



National Standard of the People's Republic of China

GB 14881-2013

National Food Safety Standard General Hygiene Practice for Food Production

食品安全国家标准

食品生产通用卫生规范

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Foreword

This Standard replaces the General Hygiene Practice for Food Enterprises (GB14881-1994).

This standard modifies GB14881-1994 in the following aspects:

- Changes the name of the standard;
- Modifies structure of the standard;
- Adds terms and definitions;
- Emphasizes food safety control requirements for the entire food production process, namely raw material purchase, processing, product storage and transportation; it also lists major control measures for biological, chemical and physical contaminations;
- Modifies sections related to production equipment; the standard sets requirements on layout, materials and design of the production equipment from the perspective of preventing biological, chemical and physical contaminations;
- Adds relevant requirements for the procurement, inspection and acceptance, transportation and storage of raw materials;
- Adds specific requirements on product traceability and recall;
- Adds requirements on record keeping and document management;
- Adds “Appendix A: Guide of Monitoring Procedure for Microorganism in the Food Production Environment”.

National Food Safety Standard

General Hygiene Practice for Food Production

1. Scope

This standard specifies basic requirements and management rules for locations, facilities and personnel of material purchasing, processing, packaging, storage and transportation in the process of food production.

This standard applies to production of various kinds of food; if it's necessary to develop a special hygienic practice for a certain kind of food production, this standard shall be taken as its basis.

2 Terms and Definitions

2.1 Contamination

Refer to the process of biological, chemical and physical contamination factors transferred in the process of food production

2.2 Insect pest

Refers to the harmful effect caused by creatures such as insect, bird or rodent (fly, cockroach, sparrow and rat included).

2.3 Food processing personnel

Refer to the operating personnel directly contacting packaged or unpackaged food, food equipment and instrument and food contact surface.

2.4 Contact surface

Refer to the contactable surface of equipment, tools and instruments or human body.

2.5 Separation

Refer to the articles, facilities and areas are separated by leaving a certain space between one another rather than arranging physical blockage.

2.6 Partition

Refer to the articles, facilities and areas are separated by physical blockage such as wall, hygienic barrier, shade and independent room.

2.7 Food processing location

Refer to the building and site for food processing and other buildings, sites and surrounding environment managed in the same way.

2.8 Monitoring

Refer to the observation or determination carried out based on the preset way and parameter to evaluate whether the controlling unit is under the controlled state

2.9 Work clothes

Refer to the specialized clothes made to reduce the contamination risk of food processing personnel on foods in accordance with the requirements of different production areas

3 Site Selection and Plant Surroundings

3.1 Site selection

3.1.1 The areas that have large contamination on foods shall not be selected for the plant. If a place has obviously adverse effect which can't be improved by taking measures on food safety and edibility, the plant shall not be built there.

3.1.2 Sites where hazardous waste, dust, harmful gas, radioactive substance and other diffusive contaminants cannot be eliminated effectively shall not be selected for the plant.

3.1.3 Regions where flood disaster can usually occur should not be selected for the plant. If it's difficult to keep it away, necessary precaution measures shall be taken.

3.1.4 There should not be potential locations with a large number of insect pest breeding around the plant. If it's difficult to keep it away, necessary precaution measures shall be taken.

3.2 Plant surroundings

3.2.1 Potential contamination risk of the surroundings to food production shall be considered and appropriate

measures shall be taken to reduce it to the minimum level.

3.2.2 The plant shall be arranged reasonably; each functional area shall be obviously divided with proper separation or partition measures to prevent cross contamination.

3.2.3 The roads in the plant shall be paved with concrete, tar or other hard materials. Necessary measures shall be taken for vacant land, e.g. cement, floor tile or lawn shall be paved to maintain clean surrounding and prevent raising dust and accumulated water under normal weather.

3.2.4 Plant greening shall be kept an appropriate distance from the production workshop, and vegetation shall be maintained on regular basis to prevent insect pest from breeding.

3.2.5 The plant shall be equipped with proper drainage system.

3.2.6 Living area such as dormitory, canteen or recreation facilities of employees shall be kept an appropriate distance or partitioned from the production areas.

4 Plant and Workshop

4.1 Design and layout

4.1.1 Internal design and layout of plant and workshop shall meet the operation requirements on the food hygiene to avoid cross contamination during the process of food production.

4.1.2 Design of plant and workshop shall be arranged reasonably according to production process to prevent and reduce the risk of contamination on products.

4.1.3 Operating areas in the plant and workshop shall be divided reasonably based on product characteristics, production process, production characteristics and the requirements of cleanliness in production process and shall be effectively separated or partitioned. For example, operating areas are generally divided into clean operating area, quasi-clean operating area and general operating area, or clean operating area and general operating area, etc. General operating area shall be partitioned from other operating areas.

