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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

GB/T 31653-2021

**National Food Safety Standard - Specifications for the
Control of Aflatoxin Contamination in Food**

食品安全国家标准
食品中黄曲霉毒素污染控制规范

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National Food Safety Standard - Specifications for the Control of Aflatoxin Contamination in Food

1 Scope

This Standard specifies the basic requirements and management guidelines for the control of aflatoxins in food during harvesting, pre-storage treatment, storage, transportation and processing, etc.

This Standard is applicable to the control of aflatoxin contamination of peanuts, corns, walnuts, hazelnuts, pistachios, pine nuts, Brazil nuts, figs and oil-bearing cottonseeds (see Appendix A ~ Appendix D).

2 Terms and Definitions

2.1 Water Activity

A_w

Water activity refers to the state of the existence of water in food or food ingredients, i.e., the degree, to which, water is combined with the food or food ingredients (the degree of freeness). Generally speaking, the ratio of the saturated vapor pressure of water in food or food ingredients to the saturated vapor pressure of pure water at the same temperature is used to reflect its value.

2.2 In-store Drying

In-store drying refers to the technique, in which, newly harvested high-moisture food ingredients are loaded into a qualified warehouse in accordance with the regulations, and then, dried in the warehouses through the mode of mechanical ventilation; after drying is completed, the food ingredients continue to be stored in the warehouse.

3 Technical Requirements for Harvesting

3.1 Before harvesting, check the harvesting equipment and clean up the residues on the equipment, so as to ensure that the equipment and facilities used for harvesting and storage can normally work and that damage to the fruits can be avoided.

3.2 Ripe fruits shall be harvested in time. Fruits with the same degree of maturity shall be harvested at the same time.

3.3 Avoid harvesting in excessively humid environment, for example, rainy days. If it is unavoidable, drying shall be conducted immediately after the harvesting.

utilized to dry the fruits in the open air on a clean site, and the influence of rain, snow, dew, soil, insects, bird droppings and other pollutants shall be avoided. During drying, the fruits shall be spread into a thin layer and turned over in due time, so as to accelerate the loss of water, make the drying faster and more uniform, and reduce the drying time. When it is impossible to dry naturally and must be dried in the shade, necessary ventilation of the site shall be maintained.

4.3 Removal of Foreign Matters

After drying is completed, the fruits shall be subjected to the removal of foreign matters. Gravity sorting, optical sorting, manual sorting or other modes may be selected to remove mildew, disease spots, insect erosion, germination, damage and other contaminated fruits and impurities. During the removal, damage to the fruits shall be avoided.

5 Storage

5.1 The storage site shall be kept dry and well-ventilated, and avoid the influence rain, snow, groundwater and condensation, as well as the intrusion of rodents, birds and insects. It shall be ensured that the storage facilities are normally working, for example, satisfying drying and ventilation facilities.

5.2 Before entering the warehouse, the storage facilities shall be cleaned to reduce or remove fungal spores, crop residues, animal and insect excrements, soil, insects, stones, metal, glass, dust and other pollutants.

5.3 A storage management system shall be established to minimize the risk of infestation by rodents, insects and fungi to the storage facilities. If a comprehensive mildew and pest control plan is established, and appropriate fungicides, antifungal agents, insecticides or other alternative methods are used, then, products that will not have a food safety impact on the final intended use of the food ingredients shall be adopted; the dosage shall be rigorously controlled, and the usage requirements shall be abided by.

5.4 During the storage, it shall be ensured that there is good ventilation, so as to avoid the occurrence of potential local heating. If necessary, the fruits may be transferred from one warehouse to another.

5.5 When fruit spoilage or fungal growth is found, the contaminated fruits shall be isolated. In addition, appropriate sampling methods shall be taken to collect samples for aflatoxin testing. After confirming the contamination, the contaminated fruits shall be removed to avoid cross-contamination; the remaining fruits shall be ventilated to reduce the temperature and moisture content to a reasonable level.

5.6 A testing system for the fruits' in and out of the warehouse and the storage period shall be formulated, including batch definition, sampling scheme and testing methods,

and cleaned should be packaged in composite polyethylene or polypropylene bags. The peanuts shall be stored in a mode of increased ventilation space, for example, being stacked in the shapes of the characters “非”, half “非” and “回”.

A.3.3 A proper distance shall be kept from the walls and the ground, so as to facilitate air circulation, goods handling and cleanliness inspection.

A.3.4 The peanuts should be stored under the conditions of relative humidity lower than 70% and temperature below 15 °C.

A.3.5 The temperature and humidity of the warehouse shall be regularly inspected to avoid condensation. Through air circulation and ventilation, the temperature of the warehouse can be kept at an appropriate and uniform level.

