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Mediterranean Region

# ABSTRACT BOOK

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# Cs-137 contamination in wild boars in Sesia Valley, Italy

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Traces of cesium-137, well above the threshold set out in the Italian regulations, have been found in wild boars in the alpine area of the Sesia Valley, Piedmont, Italy.

We analyzed samples of tongue and diaphragm of animals slaughtered during the hunting season 2012-2013 and in 27 of these the level of cesium was higher than the threshold specified by the Italian Regulation 733 of 2008, dealing with the tolerable limit in the event of a nuclear accident. In fact, 27 samples have values above 600 Bq/kg, reaching up to 5600 Bq / kg in one sample, i.e., about ten times the limit. Cesium-137 is a radioactive isotope released, in 1986 from the Chernobyl disaster. It would seem that the contamination of these boars is so high due to the Chernobyl fallout and not, as it was thought at first, due to a radioactive medical source abandoned and disposed of illegally.

According to ARPA Piemonte (Governmental Regional Agency), the fall-out from Chernobyl was particularly high in certain areas of Piedmont, including the Sesia Valley, and it is not uncommon to find wild boars so contaminated and, in particular, this has already happened in other areas heavily contaminated by Chernobyl fallout as the Sesia Valley was.

A radiological test has been carried out, to assess conclusively that cesium-137 in the boars is "old Cesium" from Chernobyl and nothing something coming from a new contamination. Cs-137 (which has a half-life of 30 years) came from Chernobyl mixed with the shortest-lived isotope Cs-134 (which has half-life of about 2 years). In particular, in May 1986, the ratio of the radioactivity of Cs-137 versus Cs-134 present in the cloud and deposited on Italian soil was equal to about two (1.94): in other words, the radioactivity from Cs-134 was approximately half that from Cs-137.

But the radioactivity from Cs-134 is halved every two years, while the longest Cs-137 halves every 30 years. So now, 27 years after Chernobyl, the radioactive concentration from Cs-134 has halved more than 13 times, falling to very little, while that of Cs-137 is still a bit 'more than a half of the original one. So, if we analyze the Chernobyl Radioactive cesium today, the ratio of the radioactivity of Cs-137 and Cs-134 is no longer near 2, but it has become, in favor of Cs-137, about 8900.

A further analysis has been performed with more precise measurements: the radioactive contamination of our boars shows a radioactivity of Cs-134 in their flesh almost imperceptible, but in the order - in the maximum case of the 5600 Bq/kg contamination - of 0.6 Bq/kg. Then it is confirmed that it is due to the heritage of the Chernobyl cloud contamination.

However, the wild boars are "sentinel animals" for pollution conditions in the areas where they live, because they provide precise information about the status of the environment. Thus, a contamination of the animals should require investigation and analysis of the environmental, meteorological and hydrological pollution in the areas where they live.

**Keywords:** Cesium-137, chernobyl, radioactive contamination, wild boars