4.1.4 Inspection room in the plant shall be partitioned from the production area.

4.1.5 Area and space of the plant shall correspond to the productivity so that it can be convenient for equipment arrangement, cleaning and disinfection, material storage and personnel operation.

4.2 Internal structure and materials of the building

4.2.1 Internal structure

The building's internal structure shall be easy for maintenance, cleaning or disinfection and shall be constructed with appropriate durable materials.

4.2.2 Ceiling

4.2.2.1 Ceiling shall be constructed with nontoxic, odorless materials to meet the production demand and easy for observing cleaning condition. If it is directly coated on the inner-layer of the roof as ceiling, nontoxic, odorless and mold-proof coatings which are difficult for shedding and easy for cleaning shall be used.

4.2.2.2 Ceiling shall be easy for cleaning and disinfection, but difficult for condensed water to vertically drip so that insects and mold can be prevented from breeding.

4.2.2.3 Pipelines of accessories for steam, water and electricity shall not be arranged above the exposed food. If it's unavoidable, device or measure to prevent dust from scattering and water drop from dripping shall be provided.

4.2.3 Wall

4.2.3.1 Wall surface and partition shall be constructed with nontoxic, odorless and anti-seepage materials. Wall surface within the range of operation height shall be smooth, difficult for accumulating dirt and easy for cleaning. If coatings are necessary, they shall be nontoxic, odorless, mold-proof, difficult for shedding and easy for cleaning.

4.2.3.2 Wall, partition and ground junctions shall be reasonable in structure, easy for cleaning and effectively avoid the accumulation of dirt, for example, the arrangement of smooth and accessible surfaces.

4.2.4 Doors and windows

4.2.4.1 Doors and windows shall be closed firmly. Door surface shall be smooth, adsorption-proof, anti-seepage and easy for cleaning and disinfection. They shall be made of water-proof, solid, and non-deformable materials.

4.2.4.2 Doors of clean operating area, quasi-cleaning operation area and other areas shall be able to timely be shut down.

4.2.4.3 Window glass shall be made of breakage-proof materials. If simple glass is used, necessary measures shall be taken to prevent contamination on materials, packaging materials and foods after glass breakage.

4.2.4.4 If windows are arranged with sills, their structure shall be able to avoid dust accumulation and be easy for cleaning. Windows able to open shall be equipped with insect pest prevention window screen which is easy for cleaning.

4.2.5 Ground

4.2.5.1 Ground shall be made of nontoxic, odorless, anti-seepage and corrosion-resistant materials. The ground structure shall contribute to sewage discharge and cleaning.

4.2.5.2 Ground shall be flat, anti-skid, crack-free and easy for cleaning and disinfection and shall be provided with appropriate measures to prevent accumulated water.

5 Facilities and Equipment

5.1 Facilities

5.1.1 Water supply facilities

5.1.1.1 Water supply facilities shall ensure that the quality, pressure and amount of water meet the production requirements.

5.1.1.2 The quality of food processing water shall meet the requirements of GB 5749. For food with special requirements of processing water quality, corresponding requirements shall be met. The quality of food production water such as indirect cooling water and boiler water shall meet the production requirements.

5.1.1.3 Food processing water and other water such as indirect cooling water, sewage or waste water with no contact with food shall be transported with completely separated pipelines to prevent cross contamination. Each pipeline system shall be marked explicitly for distinction.

5.1.1.4 Self-provided water source and water supply facilities shall meet related requirements. Products used in water supply facilities involving hygienic security of drinking water shall also meet relevant national requirements.

5.1.2 Drainage facilities

5.1.2.1 Drainage system shall be designed and constructed to ensure unblocked drainage and convenient cleaning and maintenance. It shall be adapted to the demand of food production and ensure that food, production and clean water be free from contamination.

5.1.2.2 The inlet of drainage system shall be installed with a device such as a floor drain with water seal to prevent solid waste from entering and discharged air from emitting.

5.1.2.3 Outlet of drainage system shall be provided with appropriate measures to lower the risk of insect attack.

5.1.2.4 Indoor drainage shall flow from areas with high cleanliness to those with low cleanliness and shall be designed to prevent backflow.

5.1.2.5 Sewage shall be disposed of properly before discharge on order to meet relevant national requirements on sewage discharge.

5.1.3 Cleaning and disinfection facilities

Sufficient specialized cleaning facilities for food, tools and instruments and equipment shall be provided; where necessary, appropriate disinfection facilities shall be provided. Measures shall be taken to avoid cross contamination caused by tools and instruments for cleaning and disinfection.

5.1.4 Waste storage facilities

Specialized facilities for storing waste which are reasonably designed, anti-seepage and easy for cleaning shall be provided. Facilities and containers for storing waste in the workshop shall be marked clearly. Where necessary, facilities for storing waste temporarily shall be arranged in appropriate site and waste shall be stored in classes

according to characteristics.

