How Nestlé Ensures Safe Food: Our Global Standards

Example : Lead (Pb)

Introduction

The health and safety of our consumers is our highest priority at Nestlé. Our commitment is to never compromise on the safety, compliance or quality of any product or service. This requires all of our 339,000 employees to be engaged, to understand their responsibilities and to be empowered to take action in order to protect our consumers and customers. Therefore Quality Assurance and Food Safety are an integral part of the Nestlé Business Principles. To support our employees we have 8000 Quality Professionals in the company, comprising Quality Assurance experts, Food Safety experts and Analytical experts whose job it is to be the challenger and guardian for food safety and quality.

Our Nestlé Quality Management System encompasses the whole value chain from “farm to fork”, ensuring appropriate controls are in place at each step of the chain to ensure that our products are safe and compliant.

Background on lead: how does lead get into food ?

Lead occurs in the earth’s crust and is present in air, soil and dust. Environmental occurrence, largely due to industrial emissions from mining, smelting, recycling or waste incineration, can contribute substantially to overall lead exposure (IARC 2006; JECFA 2000).

Atmospheric lead from industrial pollution or leaded gasoline can contaminate food through deposition on agricultural crop plants. Lead in soil arising from lead-containing ordnance stored on former munitions sites and from ammunition used in rifle or military firing, atmospheric deposition, or inappropriate application of pesticides, fertilizers, or sewage sludge can contaminate agricultural crop plants through uptake or through deposition of the soil on plant surfaces.

Contaminated plants and soil are, in turn, a source of contamination of livestock. Table 1 below summarises average lead levels in various food commodities (cereals, vegetables, fruits, meat fish, etc.) collected from Europe, China and Singapore (JECFA, 2011).

Table 1. Lead concentration in different commodities (source: JECFA 2011).

Food products	Average amount of lead and maximum level (parenthesis), mg/kg
Cereals and cereal products	0.0286 (7.12) [a]
Sugar and sugar products	0.034 (4.1) [a]
Fats	0.039 (7.3) [a]
Vegetables, including juices	0.402 (1.97)[c]
Starchy roots and potatoes	0.022 (1.32) [a]
Leeks and onions	0.104 (2.72) [b]
Fruits, Europe	0.014 (3.7) [a]
Fruits, China	0.075 (3.7) [b]
Juices, soft drinks and bottled water	0.0047 (0.66) [a]
Coffee, tea, cocoa	0.22 (6.21) [a]
Alcoholic beverages	0.022 (5.8) [a]
Meat products and offal	0.253 (867) [a]
Fish and seafood	0.054 (4.06) [a]
Eggs	0.0052 (0.21) [a]
Milk and dairy-based products	0.009 (4.5) [a]

a = data from Europe; *b* = data from China; *c* = data from Singapore.

Lead contamination of food can also arise from food processing (e.g. inappropriate drying conditions), food handling, and food packaging. Sources of lead in food processing areas include lead paint and lead-containing equipment, such as piping and lead-soldered machinery.

Occupational exposure apart, the main source of lead exposure of the general human population is from food and water. Other sources can include glazed pottery, brass and bronze fittings containing lead (in the beer industry), and colorants and inks in food-contact materials.

Lead levels in tap water are usually < 0.01 mg/litre, although much higher levels are present in areas where water is delivered through lead piping. Atmospheric deposition, urban runoff, lead solder in copper pipe fittings and old lead pipes contribute significantly to lead levels in water (WHO 2011).

Our Nestlé global Standards on chemical surveillance and testing

Our Nestlé Quality Management System encompasses the whole value chain from the farm to the fork, ensuring controls are in place at each step of the chain to ensure that our products will be safe and complaint. We apply the same Nestlé Quality Standards everywhere in the world - USA, India, China, Switzerland, everywhere. These standards are always aligned with Codex and are often far more stringent than some national standards.

Nestlé has established a number of comprehensive Standards related to food chemical contaminant monitoring and surveillance. These instructions define a risk-based strategy to manage chemical contaminants, i.e. different intrinsic risk levels, High, Medium, Low, Negligible, for the chemical hazard-material combination. These Standards are mandatory and applied globally, without exception, complementing our already solid food safety HACCP systems in place in all our factories, certified according to FSSC 22000.

In the case of lead, our surveillance programs, internal data, and trends, show that some agricultural crops are intrinsically a potential risk of high levels of lead. The source of lead is mainly through the environment, and we ensure that suppliers have appropriate upstream management & controls, and as well we adapt our testing regime to ensure that lead is within safe levels at all times.

In this context it is important to remember that food safety is not only "designed in" during the manufacture of food. All individual steps across the value chain in the "farm-to-fork" continuum need attention, specifically upstream at the agricultural level to the farm. Such a holistic approach enables farmers and manufacturers alike to exert most impact and address issues early on, through targeted measures or programs that mitigate the hazard ideally at the crop stage.

Codex Guidelines as a key reference for Nestlé

Codex, intergovernmental organizations, and many countries have set standards for allowable levels of lead in various foods.

Low levels of lead in foods may be unavoidable, because of the ubiquitous nature of lead in the modern industrial world. However, following good agricultural and manufacturing practices can help minimize lead contamination of foods.

The analysis of foods for the presence of lead is a verification that upstream supply chains and manufacturing processes are under control in terms of managing lead. In this context, Codex has also established a very useful code of practice for the prevention and reduction of lead contamination in foods (CAC/RCP 56-2004).

Some foods and food ingredients are particularly "at risk" to have higher concentrations of lead, for example spices and herbs have been highlighted in certain scientific studies to harbour relatively high amounts of lead. To ascertain that quality assurance measures in the supply chains are effective, a certain degree of testing is required. Any analytical testing must be representative of the particular batch of material (Codex, CAC/GL 50-2004).

Our testing laboratories and analytical methods

We have 26 state-of-the-art food safety and quality assurance (NQAC) laboratories spread around the world, including in India, to support our 443 factory laboratories. Our NQAC laboratories are all ISO 17025 certified or locally certified (for example the Moga NQAC in India is accredited according to the NABL (National Accreditation Board for Testing & Calibration Laboratories). Together the

NQACs perform more than 3 million analyses per year. They are maintained with the highest qualified staff and most up-to- date testing equipment.

Nestlé uses this highly sophisticated technology in our factories to rapidly test for a wide range of substances and microorganisms that are potentially harmful to human health. The company does extensive food testing, carrying out about 100 million tests a year on its products.

Nestlé has an in-house accredited International Proficiency testing programme that entails heavy metal testing including lead. Our 26 Nestlé Quality Assurance Laboratories participate in proficiency testing, to ensure the high standard of quality of our data.

The analytical methods that we apply in our Quality Assurance Centres are aligned with International methods. For example, our testing method for lead is based on official CEN standard EN 13805:2013 for high pressure digestion, and uses Inductively Coupled Plasma Mass Spectrometry (ICP-MS) that can measure several trace elements reliably in a wide range of liquid and solid raw materials and food products at the required low levels of quantitation. ICP-MS is the preferred method of choice versus graphite furnace-atomic absorption spectrometry (GF-AAS), which has shown problems related to "background noise" and hence insufficient limits of quantification.

References

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