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Occurrence and particle size distribution of TiO2 in various food product categories following its european ban

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Following the opinion of the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) on the risks associated with ingestion of food containing the food additive E171, French authorities suspended the use of this additive in food products from January 1st 2020 as a precautionary measure. Two years later Commission Regulation (EU) 2022/63 of 14 January 2022 banned the use of E171 as a food additive in the European Union.

We report here the outcome of a 5-year screening (2018-2022) of 352 food samples collected on the French market by the French authorities and analysed to determine the actual presence, content and/or particle size distribution of E171 additive.

Single particle inductively coupled plasma mass spectrometry (spICP-MS) analysis confirmed that E171 additive used in food products often contained significant fractions of nano-sized particles, even though 'Nano' labelling was hardly applied by the business operators. Nevertheless, determination of the total TiO_2 content in food samples through the analysis of Ti by inductively coupled plasma optical emission spectroscopy (ICP-OES) demonstrated that French and European business operators were globally able to implement the 2020 French suspension and 2022 EU ban. At the same time, business operators operating outside of the EU seemed to have more difficulty in implementing the new EU rule.

Thus, attention should be maintained on the TiO_2 content of food products on the European market, especially for those imported from non-EU countries.

Keywords: E171 food additive, titanium content, particle size distribution, spICP-MS, ICP-OES

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