5.1.5 Personal hygienic facilities

5.1.5.1 Changing room shall be arranged at the entrance of production location or production workshop. Where necessary, changing room may be arranged at the entrance of the specific operating area as needed. The changing room shall be designed to ensure that work clothes, personal clothes and other articles can be kept apart.

5.1.5.2 Facilities for changing shoes (putting on shoe covers) or disinfection facilities for work shoes or boots shall be arranged as needed at the entrance and necessary places of the production workshop. If disinfection facilities for work shoes or boots are needed, their specification and size shall meet the requirements of disinfection.

5.1.5.3 Restroom shall be arranged as needed. Its structure, facilities and internal materials shall be easy to keep clean. Facilities for washing hand shall be arranged at proper place in the rest room. The restroom shall not be directly connected with areas for food production, packaging or storage.

5.1.5.4 Facilities for washing and drying hand and disinfection shall be arranged at the entrance of clean operating area. If necessary, facilities for washing hand and (or) disinfection shall be arranged in the operating area. For the faucets that are matched with disinfection facilities, their switches shall be non-manual.

5.1.5.5 Quantity of the faucets for hand washing facilities shall be matched with the number of food processing personnel of the same shift. Where necessary, mixer of cold and hot water shall be arranged. Wash basins shall be made of smooth, water-proof and easy-to-clean materials and shall be designed and constructed to be easy for cleaning and disinfection. Simple and clear hand washing method shall be marked at visible position near the hand washing facilities.

5.1.5.6 In accordance with the cleanliness of food processing personnel, where necessary, facilities such as air shower and shower room can be arranged.

5.1.6 Ventilation facilities

5.1.6.1 Appropriate natural ventilation or artificial ventilation measures shall be taken; where necessary, natural ventilation or mechanical facilities shall be made to effectively control temperature and humidity of production environment. For ventilation facilities, air shall not flow from operating areas with low requirements on cleanliness to those with high requirements on cleanliness.

5.1.6.2 Air inlet position shall be arranged reasonably, and contamination source such as air inlet, air outlet and device for storing outdoor garbage shall be kept an appropriate distance and angle. Air inlet and outlet shall be provided with facilities such as mesh enclosure to prevent insect pest from intruding. Ventilation facilities shall be easy for cleaning, maintenance or replacement.

5.1.6.3 If filtration and purification treatment for air is needed in the production process, air filtration device shall be added and cleaned on regular basis.

5.1.6.4 According to production requirements, where necessary, de-dusting facilities shall be installed.

5.1.7 Lighting facilities

5.1.7.1 Sufficient natural lighting or artificial lighting shall be provided in the plant. Luster and luminance shall meet production and operation requirements. Light source shall make it possible that food takes on its actual color.

5.1.7.2 If lighting facilities are necessary to be installed above the exposed food and materials, safe lighting facilities shall be adopted or protection measures shall be taken.

5.1.8 Storage facilities

5.1.8.1 Storage facilities corresponding to quantity, storage requirements of products shall be provided.

5.1.8.2 Warehouse shall be made of nontoxic and solid materials; warehouse ground shall be flat and convenient for ventilation. Warehouse shall be designed to be easy for maintenance and cleaning to prevent insect pest from hiding and shall be equipped with device for preventing insect pest from intruding.

5.1.8.3 Materials, semi-finished products, finished products and packaging materials shall be arranged with different storage sites or placed in different areas based on different properties and shall be marked explicitly to

prevent cross contamination. Where necessary, warehouse shall be provided with control facilities of temperature and humidity.

5.1.8.4 Storing articles shall be kept a proper distance from wall and ground to contribute to ventilation and articles handling.

5.1.8.5 Detergent, disinfectant, pesticide, lubricant or fuel shall be packaged safely and marked explicitly and shall be kept apart from materials, semi-finished products, finished products and packaging materials.

5.1.9 Temperature control facilities

5.1.9.1 Appropriate heating, cooling and freezing facilities and facilities for monitoring temperature shall be equipped in accordance with the characteristics of food production.

5.1.9.2 According to production requirements, facilities for controlling room temperature may be arranged.

5.2 Equipment

5.2.1 Production equipment

5.2.1.1 General requirements

Production equipment corresponding to productivity shall be provided and kept in order according to process flow to avoid cross contamination.

5.2.1.2 Materials

5.2.1.2.1 Equipment and instruments contacting with materials, semi-finished products and finished products shall be made of nontoxic, odorless, corrosion-resistant materials which are difficult for shedding and shall be easy for cleaning and maintenance.

5.2.1.2.2 Surface of equipment and tools and instruments contacting with food shall be made of smooth, nonabsorbent materials easy for cleaning, curing and disinfection, and will not react with food, detergent and disinfectant under normal production and shall be kept in perfect condition.

