



Salmonella sampling for **deep litter sheds with no pens or partition using drag swabs**

Purpose/Scope: This SOP provides a method for conducting *Salmonella* sampling in deep litter sheds with no pens or partition

FREQUENCY
Every 12 to 15 weeks

MATERIALS NEEDED

- Cotton guaze swabs, can use either:
 - See instructions on how to make your own*,
 - 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

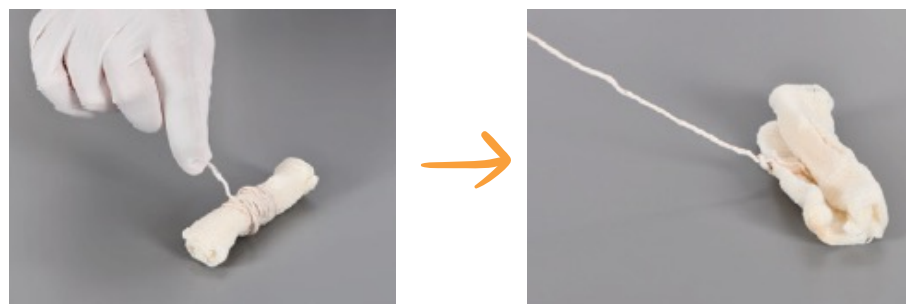
Step 1 Get prepared

- 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

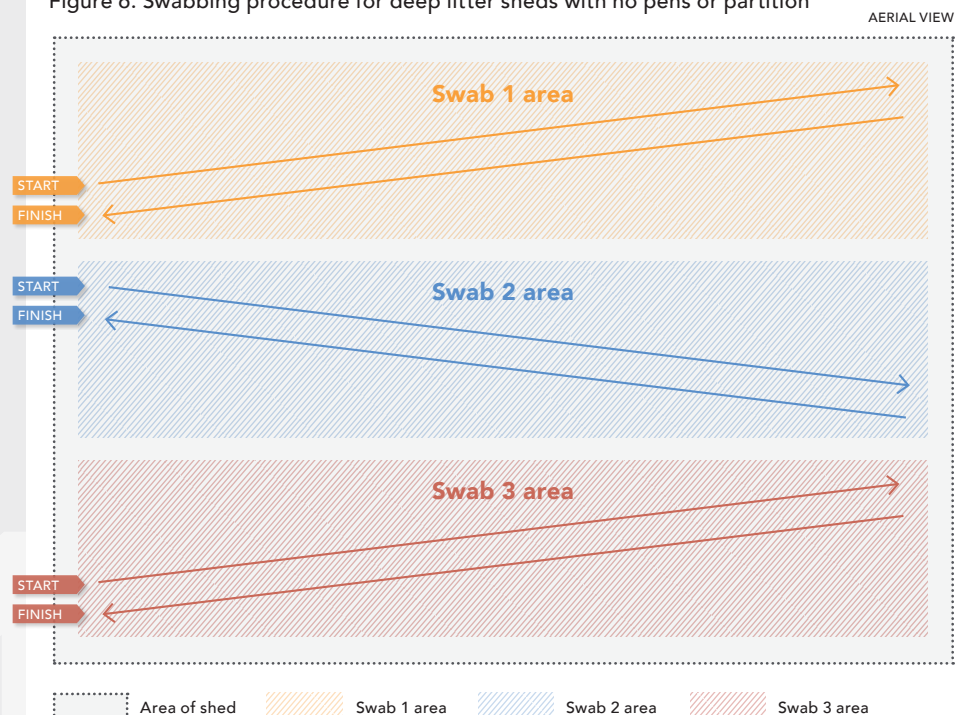
- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Moisten **Swab 1** with water from the drinkers or solution provided by the laboratory.
- 4 Hold **Swab 1** by the string and unravel (Figure 5).

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



- 5 Drag **Swab 1** twice the full length of the shed over different areas of litter in the patterns described in Figure 6.

Figure 6. Swabbing procedure for deep litter sheds with no pens or partition

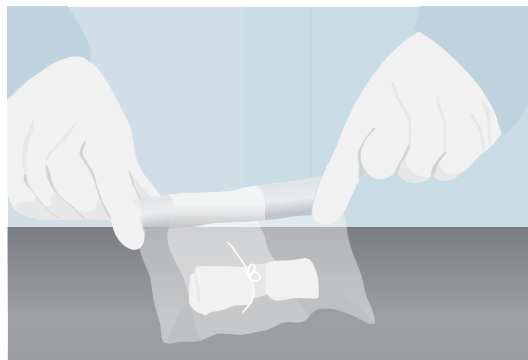


- 6 **Swab 1** should be considered finished when the swab is back to where it started from (Figure 6).

PROCEDURE

- 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)

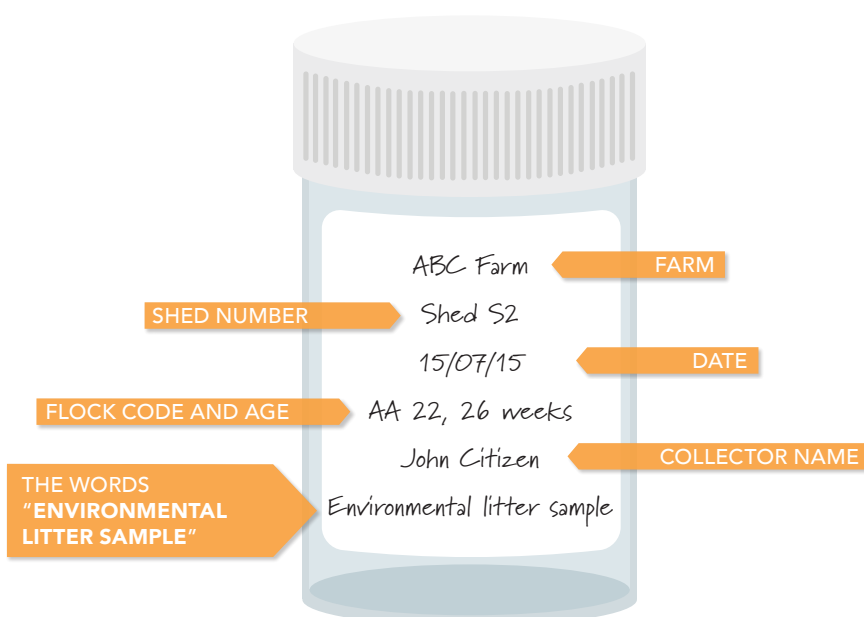


- 9 Seal the bag or plastic jar.
- 10 **Repeat procedure 3 to 9 with Swab 2 and Swab 3**, using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Salmonella sampling for **deep litter sheds with pens or partitions using drag swabs**

Purpose/Scope: This SOP provides a method for conducting *Salmonella* sampling in deep litter sheds with pens or partitions

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 **two (2) swabs** for each pen/ partition (see Example 1.)

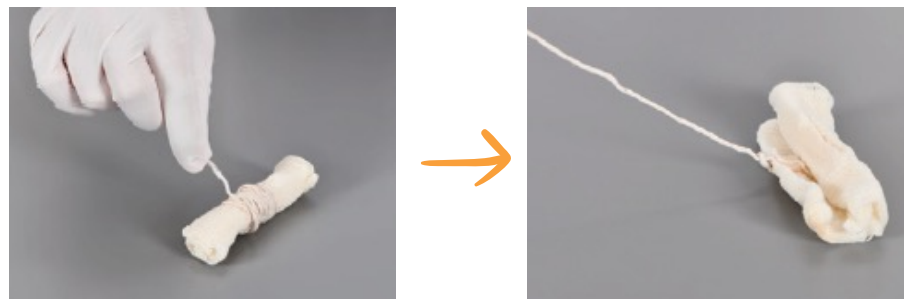
Example 1. Number of swabs required based on number of pens/ partitions

Number of pens/ partition	Number of swabs required
2	4
3	6
4	8
5	10

Step 2 Swab the shed

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

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



PROCEDURE

- 5 Drag **Swab 1** twice the full length of the pen or partition as described in Figure 6 (2 pens/ partition) or Figure 7 (3 pens/ partitions).

Figure 6. Swabbing procedure for deep litter sheds with two pens or partition

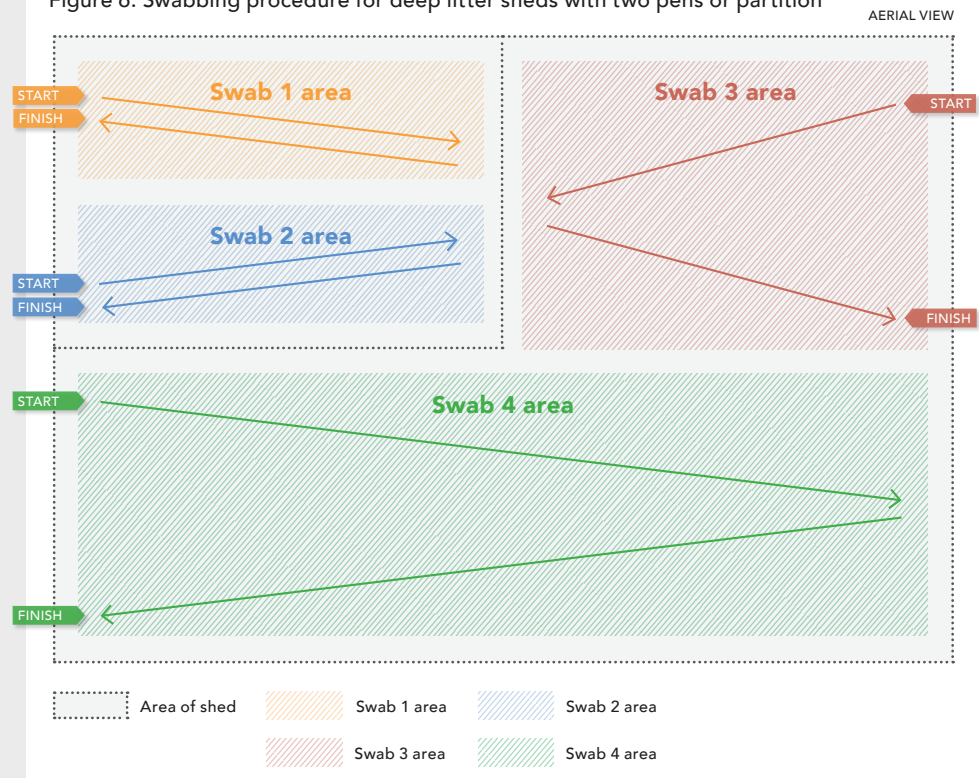
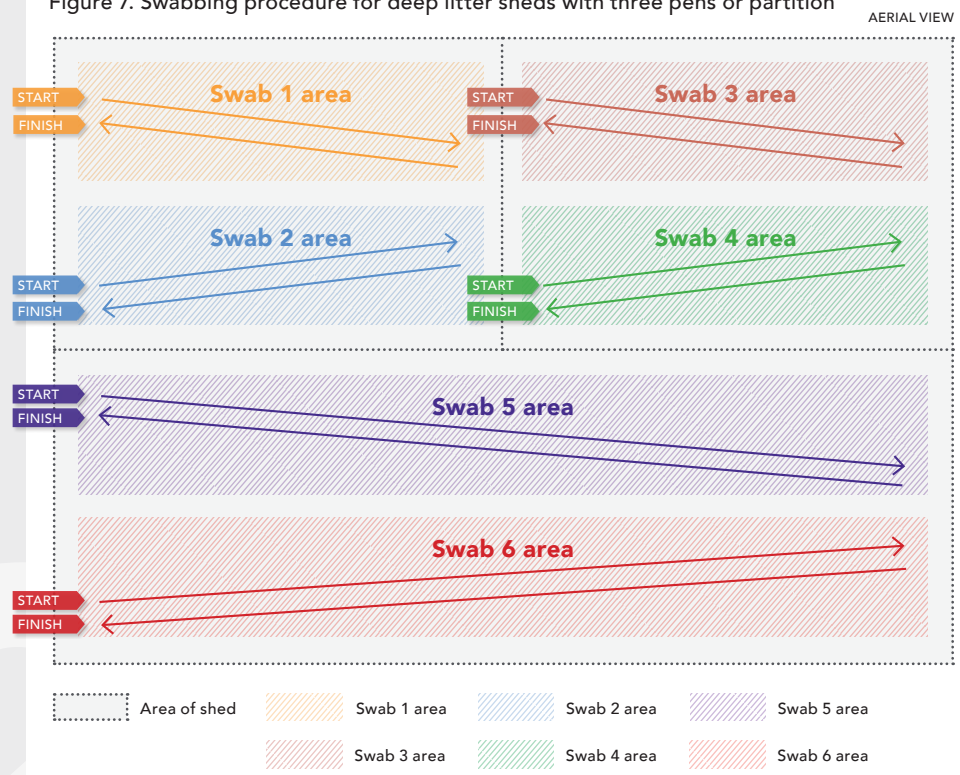


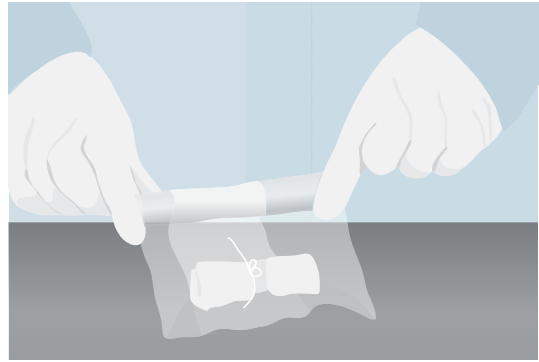
Figure 7. Swabbing procedure for deep litter sheds with three pens or partition



PROCEDURE

- 6 As per Figures 6 and 7, **Swab 1** should be considered finished when the swab is back to 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 8).

Figure 8. Put swab into Whirl-Pak® bag (Romer Labs)

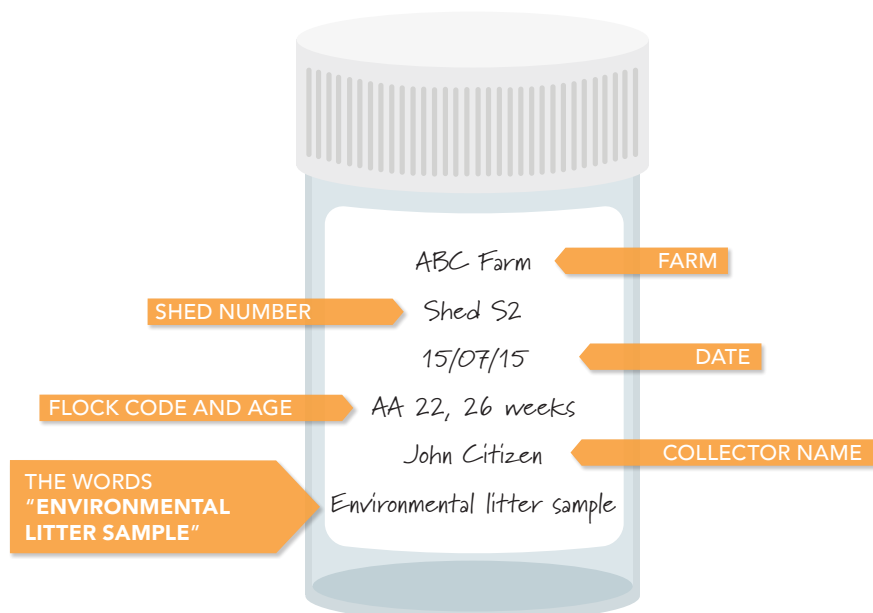


- 9 Seal the bag or plastic jar.
- 10 **Repeat procedure 3 to 9 with Swab 2, Swab 3**, etc using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

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 9A) securely into a plastic container (Figure 9B) and put the container into a plastic post satchel (Figure 9C).

