

Oct 10, 2025

Bioaerosol Sampling Protocol

DOI

<https://dx.doi.org/10.17504/protocols.io.kqdg31ykpl25/v1>

Nadia Rimi¹, Christopher LeBoa², Khaled Saifullah², William Lindsley³, Shohanur Rahman¹, Khaled Saifullah¹, Elizabeth M. Noth², Md Mustafizur Rahman¹, Md. Habibullah Fahad¹, Laura H. Kwong², Ireen Sultana Shanta¹

¹icddr,b; ²UC Berkeley; ³CDC



Christopher LeBoa

UCB

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.kqdg31ykpl25/v1>

Protocol Citation: Nadia Rimi, Christopher LeBoa, Khaled Saifullah, William Lindsley, Shohanur Rahman, Khaled Saifullah, Elizabeth M. Noth, Md Mustafizur Rahman, Md. Habibullah Fahad, Laura H. Kwong, Ireen Sultana Shanta 2025. Bioaerosol Sampling Protocol. protocols.io <https://dx.doi.org/10.17504/protocols.io.kqdg31ykpl25/v1>

License: This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited



Protocol status: Working

This protocol was used and is working

Created: October 09, 2025

Last Modified: October 10, 2025

Protocol Integer ID: 229468

Keywords: niosh sc251 biosampler in live poultry market, bioaerosol sampling protocol the process, bioaerosol sampling protocol, bioaerosol sampling, niosh sc251 biosampler, live poultry market

Funders Acknowledgements:

National Institutes of Health

Grant ID: D43TW010540

Abstract

The process used for bioaerosol sampling using a NIOSH SC251 biosampler in live poultry markets

Guidelines

8.2 Air sample processing from 15 ml tube

8.2.1 Take out the test tube from cool box and add 1000 ul/1ml lysis buffer.

8.2.2 And after that, rotate the tube properly in both directions in a vortex machine for 2 minutes.

8.2.3 Store the sample in a -80C refrigerator for future RNA extraction

8.3 Air sample processing from 1.5 ml Cryovial tube

8.3.1 Add 500 microliters (µl) of lysis buffer to a 1.5 mL cryovial tube

8.3.2 Rotate the tube properly in both directions in a vortex machine for 2 minutes

8.3.3 Store the sample in a -80C refrigerator for future RNA extraction

Laboratory cleaning of air sampler

9.1 Bring all used samplers to the laboratory for cleaning

9.2 Deposit all samplers in a plastic beaker and immerse in isopropanol for 1 hour.

9.3 After 1 hour, lift out air sampler from the isopropanol and air-dried inside the biosafety cabinet.

10. Pump charging

10.1 Charge the pump through the charger

10.2 After full charging, plug out the charger

Air sample collection

- 1 The NIOSH bioaerosol sampler (BC 251) will be prepared according to the user manual on the previous day of the sample collection. It should make sure that the pump is fully charged.
- 0.2 Other required equipment (cool box containing ice pack, tissue, masking tape) listed above will be made ready to be used where the sample collection will take place.
- 0.3 Don PPE following the appropriate sequencing.
- 0.4 The air samplers will be placed on selected point at breathing height (1.48 meters from the floor) of poultry slaughterers, processors, sellers and consumers.
- 0.5 The field team will start collecting air samples at around 10.30 am and run the sampler for 60 minutes at each predefined shop area.
- 0.6 After completing the air sampler run time, stop the air sampler by pressing the "Hold" button of the sampling pump and record the total run time which is indicated by each pump and remove the collection tubes and filter cassette from the air sampler and store it in a cool box maintaining 4 to 8 degree Celsius temperature till transporting it to the laboratory for further processing.

Laboratory cleaning of air sampler

- 1 Move the sampler to a place outside the poultry shop. Open plastic cloth and spray with 70% ethanol.
- 1.1 Remove the sealing tape and unscrew the tubes and cryovials and air tight the tubes, cryovials and cassette with filter and keep it to the 40 to 80 C control cool box.
- 1.2 Clean the sampler, connecting tube and pump instantly with isopropanol-soaked tissue paper.
- 1.3 Keep clean sampler and connecting tube on zip lock bag and lock the bag.
- 1.4 Collect all the used thread and masking tape and discard on biohazard bag.



1.5 Clean table cloth by isopropanol-soaked tissue paper and wrap up.

1.6 Discard the hand gloves in the biohazard bag.

Sample transportation

2 Samples will be transported as early as possible to the virology laboratory, icddr,b for processing.

Removing 15mL Sample for Processing

3 Clean the cassette opening tool, filter lifter and filter forceps with Isopropanol.

3.1 Air dry for 2-5 minutes.

3.2 Open the filter cassette by the cassette opening tool.

3.3 Insert the steel rod of the filter lifter through the outlet hole to push the filter up.

3.4 Grasp the filter using filter forceps and place into a pre-labelled 15 ml Falcon test tube.

3.5 Pour 1000 ul/1ml of lysis buffer onto the filter paper.

3.6 And after that, rotate the tube properly in both directions in a vortex machine for 2 minutes.

3.7 After vertexing, store the sample in a -80C refrigerator for future RNA extraction.

Air sample processing from 15 ml tube



- 3.8 Take out the test tube from cool box and add 1000 ul/1ml lysis buffer.
- 3.9 And after that, rotate the tube properly in both directions in a vortex machine for 2 minutes.
- 3.10 Store the sample in a -80C refrigerator for future RNA extraction.

Air sample processing from 1.5 ml Cryovial tube

- 3.11 Add 500 microliters (μl) of lysis buffer to a 1.5 mL cryovial tube.
- 3.12 Rotate the tube properly in both directions in a vortex machine for 2 minutes.
- 3.13 Store the sample in a -80C refrigerator for future RNA extraction.

Laboratory cleaning of air sampler

- 4 Bring all used samplers to the laboratory for cleaning.
- 4.1 Deposit all samplers in a plastic beaker and immerse in isopropanol for 1 hour.
- 4.2 After 1 hour, lift out air sampler from the isopropanol and air-dried inside the biosafety cabinet.
- 4.3 Charge the pump through the charger.
- 4.4 After full charging, unplug the charger.