumed. However, food can easily end up in the rubbish bin if consumed in a noisy, stressful or unsafe environment. One challenge for municipal meal services is that too little of the food is eaten. The first solution to reducing food waste should not be to prepare less food, but rather to ensure that the food that is prepared is eaten.

3. Preventing the waste of finite resources

Preparing food that is subsequently thrown away wastes both time and money. Estimates indicate that the ingredients for every kilo of food waste that is produced in municipal kitchens costs roughly SEK 26⁶. The cost per kilo varies, however, depending on the ingredients. Additional costs include staff (for ordering, receiving and preparing the food) and costs associated with facilities, electricity, sanitation and environmental impacts. The resources that are freed up by reducing food waste can instead be used to improve the quality of the meals and to purchase higher quality food.

4. Achieving the UN's Sustainable Development Goals, Agenda 2030 and your own goals!

Cutting food waste in half by 2030 is one of the UN's Global Sustainable Development Goals⁷. Sweden has also adopted this goal, and it has been incorporated into the National Food Strategy⁸. Municipal kitchens are an important factor in achieving the goal. Reducing food waste is also a part of complying with national legislation on waste. The legislation stipulates that food waste should be prevented; therefore, these facilities should prioritise achieving this. Food waste that cannot be prevented should be donated or redistributed^{8,9}.

3. <https://www.livsmedelsverket.se/matvanor-halsa--miljo/miljo/ta-hand-om-maten-minska-svinnet/resurshierarki-for-livsmedel/>

4. Katharina Scholza, Mattias Eriksson, Ingrid Strid (2014) Carbon footprint of supermarket food waste, Resources, Conservation and Recycling

5. This shows CO² emissions from mixed food waste from grocery stores. These figures apply at the time of writing.

6. Statistics from Hantera Livs. From 19 January 2019 to 30 September 2019, the average procurement price for food was SEK 25.47 per kilo in the participating 160 municipalities.

7. Agenda 2030, Goal 12.3. By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

8. <https://www.regeringen.se/490897/contentassets/256cc25ab5a84db7a76730abb9cc3773/en-livsmedelsstrategi-for-sverige-fler-jobb-och-hallbar-tillvaxt-i-hela-landet-prop-2016-17-104.pdf>

9. <https://www.livsmedelsverket.se/produktion-handel--kontroll/produktion-av-livsmedel/nyheter-for-livsmedelsforetagare/kommunala-verksamheter-far-salja-skanka-och-ta-emot-overbliven-mat/>

10. <https://www.livsmedelsverket.se/matvanor-halsa--miljo/miljo/ta-hand-om-maten-minska-svinnet/resurshierarki-for-livsmedel/>

What is food waste?

The food we throw away can be divided into two groups. One group consists of unavoidable food waste, such as rinds, bones, pits, and coffee. The other group consists of items that we can avoid throwing away; these are called food losses. Food losses are foods that are thrown away, but that could have been consumed if they had been handled differently. With the Swedish Food Agency's measurement method, we have chosen to include rinds, bones and napkins to make the practical work of measuring food waste easier.¹¹

Examples of food losses:

- Foods that have expired;
- Food left in serving dishes;
- Food that is thrown away from diners' plates;
- Ingredients thrown away due to excess peeling.

Food waste can be divided into three groups

There are three types of food waste, or losses, that occur in meal services: waste from kitchens, from serving the food and from diners' plates.

Kitchen waste: The food losses occurring in the kitchen. These can be divided into three groups:

- Storage waste: Food from refrigerators, freezers and pantries that must be thrown away for various reasons.
- Preparation waste: Food that is thrown away in conjunction with preparation.
- Cooking waste: Food that is cooked but cannot be used for various reasons and is thrown away without having been served.

Serving waste: Food that is served but does not reach diners' plates and is thrown away because it is not or cannot be eaten¹².

Plate waste: Everything thrown away from diners' plates.



11. This aligns with both the World Resources Institute's (WRI) and the EU's definition <https://www.wri.org/publication/reducing-food-loss-and-waste-setting-global-action-agenda>

12. Food served on a buffet, in a serving line in a school restaurant, in canteens or in serving containers at a childcare, preschool, elderly care facility or hospital. förskola eller äldreboende eller sjukhus

How to reduce food waste

The following pages provide suggestions for ways of helping you and your colleagues to systematically reduce food waste in your kitchens or facilities. Most of the described measures can be easily implemented in every kitchen and provide a good basis for creating effective routines in your daily work. Several of them can only be implemented in cooperation with other staff relevant staff, such as educators, teachers, care staff, or health and medical staff.

Many of the measures may be natural for those working in kitchens. However, it is easy to miss issues, especially when stressed. Therefore, it is recommended to make efforts for reducing food losses a part of daily routines. This needs to be a continuous process. Routines can be integrated into your regular safety protocol.

It is important to allow efforts to reduce food losses to take time, especially in the beginning. This includes measuring progress and discussing them. Changing routines takes time, and it is important to allow for this. It is also necessary to have resources to handle new ideas that may arise.

