



DRAFT TANZANIA STANDARD

Code of practice for the prevention and reduction of lead contamination in foods

For STAKEHOLDERS' COMMENTS ONLY

TANZANIA BUREAU OF STANDARDS

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Code of practice for the prevention and reduction of lead contamination in foods

Foreword

This Tanzania Standard was approved under the authority of the Board of Director of Tanzania Bureau of Standards.

Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania established by the Standards Act Cap. 130.

Tanzania Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. The Technical Committees work under the supervision of Divisional (sectoral) Committees. The Standards are developed in accordance with the Guide and Procedure for Development of Tanzania Standards and TZS 0, *Guide for presentation of Tanzania Standards*.

Tanzania Standards are subject to review, to keep pace with science and technological advances. Users of the Tanzania Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This Tanzania Standard was developed under the supervision of the Agriculture and Food Divisional Standards Committee [AFDC]. The Technical Committee responsible for the standard is AFDC 27- Contaminants.

The reporting of the result of a test or analysis made in accordance with this Tanzania Standard, if the final value, observed or calculated is to be rounded off, shall be done in accordance with TZS 4.

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Introduction

Lead is among the heavy metals that occurs in the environment both naturally, and largely from anthropogenic sources, because of its widespread industrial uses. Lead exposure can occur through the consumption of food and water, and through the use of cosmetics, dietary supplements, traditional medicines, tobacco, and other contaminated materials. Lead exposure also occurs in the workplace, from lead paint, in toys for children, and generally through exposure to lead-contaminated soil and air.

Lead contamination of food arises from numerous sources, including air, soil, food processing, food handling, and food packaging. Atmospheric lead from industrial pollution or leaded gasoline can contaminate food through deposition on agricultural crop plants. Soil lead arising from lead-containing ordnance stored on former ammunition 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.

Sources of lead in food processing areas include lead paint and lead-containing equipment, such as piping and lead-soldered machinery. In the packaging area, lead-soldered cans have been identified as a very important source of lead contamination in food. Other packaging items that are potential sources of lead contamination include colored plastic bags and wrapping papers, cardboard containers that contain lead or are colored with lead-containing dyes, lead foil capsules on wine bottles, and lead-glazed ceramic, lead crystal, or lead-containing metal vessels used for packaging or storing foods.

Chronic exposure to lead can result in damage to the kidneys and liver, as well as the reproductive, cardiovascular, immune, hematopoietic, nervous, and gastrointestinal systems. The most critical effect of chronic lead exposure is reduced cognitive and intellectual development in children. Exposure to high amounts of lead can cause acute toxicity leading to gastrointestinal distress, anaemia, encephalopathy, and death.

There have been worldwide efforts to reduce lead exposure from food. Such efforts have focused on implementing standards for maximum or allowable lead levels in food, food additives, and food contact materials; ending the use of lead-soldered cans; controlling lead levels in drinking water; reducing leaching from lead-containing vessels or restricting their use for decorative purposes; and identifying and reacting to additional sources of lead contamination in foods or dietary supplements. Although not targeted specifically at food, efforts to reduce environmental sources of lead, including restrictions on industrial emissions and restricted use of leaded gasoline, have also contributed to declining lead levels in food. Despite efforts to reduce lead exposure, lead contamination of foods may still result from lingering environmental contamination (e.g. from leaded gasoline), continued use of lead-containing products (e.g. lead-glazed ceramic vessels erroneously used for food), and consumption of products remaining on the market (like older vintage wines).

This code of practice is therefore aimed at guiding regulators, farmers, and food manufacturers as well as consumers to prevent or reduce lead contamination in foods.

1. Scope

This code of practice recommends on the application of Good Agriculture Practices and Good Manufacturing Practices to prevent or reduce lead contamination in foods along the food systems.

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/RCP 49-2001- *Code of practice concerning source directed measures to reduce contamination of food with chemicals*

3. Terms and definitions

For the purposes of this Tanzania standard, the following terms and definitions apply:

3.1 contamination

action or state of making or being made impure by polluting or poisoning

3.2 food systems

encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.

3.3 good agricultural practices

collection of principles to apply for on-farm production and post-production processes, resulting in safe and healthy food and non-food agricultural products, while taking into account economic, social and environmental sustainability

3.4 good manufacturing practices

system to ensure that products meet food safety, quality and legal requirements

3.5 food

any substance, whether processed, semi-processed or raw which is intended for human consumption, but does not include cosmetics, tobacco, medicinal products, narcotic or psychotropic substances, residues and contaminants

3.6 food value chain

consists of all the stakeholders who participate in the coordinated production and value-adding activities that are needed to make food products.

