

Commercial Sterilisation



Notes on the thermal treatments problems of the alimentary products

One of the characteristics more requested to the food industry in these years are to produce in natural way, reducing the use of preservatives and of all that can contribute to reduce the characteristic of "natural product."

Not only therefore to produce in hygienic way to guarantee the consumer from every risk of possible infections, but to preserve the product from any change of its natural characteristics. A largely practiced treatment is the thermal sterilization, an effective system to destroy the microorganisms (cells and spores) that can harm to the products salubrity, without however damage the nourishing and organoleptic characteristic of the food stuff or drinks.

The laws that regulates the thermal sterilization are all based on scientific criterions known for a long time, of which we will give only brief notes, due to the amplex of the matter. We start from the experimental experience that, at constant temperature, the cells or the spores die with constant relative speed, that is in every unity of time it is destroyed the same




percentage of cells or spores present alive at the beginning of the treatment. For unity of time we assume that is D the duration of the necessary treatment, to a certain temperature, so that the number of cells or survived spores reduces of 90%. The duration D is said time of decimal reduction, so that, for every time slice of duration D, the number of survived microorganisms reduces to 10%. An aspect immediately evident is that it is not possible to reach the absolute sterility. In fact, also prolonging the treatment up to repeat a lot of times the duration of time D, we will always destroy, every time, the 90% of the microorganisms been alive after the preceding interval D. The microorganisms will be reduced a lot, but never totally and therefore we have to speak of "Commercial Sterility". The duration D of decimal reduction depends then on the temperature, that is it reduces of ten times for every increase of 10 °C of the temperature. It would seem obvious then to rise to the

■ preserving industry

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most elevated temperatures, so that at parity of general duration of the treatment, it will be possible to apply a greater number of times the decimal reduction and therefore to mostly reduce the percentage of cells or spores alive in comparison to those present at the beginning of the treatment. But the exposure to a too much high temperature involves some alterations in the organoleptic and in the nourishing characteristics of the food stuff and the drinks. We must therefore individualize, for every product, the optimal values of duration and temperature of the treatment. To have an univocal parameter for the evaluation of the efficiency of all the possible treatments is introduced the symbol FO that represents the duration of a theoretical treatment at the temperature of reference of 250 °F (121,1 °C) able to produce the same degree of destruction obtainable with the real treatment in examination. A notable scientific literature exists on the value of FO for many products. Today so many factors therefore press so that the individualization of the duration and the temperature is effected with the maximum precision, looking for custom designed treatments to safeguard, from a side, the salubrity of the products and to reach, from the other, the maximum qualitative level with the least costs of production. The continuous comparison with the alimentary technologists is therefore at the base of the plants realized by the designers of Asepsystems, Company leader of the thermal treatment and the antiseptic packaging. The name - Asepsystems is acronym of "Aseptic Systems" - still remembers the origins of this firm, born for developing "Researches and Aseptic Applications" for the food industry, but that in the years has grown in the service of the Customers up to supply today innovative and complete processing lines for a wide range of products. 



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