Figure 9. Pack swab samples



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



<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



Salmonella sampling for **single level, fully slatted sheds using drag swabs**

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in a fully slatted shed

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

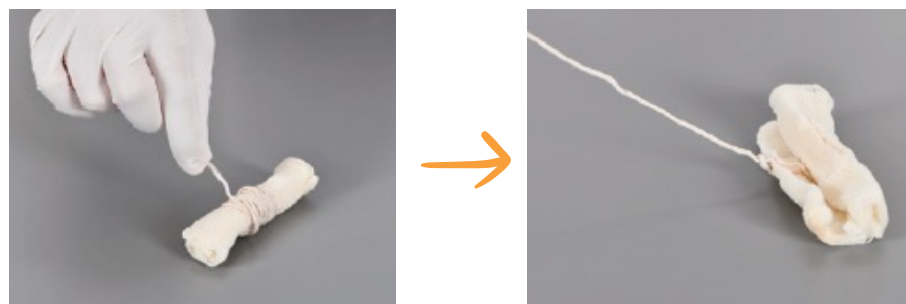
- 1 Notify the laboratory 24 hours in advance of sending the swab samples.
- 2 Obtain a sample submission form from the laboratory.
- 3 Prepare **two (2) swabs** per shed.

Step 2

Swab the shed

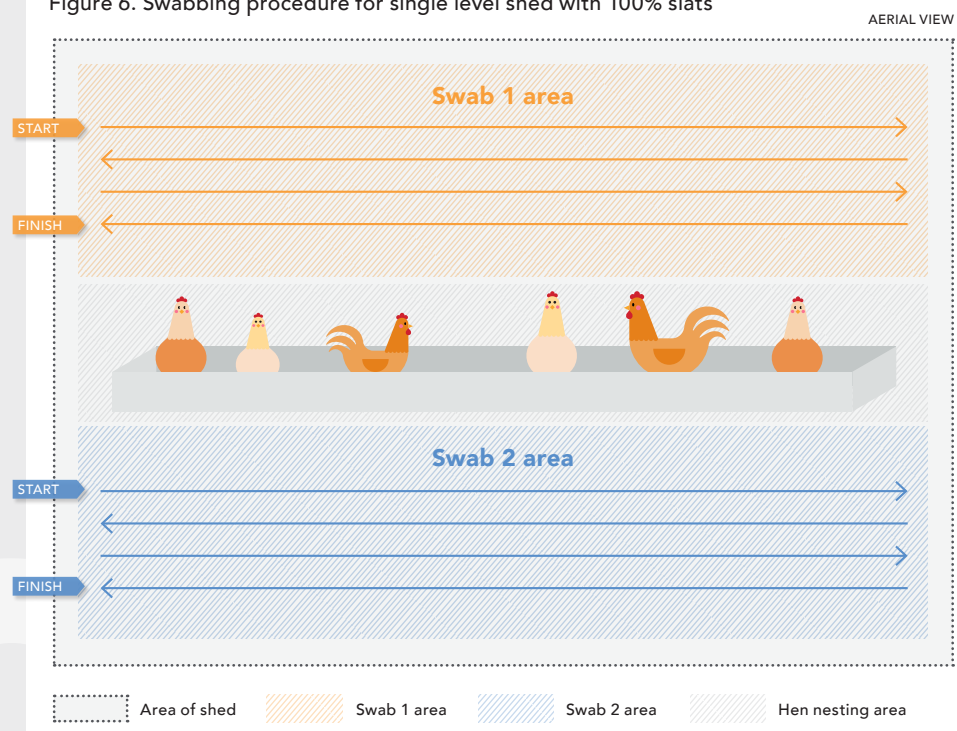
- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Moisten **Swab 1** with water from the drinkers or solution provided by the laboratory.
- 4 Hold **Swab 1** by the string and unravel (Figure 5).

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



- 5 Drag **Swab 1** four times the full length of the shed as depicted in Figure 6.

Figure 6. Swabbing procedure for single level shed with 100% slats

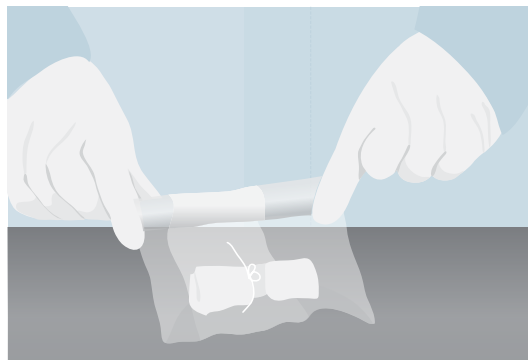


- 6 **Swab 1** should be considered finished when the swab returns to the side it started from for the second time.

PROCEDURE

- 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)

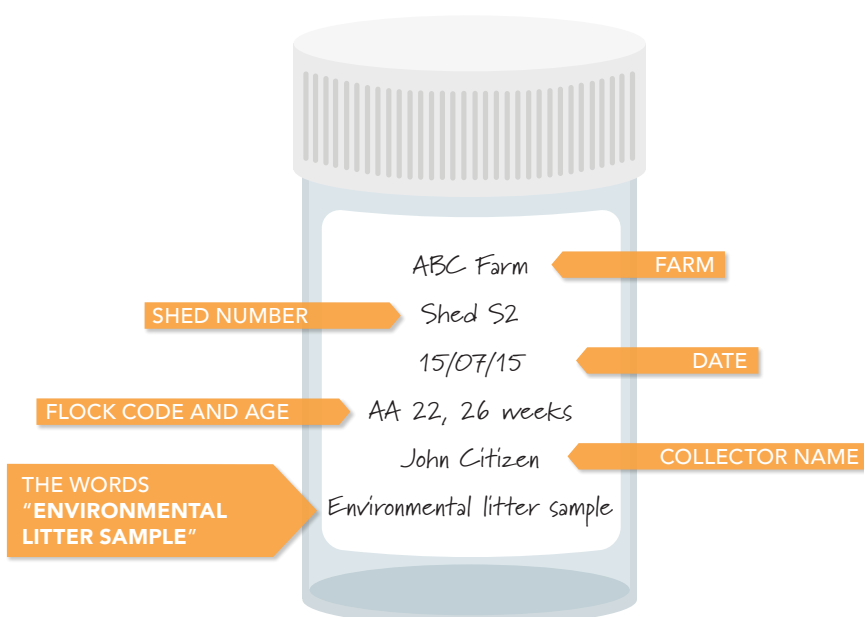


- 9 Seal the bag or plastic jar.
- 10 Repeat procedure 3 to 9 with **Swab 2**, using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Salmonella sampling for **slatted sheds with pens or partitions using drag swabs**

Purpose/Scope: This SOP provides a method for conducting *Salmonella* sampling in slatted sheds with pens or partition

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 **two (2) swabs** for each pen/ partition (see Example 1.)

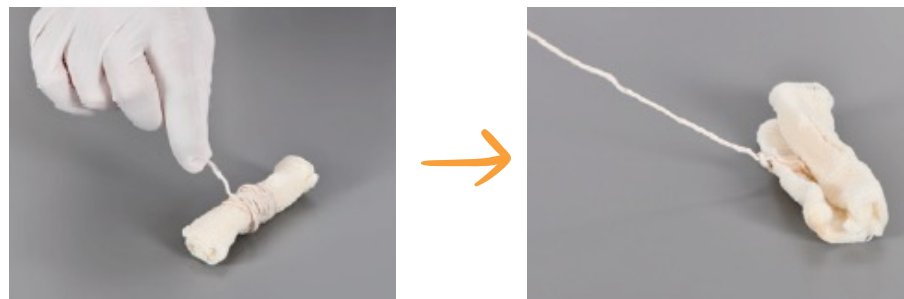
Example 1. Number of swabs required based on number of pens/ partitions

Number of pens/ partition	Number of swabs required
2	4
3	6
4	8
5	10

Step 2 Swab the shed

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

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



PROCEDURE

- 5 Drag **Swab 1** twice the full length of the pen or partition as depicted in Figure 6 (2 pens/ partition) or Figure 7 (3 pens/ partitions).

Figure 6. Swabbing procedure for fully slatted sheds with two pens

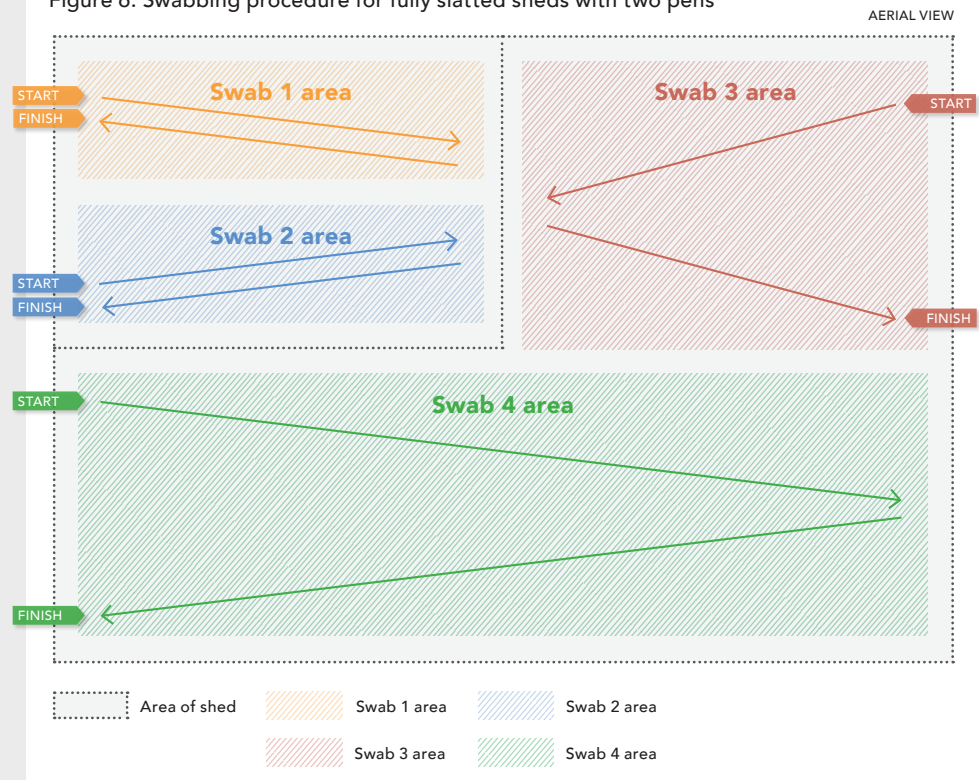
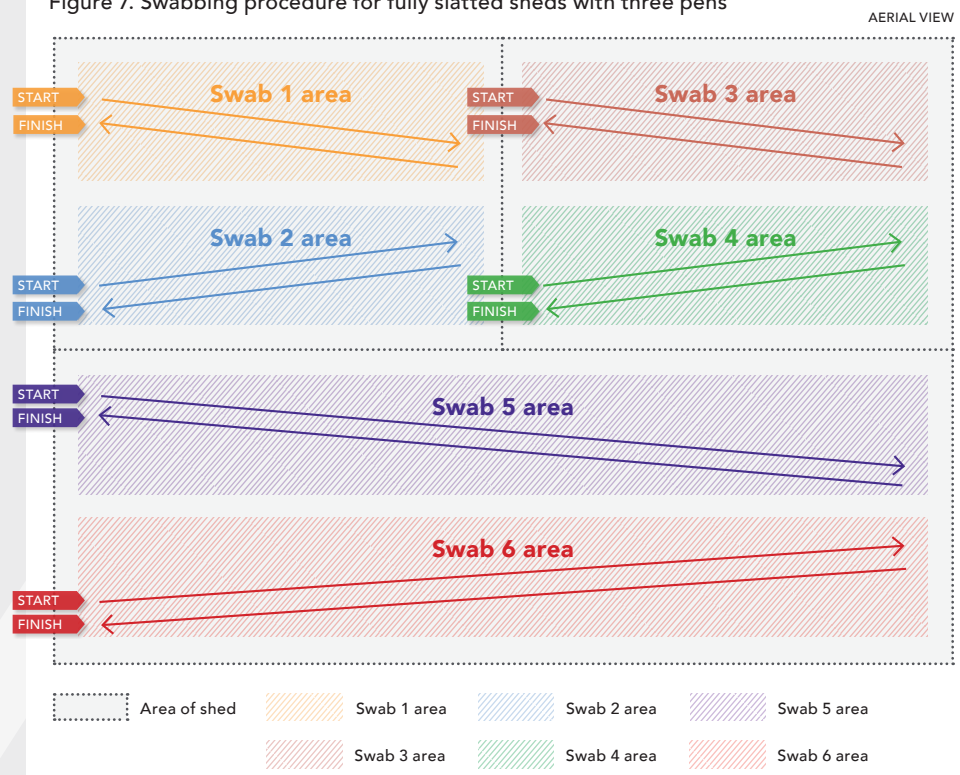


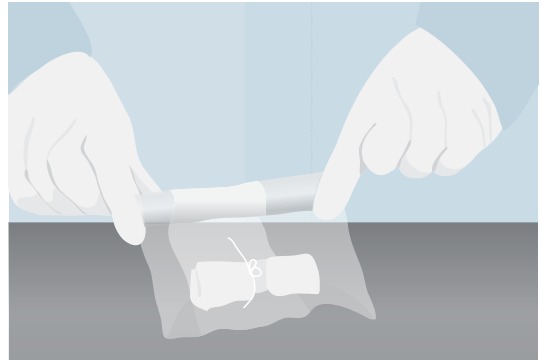
Figure 7. Swabbing procedure for fully slatted sheds with three pens



PROCEDURE

- 6 **Swab 1** should be considered finished when the swab is back to where it started from (Figure 6).
- 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 8).