5.2.1.3 Design

5.2.1.3.1 All production equipment shall make it possible in design and structure to prevent parts, metal chip, lubricating oil or other contamination factors being mixed into food and shall be easy for cleaning, disinfection, inspection and maintenance.

5.2.1.3.2 Equipment shall be fixed on the wall or floor without any gap or a sufficient distance shall be remained between the equipment and ground or wall during the installation to be convenient for cleaning and maintenance.

5.2.2 Monitoring equipment

The equipment used for monitoring, controlling and recording such as pressure gauge, thermometer and recorder shall be calibrated and maintained on regular basis.

5.2.3 Equipment maintenance and repair

Equipment maintenance and repair system shall be established to enhance the routine maintenance and curing of equipment. The equipment shall be inspected on regular basis and the result shall be recorded timely.

6 Hygiene Management

6.1 Hygiene management system

6.1.1 Hygiene management system for food processing personnel, food production and corresponding assessment standard shall be established. Post responsibilities shall be determined to carry out post responsibility system.

6.1.2 Monitoring system for key control link significant to ensure food safety shall be issued according to the characteristics of food and hygienic requirements in the production and storage process to be implemented well and inspected periodically. If any problem is found, it shall be corrected at once.

6.1.3 Hygienic monitoring system for production environment, food processing personnel, equipment and facilities shall be established to determine the range, object and frequency of internal monitoring. The monitoring results shall be recorded and filed, and executive condition and effect shall be inspected

periodically so that any problem can be corrected at once if it's found.

6.1.4 Cleaning and disinfection system and management system for cleaning and disinfection instruments shall be built up. Equipment and tools and instruments before and after cleaning and disinfection shall be kept apart and safely kept to avoid cross-contamination.

6.2 Hygiene management of plant and facilities

6.2.1 Facilities in the plant shall be kept clean and repaired or renewed timely in case of any problem. If there is any damage of plant ground, roof, ceiling and wall, it shall be repaired timely.

6.2.2 Equipment and tools and instruments for production, packaging and storage, pipeline for production, and exposed food contact surface shall be cleaned and disinfected on regular basis.

6.3 Health management and hygienic requirement for food processing personnel

6.3.1 Health management for food processing personnel

6.3.1.1 Health management system for food processing personnel shall be established and implemented.

6.3.1.2 Personnel involved in food processing shall take an annual physical examination and obtain a health certificate. They shall accept hygienic training before taking posts.

6.3.1.3 Food processing personnel who suffer from infectious disease of digestive tract such as dysentery, typhoid, viral hepatitis A and viral hepatitis E, diseases affecting food safety such as active pulmonary tuberculosis and suppurative or exudative dermatosis, or the personnel whose skin injury has not been healed shall be transferred to other posts without affecting food safety.

6.3.2 Hygiene requirements for food processing personnel

6.3.2.1 The personnel shall handle personal hygiene before entering food production site to avoid food contamination.

6.3.2.2 The personnel shall wear clean work clothes, wash hand and disinfect oneself as needed when entering the operating area. Hair shall be hidden in work cap or restraint by hairnet.

6.3.2.3 The personnel shall not wear jewelry or watch, and shall not make up, dye fingernails and spray perfume. They shall not carry or store personal articles which are irrelevant to food production.

6.3.2.4 After going to the rest room, contacting articles which may contaminate food or engaging in other activities irrelevant to food production, the personnel shall wash hand and disinfect themselves before being engaged in activities related to food production contacting food, tools and instruments or food equipment again.

6.3.3 Visitors

Those who are not food processing personnel shall not enter food production site. If they enter the food production site under special circumstances, they shall observe the same hygienic requirements as food processing personnel.

6.4 Insect pest control

6.4.1 The building shall be kept in perfect condition and tidy to prevent insect attack from intruding and breeding.

6.4.2 Insect pest control measures shall be prepared and carried out for regular inspection. Effective measures such as yarn curtain, gauze, rat guard, fly prevention lamp or wind screen shall be taken in production workshop and warehouse to prevent rodent or insects from intruding. If trail of insects or rodent is found, its source shall be traced to eradicate hidden danger.

6.4.3 Plan drawing for insect pest control shall be exactly drawn to mark the positions of mousetrap, glue board, fly-killing lamp, outdoor bait and killing device of biochemical pheromone.

6.4.4 Pest control shall be carried out on regular basis in the plant.

6.4.5 During the treatment by physical, chemical or biological agent, food safety and the proper food quality shall not be affected and food contact surface, equipment, tools and instruments and packaging material shall not be contaminated. Pest control shall be recorded correspondingly.

