Mixtures methodology equips EFSA for multiple chemicals

EFSA has developed a harmonised framework to use across its scientific panels when evaluating the potential "combined effects" of chemical mixtures in food and feed. The approach gives EFSA’s scientists the tools to follow a mixtures approach when needed, which complements the current EU regulatory requirements for assessing single substances.

People, animals and the environment can be exposed to multiple chemicals from a variety of sources. Understanding how combined chemicals behave is complex and the number of combinations is potentially infinite, so EFSA’s Scientific Committee has developed a practical scientific tool for risk assessors that also supports and informs risk managers.

Milestone in chemical risk assessment

Dr Tobin Robinson, Head of EFSA’s Scientific Committee and Emerging Risks Unit, said: “This milestone follows several years of preparatory work by EFSA and our European and international partners. We ensured the guidance remained practical by holding a public consultation in 2018, in which we received over 300 comments, and by engaging with stakeholders during the process.

“We are already using some of these principles and tools, for example, on groups of pesticides and groups of contaminants. Now, when we see that a mixtures approach is needed, our harmonised framework puts us in a stronger position to carry this out.”

How the guidance works

The approach builds on existing methods and international experience in assessing potential concerns about chemical mixtures.

Prof Christer Hogstrand, Chair of the Chemical Mixtures Working Group, said: “Assessing mixtures works similarly to how we tackle single substances. Normally we determine first who is exposed – people, farm animals or wildlife such as birds and bees – and by how much. Then, we estimate the toxicity of the mixture or its individual components. Finally, we quantify the risk by comparing combined exposure and combined toxicity.

“Often we add up the doses for common effects to estimate the overall risk. But, sometimes the chemicals ‘interact’, meaning their toxicity increases or decreases. Interactions like these are uncommon overall but need checking particularly if toxicity increases. Our guidance allows us to do this for every mixture we look at.”

Supporting decision-makers

“Ultimately,” Dr Robinson said, “this framework is designed to support EU and national risk managers so they can make informed decisions in situations when combined exposure to multiple chemicals needs to be considered.”

Low public awareness

An EFSA research study from 2018, also published today, shows that overall in the EU awareness of chemical mixtures among the general public is quite low. EFSA has developed a new interactive multimedia tool to help people understand some of the main issues and concepts, such as "combined exposure" and "combined toxicity".

The study presents useful findings for communicators and social researchers on both chemical mixtures and chemicals in food more generally.