Salmonella sampling for **backyard housing using drag or boot swabs**

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in backyard hen environments

FREQUENCY
Every 12 to 15 weeks

MATERIALS NEEDED

- Cotton guaze swabs, can use either:
  - See instructions on how to make your own*or,
  - Tampons or,
  - Supplied by laboratory
- 1.5m cotton string
- Disposable latex gloves
- Sample transport liquid (peptone water)
- ^Whirl-Pak® bags or screw top plastic jar
- Scissors
- Permanent marker
- Laboratory sample submission form
- Plastic post satchel for transporting swabs to the laboratory
- Plastic container for swabbed samples

* Making cotton gauze swabs

^ https://www.whirl-pak.com/whirl-pak-bags-general-information

MAKING THE COTTON GAUZE SWABS

1 Obtain a 10cm x 10cm cotton gauze and fold onto itself in a pleated pattern.

Figure 1
Image: Michael J et al. 2020

2 Continue folding gauze to form a pad.

Figure 2
Image: Michael J et al. 2020

3 Tie the cotton string around the centre of the cotton gauze.

Figure 3
Image: Michael J et al. 2020

4 Wind string around the cotton gauze.

Figure 4

5 Place the required number of swabs for each shed into their own plastic container or Whirl-Pak® bag.

6 Store the rest in a dry, secure place.

PROCEDURE

Step 1
Get prepared

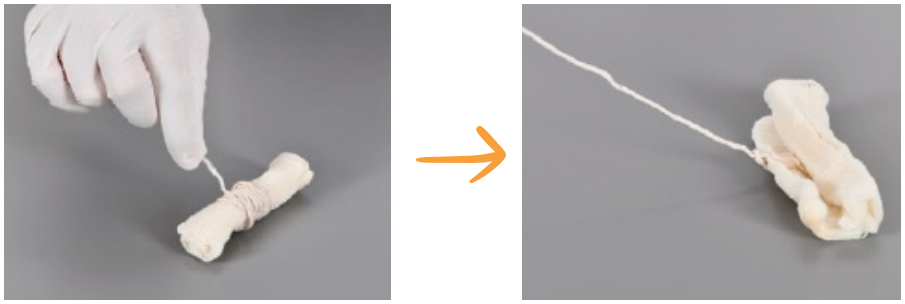
1. Notify the laboratory 24 hours in advance of sending the swab samples.
2. Obtain a sample submission form from the laboratory.
3. Prepare **three (3) swabs** per shed.

Step 2
Swab the shed

Drag swabs

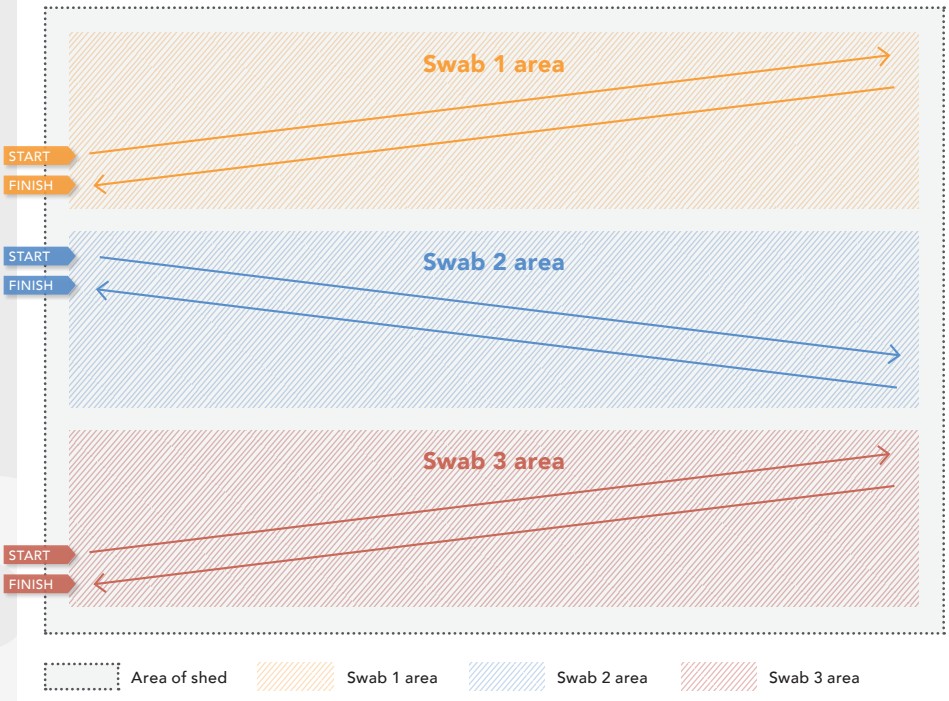
1. Wash your hands.
2. Put on a pair of disposable latex gloves.
3. Moisten **Swab 1** with solution provided by the laboratory.
4. Hold **Swab 1** by the string and unravel the entire piece of string (Figure 5).