6.4.6 Before using various kinds of pesticides or other drugs, preventive measures shall be taken to avoid contamination on persons, food, equipment and tools. In case of contamination carelessly, contaminated equipment or tools shall be cleaned thoroughly in time to eradicate contamination.

6.5 Waste disposal

6.5.1 System for waste storage and elimination shall be published; for waste with special requirements, its disposal shall meet the relevant requirements. Waste shall be eliminated periodically; corruptible waste shall be eliminated as soon as possible; where necessary, waste shall be eliminated in time.

6.5.2 Waste location outside the workshop shall be kept from food processing site to prevent contamination; smelly or harmful, toxic gas shall be prevented from escaping; insect pest shall be prevented from breeding.

6.6 Work clothes management

6.6.1 The personnel shall wear work clothes when entering the operating areas.

6.6.2 Specialized clothes such as coats, pants, shoes, caps and hairnet shall be equipped in accordance with the food characteristics and the requirements of production process; where necessary, mask, apron, sleeve or glove may be provided.

6.6.3 Cleaning system for work clothes shall be prepared, where necessary, work clothes shall be replaced timely. During the process of food production, work clothes shall be kept clean and in perfect condition.

6.6.4 Work clothes shall be designed and made to meet to the requirements of different operating areas to lower the risk of cross contamination. Position of work clothes pocket and connection fastening shall be reasonably selected to reduce the contamination risk brought by content or fastening dropping.

7 Food Raw Materials, Food Additives and Food Related Products

7.1 General requirements

Purchasing, acceptance, transportation and storage management system for food raw materials, food additives and food related products shall be established to ensure that food raw materials, food additives and food related products meet relevant national requirements. Any substance which harm to human health and life safety may do shall not be added to foods.

7.2 Food raw materials

7.2.1 Licenses and qualified certificates of the suppliers for the purchased food raw materials shall be checked. Food raw materials without qualified certificate shall be inspected based on food safety standard.

7.2.2 Food raw materials can be used only when they are approved. Food raw materials without being approved shall be kept from the qualified materials in designated areas with obvious marks and shall be returned and replaced timely.

7.2.3 Sensory inspection should be conducted before processing and where necessary, laboratory inspection shall be conducted. Once the item indexes involving food safety are found to be abnormal, the food raw materials shall not be used and only the verified applicable ones shall be used.

7.2.4 During transportation and storage, the food raw materials shall be kept away from direct sunlight and shall be equipped with rainproof and dustproof facilities. According to the characteristics and hygiene requirements of food raw materials, they shall also be equipped with facilities for insulation, cold storage and preservation.

7.2.5 Transportation tools and vessels of food raw materials shall be kept clean and in good condition and be disinfected where necessary. The food raw materials shall not be shipped together with toxic and harmful substances to avoid contamination on food raw materials.

7.2.6 For warehouse of food raw materials, management system shall be built up and it shall be managed by specific personnel who are responsible for periodical inspection on the quality and hygienic condition and timely cleaning for bad food raw materials or those exceeding quality guarantee period. The distribution order of warehouse shall comply with the principle of "first in first out"; where necessary, it shall be determined according to the characteristics of different food raw materials.

7.3 Food additives

7.3.1 Licenses of the suppliers and qualified certificates of products shall be inspected where food additives are purchased. Food additives can only be used after being approved.

7.3.2 The transportation tools and containers of food additives shall be kept clean and in good condition and shall

be provided with necessary protective measures to avoid contamination on food additives.

7.3.3 Storage of food additives shall be managed by specific personnel who are responsible for periodical inspection on the quality and hygienic condition and timely cleaning for the bad food materials or those exceeding quality guarantee period. The distribution order of warehouse shall comply with the principle of "first in first out"; where necessary, it shall be determined according to the characteristics of food additives.

7.4 Food related products

7.4.1 Food related products including purchased food packaging materials, containers, detergents and disinfectants shall be inspected for qualified certificates. Those which are carried out with license management shall also be inspected for the licenses of the suppliers and those such as food packaging materials can only be used after being approved.

7.4.2 The transportation means and vessels of food related products shall be kept clean and be maintained in good condition and shall be provided with necessary protective measures to prevent contamination on food raw materials and cross contamination.

7.4.3 Storage of food related products shall be managed by specific personnel who are responsible for periodical inspection on the quality and hygienic condition and timely cleaning for the bad food materials or those exceeding quality guarantee period. The distribution order of warehouse shall abide by the principle of "first in first out".

7.5 Others

For packaging or containers of food materials, food additives and packaging materials directly contacting food, their materials shall be stable, nontoxic, harmless, and difficult to be contaminated and meet hygienic requirements. Food materials, food additives and food packaging materials shall be provided with a certain buffer or cleaning measures for external packaging to lower the contamination risk.

