

SUMMARY

The laboratories in charge of the official and unofficial control over food and products of the supply chain, can have a considerable amount of data deriving from activities that have been taking place annually for several years. There is a need not to squander resources and to share the data produced for various purposes. Especially for very expensive analyzes (dioxins and PCBs) it is correct that the data already produced are used to better set up other surveillance and control programs.

This project allowed to process 7-year data (from 2011 to 2017) to produce knowledge on the chemical contamination of environmental origin of dairy products in the Lazio region.

The contaminants studied were polycyclic aromatic hydrocarbons (IPA), polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF), polychlorinated biphenyls (PCBs) both dioxin similar and non-dioxin (PCB dl and PCB NDL) and metals (lead, arsenic, mercury, cadmium, chromium, beryllium, nickel, copper, thallium).

The studied matrices were: all the products of the dairy supply chain (drinking milk, infant formula, mass milk, cheese, yogurt, butter), the human milk coming from a previous research (IZSLT 005/11 RC - used in this study to make comparisons with milk of animal origin), the fodder of vegetable origin for animal feed, plants for human food sampled after environmental emergencies as that following a fire of a waste storage warehouse. In general, the data have not revealed any particular critical issues even around sites sampled for specific environmental risks known or suspected.

In 7 years, only 3% of the samples (11 samples out of a total of 352) have exceeded the standard limits for PCDD, PCDDF and PCB dl (action levels and maximum limits), all belonging to the sheep milk. Sheep milk resulted the most sensitive matrix for environmental biomonitoring as regards PCDD / F and PCB dl (average values respectively 0.25 and 0.97 pg / g of fat, WHO TEQ).

With regard to dairy matrices, 90% of the controls for metals were below the limits of quantification (<LOQ) and this did not allow the spatial detection of a regional concentration gradient. About 1.7% of controls exceeded the limit for lead (5 out of a total of 290) and 3% for mercury (3 out of a total of 86). The average, median, minimum and maximum values were provided for all the matrices examined in order to have reference values in the region.

As regards plant matrices, 5 out of 63 samples (8%) exceeded the standard levels for PCDD / F and PCB dl while no sample exceeded the maximum levels for PCB NDL and for metals (cadmium and lead). In particular, mass milk and fodder have allowed first assessments of the background contamination present in these products in the Lazio region. For spatial evaluations, a critical element was the non-homogeneous distribution of the samples taken on the territory: more concentrated in some areas and scarce in others.

Subsequent programs may be targeted in particular to cover these knowledge gaps (geographical, but also on the supply chain points)

Key words: organic contaminants, metals, milk