



## **Sampling Protocols for 2019-nCoV Monitoring of Environmental, Food and Related Products**

Sample collection and 2019-nCoV nucleic acid test on environment, food and related products are effective monitoring measures for the prevention and control of epidemic spread. Timely monitoring results can help determine the characteristics and scope of potentially contaminated environment, food or related products; trace, alert and dispose of the source of virus contamination risks; and identify population at high-risk to take control measures to prevent cluster epidemic spread, ensure public health and safety, and reduce the impact on socio-economic activities.

These Protocols describe specific procedures, materials and methods for sample collection and safety protection for environmental, food and related monitoring objects, and reserve the sampling requirements for retesting , rechecking and possible requirements for intrinsic 2019-nCoV testing of food and related products.. 2019-nCoV is a newly discovered and reported pathogenic microorganism in humans, so these protocols will be updated and adjusted to meet the latest research developments and scenario of the prevention and control.

### **1. Purpose**

To standardize sampling operations such as 2019-nCoV monitoring of environmental pollution (including air, water and solid surfaces) and contamination of food and related products.



## **2. Scope**

This Protocol is applicable to the collecting and processing of samples that require 2019-nCoV monitoring, such as all food and related products, internal and external packaging, cold chain logistics sites, goods and environment, air and water.

## **3. Sampling Personnel and Protection Requirements**

### **3.1 Basic Principles**

Judge the risk level based on the risk management principle and the actual scene, and select the corresponding level of personal protective equipment reasonably for the on-site sampling operation.

Avoid personnel infection and sample pollution when monitoring and sampling pathogenic microorganisms in environment, food and related products. Deem the collected samples as infectious and take protective measures. Highlight the safety of sampling operations, sample packaging and sample transportation. Do not reuse gloves when contacting different environmental sites or samples of different types of food and related products to avoid cross-contamination. Avoid cutting or damaging gloves when using or handling syringes, scalpels and other sharp instruments, and put them in a special sharp weapon storage box after use. Equip sites with first aid kits for accidental leakage and exposure if necessary.

### **3.2 Personnel Requirements**

Sample collection personnel must receive standardized biosafety training (qualified) and have the corresponding professional skills.



### **3.3 Protection Requirements**

#### **3.3.1 Monitoring and sampling of low-risk environment, food and related products**

This scenario is applicable to preventive monitoring of the general environment or objects.

Wear overalls (or disposable overalls), gloves, masks, caps and shoe covers when sampling.

#### **3.3.2 Monitoring and sampling of high-risk environment, food and related products**

This scenario is applicable to contact or possible contact with 2019-nCoV cases or asymptomatic infected persons, pollutants (blood, body fluids, secretions, vomit and feces, etc.), contaminated food and related products, and contact or possible contact with highly suspected infected persons or items. It is recommended to wear disposable medical protective clothing, disposable working cap, double-layer gloves, KN95/N95 and above, particulate respirator or medical mask or power supply filter respirator, protective screen, work shoes or rubber boots, waterproof boot cover, and waterproof apron or waterproof insulation gown.

### **3.4 Disinfection of Sampling Personnel and Protective Equipment**

3.4.1 After completing the sampling work, use 500mg/L available chlorine disinfectant or 75% alcohol to spray and disinfect the whole body of the personnel wearing protective clothing from top to bottom, from front to back, and finally on the soles of the feet.

3.4.2 Disposable protective items shall be disposed of as medical waste,



sealed with double-layer airtight bags, and sprayed with 500 mg/L available chlorine disinfectant on the outer surface for centralized destruction.

3.4.3 Recyclable eye masks and masks shall be soaked or wiped with chlorine-containing disinfectant (500 mg/L available chlorine without obvious pollution and 1,000 mg/L available chlorine with obvious pollution) for 30 minutes, or disinfected according to the product manual.

## **4. Materials, Supplies and Reagents**

### **4.1 Materials**

Disposable sterile swab, sterile scissors, sterile tweezers with long handle, sterile virus sampling tube, sterile sample sampling tube (50 mL), water sample collection bag (sterile), self-sealing sterile sampling bag or commercial sampling kit, biosafety transfer box, ice pack, 500mg/L available chlorine disinfectant, 75% alcohol, sampling record sheet, etc.

### **4.2 Reagents**

#### **4.2.1 Sample Collection Reagents**

The virus sampling solution can be selected from the following reagents: tissue culture solution (MEM, RPMI1640 culture solution, etc.), buffer solution (HANKS solution, PBS buffer solution, etc.), solution added with RNA stabilizer, isotonic solution (normal saline, etc.) or commercial sampling kit.