8 Food Safety Control in Production Process

8.1 Contamination risk control of product

8.1.1 Hazard analysis method shall be used to affirm the key link of food safety during production process, and control measures for the key link of food safety shall be taken. In the key link, relevant documents such as list of ingredients (feeding) and post operating procedures shall be provided to implement control measures.

8.1.2 Hazard Analysis and Critical Control Point system is encouraged to be adopted for the food safety control during the process of production.

8.2 Control of biological contamination

8.2.1 Cleaning and disinfection

8.2.1.1 The effective cleaning and disinfection system shall be developed for production equipment and environment to lower the risk of microbial contamination in accordance with the characteristics of material, product and process.

8.2.1.2 Cleaning and disinfection system shall include: cleaning and disinfection area and name of equipment or instruments, responsibilities of cleaning and disinfection work, detergents and disinfectants, cleaning and disinfection method and frequency, verification of cleaning and disinfection effect and treatment for those failing to comply with the requirements, and cleaning and disinfection work and monitoring record.

8.2.1.3 The cleaning and disinfection system shall be guaranteed to be implemented and recorded faithfully. The disinfection effect shall be timely verified and it shall be corrected timely in case of any problem.

8.2.2 The cleaning and disinfection system shall be guaranteed to be implemented and recorded faithfully. The disinfection effect shall be timely verified and it shall be corrected timely in case of any problem. Microbial monitoring of food processing.

8.2.2.1 The key control link is determined based on the product characteristics to carry out microbial monitoring; where necessary, the microbial monitoring procedure of food processing shall be set up, microbial monitoring of production environment and process product included.

8.2.2.2 The microbial monitoring procedure of food processing shall include: microbial monitoring indexes, sampling points, monitoring frequency, sampling and inspection method, evaluation principles and rectification measures. The specific items may be developed by reference to the requirements of Appendix A in combination with production process and product characteristics.

8.2.2.3 The microbial monitoring shall include pathogenic bacteria monitoring and indicator bacteria monitoring, and the microbial monitoring result of food processing shall be able to manifest the control level of microbial contamination during food processing.

8.3 Control of chemical contamination

8.3.1 The management system to avoid chemical contamination shall be established. The possible contamination source and contamination way shall be analyzed and the proper control plan and control procedure shall be developed.

8.3.2 Use system of food additives and processing aids for food industry shall be established and the food additives shall be put into use according to the requirements of GB 2760.

8.3.3 Any non-edible chemical substances excluding food additives and other substances which may damage human health shall not be added during food processing.

8.3.4 On the production equipment, if the movable components which may directly or indirectly contact foods need lubrication, the edible oil or other oils meeting requirements of food safety shall be adopted.

8.3.5 The use system of chemicals such as detergents and disinfectants is established. Except for the cleaning and disinfection requirements and process demands, the chemicals which may contaminate foods shall not be used and stored in the production site.

8.3.6 All food additives, detergents and disinfectants shall be kept in proper container and shall be stored with obvious mark and in classes. They shall be accurately measured and recorded when being used.

8.3.7 Hazardous substances resulting from food production shall be monitored and effective measures shall be prepared and taken to lower risk.

8.4 Control of physical contamination

8.4.1 The management system to avoid contamination of foreign matters shall be established. The possible contamination sources and contamination ways shall be analyzed and the corresponding control plan and control procedure shall be drawn up.

8.4.2 The measures for equipment maintenance, hygiene management, site management, outsider management and processing supervision shall be taken to reduce the contamination risk of foreign matters such as glass, metal and plastic cement to the maximum extent.

8.4.3 Effective measures such as arrangement of screen mesh, collector, magnet and metal checker shall be taken to reduce the risk of metal or other foreign matters that may lead to food contamination.

8.4.4 During site repair, maintenance and construction, appropriate measures shall be taken to avoid foreign matters, unpleasant smell and chips that may contaminate food.

8.5 Packaging

8.5.1 The food packaging shall be able to protect the food safety and quality to the maximum extent under normal storage, transportation and marketing conditions.

8.5.2 Identification shall be checked to avoid misuse where packaging materials are used. The use condition of packaging materials shall be recorded faithfully.

9 Inspection

9.1 The raw materials and products shall be inspected by the enterprise itself or by consigning food inspection agencies with corresponding qualifications. The recording system for delivery inspection of food shall be established.

9.2 There shall be corresponding inspection room and inspection capability for self-inspection. The inspection shall be implemented by the inspection personnel with corresponding qualifications based on required inspection method. The inspection instruments and equipment shall be inspected on regular basis.

9.3 The inspection room shall be equipped with sound management system to properly preserve the original record and inspection report of each inspection. Products sampling system shall be built up to timely keep sample.

9.4 Comprehensive consideration shall be taken for factors such as product characteristics, process characteristics, and material control condition to reasonably determine inspection items and frequency so that control measures can be effectively verified during production process. The inspection frequency of net content, sensory requirements and other inspection items easy to change due to effect of production process shall be greater than that of other inspection items.