Many factors affect food waste

There are several reasons that food is thrown away in a meal service. The picture illustrates the various areas that must be included in efforts to reduce the various types of food waste: in the kitchen, where food is served, from diners' plates.



The various areas that must be included in efforts to reduce the different types of food waste.

Get started

1. Assemble and train relevant staff concerning why and how they should work to reduce food waste.
2. Measure food waste. What isn't measured, isn't seen.
3. Present the results of the measurements regularly at staff meetings or other relevant forums and discuss the reasons why food is thrown away. Remember to present the results for diners and other relevant staff.
4. Discuss which actions you can plan to implement first. Start with those that are the easiest and most important. It can be a good idea to focus on one aspect at a time. Make a list of measures to implement.
5. Post the list in the kitchen.
6. Create routines for reducing food waste and inform staff of these.
7. Decide who will be responsible for each measure in the kitchen or facility.
8. Lastly, celebrate your progress when a measure has been implemented.

Remember: Changing routines will take time. Don't give up. It takes time to change routines.



Measure and monitor

The first important step is to begin to measure and document food waste. What isn't measured, isn't seen. Measuring food waste creates awareness of the issue, as well as where and why it occurs. Does it predominantly occur in the kitchen, in conjunction with serving food, or is food from diners' plates being thrown away? Once you know how much food is being thrown away, the effects of the actions you implement will be more apparent later.

What measurements should you take? National method for measuring food waste in municipal kitchens

The Swedish National Food Agency has designed a national method for measuring food waste, so that comparable figures can be collected in different parts of the country. To calculate the percentage of food thrown away, it is also necessary to measure the amount of food that is served. This is also necessary for calculating the amount of food that actually is consumed (read more in the section on measuring consumption). Register your data on food waste in the systems used at your organisation, for example a cost-data system, an Excel sheet, or in the Swedish Food Agency's template for food waste measurements (in Swedish).

You can read more on methods for measurements in the Appendix to the handbook and on the Swedish Food Agency's website, under "Public meals" (in Swedish).

Set goals for reducing food waste

Set goals for how much you want to reduce food waste and in what time frame. Set sub targets to make the job more fun. Go through the handbook and make a plan to reach your goals.

How often should food waste be measured?

It is not possible to identify exactly how many days measurements need to be taken to accurately measure food waste. Each facility needs to decide its own approach. The precursor to the handbook, the Gothenburg Model for Cutting Food Waste, recommended daily measurements.

Facilities commonly measure food waste over five days in the spring and five days in the autumn. One risk of having too few measurement days is that the chosen days may not be representative for the facility.

Present your results

Display your measurements in a suitable place where everyone can see them, such as next to the kitchen scales. Share the results with diners and other relevant staff. Make it clear how large the volume of food waste is and how the volumes are changing over time. Use pictures, bar graphs or other illustrations.

Discuss food waste at staff meetings

Make presenting the results of your food waste measurements a permanent agenda item at staff meetings. Share them with diners in suitable forums as well, such as the pupil council, food committees or cafeteria ombudsman. Discuss the results you have achieved and how they can be made even better.

Conduct extra measurements if volumes of food waste are large

If there is a large amount of food waste, it could be advisable to make extra measurement to determine where the greatest waste is occurring. How great is the waste from the salad buffet? How much waste occurs from peeling and chopping?

Key indicators

Key indicators are a way for organisations to steer towards goals. They are a way to make it clear what results the measures implemented have led to. Key indicators can also be used to make comparisons between organisations/facilities and between municipalities.

Some common examples of key indicators for food servicing and food waste include:

Total food waste per diner (in grams)
Food waste in the kitchen per diner (in grams)
Waste associated with serving food per diner (in grams)
Grams of waste from plates per diner (in grams)
Total food waste (in kilograms)
Food waste in the kitchen per diner (in kilograms)
Food waste associated with serving food per diner (in kilograms)
Food waste from plates per diner (in kilograms)
Total food waste as a percentage of served food
Food consumption per diner (in grams)

To calculate the volume of average food waste per person, the number of servings eaten needs to be calculated, i.e., knowing the actual number of persons eating. To calculate the percentage of food waste and food consumption, the volume of food served also needs to be measured. You can read more on methods for measurements in the appendix to the handbook.



Kitchen waste

– The food losses occurring in the kitchen.

Purchases

Establish routines for preparing purchases

Use your recipes and your own experience of how much food is typically used as a guide. Make an inventory of ingredients and leftovers in your refrigerators, freezers and pantries. Check which diners are expected to be present or absent.

Use your stored food

Stored food that is seldom used often creates considerable food waste. Your stores of groceries and food should be turned over regularly to prevent food waste. It is, however, also necessary to have supplies in case of crises.

Have fresh ingredients delivered close to the time for use

Order fresh ingredients with a short shelf life so that they are delivered close to the time they are to be used.

Buy packages in various sizes

Buy ingredients in both larger and smaller packages. This way, it is easier to avoid unopened packages being left standing and expiring. Place food in the freezer in reasonably sized packages..