#### 4.2.2 Disinfectant

75% alcohol, chlorine-containing disinfectant (500 ~ 1,000 mg/L) or other effective disinfectants.

### 5. Sampling Principles

**5.1** Determine the sampling method according to the sampling purpose, characteristics of the inspected object, batch size, and inspection method, etc.;

**5.2** Sampling shall be carried out using the principle of randomization, while considering representativeness, to ensure that the collected samples are representative;

**5.3** Sampling process shall follow sterile operating procedures to prevent possible external pollution;

**5.4** During storage and transportation, take all necessary measures to prevent changes in the amount of virus in the sample and keep the sample in its original state.

### 6. Sampling Method

#### 6.1 Surface sampling of cold chain goods and storage and transportation sites

##### 6.1.1 Sampling of packaging surface

For food and goods in containers, cold storage, and storage and



transportation spaces, it is recommended to install sampling points in each corner and the middle, and smear the food surfaces of the cold chain and the outer packaging of goods at each sampling point. When sampling, the inspection surface shall be kept unfrozen, and a sample of at least 100cm<sup>2</sup> should be applied with a swab. When sampling, use the Virus Preservation Solution in the virus sampling tube to thoroughly infiltrate the sampling swab, and smear the surface of the item to be collected repeatedly. Insert the swab into the sampling tube filled with 3.0 mL of sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the sampling swab handle, cover the sampling tube, and record to complete the sampling.

### **6.1.2. Cold Chain Storage and Transportation Site Surface Sampling**

For inner surfaces of containers, cold storage, loading and unloading vehicles, and storage and transportation areas, select the parts frequently contacted, and smear the sample with a swab over an area of at least 100cm<sup>2</sup>. When sampling, use the Virus Preservation Solution in the virus sampling tube to thoroughly infiltrate the sampling swab, and smear the surface of the item to be collected repeatedly. Insert the swab into the sampling tube filled with 3.0 mL of sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the sampling swab handle, cover the sampling tube, and record to complete the sampling.

## **6.2 Surface of Food or Edible Agricultural Products**



## **6.2.1 Surface of aquatic products and seafood (including aquatic animals)**

6.2.1.1 Use Virus Preservation Solution in the virus sampling tube to thoroughly soak the sampling swab, smear the surface of the object to be collected repeatedly, and rotate the swab after each smear, one sampling site going back and forth eight times in a row. At the same time, perform a distributed multi-point sampling on the sample surface. Sampling quantity shall be implemented according to the specific characteristics of the products and the requirements of product standards.

6.2.1.2 In addition to the outer surface of the animal's body, the sampling swab shall be smeared into the natural pores including the mouths, gills, cloaca and shells. For segmented aquatic products, the cross section of aquatic products shall be sampled.

6.2.1.3 Insert the swab into the sampling tube filled with 3.0mL sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the handle of the sampling swab, cover the sampling tube, and record to complete sampling.

## **6.2.2 Surface of animal products**

6.2.2.1 Use Virus Preservation Solution in the virus sampling tube to thoroughly soak the sampling swab, smear the surface of the object to be collected repeatedly, and rotate the swab gently after each smear, one sampling site going back and forth eight times in a row. At the same time, perform a distributed multi-point sampling on the sample surface.



Sampling quantity shall be implemented according to the specific characteristics of the products and the requirements of product standards.

6.2.2.2 Smear and sample the surface of the animal's body, and the sampling site shall include the oral cavity and other accessible cavities plus the outer surface of the animal. For divided animal products, eggs and animal fats, smear and sample directly on their surfaces.

6.2.2.3 Insert the swab into the sampling tube filled with 3.0mL sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the handle of the sampling swab, cover the sampling tube, and record to complete sampling.

### **6.2.3 Surface of plant food**

6.2.3.1 Smear and sample the surface, including surface gaps.

6.2.3.2 Use Virus Preservation Solution in the virus sampling tube to thoroughly soak the sampling swab, smear the surface of the object to be collected repeatedly, and rotate the swab gently after each smear, one sampling site going back and forth eight times in a row. At the same time, perform a distributed multi-point sampling on the sample surface. Sampling quantity shall be implemented according to the specific characteristics of the products and the requirements of product standards.

6.2.3.3 Insert the swab into the sampling tube filled with 3.0mL sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the handle of the sampling swab, cover the sampling





tube, and record to complete sampling.

#### **6.2.4 Surface of packaged food**

6.2.4.1 Take intact,unopened packages depending on the packaging type, such as boxes, bags, bottles and cans. For large samples, sample with sterile sampling tools. For solid powder or liquid samples, mix thoroughly before sampling.