9.5 For the same variety of product with different packaging, inspection items free from effect of packaging specification and packaging type may be inspected together.

10 Storage and Transportation of Foods

10.1 Proper storage and transportation conditions are selected in accordance with requirements of food characteristics and hygienic requirements. Where necessary, the facilities shall be provided for thermal insulation, cold storage and preservation. Foods shall not be stored and transported together with toxic, harmful or smelly goods.

10.2 Suitable warehousing system shall be established and carried out. In case of any abnormality, it shall be timely handled.

10.3 The containers, tools and instruments and equipment to store, transport and load and unload foods shall be safe, harmless and clean to lower the risk of food contamination.

10.4 During the storage and transportation, direct sunlight, rain, notable temperature and humidity change and violent impact shall be avoided to prevent the adverse effect on foods.

11 Product Recall Management

11.1 The product recall system shall be established based on relevant national regulations.

11.2 Where the produced food is not up to the food safety standard or other inedible conditions are found, the production shall be stopped immediately and the food already sold in market shall be recalled. Relevant production operators and consumers shall be notified and the recall and notification condition shall be recorded.

11.3 The recalled food shall be safely disposed of or destroyed to prevent them from flowing into the market again. For foods that are recalled due to improper labeling, identification, or directions for use not in conformity with food safety standards, corrective measures shall be taken to ensure the safety of the products and explain the situation to consumers once the products are re-launched for sale.

11.4 Production batch shall be reasonably divided and recorded and it shall be labeled with product batch number for the convenience of product tracing.

12 Training

12.1 Training system for relevant posts of food production shall be established and the corresponding training on food safety knowledge shall be carried out for food processing personnel and practitioners.

12.2 The awareness and responsibility of the practitioners to comply with relevant laws, regulations and standards of food safety and implement management system of food safety shall be improved and the corresponding knowledge level shall be improved through the process of training.

12.3 The annual training plan of food safety shall be developed and implemented according to the actual demand of different posts of food production. The training plan should be evaluated, and the training should be recorded.

12.4 Where the relevant laws, regulations and standards of food safety are updated, training shall be developed in time.

12.5 The training plan shall be examined and revised on regular basis and the training effect shall be evaluated. The routine inspection is carried out to guarantee the effective implementation of the training plan.

13 Management System and Personnel

13.1 The professional technical personnel and management personnel of food safety shall be allocated and the management system to ensure food safety shall be established.

13.2 The management system of food safety shall correspond to the production scale, process level and variety characteristics of food and shall be constantly improved based on practical production and implementation experience.

13.3 The management personnel shall master the basic principles and operation procedures of food safety and shall have the ability to judge the potential risks and take appropriate preventive and corrective measures to guarantee the effective management.

14 Record and Document Management

14.1 Record management

14.1.1 The recording system shall be established to record links of food production including purchasing, processing, storage, inspection and marketing in details. The record contents shall be complete and true to ensure that all links from material purchasing to production, to marketing of the products can be traced effectively.

14.1.1.1 The contents including name, specification, quantity, supplier' name and contact information and purchase date of food related products including food raw materials, food additives and food packaging materials shall be recorded faithfully.

14.1.1.2 The contents including food processing (process parameters and environmental monitoring included), storage condition of food and inspection batch No., inspection date, inspection personnel, inspection method and inspection result of the products shall be recorded truthfully.

14.1.1.3 The contents such as name, specification, quantity, production date, production batch No., purchaser's name and contact information, quality certificate and selling date of delivery product shall be recorded truthfully.

14.1.1.4 The contents including name, batch, specification, quantity, recall reason and subsequent rectification program of recalled food shall be recorded truthfully.

14.1.2 The purchasing inspection record of food related products including food raw materials, food additives and food packaging materials as well as delivery inspection record of foods shall be rechecked and signed by the recorders and examiner. The record contents shall be integral, which shall be kept not less than 2 years.

14.1.3 The customer complaint handling mechanism shall be built up. As for the written or verbal advice and complaint put forward by customers, the related management departments of the enterprise shall make records, find out the reasons and handle them carefully.

14.2 The document management system shall be established for effective document management to ensure that documents at each relevant location are valid.

14.3 The advanced technology and means (electronic computer information system included) are encouraged to be adopted to implement record and document management.

Appendix A

Microbial Monitoring Procedure Guide of Food Processing

Notes: this appendix gives key points which shall be considered where the environmental microbial monitoring procedure in food processing is developed, and they may be referred to in actual production based on product characteristics and technical level of production process.

A.1 Microbial monitoring during food processing is an important means to ensure food safety and is the tool to verify or evaluate the effectiveness of target microorganism control procedure and ensure the continual improvement of whole food quality and safety system.