A.3.6 In accordance with the activity routines of pests in different seasons, determine the key points of pest inspection. When the temperature of the peanuts is lower than 15 °C, they shall be inspected at least once every quarter; when the temperature of the peanuts is between 15 °C ~ 20 °C, they shall be inspected at least once every half month; when the temperature of the peanuts is higher than 20 °C, they shall be inspected at least once a week. When pests are found, measures shall be taken in time to ensure the safety and quality of peanut storage.

A.3.7 The moisture content of the peanuts shall remain stable. When abnormal rise is found, measures shall be taken to reduce the moisture content to below the safe level.

A.4 Transportation

A.4.1 Transportation shall comply with the requirements of Chapter 6.

A.4.2 Sealed containers, coverings or waterproof canvas covers should be used to protect the peanuts and prevent outside moisture from entering. Meanwhile, they can avoid condensation on the surface of peanuts and local moisture accumulation due to excessive water vapor and temperature fluctuations.

A.5 Processing

A.5.1 Areas with a relatively low pollution level should be selected for the procurement of raw materials of peanuts.

A.5.2 When receiving peanuts stored by the farmers, the source and storage conditions of the peanuts shall be grasped; the cleanliness of the transport vehicles shall be inspected. During the unloading process, sensory inspection shall be carried out; when peanuts are found to be relatively wet, they shall be separately stored and dried as soon as possible.

A.5.3 The raw materials shall be inspected before entering the factory. The moisture content of peanuts should be below 10%; the moisture content of peanut kernels

Appendix B

Corns

B.1 Harvesting

Harvesting shall comply with the requirements of Chapter 3.

B.2 Pre-storage Treatment

B.2.1 Pre-storage treatment shall comply with the requirements of Chapter 4.

B.2.2 The corncobs used for threshing processing shall be preliminarily dried to reduce damage to the corns caused by threshing.

B.2.3 Threshing equipment shall be clean and dry, and the damage to the corns shall be reduced to the minimum level. The corn kernels obtained after threshing shall be placed in a clean and dry place.

B.2.4 Corn kernels to be stored for a relatively long time after threshing shall be dried as soon as possible. If they are to be processed directly after threshing, then, the time from threshing to processing shall be shortened as much as possible.

B.2.5 During natural air-drying, the corn kernels shall not directly touch the ground. Meanwhile, avoid mixing the dried corn kernels with the undried corn kernels.

B.2.6 The dried corn kernels are removed and sorted to remove the damaged kernels and foreign matters, for example, by using a density separator or an air leg.

B.3 Storage

The environment, storage facilities and equipment of the warehouse shall comply with the relevant requirements of GB 22508 *Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Cereals*.

B.4 Transportation

Transportation shall comply with the requirements of Chapter 6.

B.5 Processing

B.5.1 When receiving corns stored by the farmers, the source and storage conditions shall be grasped; the cleanliness of the transport vehicles shall be inspected. During the unloading process, sensory inspection shall be carried out; when corns are found to be relatively wet, they shall be separately stored and dried as soon as possible.

B.5.2 The moisture content of the corns shall be determined, and the corns shall be

Appendix C

Walnuts, Hazelnuts, Pistachios, Pine Nuts, Brazil Nuts and Figs

C.1 Harvesting

C.1.1 Harvesting shall comply with the requirements of Chapter 3.

C.1.2 After the fruits are ripe, they shall be harvested as soon as possible.

C.1.3 The impurities or decaying materials in the area underneath the trees shall be removed.

C.1.4 The fruits shall be prevented from falling to the ground. If the fruits are harvested by shaking the trunk, they shall be harvested by machinery with collection equipment, or a protective board or waterproof canvas shall be placed underneath the tree for collection.

C.1.5 The garbage and impurities generated during harvesting, and the remaining fruits on the trees shall be eliminated, so as to reduce aflatoxin-producing bacteria and insects from overwintering.

C.2 Pre-storage Treatment

Pre-storage treatment shall comply with the requirements of Chapter 4.

C.3 Storage

C.3.1 Storage shall comply with the requirements of Chapter 5.

C.3.2 They should be stored under the conditions of a temperature of no more than 10 °C and a relative humidity of no more than 70%, so as to reduce fungal growth. During the inspection, it shall be ensured that the measuring equipment has been calibrated.

C.4 Transportation

C.4.1 Transportation shall comply with the requirements of Chapter 6.

C.4.2 The fruits shall be transferred from the transport containers to the storage facilities. If different batches are transported together, it shall be ensured that the different batches can be physically separated, and each batch shall be marked and recorded.

C.5 Processing

C.5.1 After harvesting, fruits with hulls (peels) shall be dehulled (peeled) as soon as

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