Figure 5. Hold the swab by the string and unravel (Romer Labs)



5. Drag **Swab 1** the full length of the shed twice ('up and back') in the pattern shown in Figure 6.

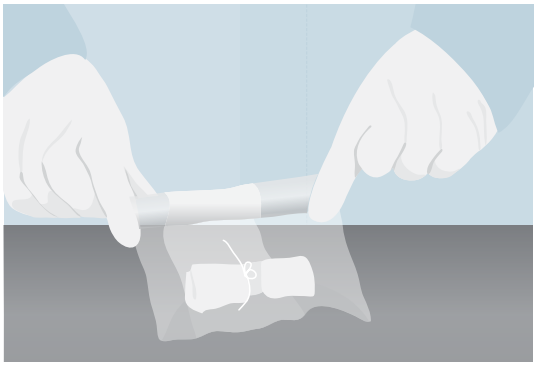
Figure 6. Swab the litter/ manure area



PROCEDURE

6. **Swab 1** should be considered finished when the swab is back where it started from.
7. The string should not be included in the sample sent to the laboratory, cut the string from **Swab 1** with a pair of scissors.
8. Place **Swab 1** in a Whirl-Pak® bag or screw top plastic jar (Figure 7).

Figure 7. Put swab into Whirl-pak® bag (Romer Labs)



9. Seal the bag or plastic jar.
10. **Repeat procedure 3 to 9 with Swab 2 and Swab 3**, using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

OR

Boot swabbing

MATERIALS NEEDED

- Boot Swab Kit (pre-moistened cotton-poly blend fabric sock style boot)* (Figure 8)
- Plastic Boot Cover* (Figure 8)
- Disposable latex gloves
- Original Twirl-tie bag (originally contain the boot swab kit)
- Permanent marker
- Laboratory sample submission form
- Plastic container for swabbed samples

* both boot swab kit and plastic boot cover can be purchased from **www.solarbiologicals.com** or may be supplied by the diagnostic laboratory

Figure 8. Boot swab (Solar Biological Inc)

PROCEDURE

Step 1
Get prepared

1. Notify the laboratory 24 hours in advance of sending the swab samples.
2. Obtain a sample submission form from the laboratory.
3. Prepare **two (2) pairs of boot swabs** per shed.

Step 2
Swab the shed

1. Wash your hands.
2. Put on a pair of disposable latex gloves.
3. Slip on one disposable plastic boot cover per shoe or boot (Figure 9).
4. Slip on the other disposable plastic boot cover over the other shoe or boot (Figure 9).

Figure 9. Put on a plastic boot cover (Romer Labs)

IMPORTANT

Don't use foot bath or any disinfectant/sanitizer prior to sample collection as it might kill the *Salmonella* in the sample if there any.

PROCEDURE

5 Carefully remove the pre-moistened boot swab from the bag (Twirl-tie bag) and place it securely over the plastic boot covers (Figure 10).

Figure 10. Put boot swabs over plastic boot cover (Romer Labs)

6 Walk in a zig-zag pattern through the full length of the area where hen manure lies (Figure 11; Figure 12 or Figure 13).