Purchase smaller cuts or volumes

Smaller potatoes, meatballs, and burgers make it easier to adapt serving sizes to different diners' wishes and needs.

At the time of delivery, make reasonable demands on expected shelf life of ingredients

It is important to place reasonable demands on suppliers for the number of days food products should have left to expiry date. The reason for this is to avoid transferring the problem of food waste higher up in the value chain – in this case to the wholesaler. A sustainability ladder for acceptable expiry dates has been produced in an industry-wide agreement between the Food & Nutrition and the industry regarding procurement of food products . See image below.

Sustainability and acceptable expiry dates, ladder for fresh goods, frozen goods, dry goods and canned goods*

Days to expiry from date of production	Minimum number of days remaining upon delivery
Up to 12 days	5 days
13–30 days	7 days
13–30 days	14 days
13–30 days	30 days
More than 300 days	90 days

* Note that this does not apply for fresh fruit and vegetables

Storage

First in – first out

Have a good turnover of groceries so that they do not expire. Apply the first-in, first-out principle. Items with a long shelf life and many days remaining to expiry should be placed farthest back or on the bottom shelves.

Stay organised

If several people are working in the kitchen at the same time, appoint individuals responsible for each pantry or refrigerator. Conduct regular stock inventories and keep things well organised, for example when placing orders.

Freeze fresh goods that are left over

Most items can be frozen if they are not used up after being cooked. Ensure that packages are closed properly.

Mark packages with dates and contents

Write dates on opened packages with fresh goods. Mark packages with leftover cooked food with the date and contents. Food legislation stipulates that the contents and source of food (traceability) must be clearly labelled. Stored food that cannot be traced must be thrown away.

Differentiate between best-before dates and use-before dates

Best-before dates

Best-before dates do not indicate how long food items are safe, but rather to which date the items are expected to maintain a certain quality, such as taste, colour, crispiness, elasticity or bite resistance. Their quality begins to depreciate after the best-before date. However, they can still be fully edible. Food that has passed its best-before date may be used, provided it is edible. Look, smell and taste!

Use-by date

Use-by dates indicate how long it is safe to eat foods. They are used for foods that can easily be destroyed by microorganisms and which can be dangerous for our health if they are stored too long – even if they are stored correctly.

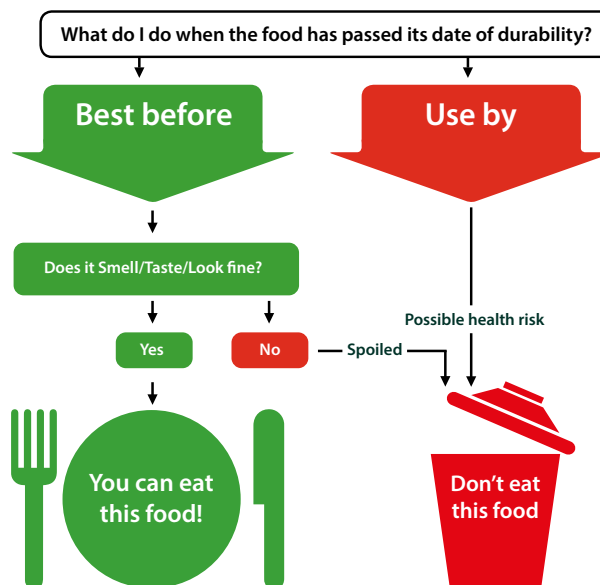
Foods that have an expiry date should not be considered safe to eat after the date on the packaging. Therefore, such foods should neither be sold nor donated after this date.

Cook, eat or freeze foods with an expiry date prior to this date. Remember that these foods should be prepared immediately after defrosting.

Best before – good after?

The food is often OK to eat after **best before**-date.

- Store the food according to the instructions on the packaging.



Set the refrigerator to 4 °C

Food that is stored at 4 °C, rather than 8 °C, holds twice as long. The lower temperature causes greater energy consumption, but each kilo of food that is not wasted reduces our environmental impact.

Rescue food if the freezer malfunctions

If the freezer malfunctions, it is important to first determine whether items can still be used. Bread can be re-frozen, even if it has thawed. Vegetables, meat, fish and poultry that have thawed can be cooked if they are below 4 °C. Half-frozen food can be re-frozen.

Store food properly

Most vegetables and some fruits can best be stored in the refrigerator; however, bananas, tomatoes, cucumbers and courgettes should preferably be stored at 12–15 °C. Ethylene, a gas produced by ripening apples and tomatoes, causes other fruits and vegetables to rot more quickly. You can read more about how food should be stored on the Swedish Foods Agency's website under the "Food losses and waste" section.

Preparation

Prepare a reasonable amount of food

Follow the recommendations on serving size on page 14. It is a good idea to have dishes on reserve that can be easily warmed up in case more food than expected is eaten. Leftovers can be chilled and served at a later time. You can read more about the various ways to save and re-use food in the new industry recommendations for safe food service in municipal kitchens.

