Garde-Manger: Pantry Storage

Low-tech Lab

https://wiki.lowtechlab.org/wiki/Garde-Manger/en

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Difficulty **Medium**

Duration **3 day(s)**

Cost **150 EUR (€)**

Description

Garde-Manger, or pantry storage, enabling optimal environmental conditions by food type

Summary

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Introduction

A Quick Overview of Food Waste

Worldwide, one-third of all food produced is thrown away.

In France, this represents ten billion kilograms of food wasted each year, the carbon impact of these losses equaling five times the domestic air traffic.

The survey of waste shows that 33% is done on the last link in the chain: the consumer.

The losses represent an overall cost of €160 a year per person.

Quantitatively, fruits and vegetables constitute the most substantial losses (50%).

However, though they represent only 6%, animal products (meat, fish, dairy) represent the largest financial loss.

Causes of Food Waste

Analyzing the causes of waste is relevant if we are to design the appropriate solutions to put in place to reduce it:

• Sociological causes: Our life rhythms, family structures, and ways of organizing our days and meals are changing. We are more hurried and less attentive, which leads to food waste.

• Cultural causes: Our perceptions of food, our aesthetic criteria, and our way of eating lead us to dismiss products that are nonetheless consumable.

•Poor knowledge of food preservation: preserving is not synonymous with keeping cold--a refrigerator is not made to accommodate all food. In addition, confusions arise between terms such as "Use by," "Best-Before," and "Expired by."

•Organizational problems: We lack organization before doing our grocery shopping, to question needs and to buy the appropriate quantities. Refrigerators and cabinets are equally sources of numerous losses due to poor storage that encourages the stacking new foods in front of older ones.

It is important to note that many of these causes can be corrected by good practices that anyone can implement. Technical solutions can be of support, mainly for:

•Creating the right storage environment for each type of food

•Promoting visibility of products

•Making products more easily accessible.

See this report for an analysis of the use of this food storage system, as well as 11 other low-tech experiments throughout the project "En Quête d'un Habitat Durable"

Step 1 - The "Zero Waste" Approach

The first step in using a food-storage system, such as the one proposed here, is for the user to question their buying and consumption behaviors.

The food storage modules that we're going to suggest below are mainly designed for raw and fresh foods. For example, it would be difficult for the user eating prepared foods to align with the technical suggestions.

The "Zero Waste" approach, originating from Franco-American Béa Johnson, is an excellent method to implement which also makes it possible to significantly reduce waste production worldwide (packaging, plastic, etc).

Zero Waste France is a very good resource for complementary information on helping consumers take action.

Step 2 - General Information on the Food Storage System

Considering the waste that fruit, vegetables, and animal products represent, it is mainly these types of food that need to be worked on: so, foods with a shorter shelf life.

Preserving does not mean keeping cold, but preserving the nutritional quality and taste of the foods.

As such, several storage environments are important to adopt for a built food storage solution.

Generally, for all short-term storage environments, the most interesting basic technical proposal, in our experience, is the rack drawer.

It's s a technical solution that can be easily integrated into a kitchen, permits direct visibility of all contents, and facilitates easy access to all foods, as opposed to a cupboard or a refrigerator.

The use of racks allows for good ventilation, a very important parameter for preserving fruits and vegetables. It can be made using wooden battens (between 2 and 3 cm wide each) or the use of pantry mesh.

On the entire storage cabinet, an air gap of 3 to 4 cm is to be integrated on the entire back side so that the "exhaust" air and moisture do not stagnate at the bottom at the risk of rotting food faster.

Step 3 - Environment 1: Dry, Ventilated, In Room Light

We'll locate this category by use of example: Apricot, eggplant, avocado, banana, citrus, tomatoes, as well as eggs or butter in a butter dish if it's not too hot.
In a kitchen for two people, we suggest two to three rack drawers, measuring 15 cm high by 40-50cm deep by 50 cm wide.
It is designed so that the front and back of the drawer allow for air circulation.

Step 4 - Environment 2: Dry, Ventilated, Dark

This food-keeping environment is useful especially for potatoes, onions, garlic, squashes, etc. The dark atmosphere prevents the germination of tubers and roots and limits the ripening of certain fruits.
In a kitchen for two people, we propose two rack drawers lined with a fabric such as linen or jute, to create darkness while ensuring ventilation.
About 25cm high, 40-50cm deep, and 50cm wide. They must be made a little higher than the previous environment to be able to store carrots vertically in a slightly damp sandbox that will be provided in one of the drawers.