6.2.4.2 For solid prepackaged foods, thoroughly soak the sampling swab, smear the surface of the object to be collected repeatedly, and rotate the swab gently after each smear, one sampling site going back and forth eight times in a row. At the same time,perform a distributed multi-point sampling on the sample surface. Sampling quantity shall be implemented according to the specific characteristics of the products and the requirements of product standards.

6.2.4.3 Insert the swab into the sampling tube filled with 3.0mL sampling solution. When the swab is about 1cm from the bottom of the sampling tube, bend and break the handle of the sampling swab, cover the sampling tube, and record to complete sampling.

6.2.4.4 For pre-packaged foods in liquid form, shake the sample evenly and open the package aseptically. For plastic or paper packaging box (bag), disinfect the box cover or bag mouth with 75% alcohol cotton ball, and cut with sterilizing scissors.For glass bottle packages, remove the paper cover or bottle mouth cap aseptically, and flame sterilize the bottle mouth. Use a



sterile straw to suck 25 mL of sample (sample after homogenization if there are solid particles), put it into a 50mL sterile centrifuge tube and close it for preservation. (See GB 4789.18-2010 5.1 Treatment of Milk and Liquid Dairy Products).

### **6.3 Surface of furs**

**6.3.1** Smear and sample the surface, and the number of samples shall be implemented according to the specific characteristics of the products and the requirements of product standards.

**6.3.2** Use Virus Preservation Solution in the virus sampling tube to thoroughly soak the sampling swab, smear the surface of the object to be collected repeatedly, and rotate the swab gently after each smear, one sampling site going back and forth eight times in a row. At the same time, perform a distributed multi-point sampling on the sample surface.

**6.3.3** Insert the swab into the sampling tube containing 3.0mL sampling liquid. When the swab is about 1cm from the bottom of the sampling tube, bend and break the handle of the sampling swab, cover the sampling tube, and record to complete sampling.

### **6.4 Environmental Samples**

#### **6.4.1 Environmental monitoring and sampling of farm market**

##### 6.4.1.1 Monitoring content

(1) Test for viruses on the surface of facilities and appliances at major market stalls. Highlight swab samples taken from table tops, panels, floors,



handles, and surfaces of various production and use appliances, including waxing or cutting machines and knives.

(2) Test for viruses on throat swabs, clothing surfaces and practitioners' hands at major market stalls. Collect swab samples from the surfaces of practitioners' hands under working condition.

(3) Test for viruses on the inner surface of refrigerators and freezers used for food storage at major market stalls. Collect swab samples from the inner surfaces of refrigerators and freezers which are frequently handled during food storage.

(4) Test for viruses on meat, poultry, seafood and aquatic products in the marketplace. Foods on the market shall be differentiated between unpackaged and packaged foods. For packaged foods, highlight the collection of swab samples from meat, poultry, seafood and aquatic foods that need to be refrigerated and transported.

(5) Test for viruses on sewage from market drainage systems. Focus on sewage from seafood, aquatic products and meat and poultry products market stalls, and collect swab or sewage samples.

(6) Collect swap samples at public spaces frequently touched in the marketplace, including surfaces of elevator buttons, stair railings and door handles at main entrances and exits, surfaces of public facilities such as pantries and toilets, wet public passage ways and toilet floors, mop pools, etc.



(7) Collect swap samples on tools or items frequently moved across market areas, including cleaning tools such as garbage trucks, garbage cans and mops, trailers for transferring items, etc.

(8) Collect environmental swabs and aerosol samples from the poorly ventilated gathering environment of the market, including offices, tool rooms, restrooms and local business environment.

#### 6.4.1.2 Sample collection

(1) Swab samples of throat swabs, hands, clothes and other objects of practitioners shall use virus preservation solution in the virus sampling tube to fully soak the sampling cotton swab, smear and rinse the surface of the object to be collected repeatedly for more than three times. At the same time, perform a distributed multi-point sampling on the surface of the object to be sampled.

(2) Take samples from the food surface: Food samples shall not be taken directly. Carefully separate the food stuffs to be sampled and store in a clean sampling bag before taking swab samples. Use Virus Preservation Solution in the virus sampling tube to thoroughly soak the sampling cotton swabs, smear and rinse the surfaces of the food samples to be taken repeatedly more than 3 times. At the same time, perform a distributed multi-point sampling on the sample surface.

(3) Sewage sample: Select 2-3 sewage sampling positions depending on the distribution of the drainage system in the market, by focusing on



collection from the internal pipe network, downstream in the water flow direction or connection to the municipal pipe network. For swab sample collection, soak the swab into the sewage to absorb the sewage and rinse in the sampling tube more than 3 times. For sewage sample collection, use polyethylene plastic bottles to collect 30-500mL sewage samples. For sewage larger than 500mL, collecting a polyethylene plastic bucket or using special enrichment equipment for field water samples. At the same time, perform a distributed multi-point sampling for the sewage sampling position.