The industry recommendations are available at www.offentligsakermat.se¹⁵

Food should be prepared and distributed in different container sizes

This makes it easier to distribute more precise quantities of food and to adjust the amount of food that is served.

Prepare food in stages

It is easier to adjust the amount of food to the number of diners when food is prepared in stages. Food can also be prepared in advance but wait with the final steps of mixing and cooking the dishes until just before serving. This also makes it easier to use excess ingredients in other dishes.

Provide feedback to those responsible for recipes

Discuss and review recipes regularly. Make suggestions for changes to those responsible for recipes. This contributes to reducing food waste.

Defrost food slowly in the refrigerator

If food is defrosted too quickly, liquid evaporates, and the food can become dry.

Weigh all food that is sent out

Do not include a “little extra”, as this can be leftovers. Include a list of the total amount of food sent and the estimated serving size, showing how much of the meal’s various components should be included in a normal portion. Include a picture of how a serving should look when served and make suggestions about choice of serving utensils. Ask for feedback on whether there were leftovers or if the food delivered was insufficient.

Prepare smaller cuts or volumes

Many diners serve themselves a certain number of each item, rather considering the total size or volume of food. By making smaller burgers, bread rolls, and other items, it is easier for diners to take the right amount of food.

Peel and chop carefully

Use the green part of leeks and broccoli stems and press lemons with a lemon press. Carrots, apples and potatoes can often be used in dishes without peeling them. Unused parts of vegetables can often be used in stews. Other bits can be used to make a bullion or vegetable stock.



15. Only in Swedish

Serving waste

– food that is served but not taken (for example, in buffets).

Menu planning

Compose flexible menus

A flexible menu makes it easier to adapt meals to the diners and for what is available in the kitchen.

A flexible menu is less detailed, and it leaves room for changes. In menus that are designed for several kitchens, many of the ingredients can be pre-determined, such as for a stew. However, alternative dishes and sides can be adapted to items available in the kitchen and diners' wishes.

A flexible menu can also be adapted to include ingredients from wholesalers and other supplies that have a short shelf life. When purchasing food services from other providers, it is important to remember that they also need flexibility

Involve the diners

Ask for feedback from a food committee or a user committee or distribute questionnaires. Make a note of which dishes lead to more food waste. If the facility has a flexible menu, it is important to inform the diners that all the dishes may not be available towards the end of the serving time.

It is important to take note of diners' needs when serving food in individual servings, such as in hospitals. Things to consider include which dishes are served, serving size and where and when individuals can eat.

Plan site visits

It is useful if cooks and chefs are able to visit the facilities where meals are served – both if they are eaten in an adjacent restaurant or delivered to another facility. This helps lead to a better understanding of the meal situation, which makes it possible to adapt the meals/serving sizes/instructions to the facility while also having the opportunity to meet the diners and staff.

Regular ingredients and dishes

Ingredients that are left over should be used in new dishes as soon as possible. The same kind of fish can be used in several different dishes, such as fried fish and fish soup. If two alternative dishes are served, it is a good idea to repeat the same combinations. That makes it easier to determine how much needs to be purchased and prepared.

Give dishes suitable names

Giving dishes attractive names sets diner expectations correctly. The name should describe a meal's ingredients. This way, the diners have the right expectations and do not reject a dish because of the name.

Plan the menu with respect to delivery times. For example, plan the menu so that fresh ingredients can be used close to the time of delivery. This reduces the risk of unnecessary food waste due to long storage times.

New dishes as an alternative

Let smaller groups test and taste entirely new dishes or add new dishes as alternatives on the menu. This allows diners to give feedback on the food and provides the kitchen staff with the opportunity to adjust the preparation and contents of the dishes, as well as how they are served.

Calculating serving sizes

Get to know your diners – adapt to how much they generally eat

All diners should naturally have the opportunity to eat a full, appropriately sized serving. However, there are often more leftovers than expected. Adjust serving sizes to the amounts that generally are consumed. The amount of food eaten is a good indicator of a meal's quality and should be used to further develop the menu and recipes to suit diners' preferences.

Adapt to diners' preferences

Many older persons have a poor appetite and are unable to eat a normal portion. There are often leftovers and they do not eat enough food. Many of them need several, smaller, easy-to-eat serving sizes with a higher energy and protein content. The meals should be spread out over the day. Snacks are important sources of energy and nutrients. Read more on this in the Swedish Food Agency's advice on "Good meals in elderly homes"¹⁶.

Provide feedback to those responsible for recipes

Discuss and review recipes and portion recommendations regularly. It is important that those serving the food can give feedback on how well the diners enjoyed their meals to those planning and preparing them.



16. Only in Swedish

Report absences among diners

An important aspect in reducing food waste is to have as good as possible estimation of the expected number of diners. This needs to be both realistic and in as real time as possible. This assumes a dialogue with headmasters, preschool directors and unit managers of elderly homes or hospitals, as well as good routines for reporting planned absences (such as field trips and outings). A routine for reporting unplanned absences (due to illness, etc.) is also necessary.