Figure 11. Walk through the shed with boot swabs

PROCEDURE

Figure 12. Swab the litter/ manure area

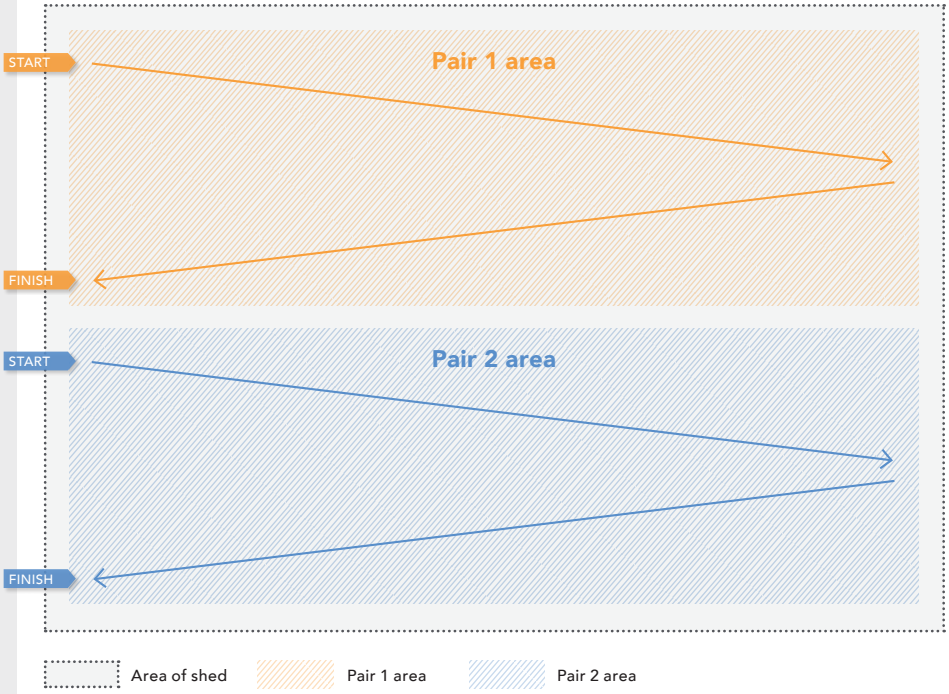
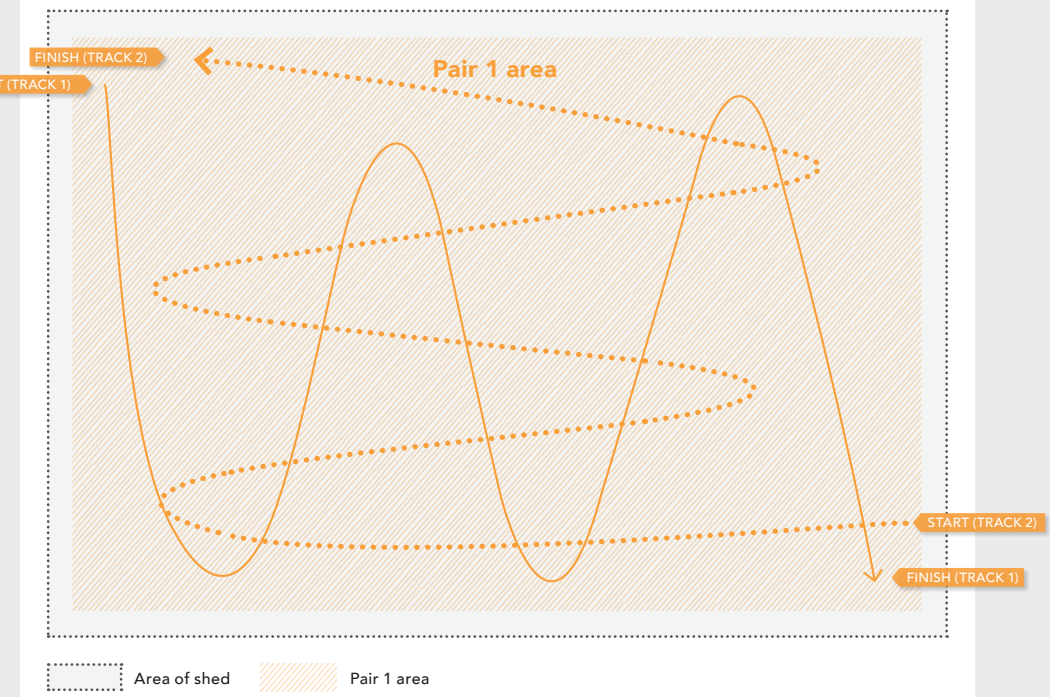


Figure 13. Alternative swabbing procedure for litter/ manure area

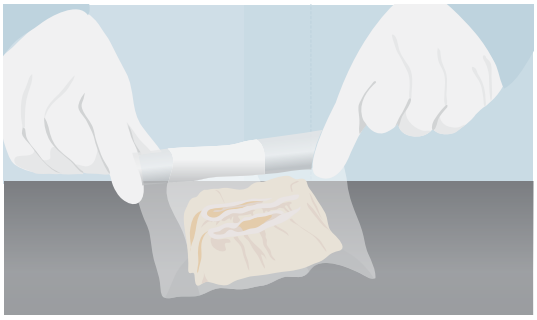


7 **If safe to do so**, access underneath the feeders and drinkers.