(4) Animal samples: For live animals, collect body surface swabs, or oropharynx and anal swabs using cotton swabs. Feces or secretion samples can also be taken and recorded on the record sheet. For animal samples treated by skinning, collect body surface and body cavity samples with cotton swabs. Use Virus Preservation Solution in the virus sampling tube to fully thoroughly the sampling cotton swabs, smear and rinse the surfaces of the food samples to be taken repeatedly more than 3 times. At the same time, perform a distributed multi-point sampling on the sample surface.

(5) Other appliances: For containers designed for the transport and breeding of animals such as cages or aquariums, it is necessary to first observe or understand the specific types of animals stored and bred in the container and then take swab or liquid samples of the contents from the inner wall of the container.



(6) Collect aerosol samples at local business areas, offices, restrooms and other poorly ventilated gathering environments.

#### **6.4.2 Environmental monitoring and sampling of hotels**

(1) Guest rooms;

- Toilets: Tapss, toilet flush buttons, toilet seat rings, floor drains and ground;
- Seat armrests, table surface;
- Air conditioner and TV remote controls;
- Door handles;
- Bedding surfaces.
- Floors

(2) Elevators and escalators;

- Buttons;
- Handrails;
- Walls and floors.

(3) Rest sofas and countertops in public places;

(4) Public restrooms: tapss, door handles, toilets, flush buttons and floor drains;

(5) Meeting rooms: microphones, desktops and armrests;

#### **6.4.3 Environmental monitoring and sampling of commercial buildings and industrial parks**

(1) Public restrooms: faucets, door handles, toilets, flush buttons and floor



drains;

(2) Offices: work surfaces, keyboards, mice, water dispenser buttons, lamp switches and public equipment buttons;

(3) Meeting rooms: microphones, desktops and armrests;

(4) Door and window handles in public places;

(5) Elevators and escalators.

#### **6.4.4 Environmental monitoring and sampling of shopping malls and supermarkets**

(1) Cashiers;

(2) Shelves;

(3) Public restrooms: taps, door handles, toilets, flush buttons and floor drains;

(4) Elevators and escalators.

(5) Shopping cart;

(6) countertops, chopping boards, processing tools, weighing tools, drainage ditches, refrigerators and freezers in the meat and aquatic products sales area;

(7) Cold storage warehouse;

(8) Mops.

#### **6.4.5 Environmental monitoring and sampling of restaurants and bars**

(1) Kitchen: countertops, chopping boards, knives, cold storage and freezing cabinets;



- (2) Dining room: armrest, shelf, self-service dining table and cashier;
- (3) Public restrooms: tapss, door handles, toilets and buttons, and floor drains.

#### **6.4.6 Sampling on construction site**

- (1) Public restrooms: tapss, door handles, toilets and buttons, and floor drains;
- (2) Dormitory desktops, bedside tables, wardrobe surfaces and door handles;
- (3) Kitchens: countertops, cuttingboards, knives, cold storage and freezing cabinets.

#### **6.4.7 Sampling at beauty salons**

- (1) Work surface;
- (2) Seat armrest;
- (3) Hairdressing tools.

#### **6.5 Sewage sampling**

Select 2-3 sewage sampling positions depending on the distribution of the drainage system in the market, by focusing on collection from the internal pipe network, downstream in water flow direction or connection to the municipal pipe network. For swab samples, immerse the swab in sewage to absorb the sewage and rinse in the sampling tube more than 3 times. For sewage samples, use polyethylene plastic bottles to collect 30-500 mL sewage samples. For sewage larger than 500 mL, collecting a polyethylene





plastic bucket or using special enrichment equipment for field water samples. At the same time, perform a distributed multi-point sampling for the sewage sampling position.

## **6.6 Air sampling**

### **6.6.1 Principles**

1. 2019-nCoV can be airborne by aerosol. BIO-Capturer-6 (Viral Aerosol Sampling and Enrichment System, Hangzhou Enrichment Biotechnology Co., Ltd. or other equivalent air virus sampler) can be used with its high-efficiency gas-liquid mixing technology combined with real-time liquid-phase capture of biological particles to realize virus particle collection in ambient air as well as virus concentration and enrichment. The resulting liquid sample can be used for the separation and culture of microorganisms containing aerosol transmission such as 2019-nCoV in the environment or for docking nucleic acid extraction and test.

