

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 gauze 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.)

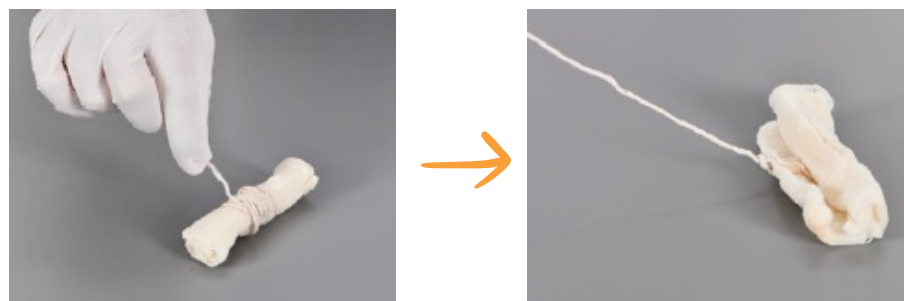
Example 1. Number of swabs required per rows of cages

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).

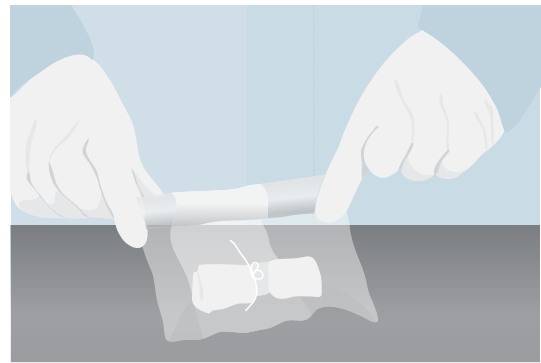
Figure 6. Dangle swabs over the manure belt



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)



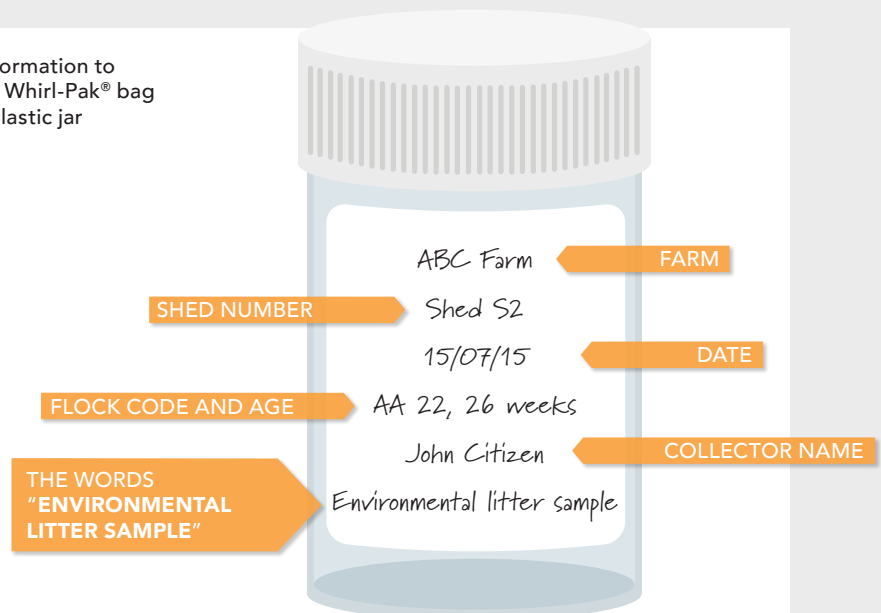
- 11 Seal the bag or plastic jar.
- 12 Repeat procedure 3 to 11 for the remaining rows of cages.

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)

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