Step 5 - Environment 3: Dark, Cold, Humid

For an Existing Living Space:
This environment is the most difficult to create in an existing space; however, it is very useful as it can allow you to keep the refrigerator off for a part of the year.
For existing spaces indoors, we can draw inspiration from the desert refrigerator, or the "zeer pot." It is a pot nested within a second pot. Sand is added between the two.
The foods are placed in the central pot and the sand is regularly moistened. By evapo-transpiration, the interior temperature can drop between 5-10°C lower than the room temperature.
For a New Living Space:
In the case of new housing, we might imagine the old Parisian pantries or "garde-mangers" with boxes opening to the outside--to the north--via a window dedicated to this usage. (Or in a non-insulated partition in this place).
We will find in this environment: artichoke, cucumber, beans, parsnip, butter in the spring and fall, etc.
For sizing, an interior volume of 40L divided in two is suitable (for example 40cm high, 40cm wide, and 30cm deep).

Step 6 - Environment 4: Dark and Cold

This environment is achieved using a refrigerator. The idea is to work to reduce its size to keep only leftovers, dairy, meat, fish, and cold beverages inside.
In addition, the reduction in the size of the refrigerator directly reduces electricity consumption.
For two people, we propose the use of a 40L refrigerator (bar refrigerator type). Depending on the allotted budget, it is possible to find fridge drawers that allow a direct view of the entire container. However, they are significantly more expensive.
Be careful, though, to choose a refrigerator where the vertical storage of standard-sized bottles is possible for more functionality.
Avoid placing the refrigerator next to the oven (which is the case in many kitchens) for more efficiency.
The release of heat from the back of the refrigerator into the air gaps of the food storage cabinet will promote the circulation of air and moisture throughout the storage system.

Step 7 - Climacteric Fruits and Vegetables

In addition to the environments, a second parameter comes into play in preserving fruits and vegetables: whether or not they emit ethylene, a gas that promotes ripening, and whether or not they are sensitive to it.
Fruits and vegetables that produce ethylene and that continue to ripen after harvest are called "climacteric," while others can be very sensitive and rot more quickly upon contact with ethylene.
A simple rule is to keep foods that release ethylene separate from those that are sensitive to it, which is why you need at least two drawers per environment, and they must be large and ventilated enough for the ethylene to properly escape.

Step 8 - Overview Table

Environment by Food Type	Short-term Food Storage Environment				Climacteric Factor	
Food Types	Cool, Humid and Dark	Dry, Ventilated, In Room Light	Dry, Ventilated, In the Dark	Other?	Ethylene Producer	Sensitive to Ethylene
Apricot		x			x	x
Garlic			x			
Pineapple		x				
Artichoke	x					
Asparagus	x			Refrigerator Crisper		
Eggplant		x				x
Avocado		x			x	x
Banana		x			x	x
Chard	x					
Beet	x					

Broccoli	x			Refrigerator Crisper		x
Carrot	x					x
Celery	x					
Cherry	x	x				
Mushroom	x					
Cauliflower	x			Refrigerator Crisper		x
Cabbage	x					
Lemon		x				
Pumpkin		x				
Clementine		x				
Cucumber	x	x				x
Coriander, Cumin			x			
Squash		x				
Zucchini	x					x
Shallot			x			
Endive	x			Refrigerator Crisper		x
Strawberry	x					
Legumes (beans, lentils)			x			
Seed Spices			x			
Green Beans	x			Refrigerator Crisper		x
Kiwi		x				x
Mango		x				
Melon			x		x	x
Blackberry			x			
Turnip	x					
Onion			x			
Orange		x				
Parsnip	x					
Watermelon		x				
Sweet Potato			x			
Peach		x	x		x	x
Parsley, Chives, Mint, Fresh Coriander, Dill,				In a glass of water		
Pear		x	x		x	x
Leek	x					
Pepper		x			x	x
Pomelo		x				
Apple			x		x	x
Potato			x			
Plum		x	x		x	x
Radish	x					
Grapes		x				
Arugula	x					
Lettuce	x					x
Tomato		x			x	x
Leftovers				Refrigerator		
Dairy				Refrigerator		
Meat and Fish				Refrigerator		

Notes and references

By Pierre-Alain Lévêque for Low-tech Lab, August 2019
English translation : Katia Krussel
Italian translation : Samou
ADEME
Zero gachis