PROCEDURE

8. Immediately after the sample collection carefully remove the boot swabs and return it to its original Twirl-tie bag (Figure 14).

Figure 14. Remove boot swabs and put it into the original bag

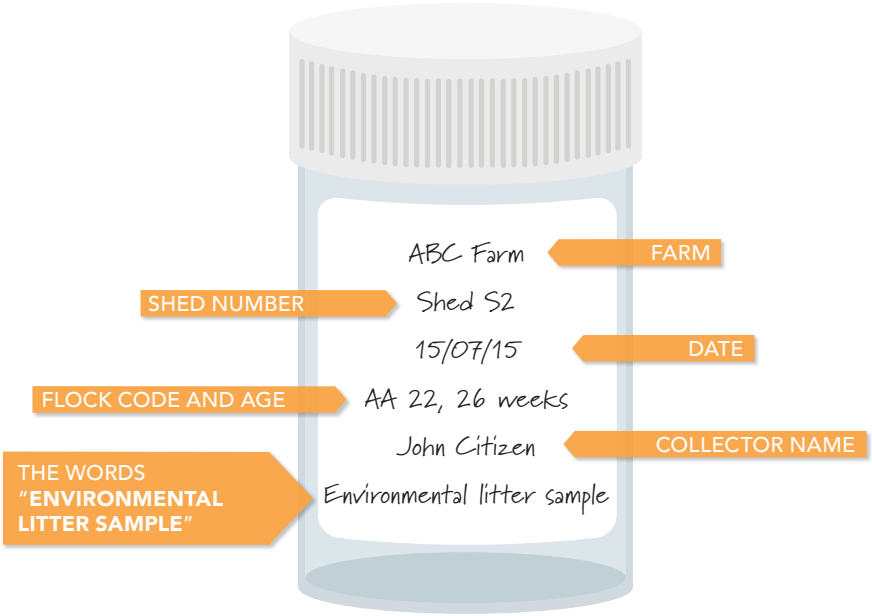


9. Seal the Twirl-tie bag.
10. If using the method shown in **Figure 12, repeat procedure 2 to 9**. If using the method depicted in **Figure 13 there is no need for a second swabbing**.

Step 3
Pack the samples

1. Each sample should be placed in it's own Whirl-Pak® bag or screw top plastic jar. Clearly label each bag or jar with permanent marker.
2. Include information as per Example 1.

Example 1. Information to include on the Whirl-Pak® bag or screw top plastic jar



3. Complete the laboratory sample submission form (always record on submission sheets as "ENVIRONMENTAL LITTER SAMPLES").

PROCEDURE

Step 4
Submit the samples

1. Pack the swabs that are in the bags (Figure 15A) securely into a plastic container (Figure 15B) and put the container into a plastic post satchel (Figure 15C).

Figure 15. Pack swab samples

15B
https://ie.vwr.com/store/product/17962031/sample-container-with-screw-cap-sterilin#gallery-1

15C
https://auspost.com.au/shop/product/flat-rate-small-satchel-10-pack-059049131?fm=recommendations:shop:1

2. Put the completed sample submission form into the same plastic post satchel as the swabs.
3. Post the samples to the diagnostic laboratory.
4. If the swabs cannot be posted on the same day, store the swabs in the fridge (between 4 and 8°C) until ready to be posted. Conduct procedures 1 to 4 as soon as possible.

Swabs must not be frozen.

REFERENCE

Michael J. Sikorski, Myron M. Levine 2020 Reviving the "Moore Swab": A Classic Environmental Surveillance Tool Involving Filtration of Flowing Surface Water and Sewage Water To Recover Typhoidal *Salmonella* Bacteria

Applied and Environmental Microbiology, 86 (13) e00060-20; **DOI:** 10.1128/AEM.00060-20)

Romer Labs - SurfACE™ Sampling Solutions in Primary Production