Figure 8. Put swab into Whirl-Pak® bag (Romer Labs)

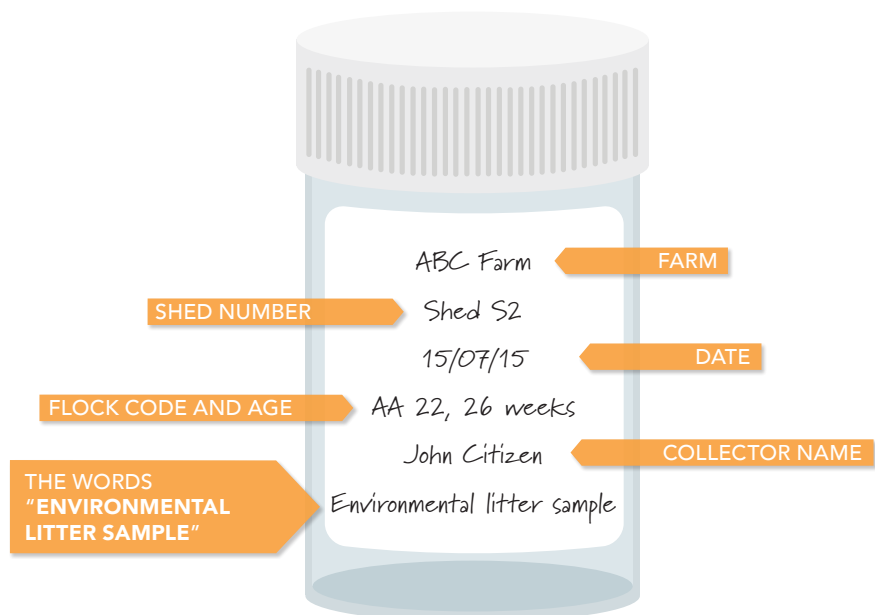


- 9 Seal the bag or plastic jar.
- 10 **Repeat procedure 3 to 9 with Swab 2, Swab 3**, using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

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 9A) securely into a plastic container (Figure 9B) and put the container into a plastic post satchel (Figure 9C).

Figure 9. Pack swab samples



9B

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

9C

<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

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

Romer Labs - SurfACE™ Sampling Solutions in Primary Production



Salmonella sampling for a combined deep litter and slatted shed using drag swabs

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in a combined deep litter and slatted shed

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 **one (1) swab** for each **litter** area and one (1) swab for each **slatted** area (see Example 1.)

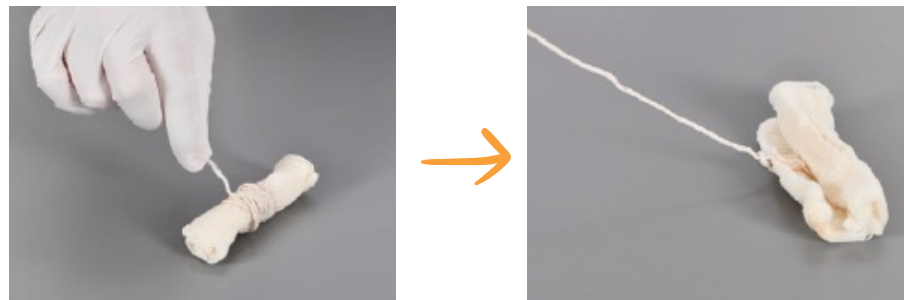
Example 1. Number of swabs required based on number of pens/ partitions

Number of litter areas	Number of slatted areas	Number of swabs required
1	1	2
1	2	3
2	1	3
2	2	4

Step 2 Swab the shed

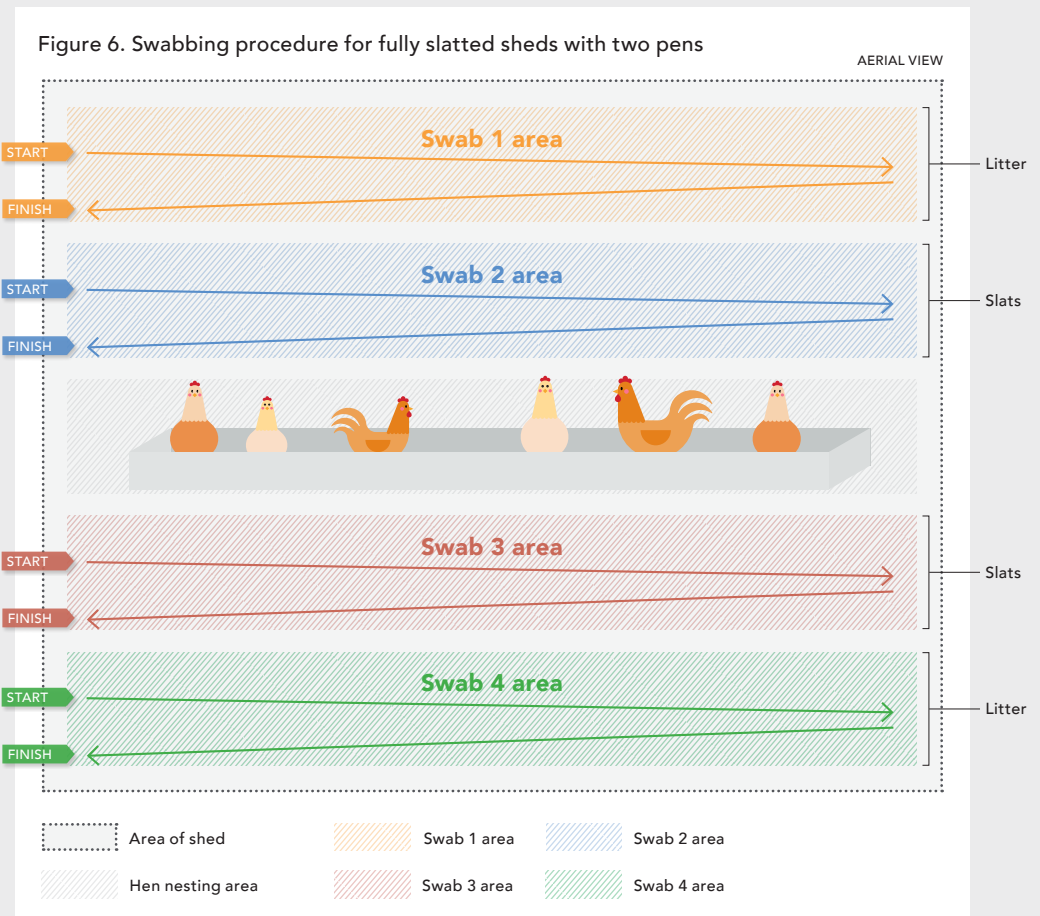
- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Moisten **Swab 1** with water from the drinkers or solution provided by the laboratory.
- 4 Hold **Swab 1** by the string and unravel (Figure 5).

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



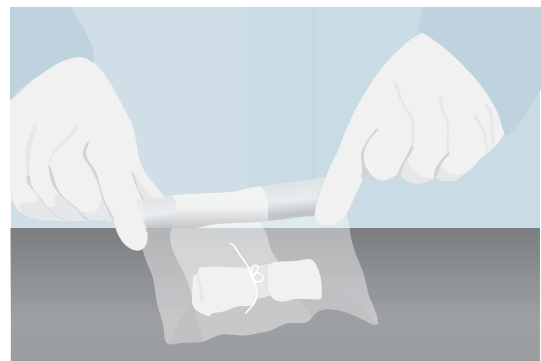
PROCEDURE

- 5 Drag **Swab 1** twice the full length of one **litter** area in the pattern described in Figure 6 (yellow and green arrows).



- 6 **Swab 1** should be considered finished when the swab has returned to the side 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).

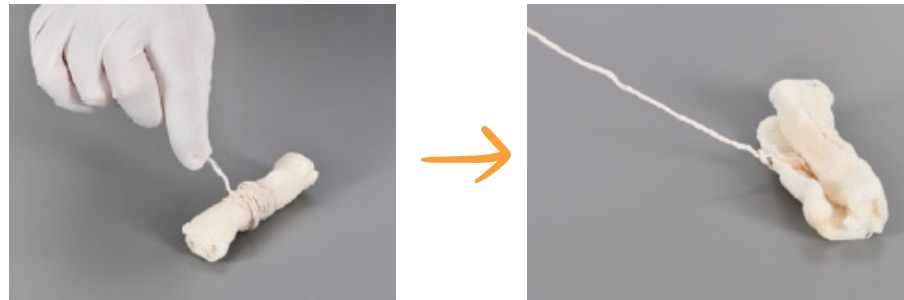
Figure 7. Put swab into Whirl-Pak® bag (Romer Labs)



PROCEDURE

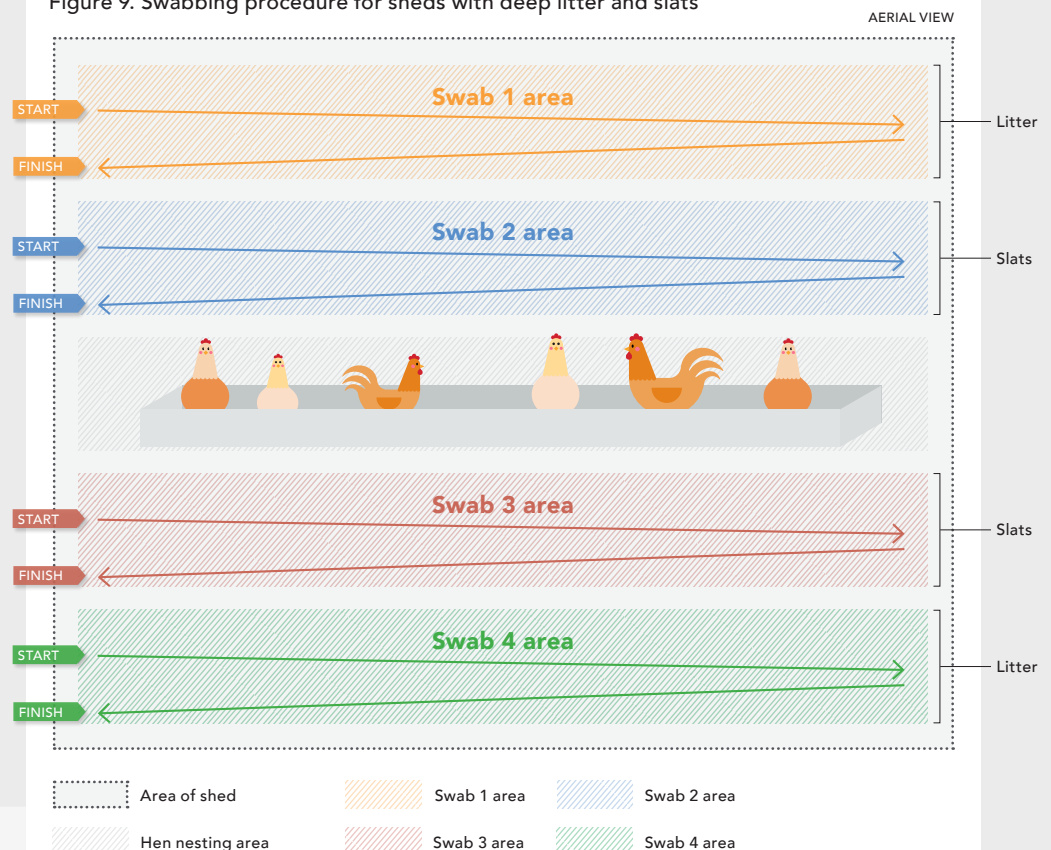
- 9 Seal the bag or plastic jar.
- 10 Moisten **Swab 2** with water from the drinkers or solution provided by the laboratory.
- 11 Hold **Swab 2** by the string and unravel the entire piece of string (Figure 8).

Figure 8. Hold the swab by the string and unravel (Romer Labs)



- 12 Drag **Swab 2** twice the full length of **one slatted area** in the pattern described in Figure 9 (blue and brown arrows).

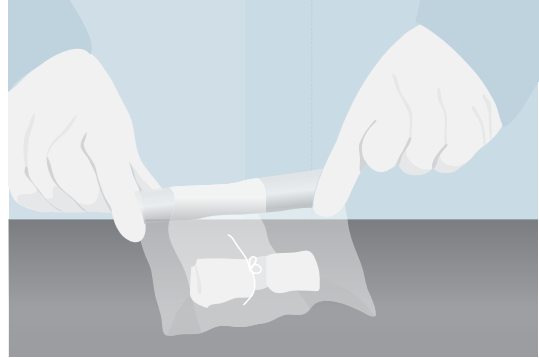
Figure 9. Swabbing procedure for sheds with deep litter and slats



PROCEDURE

- 13 **Swab 2** should be considered finished when the swab has swabbed 'up and back' and returned to the side of the shed it started from.
- 14 The string should not be included in the sample sent to the laboratory, cut the string from **Swab 2** with a pair of scissors.
- 15 Place **Swab 2** in a Whirl-Pak® bag or screw top plastic jar (Figure 10).

Figure 10. Put swab into Whirl-Pak® bag (Romer Labs)



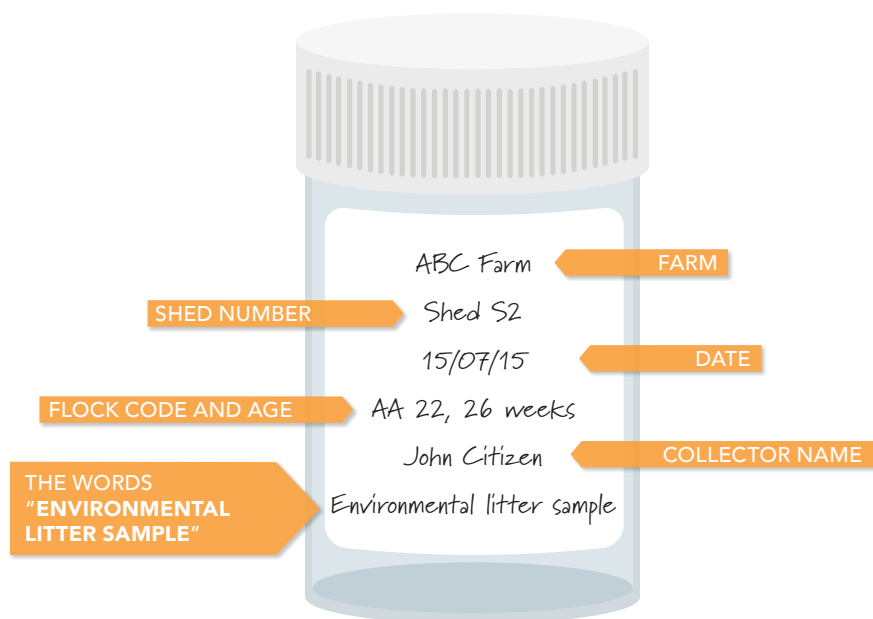
- 16 Seal the bag or plastic jar.
- 17 Repeat procedure 3–9 for **Swab 3** on any other **slatted** areas.
- 18 Repeat procedure 10–16 for **Swab 4** on any other **litter** areas.

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 11A) securely into a plastic container (Figure 11B) and put the container into a plastic post satchel (Figure 11C).

Figure 11. Pack swab samples



11B

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

11C

<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

Salmonella sampling for **conventional multi-tier cages with manure belt using drag swabs**

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in conventional multi-tier cages with a manure belt

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 **two (2) swabs** for each cage row (see Example 1.)

