

Hygiene in the production of sterile canned food

Even with sterilized products, hygiene measures must be taken into account in the raw materials and in the packaging, otherwise there could be nasty surprises.

Sterilized foods (core temperatures above 100 °C) are fully preserved and can be stored at room temperature for years. In contrast, semi-preserved foods are only pasteurized (70-95 °C core temperatures), less durable and usually stored in a refrigerator. This report deals with hygiene measures for sterile canned foods such as canned meat (goulash, corned beef, roast), soups (cream soups, bouillons) and finished products (ravioli, beef rice). These are heated in a sealed primary packaging (can, glass, aluminium bag) so that re-infection can no longer take place.

Again, and again, hygiene measures within this area of sterilized canned foods production are being marginalized.: "Later, sterilization will be done anyway, so why take care of the hygiene measures?" One must not forget that every heating process in canning was established based on certain preconditions. In the sterilizer, the quality of the raw materials, packaging materials and storage conditions of the finished good play a major role in the evaluation of the heating process (time and temperature).

In terms of microbiological specifications, a consistent quality of the raw materials is important. Not only the germ count, but also the germ species are important. Especially spore-forming bacteria and the spores themselves respectively, increase the necessary sterilization value exponentially. In the case of ingredients such as ground-level vegetables, soya or milk components, this can play a major role. It is therefore important that raw materials with microbiological specifications are ordered and that a certificate of analysis is delivered by the supplier showing the important parameters.

In sterile products that are acid weak, control with quarantines are done at 30° C and 55° C. For example, ten products are stored at 30° C for about 10 +/- 3 days and additionally five products at 55° C for about 5 +/- 1 days. If products only swell at 55° C, this may be an indication for spores. When products swell at both 55° C and 30° C, there could be many causes: lack of integrity of the packaging, sterilization that is too weak etc. The quarantine should only be a final verification of whether the process works. It does not mean that the sterilization conditions are sufficient if all incubated samples are good. But if there is a problem with the quarantine, something is definitely wrong with the process. For acidic sterile products (pH <4.5), the 55° C quarantine can be skipped since spores do not germinate in the acidic range.

Depending on the viscosity of a product, the heat is transferred differently. If the product can flow, it is called heat flow (or heat convection), if it does not flow heat is transferred by heat conduction. Heat conduction is less efficient than heat flow. This means that if the viscosity of the raw materials changes during heating, this must be taken into account during the heating process. This can happen, for example, if thickeners clump together or are incorrectly dosed. Also, the same problem can be caused by varying raw material properties. An example is the variation of gelling behaviour with flour. If that could happen, monitoring should also be introduced here.

Do not neglect packaging

The hygiene of the packaging often does not receive the necessary attention. It happens that dust affects the sterilization process. Foreign objects are not only dangerous, but are immediately noticed by the consumer. Therefore, they should be avoided throughout the process. One important aspect

is the correct setting of the machines when sealing the packaging. Here, unwanted abrasion can produce foreign bodies. Even soiled sealing devices can affect the integrity of the packaging.

Conclusion: It is important

- to protect the packaging until it is used in production;
- before use, blow out the packaging or rinse with water;
- regularly inspect the sealing tools and the integrity of the packaging.

Although a final check with metal or x-ray detectors is good, it does not guarantee that all foreign bodies have been retrieved. Therefore, prevention as described above is important. During storage, hygiene no longer matters if the packaging is properly sealed. But one should observe the stability of the packaging especially when exporting to tropical countries. At the beginning of a new export project it may be worthwhile to deliver a test freight and to check it on reaching the destination. Once delivered, the palletization is checked if it was adequate and whether the packaging remained intact during transport.

Of course, the maintenance of the autoclave is important for the process. With regard to hygiene, especially its cooling water should be mentioned. This should be replaced regularly because of the risk of contamination should a product leak. Equally important is the controlling the chlorination of this water.

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