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SERENADE
Shaping the future of sustainable Food

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How Science Knows When Leftovers in the Fridge Go Bad

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Curious about how science helps to monitor food freshness and reduce waste?

Join us to know more!

Marie Skłodowska-Curie Actions

Sensing what we can't see

Understanding what it means

Reducing waste, protecting our future

PINT OF SCIENCE

HOW DO WE DECIDE TO DISCARD COOKED FOOD?

Most of the time... we rely on our eyes, nose, taste or memory!

We store cooked food in boxes in the fridge

Days later... we decide what to do

1. We see visible microbes

If YES, we discard it!

OR

2. We smell it

If it smells "off", we discard it!

OR

3. We taste it (sometimes)

If the taste is strange or sour, we discard it!

OR

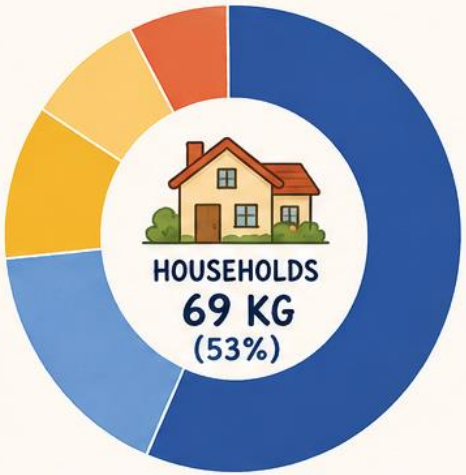
4. We think about the time

If it has been in the fridge for too many days, we discard it!

In the end...

Our decisions are based on limited clues, not on what is really happening inside the food.
This leads to unnecessary food waste... or sometimes, health risks.

THE BIGGEST SHARE OF FOOD WASTE HAPPENS AT HOME



- Households
  69 KG (53%)
- Manufacture of food products and beverages
  24 KG (18%)
- Restaurants and food services
  14 KG (11%)
- Primary production
  12 KG (9%)
- Retail and other distribution of food
  10 KG (8%)

More than half of all food waste in the EU comes from our homes. That's 69 kg per person every year!

OUR OBJECTIVE

To reduce food waste by developing simple, smart tools that monitor food freshness in real time.

Less waste

Better for our planet

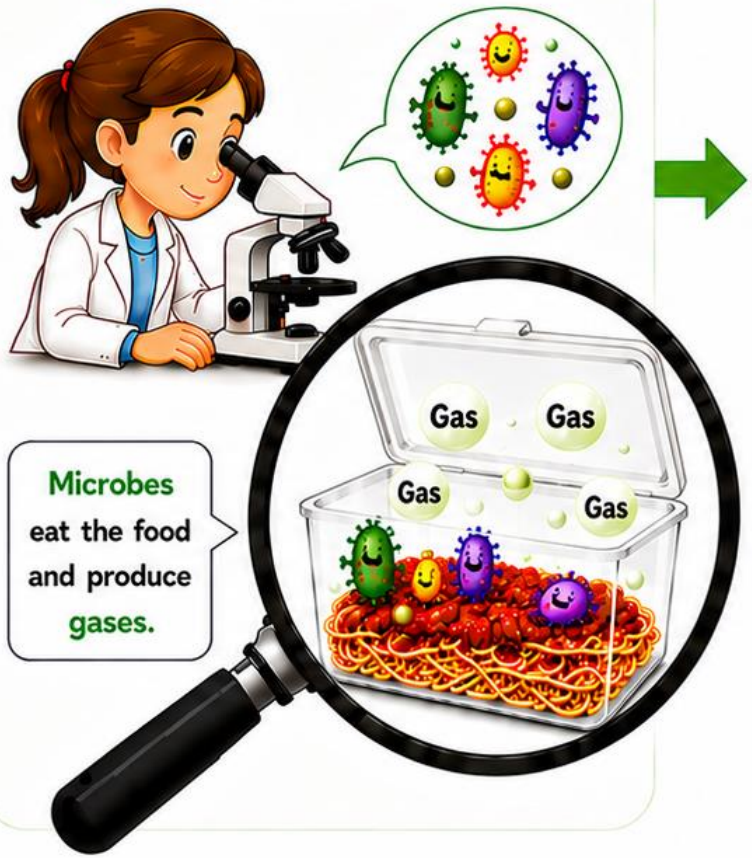
From guessing... to knowing.
From waste... to value.

HOW DO WE ACHIEVE THIS GOAL?

We need two important partners working together!

MICROBIOLOGY

Microbiologist study tiny **microbes** that we can't see.



