Levels of Indicator Polychlorinated Biphenyls in Raw Materials Used for Feed Production

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SUMMARY

Polychlorinated biphenyls have been used as lubricants, insulators, heat conductors and fire retardants; due to their elasticity they have also been widely used in varnishing. Currently their use is in marked decline because of their toxicity and were banned under the Stockholm Convention (Rossi et al., 2010). The major route by which humans are exposed to this contaminant is the consumption of contaminated food, nearly 90% of cases, of which 60 – 80% are due to the ingestion of contaminated feed by the food production animals (Schwind et al., 2010). Cereals constitute the principal raw material used in the production of compound feed, 40%, but in Romania this feed ingredient are also by local farmers as animal food. Six indicator PCBs, with the IUPAC number 28, 52, 101, 138, 153 and 180, were analyzed in barley, maize and sunflower samples collected from three units located in North-West of Romania. Samples were spiked with internal standard, extracted using an Accelerated Solvent Extraction from Dionex, cleaned-up using a multilayer silica gel column and a carbon column, purified on a C18 cartridge, concentrated and injected in a HRGC/HRMS (1 μL). Table 1 presents the mean and standard deviation for the concentration of indicator PCBs analyzed in barley, maize and sunflower samples. Concentrations are expressed in pg/g feedstuff (whole weight).

Results showed that sunflower samples had higher concentrations of PCBs (410.6 pg/g ww) because these samples have a fat percentage between 40 – 50% while barley and maize have a much lower fat content, 2.8% and 4.3%, respectively. The contribution of PCB 28 and 52 to the sum of six PCBs was between 46 – 61%, while PCB 180 contributed only with 5 – 6%.

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REFERENCES