### **6.6.2 Principles of air sampling distribution**

For centralized air conditioning and ventilation system, set sampling points according to WS/T395-2012 Hygienic Evaluation Code for Centralized Air Conditioning and Ventilation System in Public Sites, and sampling points shall be set for site sampling according to GB/T 18204.3-2013 Hygienic Inspection Methods for Public Sites Part 3: Air Microbes. For rooms less than 100, select 3%-5% for distribution. Set one sampling point for indoor



area less than 50m<sup>2</sup>, two sampling points for indoor area of 50m<sup>2</sup>-100m<sup>2</sup>, and 3-5 sampling points for indoor area above 200m<sup>2</sup>.

Distribute sampling points according to the principle of uniform distribution; 1.2-1.5m from the floor and at least 1m from the wall; avoid vents, air ducts, etc. If there are scenes of suspected pollution sources such as sprays and secretions, put the sampler as close as possible to the pollution source, without limiting the specific sampling height or distance.

### **6.6.3 Sampling method**

(1) Select the sampling site according to the distribution principle (see 6.2 for details). Place a tripod and fix the virus aerosol collection and enrichment instrument on the tripod, turn on the power switch and record the sampling time (minutes), gas production and temperature and humidity displayed on the instrument.

(2) Add fluid (about 25 mL) to the collection bottle. Note: the fluid shall not be higher than the air outlet position of the sampling head, i.e., do not touch the sampling probe when still. Open the corresponding Real-time Bioaerosol Enrichment Kit and remove the magnetic bead enrichment solution. Shake evenly, add 3 drops (about 150 μL) of magnetic bead enrichment solution to the collection bottle. Shake and disperse evenly, then rotate to the sampling probe and tighten it.

(3) Click the "Settings" button on the main interface to enter the instrument settings page. Select the working mode as time sampling or volume



sampling. Set the corresponding timing time or sampling volume, and sample 500-1,000ml of air in general. Press the "Start" button to start sampling.

(4) When the sampler stops, turn off the power switch, unscrew the collecting bottle from the sampling probe, cover and open the instrument enrichment rack. Place the collection bottle on the magnetic rack to stand for 5 min. Remove the bottle cap, slowly rotate the collection bracket, and pour the supernatant onto the magnetic rack. At this time, the magnetic beads will remain at the bottom of the collecting bottle. Note the slow rate of decant. Do not pour the magnetic beads with the waste liquid (prolong the time of standing appropriately to ensure the enrichment quality). Generally, the volume of the remaining collecting liquid should be less than 500  $\mu$ L, and the mixed magnetic bead liquid is the test sample, which can be sucked up and transferred to a 1.5ml sample tube for test.

(5) The test samples can be used directly for pathogen culture such as viruses and bacteria or for subsequent pathogen identification operations such as nucleic acid extraction and biological test. (Note: If immunochromatography test strips are used, it is recommended to specify the specific method. Generally, direct addition of magnetic bead samples is not recommended. Air samples can be taken directly with a sampling solution without magnetic beads as a test sample, and another sample



enriched with magnetic beads can be taken and sent to the laboratory for storage.)

(6) Suggestions: If the samples to be collected on site are numerous or if further nucleic acid extraction is required, the collection bottle can be removed from the bracket, the remaining collection solution and magnetic bottom beads can be mixed uniformly with a pipette or disposable dropper, and the aerosol collected samples enriched with magnetic beads can be transferred to a 1.5 ml sample tube, labeled and frozen for storage.

(7) The collection bottle can be reused for aerosol collection and enrichment after being cleaned with 75% alcohol and ultrapure water.

(8) After the collection, clean the sampling probe with a cleaning solution for 20s.

## **7. Sampling Method for Monitoring Virus contamination in Food**

2019-nCoV monitoring of food samples mainly adopts "surface" contamination sampling by wiping with surface swabs. In actual work, samples can also be kept and kept according to the conventional food sampling method if necessary to further test 2019-nCoV, investigate internal contamination or trace the source when necessary. The following methods are provided for the monitoring and sampling of various internal food pollution.

(1) For granular samples (grain, powdered food), take a sample from a



certain corner, one from the top, one from the middle and one from the bottom. Mix the samples to obtain average samples using quartering method. As for solids, such as grain and powdery food, sample according to different batches, and determine the number of bags (barrels and bags) in the same batch based on the number of sampling points. Insert double sets of rotating sampling tubes into the upper, middle and lower parts of each bag to sample and mix respectively.

(2) For semi-solid samples (such as honey and cream), fill the barrels (cylinders and cans) with samples, determine the number of sampling barrels. Divide the samples into upper, middle and lower layers using the siphon method, and then divide them after mixing to reduce the number of average samples required.