3.7 packaging materials

materials that have direct contact with foods

3.8 heavy metal

an element having an atomic number greater than 20 and density above 5 g/cm³ that is especially poisonous

4. Recommended practices based on Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP)

4.1 Source directed measures

Food control authorities should consider implementation of source directed measures recommended in CAC/RCP 49-2001.

4.2 Agricultural practices

4.2.1 Leaded gasoline is a major contributor to atmospheric lead. For instance, dryers powered with leaded gasoline have been found to contaminate drying crops with lead. Farmers and processors should avoid using dryers or other equipment powered by leaded gasoline to dry produce. Regulators should consider reducing or eliminating the use of leaded gasoline in agriculture.

4.2.2 Agricultural lands near industrial facilities, roadways, ordnance depots, mining sites, rifle ranges and military firing ranges may have higher lead levels than more isolated lands. Land near buildings with weathered exterior paint also may have high lead levels, a particular concern when such buildings are situated near livestock or small gardens. Where possible, farmers should test lead levels in soils that are near lead sources or that are suspected of having elevated lead levels to determine if they exceed recommended levels by regulators.

4.2.3 Regulators and extension officers should identify the land contaminated with lead arsenate pesticides from previous application/or premises used to store obsolete pesticides.

4.2.4 Farmers should avoid using lands that have been treated with lead arsenate pesticide, such as former orchards, to grow crops that may accumulate lead internally (such as carrots, cassava and other root crops) or on their surface (such as leafy vegetables).

4.2.5 Farmers should be educated and informed on the health risks on growing crops on lands that have been treated with sewage sludge from different sources. Farmers should also avoid growing crops on lands that have been treated with sewage sludge that does not adhere to national maximum allowable lead levels.

4.2.6 Leafy vegetables are more vulnerable than non-leafy vegetables or root vegetables to deposition from airborne lead. Cereal grains also can absorb lead from the air at a significant rate. In areas like along the high ways, industrial facilities and mining sites, where atmospheric lead levels are higher, farmers should be advised choosing crops that are less vulnerable to airborne deposition.

4.2.7 Regulators responsible for pesticides and fertilizers should regulate pesticide and fertilizers in order to limit access by farmers to lead contaminated inputs.

4.2.8 Farmers should avoid using non- registered pesticides and fertilizers to prevent lead contamination.

4.2.9 Crops should be protected from lead contamination (e.g., exposure to atmospheric lead, soil, dust) during transport to processing facilities.

4.2.10 Home or small-scale commercial gardeners should also take steps to reduce lead contamination. For instance testing of the soil before planting, avoid planting near roadways and buildings painted with lead-based paint, good gardening practices for soils with elevated lead levels include mixing organic matter into the soil, adjusting soil pH to reduce availability of lead to plants, choosing plants that are less vulnerable to lead contamination, using liners to reduce contact deposition of soil on plants and build up gardening beds with lead-free soil. Gardeners should consult extension officers, for advice on what lead levels are too high for gardening and advice on how to garden safely in lead-contaminated soils.

4.2.11 Agricultural water for irrigation should be protected from sources of lead contamination and monitored for lead levels to prevent or reduce lead contamination of crops. For example, well water and waste water from treatment facilities used for irrigation should be properly protected and routinely monitored to prevent contamination.

4.2.12 Farmers should be trained on good agricultural practices to prevent lead contamination of farmlands and crops.

4.3 Drinking water

4.3.1 Regulators should monitor lead levels or treatment techniques for controlling lead levels in drinking water.

4.3.2 Water supply authorities should consider treatment techniques, such as increasing the pH of acidic waters, to minimize corrosion and reduce leaching of lead in the distribution system.

4.3.3 Where appropriate, water supply authorities should consider replacing lead piping and other lead-containing fixtures.