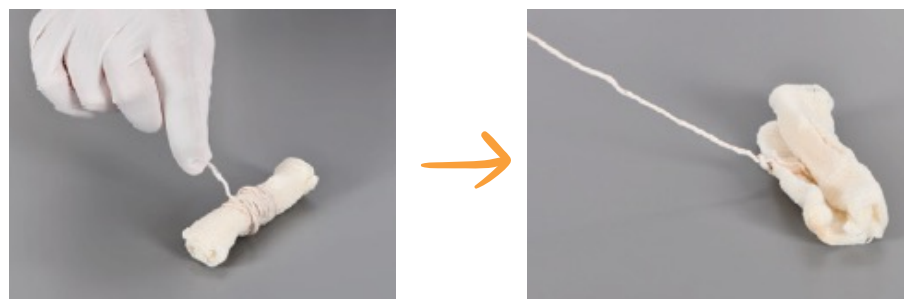
Example 1. Number of swabs required per rows of cages

Number of cage rows	Number of tampons/ swabs required
2	4
3	6
4	8
5	10

Step 2 Swab the shed

- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Moisten swab with water from the drinkers or solution provided by the laboratory.
- 4 Hold swab 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 Tie the swab string over holes where the manure falls from the belts, leaving the swab dangling down (Figure 6- circled in green).

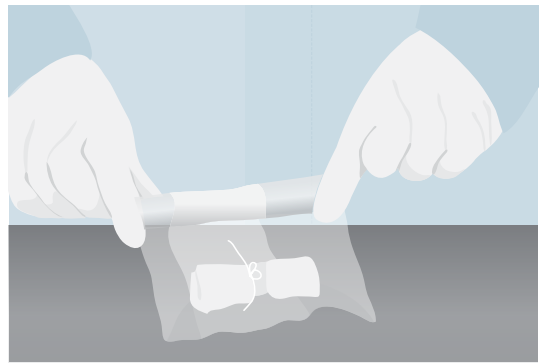
Figure 6. Dangle swabs over the manure belt



PROCEDURE

- 6 **For one row, repeat procedure 3 to 5 with another swab**, so there is a swab dangling on each side (left and right) of the belt. If gloves come into contact with litter or manure they should be changed between swabs.
- 7 Once manure belts are started, manure from the top levels should fall directly onto the swab.
- 8 Let manure belt run one full run then once stopped, retrieve the swabs.
- 9 The string should not be included in the sample sent to the laboratory, cut the string from swabs with a pair of scissors.
- 10 Place the **two (2) swabs** from each row of cages in one (1) Whirl-Pak® bag or screw top plastic jar (Figure 7).

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



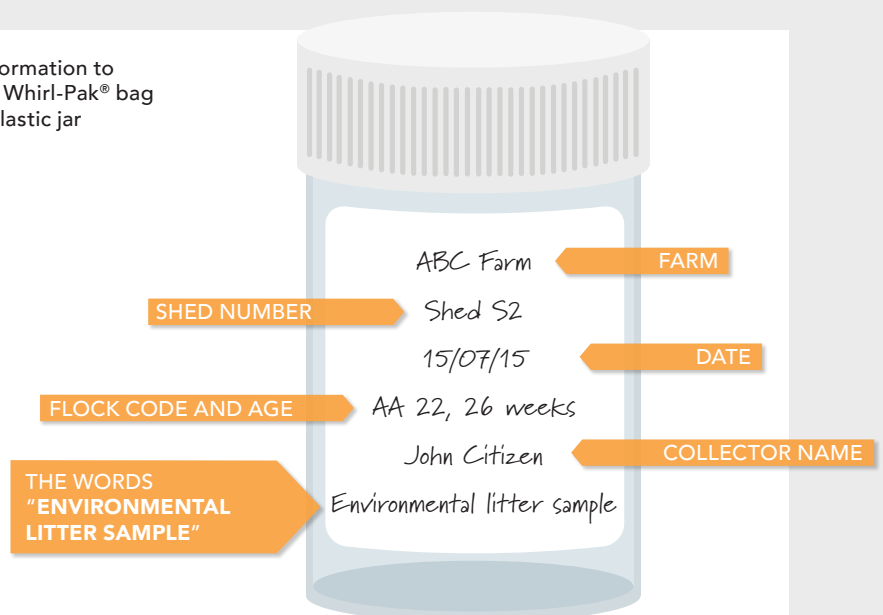
- 11 Seal the bag or plastic jar.
- 12 **Repeat procedure 3 to 11** for the remaining rows of cages.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Salmonella sampling for **conventional multi-tier cages with manure pit using drag swab**

Purpose/Scope: This SOP defines the methodology for *Salmonella* sampling in conventional multi-tier cages with a manure pit

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

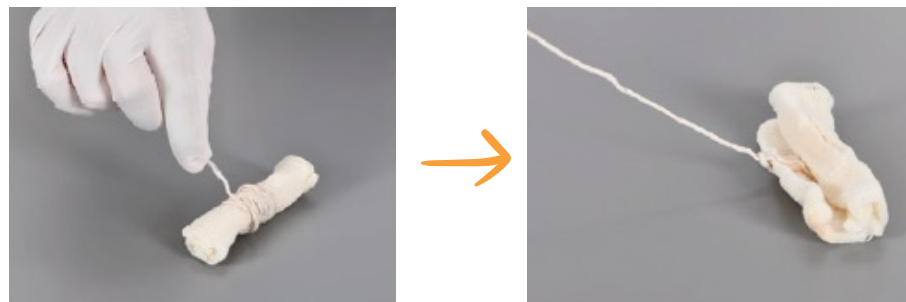
- 1 Notify the laboratory 24 hours in advance of sending the swab samples.
- 2 Obtain a sample submission form from the laboratory.
- 3 Prepare **three (3) drag swabs** for each manure pit.

Step 2

Swab the shed

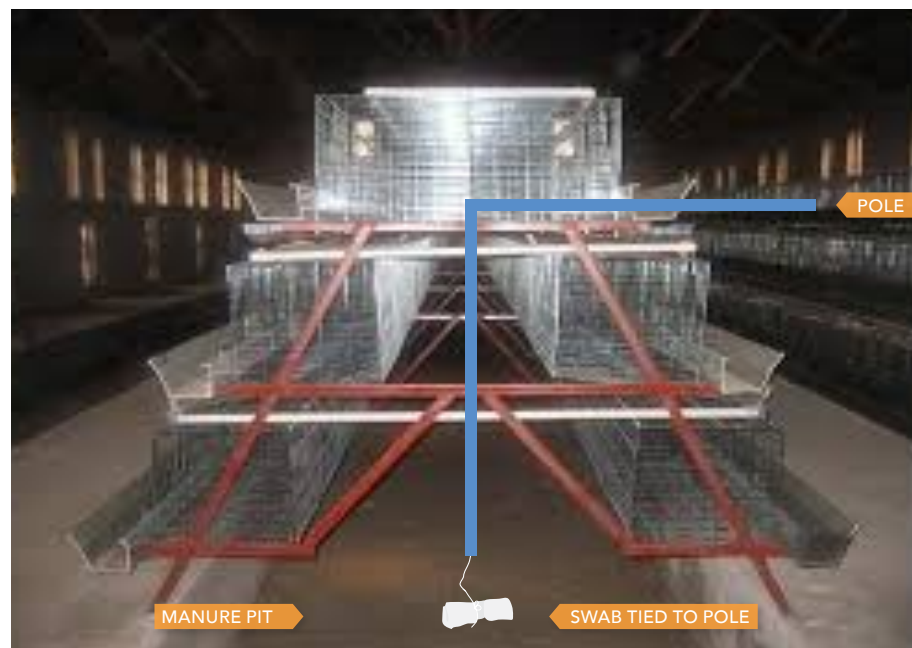
- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Moisten **Swab 1** with water from the drinkers or solution provided by the laboratory.
- 4 Hold **Swab 1** by the string and unravel (Figure 5).

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



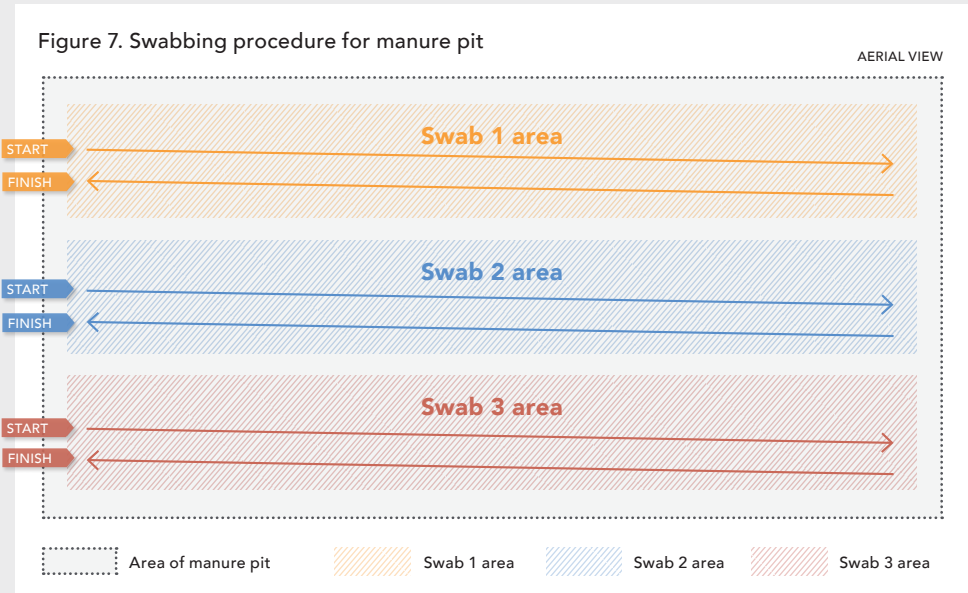
- 5 Attach moistened swab by the string to a pole (Figure 6).

Figure 6. Attach swab to a pole



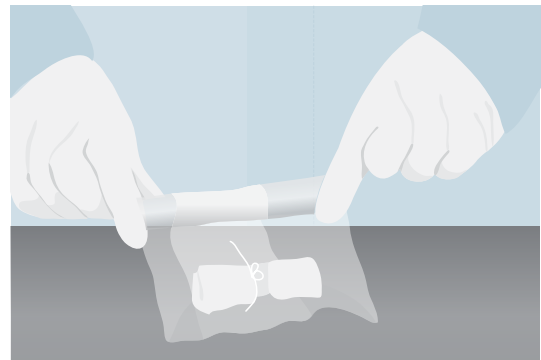
PROCEDURE

- 6 Walk between the cages for the full length of the shed, dragging the swab over the top of the manure piles in the manner shown in Figure 7 by the arrow 'Swab 1'.



- 7 With **Swab 1** repeat in the opposite direction as depicted in Figure 7.
- 8 **Swab 1** should be considered finished when it has been run 'up and back' the entire length of the manure pit.
- 9 The string should not be included in the sample sent to the laboratory, cut the string from **Swab 1** with a pair of scissors.
- 10 Place **Swab 1** in a Whirl-Pak® bag or screw top plastic jar (Figure 8).

Figure 8. Put swab into Whirl-Pak® bag (Romer Labs)



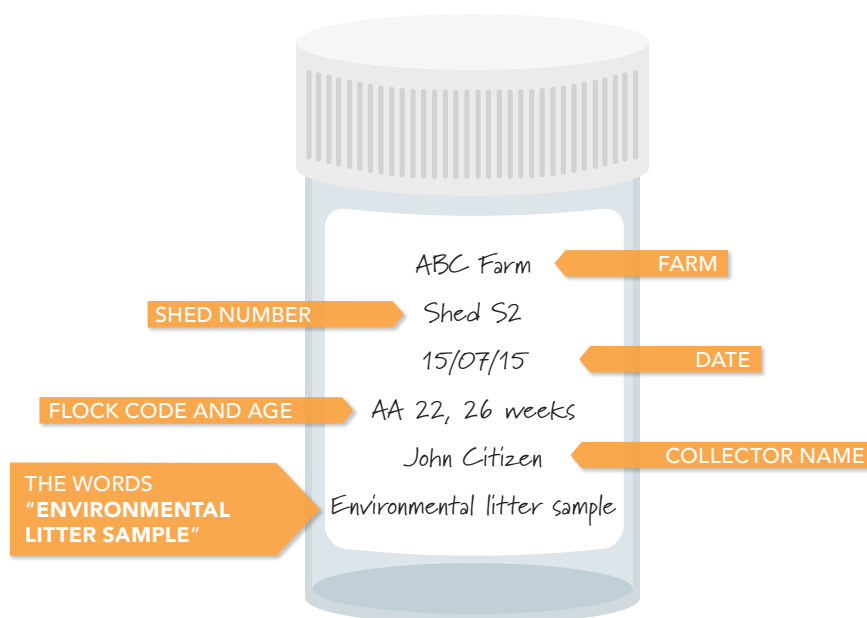
- 11 Seal the bag or plastic jar.
- 12 Repeat procedure 3 to 11 with **Swab 2**, **Swab 3**, etc using one Whirl-Pak® bag or plastic jar per swab. If gloves come into contact with litter or manure they should be changed between swabs.

PROCEDURE

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 9A) securely into a plastic container (Figure 9B) and put the container into a plastic post satchel (Figure 9C).

Figure 9. Pack swab samples



9B

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

9C

<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

Salmonella sampling for **single or multi-level slatted shed with no pens or partitions using boot swabs**

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in a fully slatted single or multi-level shed with no pens or partitions

FREQUENCY
Every 12 to 15 weeks



MATERIALS NEEDED

- Boot Swab Kit (pre-moistened cotton-poly blend fabric sock style boot)* (Figure 1)
- Plastic Boot Cover* (Figure 1)
- 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 1. 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 the number of boot swabs required (see Table 1).

Table 1. Number of swabs required for different sheds

Type of shed	Number pairs of boot swabs
Single level shed without pens or partitions	2
Multi-level shed without pens or partitions	1 for each level

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 2).
- 4 Slip on the other disposable plastic boot cover over the other shoe or boot (Figure 2).

Figure 2. Slip 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 3).

Figure 3. Put boot swabs over plastic boot cover (Romer Labs)



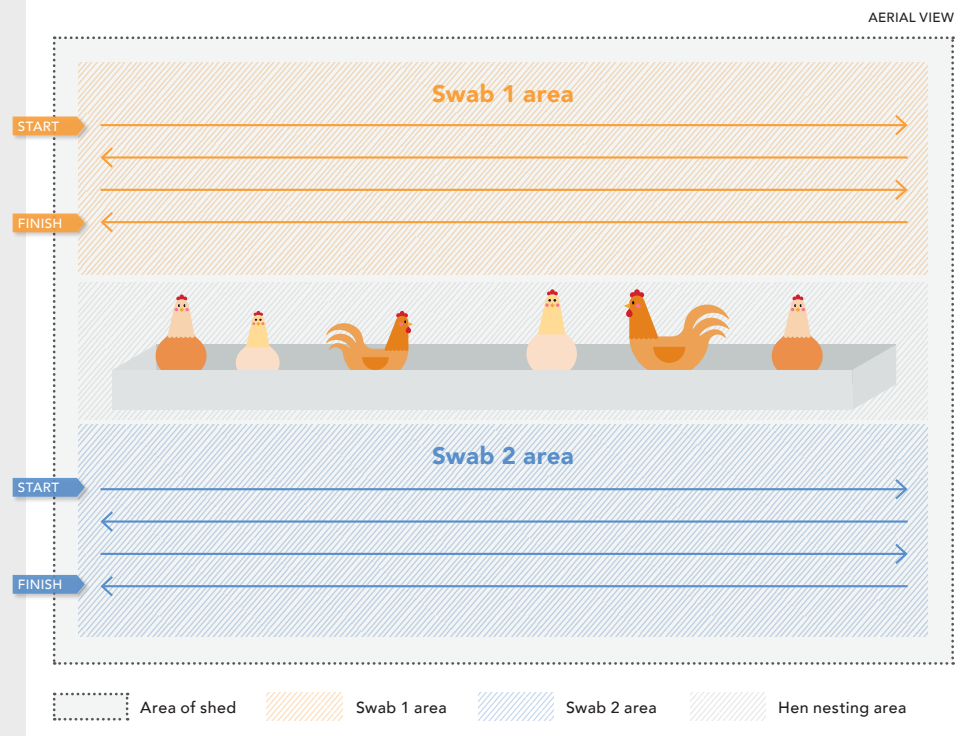
- 6 Walk the full length of the shed twice in each direction, in the pattern depicted in Figure 5.