(3) For liquid samples, mix the liquid sample evenly and sample in layers. Take 500mL from each layer, put it into a bottle and mix evenly to obtain an average sample.

(4) For small packaged samples, sample with the packaging (such as canned food and milk powder). Generally, the sampling ratio is 1: 3,000. Take one if the mantissa exceeds 1,000, but the sampling ratio of each variety shall not be less than 3 cans per day.

(5) Solid samples with uneven composition such as fish, meat, fruits and vegetables. Uneven solid samples (such as meat, fish, fruits and vegetables, etc.) can be used for various parts (such as meat, including fat and muscle



parts depending on the purpose of inspection; Vegetables including roots, stems, leaves, etc.) can be sampled separately, mashed and mixed into average samples. To analyze the water pollution degree by fish, only take viscera. This kind of food is extremely uneven in different parts, with great differences in individual size and maturity, so please make sure that the sampling is representative.

For small fish, randomly take multiple samples, chop and mix them evenly, then cut them into the required amount. For large fish, cut a small quantity of edible parts from several individuals, chop them, mix them evenly, divide and cut them.

Peel and stone fruits and vegetables to leave only the edible parts. For small fruits and vegetables such as grapes, randomly take them as a whole, chop and mix them evenly, then reduce them to the required amount. For large fruits and vegetables, such as tomatoes, eggplant, wax gourd, apple, watermelon, etc., select several individuals based on their size ratio, and sample each one separately. The sampling method consists of dividing each individual into 4 parts length-wise from the growth axis and 2 parts diagonally, then mixing and cutting to reduce internal differences. Bulk types such as rape, spinach, Pak Choi, etc., shall be taken from several packages (bundles and baskets), and mixed to obtain an average sample. The batch number of packaged food (canned food, bottled beverage, milk powder, etc.) shall be sampled in batches together with packaging. For



large packages, a certain quantity of large packages can be proportionally extracted from the batch, and then extracted from small packages, which can be used as the quantity needed for sampling after being mixed evenly. Specific regulations on the quantity and sampling methods of different foods can be referred to if necessary.

## **8. Packaging, Marking, Storage and Transportation**

**8.1** After taking the samples, mark the sampling tube and put into an appropriate size sealed plastic bag with a sample in each bag.

**8.2** Put the plastic bag containing the test sample into the sample container, and keep the sampling tube placed upright. Samples shall be packed in biosafety transfer boxes for cold chain transfer according to the packaging and transportation requirements of infectious substances. The biosafety transfer boxes shall meet the packaging requirements of Class B substances in ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (DOC 9284-AN/905), and shall be marked with UN3373. After packing, the outer surface of the biosafety transfer boxes shall be sprayed with 75% alcohol for disinfection.

**8.3** When the test samples are sent to the laboratory, fill in the inspection form according to the following: including inspection unit (inspector), inspection date, sample name, sampling position, sample quantity, sampling place, items to test, etc. When sending for inspection, the



sampling sheet must be submitted at the same time in duplicate, one kept in the sampling unit for future reference, and the other transported to the BSL-2 laboratory or above with the 2019-nCoV test samples.

**8.4** Send the collected test samples to the testing laboratory as soon as possible, and store them at 4°C for 24 h. Samples that cannot be tested within 24 h should be stored at -70°C or below (if there are no storage conditions at -70°C, store them in a refrigerator at -20°C for up to 48 h). Avoid repeated freezing and thawing during sample transportation.

## **9. Precautions**

**9.1** Before sampling, confirm that the sampled items are in their original natural state. Take samples first if sampling and disinfection treatment are required on site.

**9.2** During sampling, select a relatively clean area on the site and wear personal protective equipment (PPE) such as protective clothing. After sampling, take off protective clothing and other equipment in another area (semi-polluted area), and put the protective equipment and other used items in yellow medical waste bags, and dispose of them according to medical waste regulations.

**9.3** During the sampling, keep the sampling environment clean, avoid the adverse environmental factors such as rain and prevent the samples from being polluted.





**9.4** During continuous sampling, sampling personnel shall disinfect the outer gloves with 75% alcohol before taking new sampling tools (including long-handled disposable sampling swab, sterile pipette, etc.), and replace the outer gloves if necessary.

**9.5** For pre-packaged goods, use 75% alcohol to disinfect the outer packaging and then sample when it is necessary to sample the goods from it.

**9.6** After sampling, disinfect the outer gloves in good time with 75% alcohol or chlorine-containing disinfectant (500-1,000 mg/L).

**9.7** The waste generated from sampling shall be packed in medical waste storage bags for spraying and disinfection, and delivered to qualified medical waste disposal units for safe disposal.

