Aseptic. Engineered.
The SIG Expert Series

Food safety & preservation

Why it matters and how food actually spoils

for better

1 Why is food safety and preservation such a crucial topic?

Food must pose no risk to the consumer

Food must retain its characteristics - nutrients, taste, appearance, and typical contents at least until the best before date

Food operators carry great responsibility and must comply with strict legal requirements

The consequences range from quality loss to food safety risks.

2 How does food actually spoil?

Microbiological

Growth of or toxins from bacteria, yeasts or molds. Can alter taste, texture and colour - and may produce toxins that can endanger the consumer

Enzymatical

Naturally present enzymes in the food that cause browning, etc.

Chemical

Most prominently oxidation affecting nutrients, flavour or colour

Physical

E.g. moisture gain or loss, separation, light damage

3 How does aseptic processing prevent food from spoiling quickly?

UHT treatment

Inactivates microorganisms with minimal heat impact

Sterilized packaging

Packaging material is sterilized separately

Aseptic filling & sealing

Product and packaging are brought together in a sterile environment

Protection

Microorganisms cannot get back in

In addition, barriers against oxygen and light help slow quality degrading reactions such as oxidation - preserving nutritional and sensory quality over time, even without refrigeration.

4 How does aseptic technology compare to other preservation methods?

Classic sterilization	Food is sterilized in the package at high temperatures for a long time. Can negatively affect nutrients and requires highly specialized packaging materials.
Hot-fill	Similar drawbacks.
Pasteurization	Does not protect perishable foods on the long term, and requires cooling or usage of preservatives, which are often not permitted for certain foods.
UHT treatment + aseptic technology and packaging	Offers long term protection without need for cooling or preservatives and keeps the temperature-induced stress for the food as low as possible.

5 What makes a reliable aseptic packaging system?

- Careful selection of raw materials that are appropriate for aseptic packaging.
- Ensuring materials are nonreactive, trustworthy, and compliant with international standards - also during long storage times.
- Providing strong barrier properties against light and oxygen to retain nutrients and protect the product over time.
- Using materials that are suitable forthe sterilization step before filling.
- Conducting extensive testing to ensure the packaging material meets the high demands of aseptic technology.
- Advanced and robust aseptic filling technology to ensure sterile product handling and hermetic package sealing
- Expert technical and digital services to support operational excellence through preventive maintenance, performance monitoring and continuous process optimization

6 Trust is built on expertise

Safe
Protects consumers from food safety risks

Nutritious
Preserves nutrients over time

Great taste
Maintains the natural taste and appearance

Long shelf-life
Without refrigeration or preservatives



"Consumers don't need to know all of this. And they shouldn't worry about it. They buy a product they know they can trust."

Kai Wittkowski, Global Quality Leader - SIG Food & Product Safety Compliance