A close dialogue between the kitchens preparing and the kitchens receiving and serving meals is needed to adjust the number of servings required. Routines for reporting absences are especially important for diners requiring special meals. The form for ordering special meals can include when, how and to whom absences should be reported. Absences can also be reported using school software, on school websites etc.

Serving food

Serve only as much food as is expected to be consumed

It is important that staff are knowledgeable in and able to cook and serve food adapted to the number and flow of diners. This is important when meals are served on a buffet or in serving dishes in wards.

Putting one serving dish out at a time makes it easier to minimise food waste. When serving cold cuts at breakfast, for snacks or as side dishes, it is important to portion them out, so that it is not necessary to throw out leftovers later

Use the right size of serving utensils

Use smaller serving utensils. This makes it easier for diners to take the right serving size.

Give regular feedback to the kitchen preparing or delivering the food

Establish a routine for informing the kitchen preparing or delivering the food on how much food is consumed. Make an agreement with those preparing meals on how feedback will be provided – by telephone, email, SMS or make a note of it on the documents sent with the food when serving dishes are returned. Indicate how much leftovers there were, how many diners were present and what they thought about the food.

Buffets – primarily in schools

Use smaller serving dishes towards the end of the mealtime.

Smaller dishes that are well-filled are often seen as more pleasant. Larger dishes can easily begin to look sticky and unclean when there is little food left in them.

Count the number of plates used

This is an easy way to keep a record of how many have eaten and how many more diners are expected. This makes it easier for the kitchen to prepare food in stages.

Work together with those who schedule lessons and mealtimes

A good lunch schedule creates an even flow of diners and prevents larger peaks during the latter part of the meal service. Discuss ways to achieve this with those responsible for scheduling at the school. Plan lunches sandwiched between lessons. Read more on this in the Swedish Food Agency's advice in Good School Lunches¹⁷.

Meals in serving dishes – primarily at preschools and in elderly care

Make taking seconds easier

It is important to make it easy for staff at preschools and elderly care to refill food from the kitchen if it is running out. Either by fetching it themselves or contacting kitchen staff.

Keep covered containers on serving carts

Place less food in serving bowls than you expect to be consumed. Save leftovers in covered containers only to be opened if needed. New containers should only be used once food on the tables has been consumed. Unopened containers can be sent back to the kitchen directly after the meal and be refrigerated quickly. This way they can be re-heated and used at a later meal. As an alternative, they may be used for daytime or evening snacks or as cold cuts.

17. Only in Swedish

Tray service or individual portions – primarily in hospitals

Right serving size

If food is served on trays or in individual portions, it is important to ensure that the right amount of food is served. Ideally, it should be possible to adapt the serving sizes so that the diners can “order” meals according to their needs, wishes, appetite and desire to eat.

Using leftovers

Use leftovers safely

Leftover food can be served as it is or used in new dishes, such as soups, stews, potato hash, salads or as snacks. Leftovers can also be served as alternative dishes in buffets or used as a back-up if the ordinary dishes have been finished. Read more on using leftovers in the industry guidelines for municipal kitchens from the Swedish Association of Local Authorities and Regions (SALAR)¹⁸ :

Always follow the routines of your safety protocol for refrigeration, labelling and reheating. Maintain the same high level of caution for allergens as

when preparing meals from scratch. Note that the recommended time to refrigeration is six hours . This is longer than previous recommendations, and it makes it possible for more facilities to refrigerate food within the recommended time frame.

Compile recipes and suggestions

Fruits and vegetables that risk over ripening can be used in smoothies. Vegetables can be stir-fried and used to make stock or stews. Leftover oatmeal or porridge can be used in baking. Bread can be used for croutons, grilled sandwiches or as bread sticks. Compile recipes and suggestions on how to use leftovers and share them with your colleagues.

Use cold leftovers in hot dishes

Fresh leftovers from salad buffets can be used in warm dishes. Carrots, for example, can be used in bolognaise sauce or in stock.

Always have a plan B – plan on there being leftovers

Otherwise, there is a risk they will be thrown away. Use leftover cooked food as soon as possible. Leftovers reduce the need to cook new food. Adjust the amount of food to be cooked and prepared; order less ingredients when you can use leftovers.



18. www.offentligsakermat.se

Plate waste

– Uneaten food on diners' plates

We need to take a broad approach to halving food waste. This is the responsibility of everyone in the organisation. Educators, care staff and medical staff have important roles to play, and they need to work together with food preparation and service staff. This is especially important when it comes to plate waste, i.e., the food that is left on diners' plates.

Pleasant dining environment

The quality of the food as well as interactions between staff and other diners, the layout of the dining room, smells and sounds all play a role in determining how much food diners actually eat. A calm and pleasant dining setting increases chances that diners can and will sit longer and finish their meals.

Read more on ways to create pleasant and integrated meals in the Swedish Food Agency's recommendations for good meals in schools and elderly care.

Scheduling sufficient time for lunch (in schools)

For pupils to have sufficient time to eat, chat and socialise, each pupil should be able to seat in the lunchroom for at least 20 minutes. They also need additional time to collect food and return their plate and utensils after eating.