**9.8** After sampling, sampling personnel shall remove personal protective equipment according to standard procedure, put it in the medical waste storage bag, spray and disinfect it, then hand it over to the medical waste disposal unit for safe disposal, and the individual shall perform hand hygiene disinfection.



## 10. References

1. Transportation Administrative Regulations on Highly Pathogenic Microorganisms (Viruses) or Samples
2. GB/T 4789.1-2016 Food Safety Microbiological Examination-General Rules
3. Environmental Monitoring Technical Specifications of Farm Market in 2019-nCoV
4. GB 4789.18-2010 5.1 Treatment of Milk and Liquid Dairy Products
5. Hygiene Evaluation Code for Central Air Conditioning and Ventilation System for Public Places  
WS / T 395-2012
6. GB/T 18204.3-2013 Hygiene Inspection Methods in Public Places Part 3. Airborne Microorganism

### Appendixes:

Appendix 1 Registration Form for Sampling of Objects

Appendix 2 Record Table for 2019-nCoV Environmental Test Samples

Appendix 3 Biological Aerosol Sampling Record Form

Appendix 4 Food Sample Test Report (Sample)

Appendix 5 Test Report of Object and Air Sample (Sample)



## Appendix 1

### Registration Form for Sampling of Objects

Sampling Site:

Sampling Time:

Sampling Code	Sampling position	Sampling Site 1	Sampling Site 2	Sampling Site 3	Sampling Site 4	Sampling Site 5



## Appendix 2 Sampling Table for 2019-nCoV Environmental Test Samples

### Sampling Table for 2019-nCoV Environmental Test Specimens

Market Name:                      Monitoring Place:

Sampling Date: MM/DD/YY

No.	Booth No.	Environment								Practitioner	
		Board	Panel	Ground	Handle	Hair Removal or Cutting Machinery	Tool	Refrigerator	Cold Cupboard	Clothes Surface	Hands

### Appendix 3 Biological Aerosol Sampling Record Form

#### Biological Aerosol Sampling Record Form

Client:						Task No.:						
Objectives:						Sampler Type and Serial No.:						
Sampling Site:						Date:						
Sample No.	Sampling Start Time (min)	Sampling Quantity (m3)	Sampling (min)	Source Distance (m)	Temperature	Relative Humidity (%)	Air pressure (hPa)	Orientation	Wind Speed (m/s)	Weather Conditions	Altitude	Latitude and Longitude

Record the geographic conditions in the draft:

Observation conditions:

Sampler signature:

Date:

## Appendix 4 Appendix 4 Food Sample Test Report (Sample)



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INSTITUTE OF HEALTH INSPECTION AND QUARANTINE, CHINESE ACADEMY OF INSPECTION AND QUARANTINE

## 2019-nCoV Nucleic Acid Test Report

Sample No.: CAIQ1012011, 12, 014, 016, 018 Client: Nuo'er Supply Chain Management (Shanghai) Co., Ltd.

Sampling Type: Food

Sampling Site: See Appendix

Sample Type: Surface swab

Sample Quantity: 5

Test item: 2019-nCoV nucleic acid test

Test method/instrument: Real-Time RT PCR method /ABI 7500

Test results:

Sample No.	Test Indicators and Target Gene Test Results		Test Results
	ORF1ab Gene	N Gene	
Positive Control	+	+	Positive
Negative Control	-	-	Negative
CAIQ1012011	-	-	Negative
CAIQ1012012	-	-	Negative
CAIQ1012014	-	-	Negative
CAIQ1012016	-	-	Negative
CAIQ1012018	-	-	Negative

Result Suggestion:

The 2019-nCoV nucleic acid test results are all **negative**.

Statement:

1. The report result is only for the samples taken this time. Any report without the signature of the inspector and reviewer as well as the alteration and defect in content are invalid.
2. The fluorescence PCR method is applied in this test to issue the qualitative test results.
3. Given the limitations of medical molecular detection technology, it remains impossible to completely rule out the possibility of false positives or false negatives in some pathogen detection.