Figure 4. Walk through the shed with boot swabs



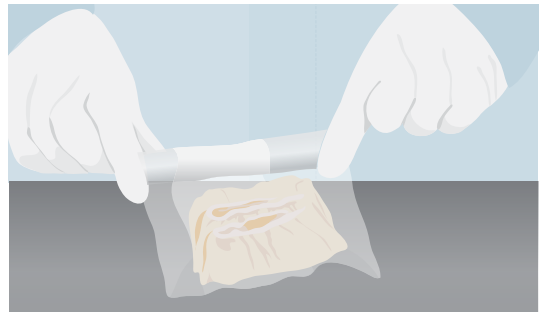
PROCEDURE

Figure 5. Swabbing procedure for single level slatted shed without pens or partitions



- 7 **If safe to do so**, access underneath the feeders and drinkers.
- 8 Immediately after the sample collection carefully remove the boot swabs and return it to its original Twirl-tie bag (Figure 6).

Figure 6. Remove boot swabs and put it into the original bag



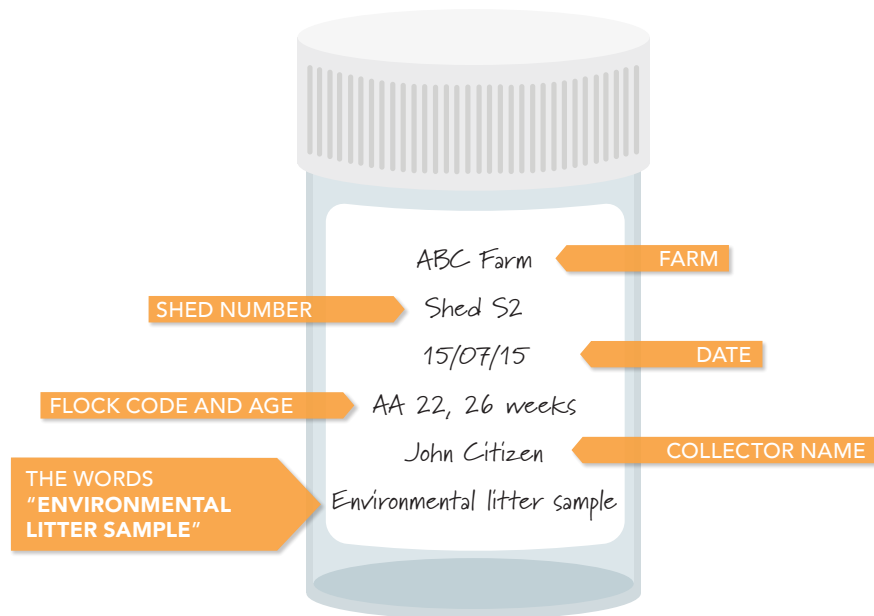
- 9 Seal the Twirl-tie bag.
- 10 **Repeat procedure 3 to 9 with Swab 2.** If gloves come into contact with litter or manure they should be changed between swabs.

PROCEDURE

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 7A) securely into a plastic container (Figure 7B) and put the container into a plastic post satchel (Figure 7C).

Figure 7. Pack swab samples



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



<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

Romer Labs - SurfACE™ Sampling Solutions in Primary Production

Salmonella sampling for **slatted shed with pens or partitions using boot swabs**

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in a fully slatted single or multi-level shed with no pens or partitions

FREQUENCY
Every 12 to 15 weeks



MATERIALS NEEDED

- Boot Swab Kit (pre-moistened cotton-poly blend fabric sock style boot)*
- Plastic Boot Cover* (Figure 1)
- 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 1. 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 Obtain the number of boot swabs required (see Table 1).

Table 1. Number of swabs required

Number of pens or partitions	Number pairs of boot swabs
2	2
3	3
4	4
5	5

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 2).
- 4 Slip on the other disposable plastic boot cover over the other shoe or boot (Figure 2).

Figure 2. Slip 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 3).

Figure 3. Put boot swabs over plastic boot cover (Romer Labs)



- 6 Walk the full length of the pen or partition in the pattern described in Figure 5 (2 pens/ partition) or Figure 6 (3 pens/ partition) with Pair 1 boot swab.

Figure 4. Walk through the shed with boot swabs



PROCEDURE

Figure 5. Swabbing procedure for fully slatted sheds with two pens

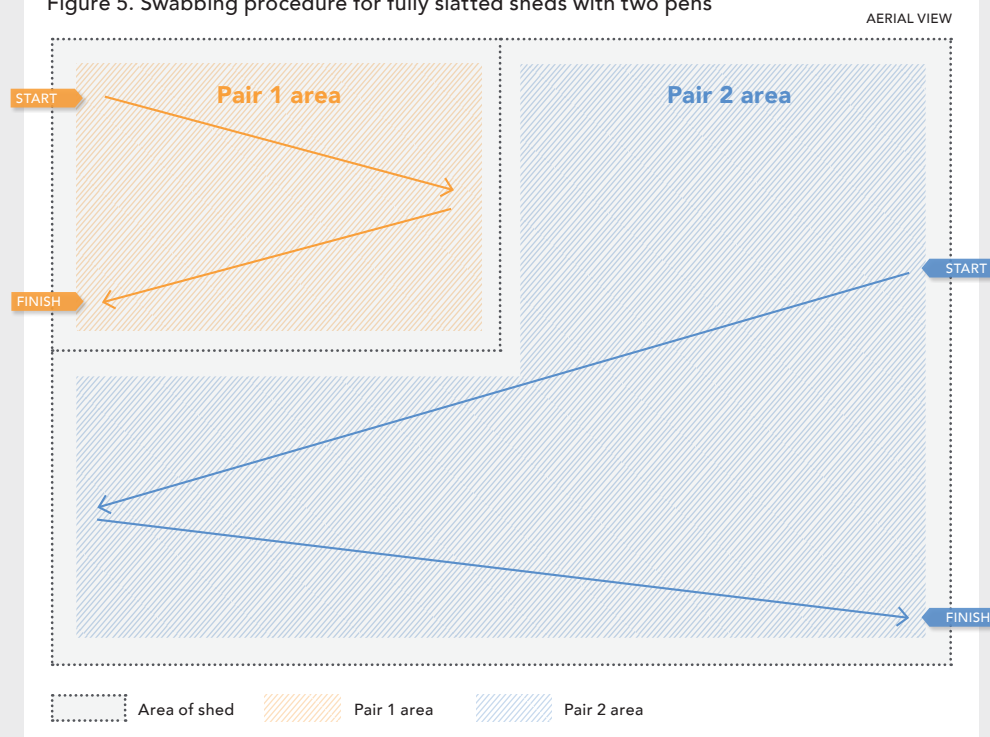
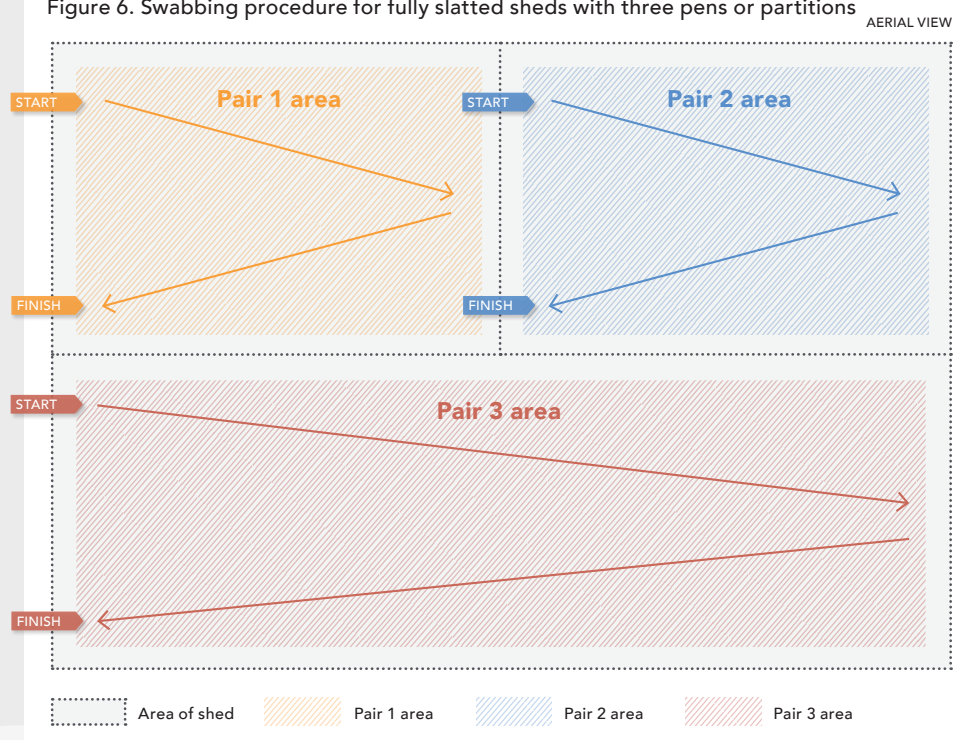


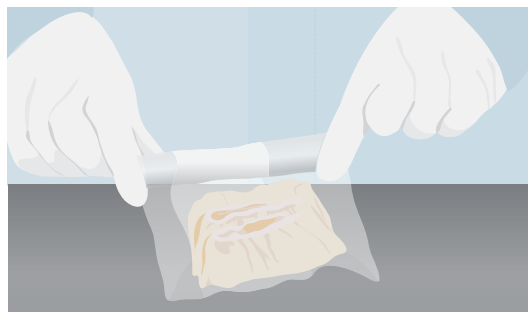
Figure 6. Swabbing procedure for fully slatted sheds with three pens or partitions



PROCEDURE

- 7 **If safe to do so**, access underneath the feeders and drinkers.
- 8 Immediately after the sample collection carefully remove the boot swabs and return it to its original Twirl-tie bag (Figure 7).

Figure 7. Remove boot swabs and put it into its original bag

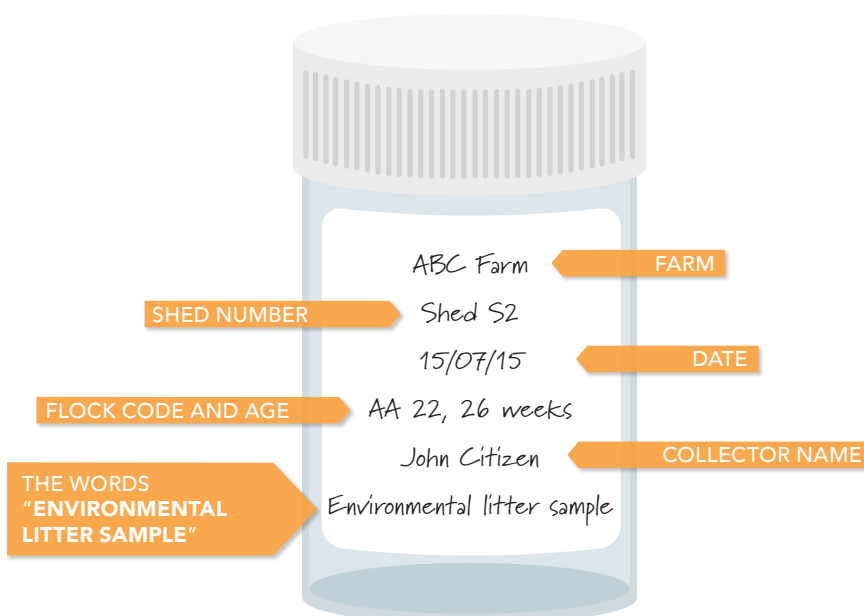


- 9 Seal the Twirl-tie bag.
- 10 **Repeat procedure 3 to 9 with Pair 2 and Pair 3** of boot swabs. If gloves come into contact with litter or manure they should be changed between swabs.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Romer Labs - SurfACE™ Sampling Solutions in Primary Production

Salmonella sampling for **single or multi-level deep litter sheds with no pens or partitions using boot swabs**

Purpose/Scope: This SOP provides a method for conducting *Salmonella* sampling in a fully deep litter single or multi-level shed with no pens or partitions

FREQUENCY
Every 12 to 15 weeks



MATERIALS NEEDED

- Boot Swab Kit (pre-moistened cotton-poly blend fabric sock style boot)* (Figure 1)
- Plastic Boot Cover* (Figure 1)
- 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 1. 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 Obtain the number of boot swabs required (see Table 1).

Table 1. Number of swabs required for different sheds

Type of shed	Number pairs of boot swabs
Single level shed without pens or partitions	2
Multi-level shed without pens or partitions	1 for each level

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 2).
- 4 Slip on the other disposable plastic boot cover over the other shoe or boot (Figure 2).

Figure 2. Slip 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 3).

Figure 3. Put boot swabs over plastic boot cover (Romer Labs)



- 6 Walk the full length of the shed twice, in the pattern described in Figure 5 or Figure 6.

