The word RADURA is derived from radurization, glued from RADiation and 'durus' (Latin for hard, lasting etc.). Radicidation is derived from RADiation and 'cadere' (Latin for fell, cut, kill). Radappertization is derived from RADiation and the name of Appert, a French scientist/engineer who invented sterilized food for the troops of Napoleon.

The proposals for a new terminology were originally made by

**Radappertization**: dose (25 - 45 kGy) sufficient to reduce the number and/or activity of viable microorganisms to such an extent that very few, if any, are detectable by any recognized method (viruses being excepted). No microbial spoilage or toxicity should become detectable in a food so treated, no matter how long or under what conditions it is stored, provided the package remains undamaged.

**Radicidation**: dose (2 - 8 kGy) sufficient to reduce the number of viable specific non-spore-forming pathogenic bacteria to such a level that none are detectable by any recognized method; also be applied to the destruction of parasites such as tapeworm and trichina in meat (0.1 - 1 kGy)

**Radurization**: dose (0.4 - 10 kGy) sufficient to enhance its keeping quality by causing a substantial decrease in numbers of viable specific spoilage microorganisms.

(adapted from J.F. Diehl, Safety of Irradiated Foods, Marcel Dekker, 1995, p. 99 ff.)
The inventors of the symbol RADURA came from the Pilot Plant for Food Irradiation, Wageningen, Netherlands. And the leading head was R.M. Ulmann, the then director, who introduced this symbol to the international community:

Ulmann, R.M., Introducing irradiated foods to the producer and consumer, in: Peaceful uses of atomic energy, Vienna (Austria), IAEA, 1972, v. 12 p. 299-308

Dr. Ulmann in his lecture also provided the interpretation of this symbol: denoting food - as an agricultural product - i.e. a plant (dot and two leaves) in a closed package (the circle) - irradiated by penetrating ionizing rays (the breaks in the upper part of the circle).

The symbol RADURA was always used as a symbol of quality exceptionally for food processed by ionizing radiation. The Dutch pilot plant used the logo as an identification of irradiated products and as a promotion tool for a high quality product with extended shelf life. In supermarkets where the irradiated mushrooms were on sale the logo was dominantly shown and buyers received a leaflet with information about the process and the advantages of the treated products. In clearances for other products granted by the Dutch authorities at later dates, application of the logo on the product or a clearly visible logo near treated bulk product was even demanded

Originally, it was used in the 60's exclusively by the Pilot Plant for food irradiation, Wageningen, Netherlands, owning the copyright; which facility was the nucleus for the later Gammaster. It was the then president of Gammaster, Jan Leemhorst who propagated the use of this logo internationally. By his intervention, it was also included in the Codex Alimentarius standards on irradiated food as an option to label irradiated food. The use of the logo was permitted to everybody adhering to the same rules of quality. The symbol was also widely used by Atomic Energy of South Africa, including the labelling by the term 'radurized' instead of irradiated.

Following the later interpretation by some food and process engineers, the symbol may also be read the following way:

- The central dot is the radiation source.
- The two circle segments ('leaves') are the biological shield to protect the workers and the environment.
- The outer ring is the transport system, the lower half of it is shielded from radiation by the biological shield, the upper broken half symbolizes the rays hitting the target goods on the transport system.

This summary originated from discussions among members of ASTM international E10 subgroups, it includes also contributions by Henry Delincée, Harry Farrar, Yves Henon, and Jan Leemhorst.

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