4.4 Food ingredients and processing

- 4.4.1** Regulators should monitor the levels of lead in foods and food ingredients.
- 4.4.2** Food processors should use food and food ingredients, including ingredients for food supplements that have complied with the set lead limit. The food processors should know the source of the raw materials and food ingredients.
- 4.4.3** During processing and preparation, maximum removal of surface lead from plants should be practiced, e.g., by thoroughly washing vegetables, removing the outer leaves of vegetables; and peeling root vegetables, where appropriate.
- 4.4.4** Food processors should ensure that the water supply for food processing complies with established maximum limits for lead.
- 4.4.5** Food processors should use non-leaded pipes and examine piping within facilities to ensure that older piping is not adding lead to water supplies. Such piping may include brass fixtures, in addition to lead-soldered pipes.
- 4.4.6** Food processors and food service establishments should use food-grade metals for all metal surfaces that come into contact with food and beverages.
- 4.4.7** Food processors and food service establishments should not use lead solder to repair broken equipment in food processing facilities. They should also not substitute non-food-grade equipment that may be present in a food processing facility for broken food-grade equipment.
- 4.4.8** Food processors and food service establishments should ensure that lead paint peelings do not become a source of lead contamination in processing facilities. If food processors and food service establishments carry out lead paint abatement, they should also ensure that appropriate clean-up procedures are followed to prevent further dispersion of lead paint and dust, which could create a greater hazard.
- 4.4.9** Food processors and food service establishments should occasionally test incoming raw materials and finished products for lead to verify that their control measures are functioning effectively.
- 4.4.10** Food processing facilities should be located in food processing designated areas to prevent lead contamination. For the food service establishments located in higher risks areas of lead contamination, the measures should be taken to prevent contamination.

4.5 Production, use of packaging and storage products

- 4.5.1** To provide maximum protection against lead contamination, food processors should not use lead-soldered cans.
- 4.5.2** Lead can be released from the solder surface itself, or from solder dust or solder splashes deposited inside the can during the can-making process. Methods for reducing splashing and dust formation include avoiding the use of excess flux, controlling exhaust over the work area to minimize dust deposition, controlling the temperature of the fluxed can body and solder, post-solder lacquering of the interior surface or interior side seams of cans, careful wiping of excess solder from finished cans, and washing soldered cans before use.
- 4.5.3** Tinplate used for food cans should meet national or international standards for maximum level of lead.
- 4.5.4** Lead dyes or lead-based printing inks should not be used for packaging, such as for brightly coloured candy wrappers. Even if such wrapping does not come into direct contact with foods, children may be tempted to put the brightly colour wrappers in their mouths.
- 4.5.5** Plastic bags or boxes with exteriors treated with lead-based dyes or lead-based printing inks should not be used as primary packaging materials for food. Handling of these items during cooking or reuse by consumers for storing other food items can cause lead contamination.

4.5.6 Packing foods for sale in traditional lead-glazed ceramics should be avoided because these ceramics may leach significant quantities of lead into the foods.

4.5.7 Lead foil capsules should not be used on wine bottles because this practice may leave lead residues around the mouth of the bottle that can contaminate wine upon pouring.

4.5.8 Decorative ceramic ware that has the potential to leach unacceptable quantities of lead should be clearly labelled as not for food use.

4.5.9 Ceramic ware producers should use manufacturing procedures and quality control mechanisms that minimize lead leaching.

4.6 Consumer practices

4.6.1 Regulators should educate consumers about appropriate practices to reduce lead contamination in foods.

4.6.2 Consumers should avoid storing foods, particularly acidic foods or foods for infants and children, in decorative ceramic ware, lead crystal, or other containers that can leach lead. Foods should not be stored in opened lead-soldered cans or stored in reused lead-dyed bags and containers. Consumers should avoid frequent use of ceramic mugs when drinking hot beverages such as coffee or tea, unless the mugs are known to have been made with a lead glaze that is properly fired or with a non-lead glaze.

4.6.3 Consumers should wash vegetables and fruit thoroughly to remove dust and soil that may contain lead. Washing hands before preparing food will also help remove any lead-contaminated dust or soil from hands.

4.6.4 Where lead in water distribution systems is a problem due to corrosion, consumers should let water run from faucets before use to allow corroded lead from piping to be flushed out of the system, particularly if they are preparing foods for infants or children. Hot water from the faucet should not be used for cooking or food preparation.

4.6.5 Consumers should avoid buying and consuming the foods originated from lead contaminated areas.

4.7 Handling of food products at the point of sales

Regulators should regularly train food retailers on good handling practices to prevent among others lead contamination. Retailers should be responsible to prevent contamination of foods with lead.

Bibliography

CAC/RCP 56: 2004 - Code of practice for the prevention and reduction of lead contamination in foods

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