

Chromosomal instability in Italian Friesian cows exposed to dioxins and raised in proximity of an industrial area producing steel in Taranto city (Southern-Italy)

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Dioxins are a large family of congeners which can be fitted in three main groups: polychloro-dibenzo-dioxins (PCDDs), polychloro-dibenzo-furans (PCDFs) and dioxin-like polychlorobiphenyls (DL-PCBs). These chemicals are considered highly toxic, especially the tetrachloro-dibenzo-*p*-dioxin (TCDD). Most PCDDs, PCDFs are produced by both industrial processes and illegal waste burning, while DL-PCBs are produced only during some industrial process like those producing steel. Dioxins are also high persistent in the environment, especially when entering the human or animal body due to their ability to be absorbed by fat tissue where they can remain for long time being their half-life in the body for years. Fifty-six randomly selected Italian Friesian cows from two farms located in vicinity and far (control) from a metallurgic factory of Taranto city (Southern-Italy) underwent cytogenetic investigations to ascertain possible differences in their chromosome fragility. The farm located close to the industrial area was under legal sequestration due to the presence in the milk mass of higher mean values of dioxins (mainly DL-PCBs) than those permitted. As control, samples of cows of same breed reared far (65 Km) from the industrial area, were employed. The two cytogenetic test we used (chromatid and chromosome breaks, SCE) revealed a significantly ($P < 0.01$) higher chromosome fragility in cells of exposed cows compared to those of control, thus suggesting a new politic of animal breeding to prevent contamination of the food chain and human diseases in urban areas, especially close to metallurgic factories.

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