A.2 This appendix advances the key points which shall be considered where the microbial monitoring procedure of food processing is developed.

A.3 The microbial monitoring of food processing mainly covers the environmental microbial monitoring and microbial monitoring of process products. The environmental microbial monitoring is used with the main purpose of judging the hygienic control condition of processing and finding out the potential contamination sources. Generally, the environmental monitoring objects include food contact surface, adjacent contact surface to food or food contact surface and environmental air. The microbial monitoring of process product is mainly used to appraise the hygiene control capacity of processing and hygienic condition of product.

A.4 The microbial monitoring of food processing includes microbiology evaluation and evaluation of cleaning and disinfection effect and microorganism control effect of each link during processing. The following contents shall be considered during the development:

a) The microbial monitoring of processing shall include the microbial monitoring indexes, sampling points, monitoring frequency, sampling and inspection method, evaluation principles and treatment of nonconformity condition.

b) The microbial monitoring indexes of processing shall take the indicator microorganism (such as total bacteria count, coliform bacteria, yeast molds or other indicator bacteria) which is able to appraise the hygienic condition of processing environment and process control capacity as priority. Where necessary, the pathogenic bacteria may also be adopted as the monitoring index.

c) The microbial monitoring sampling points of processing: sampling points of environmental monitoring shall be the places which are contaminated due to the possible existence or entrance of microorganism. The sampling points may be determined according to relevant literature information, experience or accumulated historical data. The sampling points of process product monitoring plan shall include all process products whose microorganism level may change and affect the product safety and (or) food quality in the whole processing link, such as the one behind the key control point controlled by microorganism. Please refer to the specific examples listed in Table A.1.

d) The microbial monitoring frequency of processing: monitoring frequency shall be determined based on the possible risk of contamination. The reasonable monitoring frequency may be determined according to relevant literature information, relevant experience and professional knowledge or accumulated historical data. Please refer to the specific examples detailed in Table A.1. The microbial monitoring of processing shall be dynamic and is adjusted according to the data change and contamination risk of processing and periodically evaluated. For example, the sampling points and monitoring frequency need to be promoted when the indicator microorganism monitoring result is on the high side, the pathogenic bacteria is found in final product, after the significant maintenance construction activities are completed, or downtrend appears for hygienic condition. The sampling points or the monitoring frequency may be properly reduced if the monitoring result is in accordance with the requirements all the time.

e) The sampling and inspection method: generally, coating sampling is the primary of environmental monitoring and the direct sampling is adopted for process product monitoring. The selection of inspection method shall be based on the monitoring index.

f) The evaluation principles: the judgment shall be carried out according to the certain monitoring index limit and the limit may be determined according to the microorganism control effect and its influence on the product quality and food safety.

g) The handling requirements for inconformity condition of microbial monitoring: the monitoring result of each monitoring point shall meet the monitoring index limit and remain stable. When the slight inconformity appears, measures such as increasing sampling frequency may be taken to enhance monitoring; when the severe inconformity appears, correction shall be carried out immediately and the reason leading to problem shall be found meanwhile to determine whether corresponding corrective measures should be taken for microorganism control procedure.

Table A.1 Microbial Monitoring Example of Food Processing

| Monitoring items | | Suggested sampling points ^a | Suggested monitoring microorganism ^b | Suggested monitoring frequency ^c | Suggested monitoring Index limit |
|---|--|---|---|---|---|
| Microbial monitoring of environment | Food contact surface | Hands and work clothes of food processing personnel, surfaces of glove conveyors, tools and instruments and other equipment directly contacting foods | Bacterial colony, coliform etc. | The verification of cleaning effects shall be carried out after the cleaning and disinfection and others may be carried out every week, every two weeks or every month. | Determined in combination with actual situation of production |
| | Contact surface adjacent to food or food contact surface | External surface of equipment, support surface, control panel and contact surface of part car | Indicator microorganism for hygienic condition bacteria colony and coliform; where necessary, the pathos bacteria is monitored | Every two weeks or every month | Determined in combination with actual situation of production |
| | Environmental air of processing area | Position closeto exposed products | Bacteria colony, yeast etc. | Every week, every two weeks or every month | Determined in combination with actual situation of production |
| Microbial monitoring of process products | | Process products whose microorganism level may change and affect food safety and (or) food quality during processing link | Indicator microorganism for hygienic condition such as total bacteria count, coliform bacteria, yeast molds or other indicator bacteria | Every week (every two weeks or every month) for the products produced in the first time of shift beginning and subsequent continuous production process | Determined in combination with actual situation of production |
| ^a Sampling points may be selected in accordance with the food characteristics and actual situation of processing. ^b One or more hygienic indicator microorganism may be selected for monitoring as required. ^c Monitoring frequency may be determined based on the risk of specific sampling points. | | | | | |