SHELF LIFE
&
AROMATIC PROFILE

SAFE SUSTAINABLE SOLUTIONS

SAFE SUSTAINABLE SOLUTIONS

What is shelf-life?

By definition, **shelf-life is the time interval after production and packaging during which the food, if stored under specific conditions, maintains an acceptable level of quality.**
Acceptability depends on many factors, including:

- Microbial proliferation
- Changes in color/odor/taste
- Oxidative phenomena and loss of vitamins or nutrients
- Development of undesirable sensory characteristics and loss of the initial aromatic profile

Shelf-life primarily depends on the product's recipe, its physicochemical properties, and its initial microbiological profile. Packaging, packaging conditions, and storage conditions are also fundamental. Therefore, the raw material is the first factor to consider in a shelf-life study, and the quality of the final product will depend on it. In this context, it is important to assess the need for additives that enhance preservation, including by modifying the pH.
But in addition to the characteristics of the food itself, other factors are also crucial, such as:

- the cooking/transformation process applied to the food;
- the type of packaging, including its thickness and barrier properties, as well as the packaging process used. Sometimes, the use of active and intelligent packaging can also be beneficial;
- environmental variables, and therefore the storage conditions.

It is therefore important to be aware that packaging is only one of the variables involved in defining shelf-life.

Rev.2 of 15/09/2025

SHELF-LIFE & AROMATIC PROFILE

SAFE SUSTAINABLE SOLUTIONS

OUR SOLUTION

The Food Contact Center laboratory carries out shelf-life tests, including those aimed at the validation of packaging materials in relation to food products and the barrier properties required by the studied foods. Packaging materials can be characterized, for example, through analyses of water vapor and oxygen permeability. The subsequent shelf-life study involves subjecting the food or beverage to accelerated aging, in order to simulate the estimated storage period and then assess its physicochemical and sensory quality, with the aim of determining the barrier properties and, consequently, the suitability of both food and packaging.
The studies, designed by Food Contact Services, are based on the Arrhenius equation, applied using the Q10 approach.

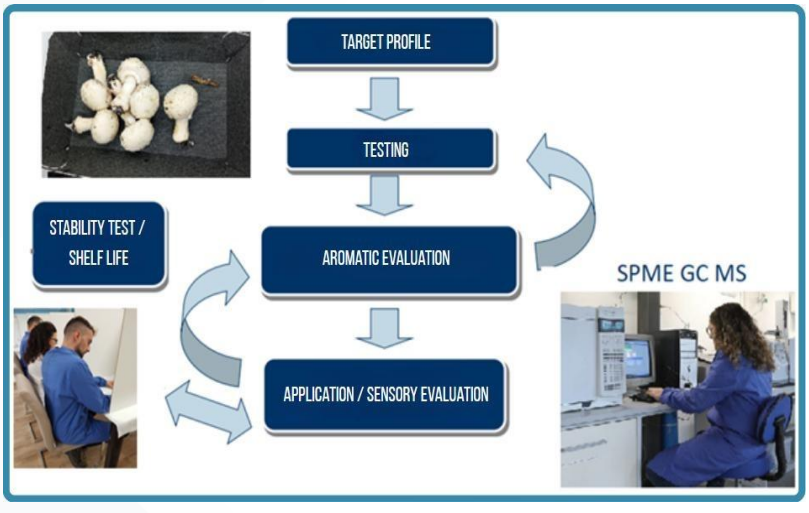
$$Q_{10} = \left(\frac{R_2}{R_1}\right)^{\left(\frac{10}{T_2 - T_1}\right)} \qquad Q_{10} = 2$$

The Laboratory has defined a series of analytical parameters to be determined, selecting those that can provide the most complete and useful information possible for defining the durability of foods in different packaging. As is well known, the most frequently analyzed indicators, required by voluntary certification standards (IFS and BRC) and partly by mandatory regulations (e.g., EC Regulation 2073/05), are divided into:

- Microbiological indicators (molds, yeasts, total bacterial count, Enterobacteriaceae, coliforms, etc.);
- Chemical indicators (appearance of degradation and oxidation substances, loss of aromatic components);
- Organoleptic indicators (color, taste, odor, aroma, texture, hardness, friability, etc.).

One of our distinctive competencies is the ability to analyze the aromatic profile of foods:
Instrumental analysis of the aromatic profile by SPME-GC/MS.

The difficulty in performing aromatic profile analysis, carried out by very few laboratories, lies in the correct identification of the molecules. Food Contact Center can boast over twenty years of experience in the investigation of food aromas using GC-MS, thanks to a highly qualified team of experts and collaborations with leading figures in the industry and academia. Moreover, with a focus on continuous improvement, the laboratory has acquired the “Library specialized in Flavor and Fragrance” distributed by Shimadzu®.



The Laboratory Management

Rev.2 of 15/09/2025

FOOD CONTACT CENTER
FOOD CONTACT SERVICES
HEADQUARTER
VIA DEL REDOLONE 65, 51034 SERRAVALLE PISTOIESE
LEGAL AND ADMINISTRATIVE HEADQUARTER
VIA ALDO MORO 16 - 25124 BRESCIA
+39 0573 245244
+39 030 3457131
SALES@FOODCONTACTCENTER.COM
FCS@FOODCONTACTSERVICES.COM
WWW.FOODCONTACTCENTER.COM
WWW.FOODCONTACTSERVICES.COM