Figure 4. Walk through the shed with boot swabs



PROCEDURE (CONT)

Figure 5. Swabbing procedure for single level deep litter shed without pens or partitions

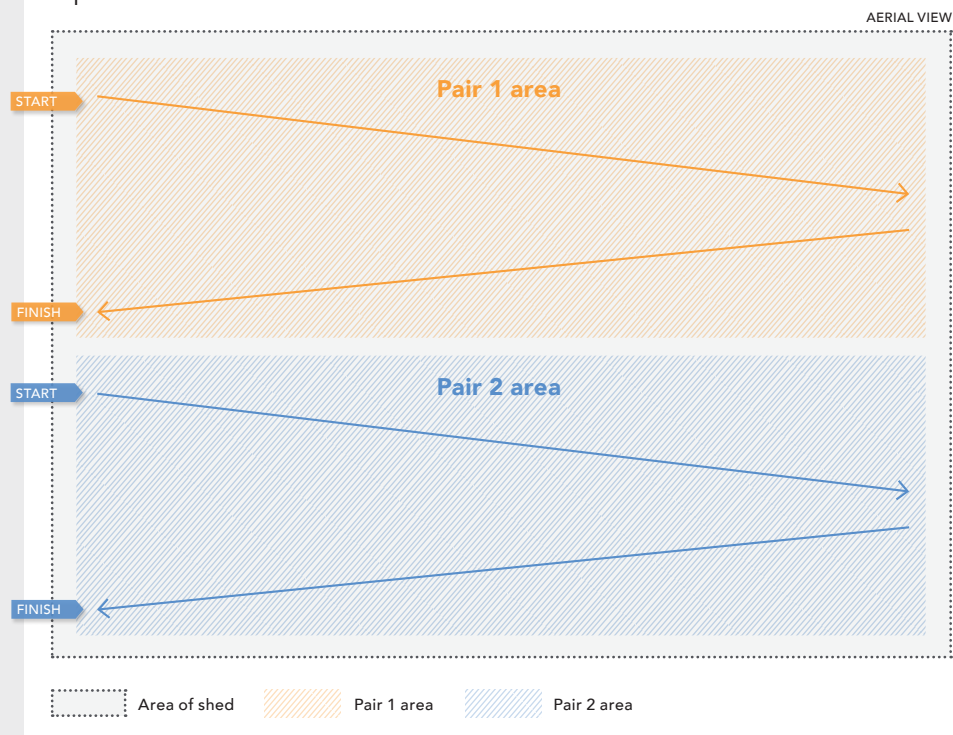
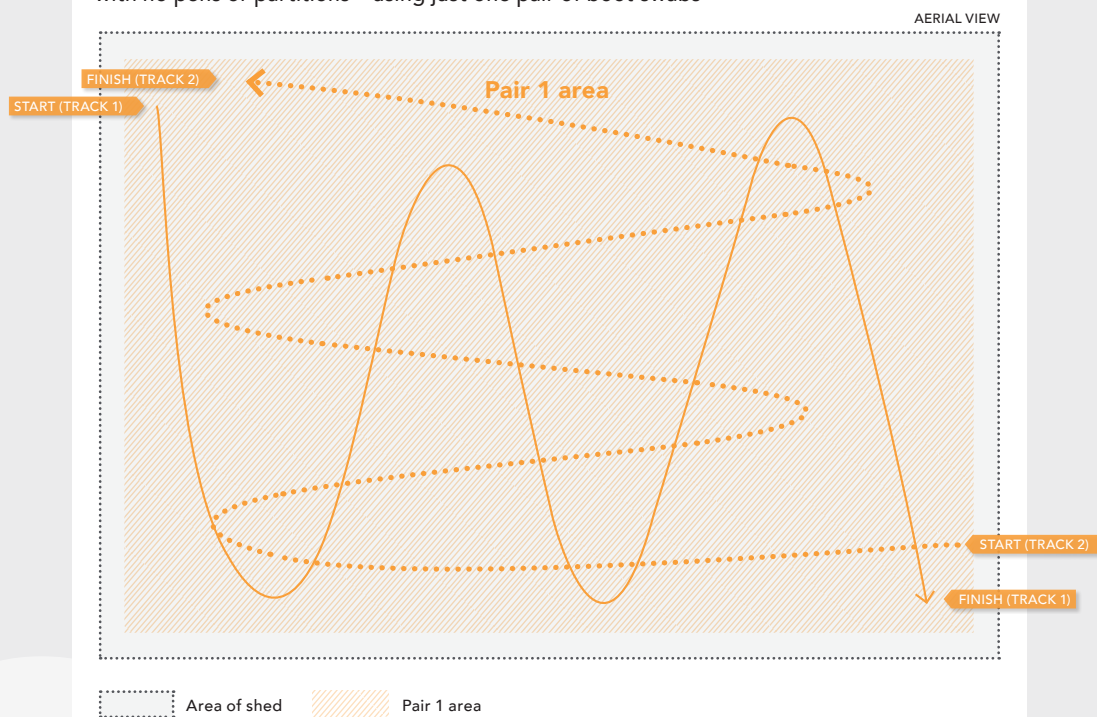


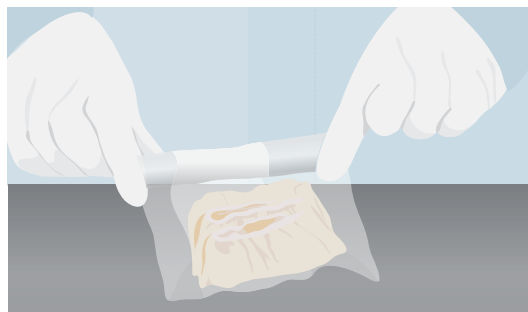
Figure 6. Alternative swabbing procedure for single level deep litter shed with no pens or partitions – using just one pair of boot swabs



PROCEDURE

- 7 **If safe to do so**, access underneath the feeders and drinkers.
- 8 Immediately after the sample collection carefully remove the boot swabs and return it to its original Twirl-tie bag (Figure 7).

Figure 7. Remove boot swabs and put it into the original bag

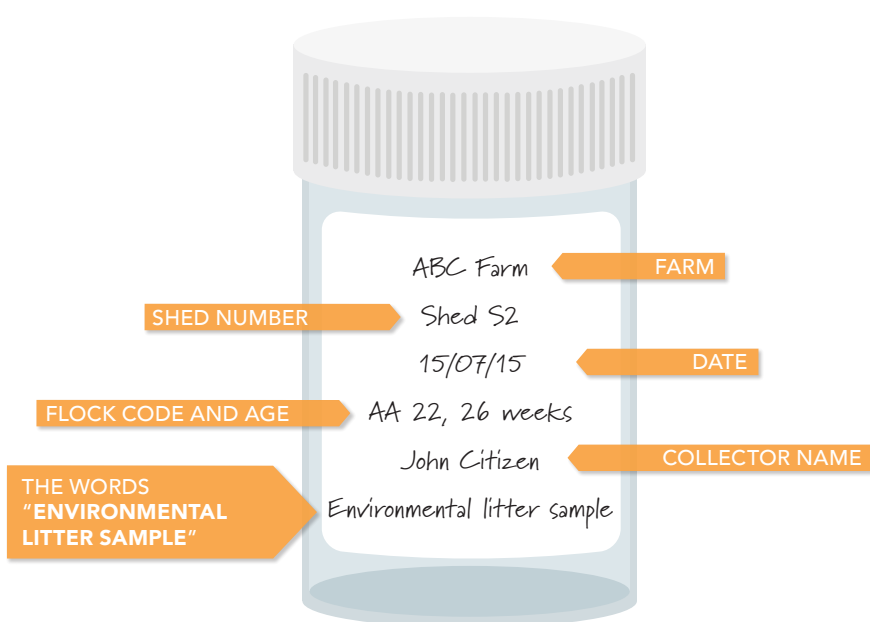


- 9 Seal the Twirl-tie bag.
- 10 **Repeat procedure 3 to 9** as required to complete shed swabbing. If gloves come into contact with litter or manure they should be changed between swabs.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Romer Labs - SurfACE™ Sampling Solutions in Primary Production

Salmonella sampling for **deep litter sheds with pens or partitions using boot swabs**

Purpose/Scope: This SOP provides a method for conducting *Salmonella* sampling in a deep litter shed with pens or partitions

FREQUENCY
Every 12 to 15 weeks



MATERIALS NEEDED

- Boot Swab Kit (pre-moistened cotton-poly blend fabric sock style boot)* (Figure 1)
- Plastic Boot Cover* (Figure 1)
- 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 1. 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 Obtain the number of boot swabs required (see Table 1).

Table 1. Number of swabs required

Number of pens or partitions	Number pairs of boot swabs
2	2
3	3
4	4
5	5

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 2).
- 4 Slip on the other disposable plastic boot cover over the other shoe or boot (Figure 2).

Figure 2. Slip 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 3).

Figure 3. Put boot swabs over plastic boot cover (Romer Labs)



- 6 Walk the full length of the pen or partition in the pattern described in Figure 5 (2 pens/partition) or Figure 6 (3 pens/partition) with Pair 1 of boot swabs.

Figure 4. Walk through the shed with boot swabs



PROCEDURE (CONT)

Figure 5. Swabbing procedure for deep litter sheds with two pens

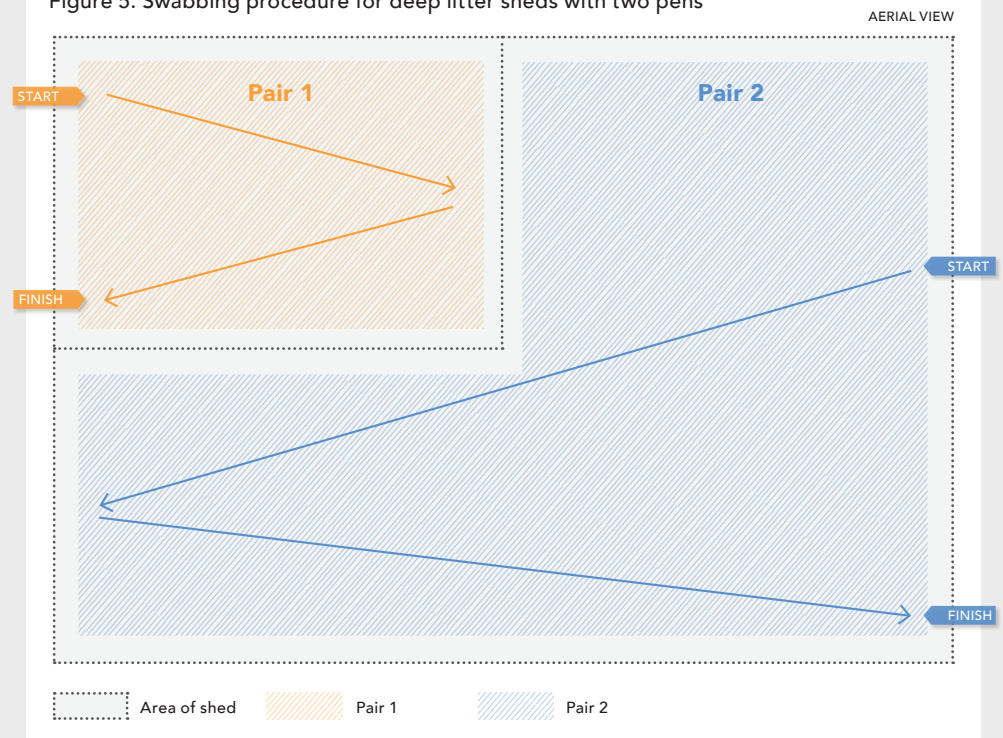
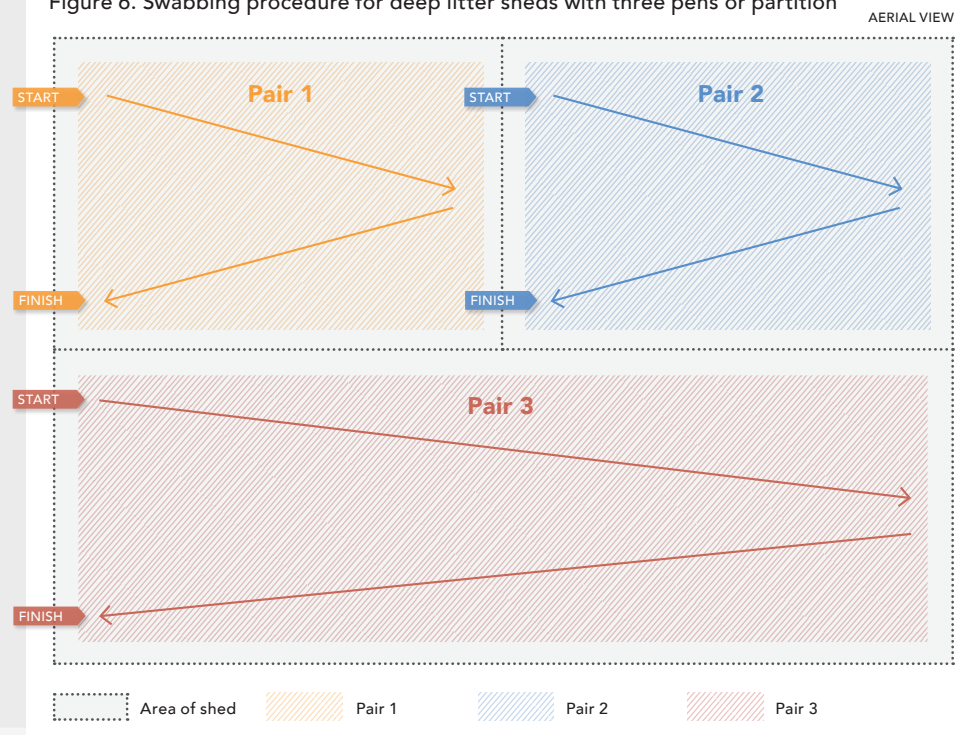


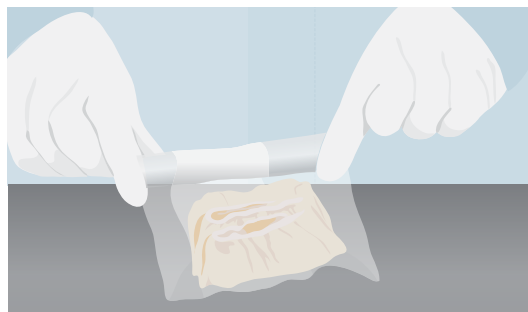
Figure 6. Swabbing procedure for deep litter sheds with three pens or partition



PROCEDURE

- 7 **If safe to do so**, access underneath the feeders and drinkers.
- 8 Immediately after the sample collection carefully remove the boot swabs and return it to its original Twirl-tie bag (Figure 7).

Figure 7. Remove boot swabs and put it into its original bag

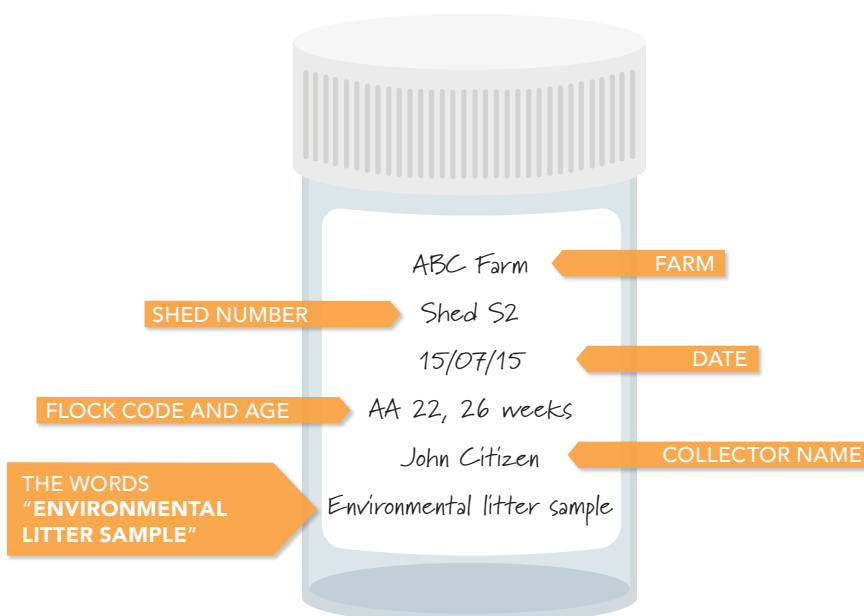


- 9 Seal the Twirl-tie bag.
- 10 **Repeat procedure 3 to 9 with Pair 2 and Pair 3** of boot swabs. If gloves come into contact with litter or manure they should be changed between swabs.