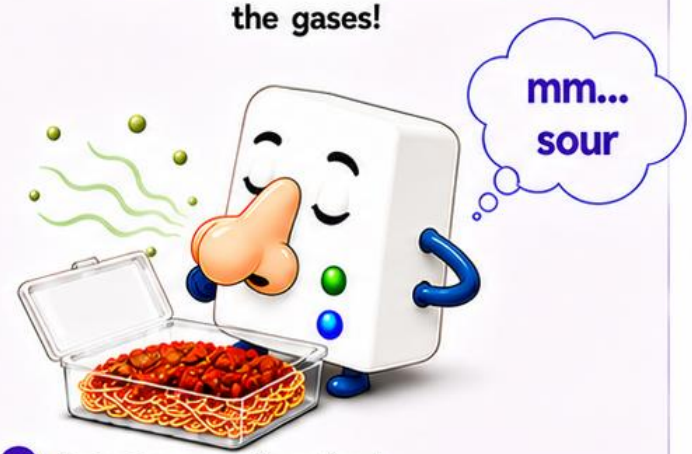
Microbes eat the food and produce **gases.**

TOGETHER THEY BUILD SMART FOOD BOXES

This smart box watches over the food and tells us how fresh it is – in **real time!**

SENSOR TECHNOLOGY

Sensors are like our **nose.** They are better at knowing the gases!



- Detects gases from food
- Sends information in real time
- Helps us know if food is still good to eat

Sensors do the smelling job for us and help us **understand the food better!**

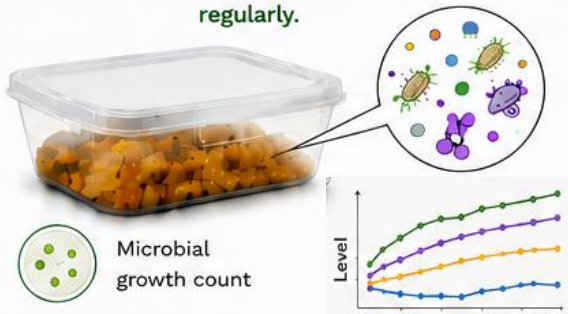
FROM MICROBES TO SMART FOOD BOXES

Working together today to tell you about your food tomorrow.

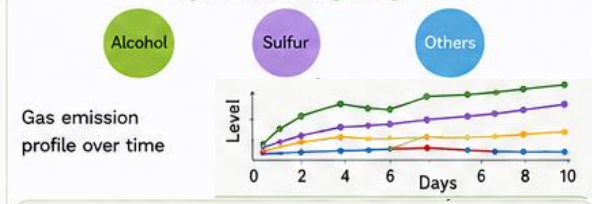
1. MICROBIOLOGIST SIDE

Understanding the invisible

I analyze how microbes grow in food **regularly.**



I also analyze the **gases emitted** by the food **regularly.**

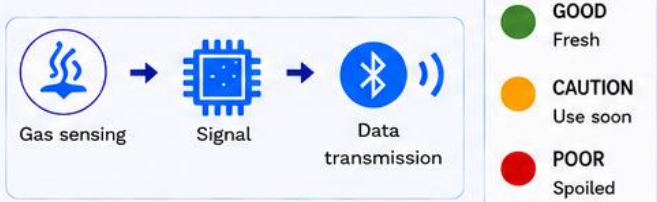


Output: Periodic data on microbial growth and gas emission from food.

2. SENSOR TECHNOLOGY SIDE

Capturing the invisible

They use sensor technology to capture the gases emitted in the food box.

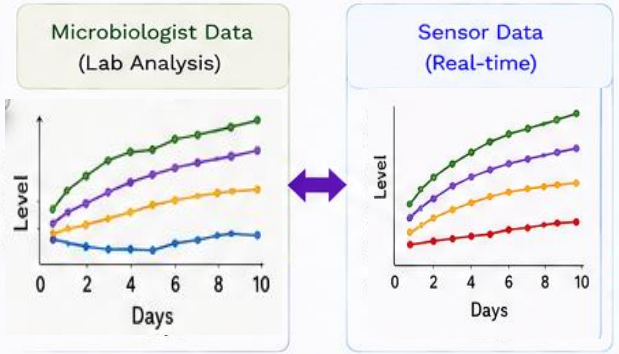


Output: Real-time gas data from the food environment.

3. ALIGNMENT & INTEGRATION

Bringing it all together

We compare, align and understand how well the sensor data matches the microbiological data.



We evaluate the correlation and improve accuracy every day.

Output: A validated model that links microbial growth with gas emissions captured by sensors.

4. OUR FUTURE GOAL

To build **SMART FOOD BOXES** that tell you about your food in real time.

Together, they help us make smarter choices.

Less food waste

Smarter choices.
Less waste.
Better future.

Our mission: Science + Technology working together today for a smarter, sustainable tomorrow.

Real-time Experimental Setup & Microscopic view of Microbes

Fridge with food boxes and sensors

Microbes under the microscope

Thank You!

Any Questions?

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