To reduce stress and the risk of pupils eating too little, many schools have introduced "scheduled lunches". This means that the class goes to the lunchroom together with their teacher and eats during the lesson. A lesson can either begin or end with the lunch. Lunches can be scheduled in the middle of longer lessons. When the class has finished eating, the pupils return to the classroom and continue with the lesson. Lunch is not combined with recess. Recess and time for play and fresh air should be scheduled at a different time during the school day. Food waste decreases when pupils are able to eat in a stress-free environment.

Sufficient time for meals (in preschools, elderly care and hospitals)

It is important that sufficient time is scheduled for meals. This increases the chances of more food actually being eaten by diners and less food wasted. The sick and elderly run a lower risk of malnutrition if there is sufficient time for meals.

Involving educators

Children and young people need adults as role models and as support during meals. This contributes to more food being eaten and reducing food waste. Educators (in preschools and schools) can serve as role models by sitting at the table and encouraging the children and young people to try foods with new tastes, smells and colours.

Adult presence in school lunchrooms can contribute to a calmer atmosphere and to building good relationships among pupils and adults. Their presence can also reduce arguments, bullying and ostracism, all things that can contribute to pupils and students not eating in school. Pupils who are shy and lonely may feel more secure, and boisterous pupils are often calmer. It is also important for adults to participate in meals with older students.

Involving medical staff and care providers

Most people enjoy eating in the company of others. It is important that medical staff and care providers are able to participate actively in meals and assist the diners so that they are served a reasonable amount of food.

Medical staff and care providers can also contribute to creating a calm and pleasant environment by being present during meals. Mealtime can be made more pleasant if staff pause other health care-related activities (such as rounds, taking samples and private conversations). This can lead to more food being consumed.

Encourage diners to take reasonably sized servings and to take seconds if they want more.

It is important to share the responsibility of communicating with diners. Both food service personnel and other professions, such as educators, teachers, nurses and other care and medical staff can encourage diners to take a reasonable amount of food the first time, but then to go back for seconds if they wish.

For this to work, it must be easy for diners to take more food, without long queues or pressure to finish quickly. Some facilities have created a dedicated serving space for seconds so that those wanting more food do not have to wait in the queue. This can also be done when there is only one queue if there is clear communication that diners wishing to take seconds are given priority.

Communicate the positive aspects of not throwing away food (primarily at preschools and in schools)

Inform diners of the benefits of not throwing away food and what they can do to reduce food waste. This includes what they can do both when eating in municipal kitchens and at home.

The Swedish Food Agency had produced a PR package (in Swedish), “Svinniska – a new language”, for use in municipal kitchens. There are posters, table decorations, videos and more as well as guidelines available on the Swedish Food Agency’s website.

Read more at www.livsmedelsverket.se/svinniska (in Swedish).



Measuring consumption

– How much food is actually eaten?

A major challenge concerning municipal meals is that diners generally eat less food than they need. Efforts to reduce food waste should not lead to less food being consumed. It is important for facilities to be aware of how much of the prepared food is actually eaten. This requires measuring how much food is served and how much is thrown away. The volumes of food eaten can be compared with planned serving sizes. This provides important information both on whether diners are consuming enough food and on the quality of the food.

“Skolmat Sverige” has created a model for measuring food consumption in schools, harmonised with the Swedish Food Agency’s national method for measuring food waste and consumption.

Read more about the model at www.skolmatsverige.se/nyhet/ny-mall-konsumtion-svinn

How is consumption measured?

The following information is needed to determine the volume of food consumed:

- Volume of food served
- Volumes of waste from food service and from diners’ plates
- The number of diners

The total amount of food consumed can be calculated by subtracting the volume of food thrown away from the volume of food served. Dividing this by the number of diners gives you the average volume of food each diner consumes.

Total volume of food consumed:



Food served



waste from food service
and from diners’ plates



Total volume of
food consumed

Total volume of
food consumed



Number of diners



Average volume of food
consumed per person

Action lists for reduced food waste

– for health care, education and social care.

Measuring and monitoring

Measures/To do	Responsible party
Set goals for how much you want to reduce food waste and by when.	
Measure food waste regularly, according to plan.	
Monitor food waste regularly and plan actions to reduce food waste at staff conferences.	
Display the results of your measurements so that all kitchen staff, diners and other staff members can see them.	
Conduct additional measurements if there is a high level of food waste in a specific area.	
Select key indicators to communicate with staff.	