Inspected by:

Reviewed by:

Sampling Time: 2020/10/12 Test Time: 2020/10/13 Report Time: 2020/10/13



## Appendix

Sample Code	No.	Sample Name	Sample Identity	Sampling Part	Test Item	Sampling Method
CAIQ1012011	1	Kapiti Vanilla Ice Cream	CSY20191202	Editable Part	2019-nCoV Nucleic Acid Test	Submitted by client
CAIQ1012012	2	Kapiti Vanilla Ice Cream	CSY20191202	carton Outer Case	2019-nCoV Nucleic Acid Test	Submitted by client
CAIQ1012014	3	Kapiti Vanilla Ice Cream	20191018	Editable Part	2019-nCoV Nucleic Acid Test	Submitted by client
CAIQ1012016	4	Kapiti Vanilla Ice Cream	20191113	Editable Part	2019-nCoV Nucleic Acid Test	Submitted by client
CAIQ1012018	5	Kapiti Vanilla Ice Cream	20191129	Editable Part	2019-nCoV Nucleic Acid Test	Submitted by client

## Appendix 5 Test Report of Object Table and Air Sample (Sample)



中国检验检疫科学研究院 卫生检验与检疫研究所

INSTITUTE OF HEALTH INSPECTION AND QUARANTINE, CHINESE ACADEMY OF INSPECTION AND QUARANTINE

## 2019-nCoV Nucleic Acid Test Report

Sample No.: CAIQ1111026-044 Client: National Government Offices Administration Services Division

Sampling Type: Environment Surface, Air

Sampling Site: See Appendix

Sample Type: Surface Swab

Quantity: 19

Test item: 2019-nCoV nucleic acid test

Test method/instrument: Real-Time RT PCR method /ABI 7500

Test Result:

Sample No.	Test Indicators and Target Gene Test Results		Test Results
	ORF1ab Gene	N Gene	
Positive Control	+	+	Positive
Negative Control	-	-	Negative
CAIQ1111026	-	-	Negative
CAIQ1111027	-	-	Negative
CAIQ1111028	-	-	Negative
CAIQ1111029	-	-	Negative
CAIQ1111030	-	-	Negative
CAIQ1111031	-	-	Negative
CAIQ1111032	-	-	Negative
CAIQ1111033	-	-	Negative
CAIQ1111034	-	-	Negative
CAIQ1111035	-	-	Negative
CAIQ1111036	-	-	Negative
CAIQ1111037	-	-	Negative
CAIQ1111038	-	-	Negative
CAIQ1111039	-	-	Negative
CAIQ1111040	-	-	Negative
CAIQ1111041	-	-	Negative
CAIQ1111042	-	-	Negative
CAIQ1111043	-	-	Negative
CAIQ1111044	-	-	Negative

**Result Suggestion:**The 2019-nCoV nucleic acid test results are all **negative**.**Statement:**

1. The report result is only for the samples taken this time. Any report without the signature of the inspector and review eras well as the alteration and defect in content are invalid.
2. The fluorescence PCR method is applied in this test to issue the qualitative test results.
3. Given the limitations of medical molecular detection technology, it remains impossible to completely rule out the possibility of false positives or false negatives in some pathogen detection.

**Inspected by:****Reviewed by:****Sampling Time: 2020/11/11****Test Time: 2020/11/12 Report Time: 2020/11/12**





# 中国检验检疫科学研究院卫生检验与检疫研究所

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## Appendix

Sample Code	No.	Test Site	Position	Sampling Type	Test Item	Sampling Mode
CAIQ1111026	1	Underground 1 Refrigerated Warehouse	Handle Switch	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111027	2	Underground 1 Refrigerated Warehouse	Food Surface	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111028	3	Underground 1 Refrigerated Warehouse	Shelf	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111029	4	Underground 1 Refrigerated Warehouse	Ground	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111030	5	Underground 1 Frozen Warehouse	Handle Switch	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111031	6	Underground 1 Frozen Warehouse	Food Surface	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111032	7	Underground 1 Frozen Warehouse	Shelf	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111033	8	Underground 1 Frozen Warehouse	Ground	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111034	9	Underground 1 Outer Warehouse	Shelf	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111035	10	Underground 1 Outer Warehouse	Food Surface	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111036	11	Underground 2			2019-nCoV Nucleic	

		Warehouse	Jinzi Savory Ham Sausage	Surface	Acid Screening	Sampled by client
CAIQ1111037	12	Underground 2 Warehouse	Dried Bamboo Shoot	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111038	13	Underground 2 Warehouse	Fragrant Rice	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111039	14	Underground 2 Warehouse	Japanese Rice	Surface	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111040	15	Underground 1 Refrigerated Warehouse	Underground 1 Refrigerated Warehouse	Air	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111041	16	Underground 1 Frozen Warehouse	Underground 1 Frozen Warehouse	Air	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111042	17	Underground 1 Outer Warehouse	Underground 1 Outer Warehouse	Air	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111043	18	Underground 2 Warehouse 1	Underground 2 Warehouse 1	Air	2019-nCoV Nucleic Acid Screening	Sampled by client
CAIQ1111044	19	Underground 2 Warehouse 2	Underground 2 Warehouse 2	Air	2019-nCoV Nucleic Acid Screening	Sampled by client

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