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 8A) securely into a plastic container (Figure 8B) and put the container into a plastic post satchel (Figure 8C).

Figure 8. Pack swab samples



8B

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

8C

<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

Romer Labs - SurfACE™ Sampling Solutions in Primary Production

Salmonella sampling for caravan farms using sponge swabs or sponge sticks

Purpose/Scope: This SOP provides a methodology for conducting *Salmonella* sampling in a mobile or caravan egg farm environment

FREQUENCY
Every 12 to 15 weeks



MATERIALS NEEDED

- 3M sponge swabs or sponge sticks
 - Supplied by laboratory or,
 - Purchased from 3M
- Disposable latex gloves
- Sample transport liquid (peptone water)
- ^Whirl-Pak® bags or screw top plastic jar
- Permanent marker
- Laboratory sample submission form
- Plastic post satchel for transporting swab to laboratory
- Plastic container for swabbed samples

[^] www.whirl-pak.com/whirl-pak-bags-general-information

PROCEDURE

Step 1 Get prepared

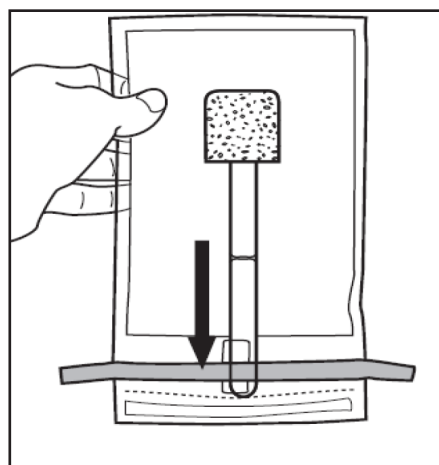
- 1 Notify the laboratory 24 hours in advance of sending the swab samples.
- 2 Obtain a sample submission form from the laboratory.
- 3 Prepare **two (2) swabs** per shed.

Step 2 Swab the shed

Sponge stick method

- 1 Wash your hands.
- 2 Put on a pair of disposable latex gloves.
- 3 Shake stick to end of bag (Figure 1).

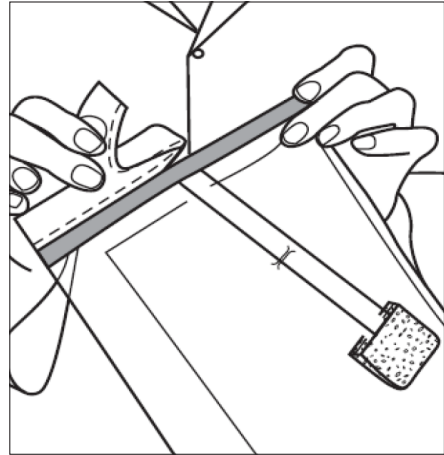
Figure 1. Shake the stick



PROCEDURE

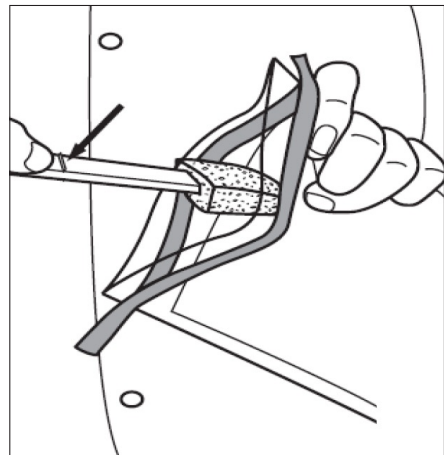
- 4 Tear bag open. Add peptone water to dry sponge, as per directions or so that sponge is moistened (Figure 2).

Figure 2. Tear open the bag



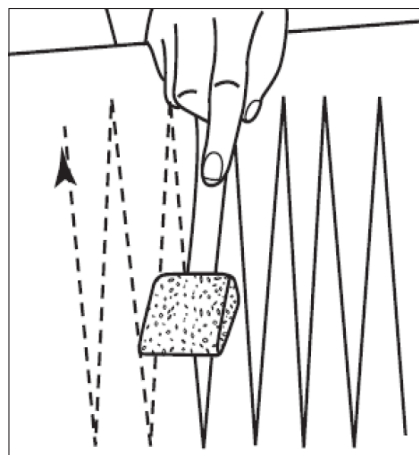
- 5 Squeeze bag to fully open. Grasp the stick above the thumb-stop line to remove the sponge from the bag (Figure 3).

Figure 3. Squeeze to open bag and grab the stick



- 6 Swab all areas that manure collects on in a zig-zag pattern (red arrow) (Figure 4).

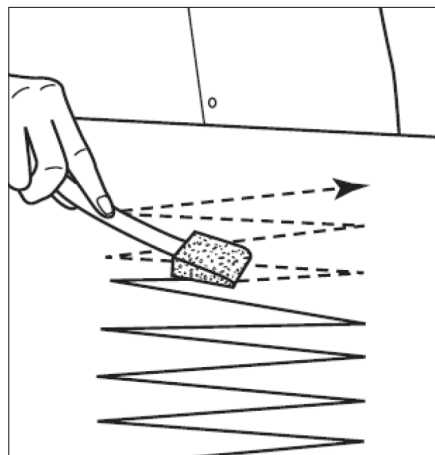
Figure 4. Swab the manure area



PROCEDURE

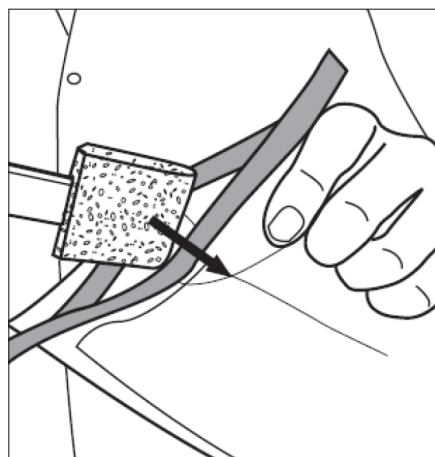
- 7 Turn sponge over and swab the same area in the opposite direction (Figure 5).

Figure 5. Turn over the swab and swab the same area in opposite direction



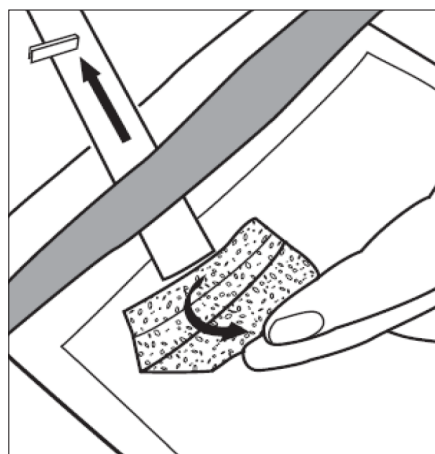
- 8 Carefully place sponge into bag up to the thumb-stop (Figure 6).

Figure 6. Place sponge into bag



- 9 Do not touch the sponge directly with your hands, hold sponge in place inside bag. Bend stick to break. Allow sponge to drop into bag. Discard stick (Figure 7).

Figure 7. Drop sponge into the bag and throw the stick away



PROCEDURE

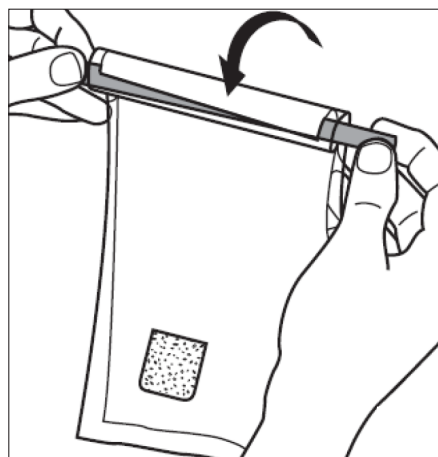
- 10 Dispose of gloves (Figure 8).

Figure 8. Throw gloves away



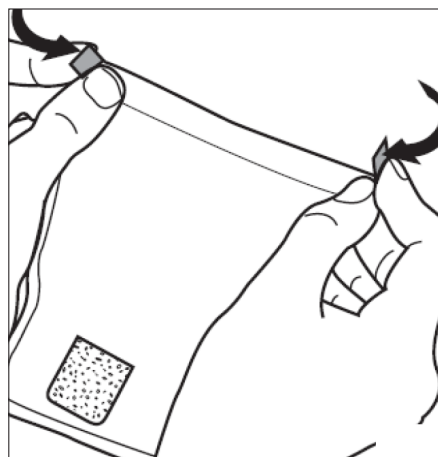
- 11 Fold bag to close (Figure 9).

Figure 9. Fold to close bag



- 12 To seal the bag, fold the ends of the wires inward (Figure 10).

Figure 10. Fold the wires



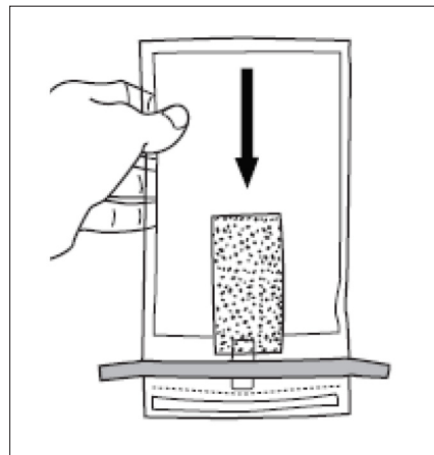
- 13 Swab the other side of the shed with a new swab following procedure 2 to 12.

PROCEDURE

Sponge swab method

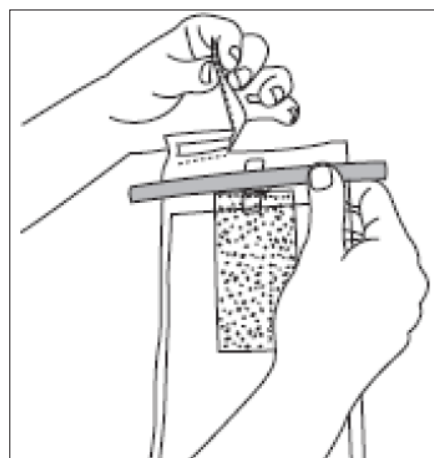
- 1 Wash your hands.
- 2 Shake sponge to the top of the bag (Figure 11).

Figure 11. Shake the bag to move the sponge



- 3 Tear open the bag (Figure 12).

Figure 12. Tear open bag



- 4 Gently push sponge so it pokes out of the top of the bag (Figure 13).

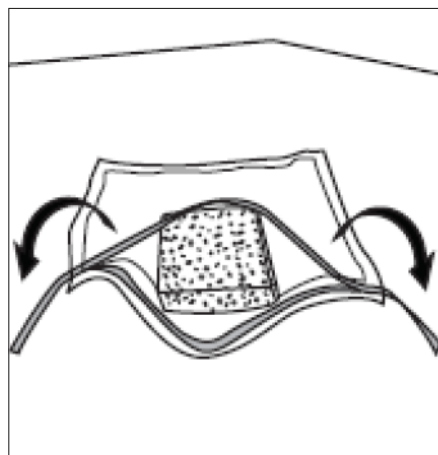
Figure 13. Push sponge out from bag



PROCEDURE

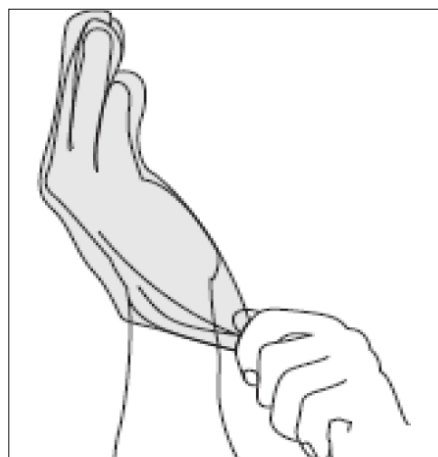
- 5 Bend the wires to fully open the bag (Figure 14).

Figure 14. Bend the wires to open bag



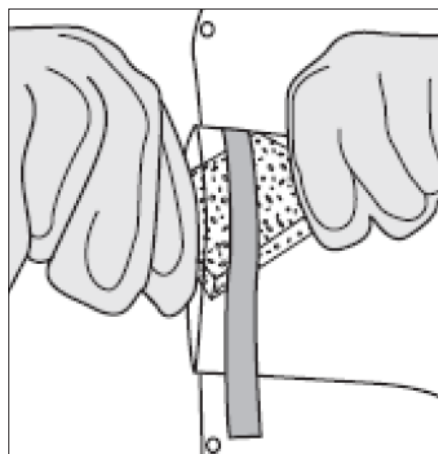
- 6 Put on disposable gloves, carefully to avoid tearing (Figure 15).

Figure 15. Put on gloves



- 7 Carefully remove sponge. Do not touch the inside of the bag (Figure 16).

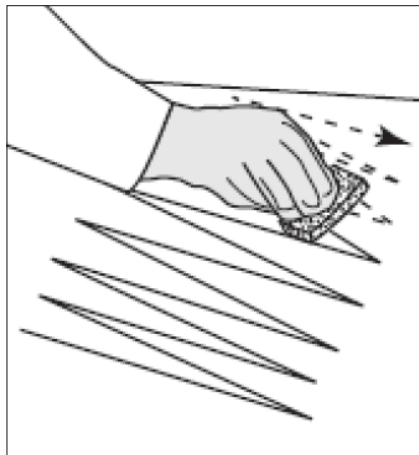
Figure 16. Remove sponge from bag



PROCEDURE

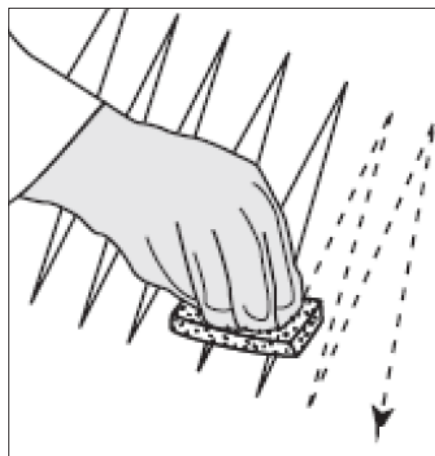
- 8 Swab all areas that manure collects on in a zig-zag pattern (red arrow) (Figure 17).

Figure 17. Swab the manure area



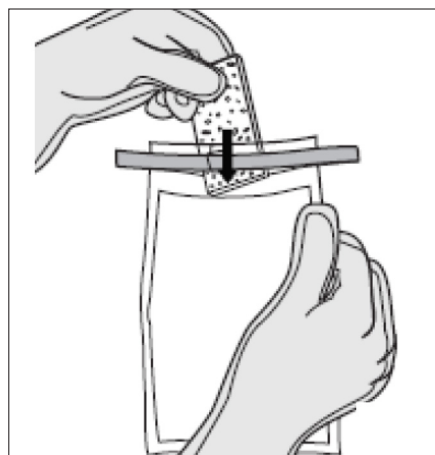
- 9 Turn sponge over and swab the same sampled surface in the opposite direction (Figure 18).