Kitchen waste

Purchases

Measures/To do	Responsible party
Check storage volumes, expected absences, earlier departures and recipes prior to placing orders.	
Use your stored food	
Order fresh ingredients so that they are delivered close to the time they are to be used.	
Buy packages in various sizes	
Purchase smaller cuts or volumes	
Purchase high-quality food in season	
At the time of delivery, make reasonable demands on expected shelf life of ingredients	

Storage

Measures/To do	Responsible party
Stock ingredients following the first in–first out principle	
Keep things organised so that you have a good overview of your supplies	
Freeze fresh goods that are left over	
Label packages with dates and contents.	
Differentiate between best-before dates and use-by dates.	
Set the refrigerator to 4 °C.	
Have routines in place for saving food if your freezer breaks down	
Store food properly	

Preparation

Measures/To do	Responsible party
Prepare a reasonable amount of food	
Prepare and distribute food in different sized containers.	
Use a thermometer when cooking food.	
Cook food in stages when possible.	
Evaluate recipes and give feedback to those responsible for recipes.	
Let frozen food thaw slowly in the refrigerator.	
Weigh all food that is sent out Don't add a "little extra"	
Prepare smaller cuts or volumes	
Don't peel or chop fruit and vegetables more than necessary.	

Serving waste

Menu planning

Measures/To do	Responsible party
Make a flexible menu with room for changes.	
Plan the menu to include wholesome and varied meals that are appreciated.	
Involve the diners.	
Visit facilities where meals are served.	
Plan to repeat some meals and ingredients on the menu.	
Give the meals appropriate names that reflect their ingredients.	
Plan the menu following the seasons and delivery days.	
Serve new dishes as options.	

Calculating serving sizes

Measures/To do	Responsible party
Get to know your diners – adapt the menu to the amounts they generally eat.	
Adapt the menu to diners' preferences.	
Provide feedback to those responsible for recipes.	
Establish routines for reporting absences among diners.	

Serving food

Measures/To do	Responsible party
Only cook as much food as you expect to be eaten.	
Bring out one serving bowl at a time.	
Use the right size serving utensils.	
Give regular feedback to the kitchen responsible for cooking the food.	
Use smaller serving dishes towards the end of the serving time (buffet).	
Count the number of plates used so that you know how many persons have eaten (buffet).	
Cooperate with those responsible for scheduling to make the best possible lunch schedule (buffet).	
Make it easy for staff at preschools and elderly care to obtain more food from the kitchen (serving dishes).	
Save covered containers on the serving carts and only open them if needed.	
Make ordering different serving sizes an option (hospital).	

Using leftovers

Measures/To do	Responsible party
Use leftovers safely; follow your internal safety protocol.	
Create recipes that use leftovers and make a list of them.	
Save cold leftovers from buffets and serving carts and use them in hot dishes.	
Always have a plan B – plan on there being leftovers.	



Plate waste

Measures/To do	Responsible party
Create a pleasant dining environment.	
Schedule lunches so that there is enough time to eat (in schools).	
Ensure there is enough time to eat (elderly care, hospitals).	
Encourage diners to take reasonably sized portions but come back for seconds.	
Set up a station for seconds or see to it that those wishing to take seconds are given priority in the queue.	
Adults present at meals.	
Inform others about the advantages of not throwing away food.	



Appendix

National method for measuring food waste in municipal kitchens

Preparations

Measuring equipment: It is important to have well-calibrated digital scales appropriate for the volumes of food prepared in your kitchen. Weigh the pots and containers often used in your kitchen and note their weights. Then you can easily subtract their weights when weighing food. This saves a lot of work.

Measurement station: Find a suitable place in the kitchen for recording food waste – with room for scales and perhaps a computer or tablet.

Instructions: Read through the instructions before it is time to start measuring so that you know which components (ingredients, dishes and leftovers) should be weighed and counted

The following information should be noted when measuring food waste (in addition to the results of the actual measurements):

- Type of organisation (preschool, compulsory school, upper-secondary school, elderly care, hospital)

- Type of kitchen (where food is prepared or served)
- Measurement dates (the dates measurements are taken)
- Number of diners present on measurement dates (number of individuals eating)

Measurement period – How often should food waste be measured?

The measurement period refers to the days on which food waste is calculated. Every facility must decide on how often to measure food waste. Food waste is commonly measured over five days in the spring and five days in the autumn. One risk of having too few measurement days is that the chosen days may not be representative for the organisation.

Which units of measurement should be used?

All volumes should be given in kg, to one decimal point. If there is no decimal, add a 0. For example, write 10.0 kg.



What should be weighed?

Three types of food waste occur in a meal service: waste from kitchens, waste associated with serving food and waste from diners' plates. For the sake of simplicity, this method includes rinds, bones and napkins. Read more below in the section on Limitations:

Kitchen waste

By kitchen waste we mean the waste that occurs in the kitchen. Kitchen waste can be divided into three groups.

- Storage waste: Food from refrigerators, freezers and pantries that must be thrown away for various reasons.
- Preparation waste: Food that is thrown away in conjunction with preparation.
- Cooking waste: Food that is cooked but cannot be used for various reasons and is thrown away without having been served. Please note: Do not include leftover food that is frozen or chilled and kept for serving at a later date.

Count only the kitchen waste from the portions that are served by your facility. Food that is prepared for service in another facility or catering should not be included.

Serving waste

Serving waste refers to the food that is served but does not reach diners' plates and is instead thrown away. Food can be served in a buffet, a serving line,

or in a school cafeteria. It can be served in canteens or on serving dishes at a facility such as a preschool or an elderly care home. Food can also be served on trays and in individual portions in a hospital.

