

**EB SURFACE STERILIZATION of FOOD MATERIAL**

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As frozen or chilled foods have become popular nowadays, it has become very important to provide raw materials with lower level microbial contamination to food processing companies. Consequently the food sterilization is one of the major topics of food processing.

Among raw materials of processed food, dried materials like grains, spices and beans etc., are hardly invaded deeply by microbes, which just stay on the surfaces of materials. And such microbes often form spores and have high resistance against heating, sterilizers and dry-out.

Today, superheated steam is used to sterilize microbes on the surfaces of raw materials in most cases in Japan, but with this method it is very difficult to sterilize thermoduric microbes, and what is worse, it causes deterioration of protein, loss of fragrances, and discoloration. So it is very preferable to replace heat sterilization method by unheated sterilization method, to keep foods hygienic and avoid deterioration at the same time.

As typical unheated sterilization method, there are a chemical sterilization method and a physical sterilization method, like a food irradiation.

The former method has potential problems as follows:

- It causes residues of chemicals which may affect the human health
- It causes environmental pollution by harmful chemicals

Because of these potential problems, a chemical sterilization method is applied under very strict regulations.

The latter method, a physical sterilization method, does not have such potential problems as a chemical sterilization method suffers from.

On this paper, we introduce a food irradiation with low energetic, lower than 300keV, electrons (so called SOFT ELECTRON,) as a rather new method of food sterilization. It is also a physical sterilization method, and free from the problems mentioned above.

Low energetic electrons have small penetration power (50~200micron) through raw materials, and by selecting a proper energy of electrons we can sterilize only the surfaces or skins of target materials.

Typical features of sterilization by using SOFT ELECTRON are as follows:

- It is for dried raw materials like grains, spices and beans etc., only on whose surface microbes usually stay.
- Using SOFT ELECTRON, one can sterilize only the surfaces of materials without any serious deterioration of the inside (see fig. 1.)
- The shielding system for SOFT ELECTRON is rather simple, and it makes easy to install SOFT ELECTRON system(s) in a food process line.

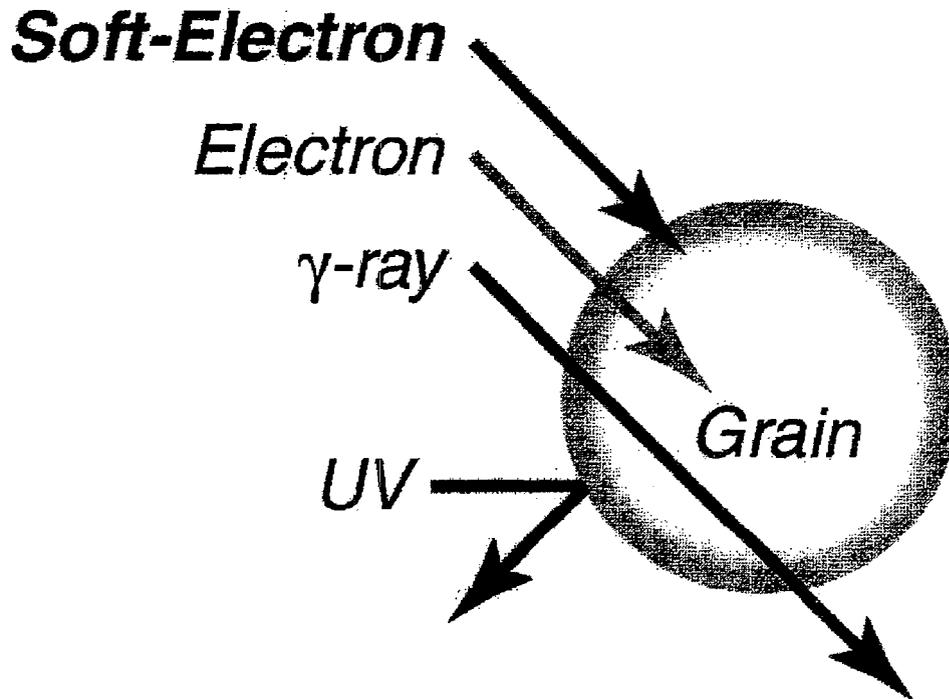


Fig.1 Schematic view of SOFT ELECTRON and other radiant rays