Figure 18. Turn over the swab and swab the same area in opposite direction



- 10 With gloves still on return the sponge to the bag carefully (Figure 19).

Figure 19. Put sponge back into bag



PROCEDURE

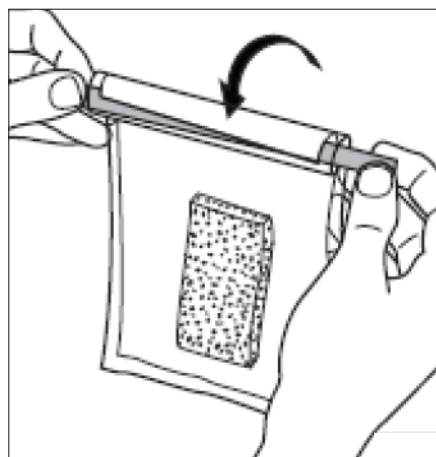
- 11 Remove and dispose of gloves (Figure 20).

Figure 20. Throw gloves away



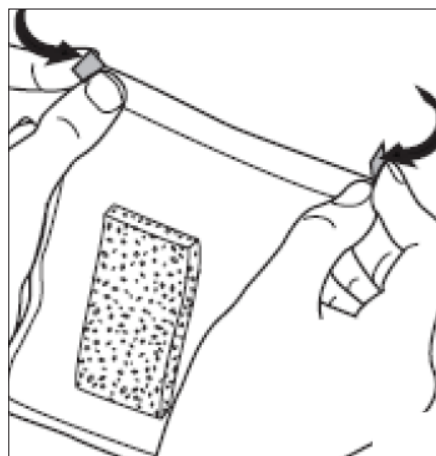
- 12 Fold bag to close (Figure 21).

Figure 21. Fold to close bag



- 13 To seal the bag, fold the wires inwards (Figure 22).

Figure 22. Fold the wires



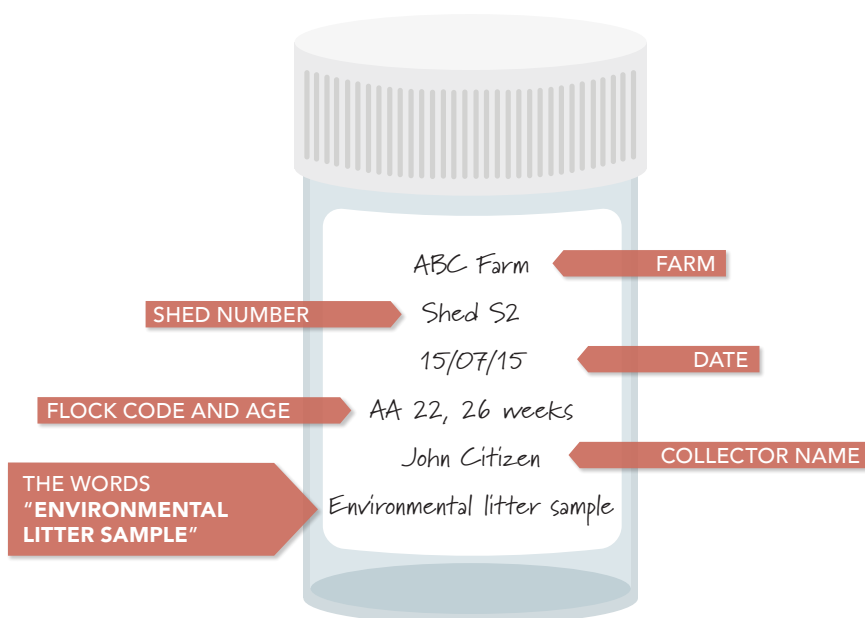
PROCEDURE

Step 3

Packaging 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



Step 4

Submit the samples

- 1 Pack the swabs that are in the bags (Figure 23A) securely into a plastic container (Figure 23B) and put the container into a plastic post satchel (Figure 23C).

Figure 23 (23A, B, C). Pack swab samples



23B

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

23C

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

PROCEDURE

- 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

3M Hydrated Sponge Product Instructions, Issue Date 2012-10

3M Sponge Stick Product Instructions, Issue Date 2013-03

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.

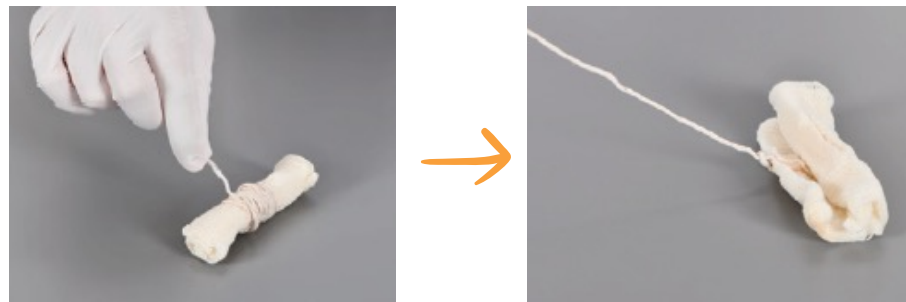
Step 2

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).

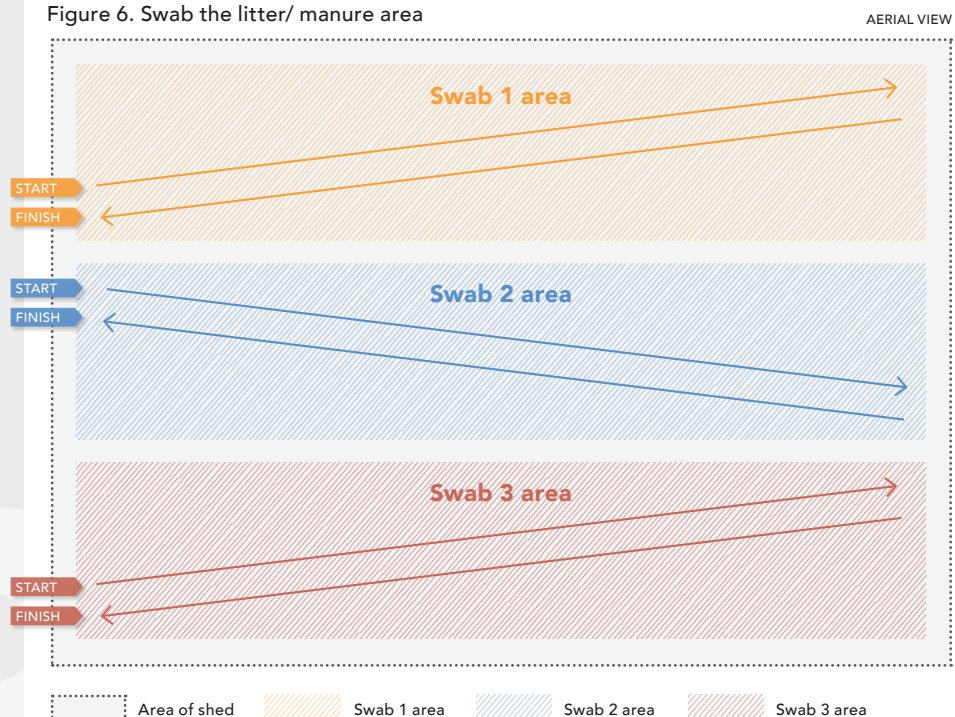
Figure 5. Hold the swab by the string and unravel (Romer Labs)



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



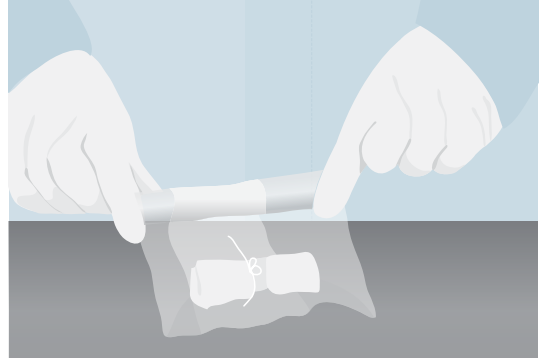
Figure 6. Swab the litter/ manure area



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

AERIAL VIEW

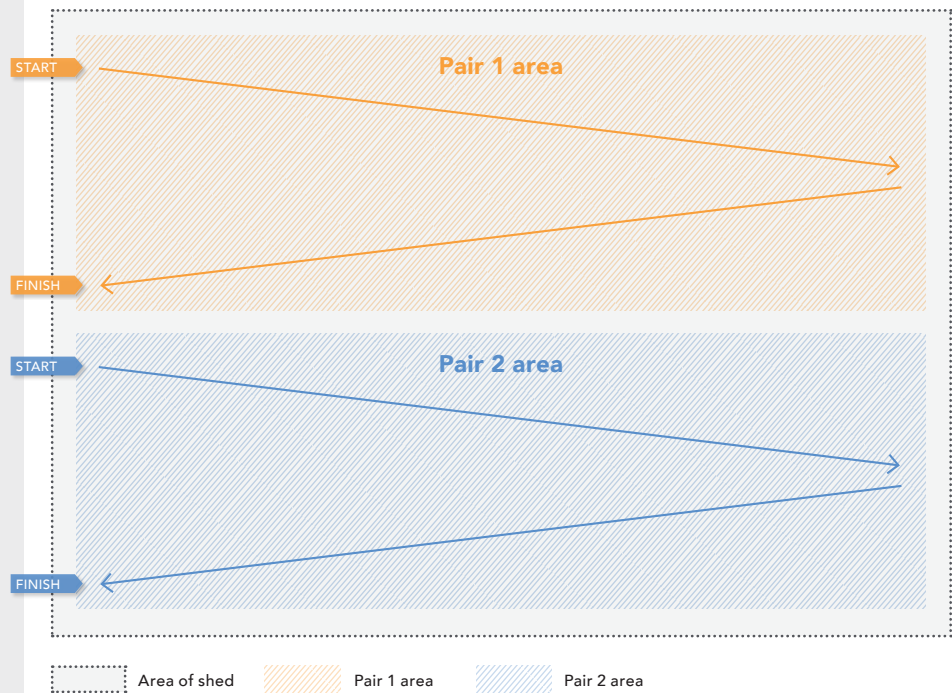
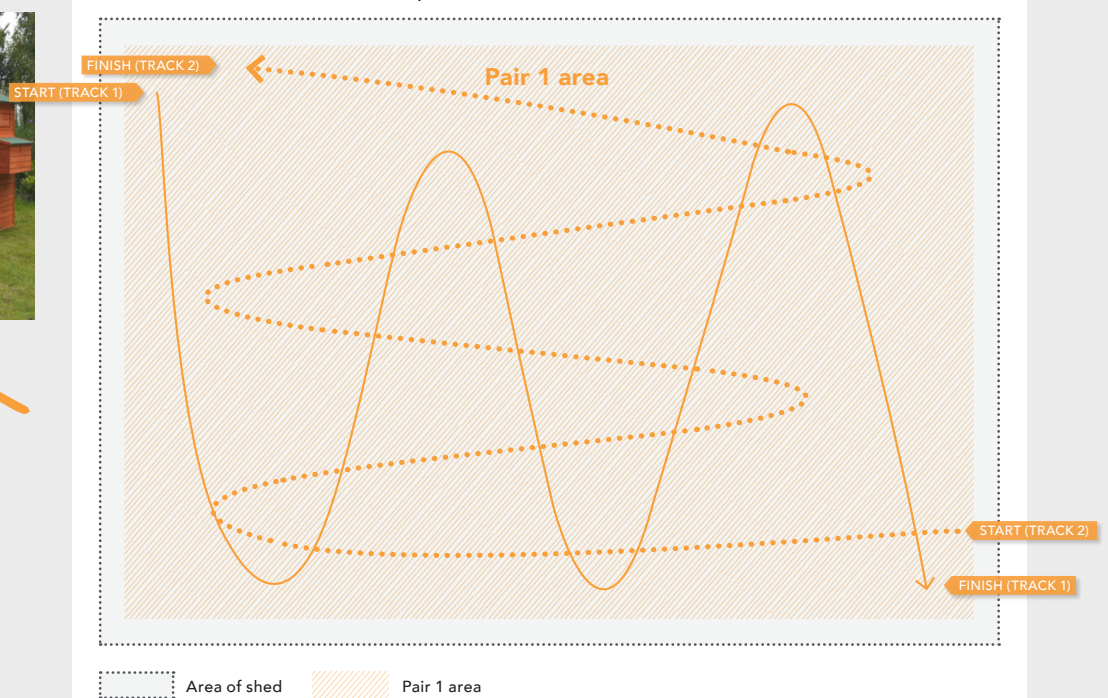


Figure 13. Alternative swabbing procedure for litter/ manure area

AERIAL VIEW

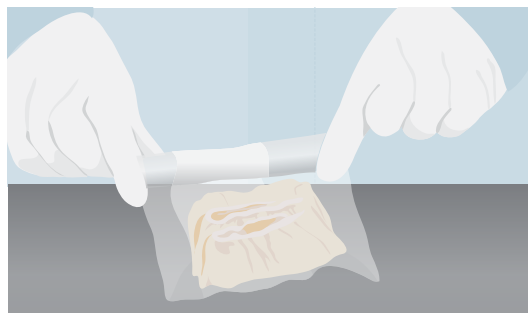


- 7** If safe to do so, access underneath the feeders and drinkers.

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

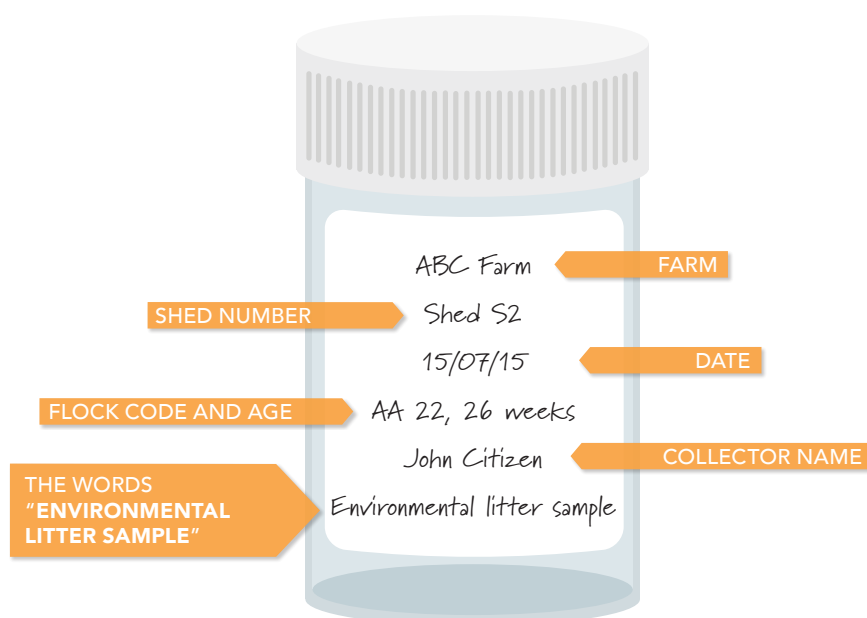


- 9 Seal the Twirl-tie bag.
- 10 If using the method shown in **Figure 12**, repeat procedure 2 to 9. If using the method depicted in **Figure 13** there is no need for a second swabbing.

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)

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