Plate waste

Plate waste refers to all food guests have taken or been served that is subsequently thrown away instead of being eaten.

Volume of food served

It is necessary to have information on the total volume of food served to calculate the percentage of food waste and to estimate how much food diners have eaten.

Where should the volume of food served be measured?

To avoid double-counting the volume of food served, it is important to decide which kitchen (the kitchen preparing or serving the food) is responsible for measuring and documenting the volume of food served. It is a good idea to measure the volume of food served as close as possible to where it is served.

What should be weighed?

All food should be weighed before it is served. The weights of the serving dishes should not be included. If the serving dishes or bowls you use all contain roughly the same amount of a certain dish, it is only necessary to weigh one and then multiply it by the total number of serving dishes. Liquids, such as sauces, can be measured in litres rather than being weighed.

What to weigh	What not to weigh
Hot dishes	Customary sides, such as:
Cold dishes	• hard bread
Sauces*	• butter or margarine
Special diet	• mustard or ketchup
Salad buffet	• drink
Occasional sides**, such as fruit, soft bread, jams, red beets	

* Liquids, such as sauces, can be measured in litres rather than being weighed. One litre equals roughly 1.0 kg.

** Sides, such as whole fruits and soft bread, can be weighed together and added to the total volume of food served.

Number of diners

This figure is necessary for calculating average food consumption and waste per person. The figure should reflect the actual number of individuals eating, not the number of individuals at the facility or the number of servings planned. This means that there is a difference between the number of servings planned and the number of servings that are eaten. Count the number of plates that are used at a meal.

Kitchens that prepare food should only count diners at adjacent restaurants, not diners at other facilities to which meals are delivered.

Key indicators

Key indicators are a way for organisations to steer towards goals. They are a way to make it clear what results the measures implemented have led to. Key indicators can also be used to make comparisons between organisations/facilities and between municipalities.

Some common examples of key indicators for food waste and consumption include:

- Total food waste per diner (in grams)
 - Food waste in the kitchen per diner (in grams)
 - Waste associated with serving food per diner (in grams)
 - Grams of waste from plates per diner (in grams)
- Total food waste (in kilograms)
 - Food waste in the kitchen per diner (in kilograms)
 - Food waste associated with serving food per diner (in kilograms)
 - Food waste from plates per diner (in kilograms)
- Total food waste as a percentage of served food
- Food consumption per diner (in grams)

Measuring food consumption

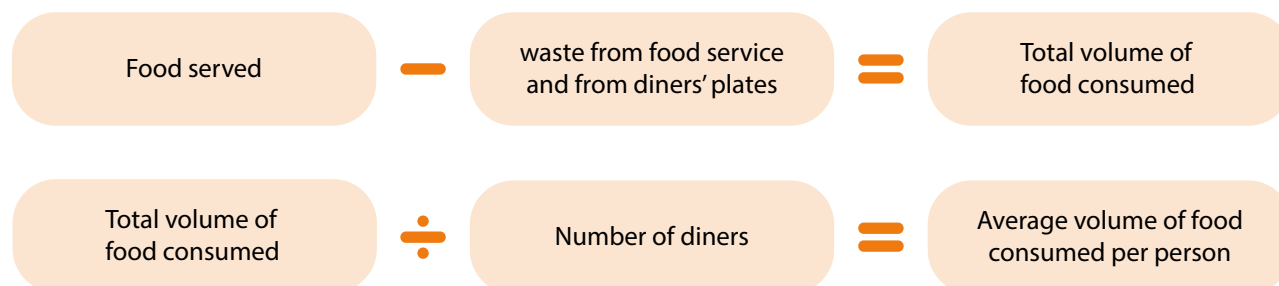
It is important to monitor that efforts to reduce food waste do not lead to less food being eaten. To calculate how much food is consumed, the following information is needed:

- Volume of food served
- Volumes of waste from food service and from diners' plates
- The number of diners

The total amount of food consumed can be calculated by subtracting the volume of food wasted (from food served and from diners' plates) from the volume of food served. Dividing this by the number of diners gives you the average volume of food each diner consumes.

The volumes of food eaten can be compared with planned serving sizes. This provides important information both on whether diners are consuming enough food and on the quality of the food.

Total volume of food consumed:



Limitations

Measuring food waste is important. Several simplifications have been made to make it easier to carry out measurements.

- Rinds, bones and napkins thrown away from diners' plates are included, even though these should not be considered food waste.
- Drinks are not included in food waste as this would be difficult for kitchens to measure. Coffee grounds are not included either.
- Sides, such as ketchup, butter or margarine and hard bread, are not included as this would be difficult. These items do not create much food waste and their environmental impact is low. If a municipality so wishes, it may decide to include estimates for the amounts of these items that are wasted/thrown away.
- Liquids can be measured in litres rather than being weighed.
- When measuring the volume of food served, it is enough to weigh one serving dish of each component if the dishes contain roughly the same volume of food.





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