

5 The European pro-active approach for dioxins: the analytical point of view

5.1 Summary

In this chapter, we discuss the capability of the state-of-the-art GC/HRMS method to provide reliable results at decreasing maximum levels. Indeed, the European pro-active approach regarding dioxin issue has an ultimate goal to establish target maximum levels in food and feed in order to reduce the exposure of the majority of the European population below the tolerable weekly intake (TWI, i.e. 14 pgWHO-TEQ/kg body weight/day). This chapter presents the issue from a different angle, i.e. the analytical point of view for the future establishment of target levels. Based on the results of PCDD/Fs and DL-PCBs interlaboratory study in animal feedingstuffs described in the previous chapter, we demonstrated for the sum of the 17 PCDD/Fs toxic congeners that reliable results can easily be provided up to a value of 0.17 ng WHO-TEQ/kg. The ability to reliably quantify a minute trace of these contaminants has been pointed out with the aim of providing an analytical benchmark for the future establishment of target dioxin levels in animal feedingstuffs. Hence, both analytical and toxicological aspects should be examined together to set realistic target levels achievable for most dioxin laboratories involved in monitoring programs.

We also underlined the need to harmonize the concepts for LOD/LOQ determination. A non-exhaustive list of definitions and concepts for LOD/LOQ are introduced and discussed. For this study, the results showed good agreement between the different approaches used for congeners not present in procedural blank, but nevertheless, there is clearly a need for greater consensus on the definitions for detection and quantification methods. In addition, the particular case of congeners present in procedural blank should be treated separately (see annex to this chapter).

Finally, we discuss two different ways of reporting and interpreting a dioxin result to assess compliance with statutory limits. One is to report a result close to a maximum level with its measurement uncertainty. The decision of non-compliance beyond reasonable doubt is only taken if the result minus its expanded uncertainty (U) is above the maximum limit. The other is to report only the result and to shift the decision level above the maximum level (decision limit cc_α), where it can be decided with statistical certainty that the maximum level has been truly exceeded. Both approaches favor the producers rather than consumer protection.