

Water sampling for microbiology (Farm assurance requirement)

Standard Operating Procedure (SOP)



Figure 1. Borehole sampling point

Read the entire SOP thoroughly before commencing any water sampling.

Good-quality, hygienic water is a key component of pig health, welfare and productivity. Sampling non-mains water at point of entry (Figure 1) to determine bacterial contamination may also be a farm assurance scheme requirement (eg Red Tractor Assurance).

You may also wish to test for mineral content and other aspects (eg temperature) to assess water quality and quantity of a new supply, such as a borehole, or as part of problem-solving activity to investigate issues, such as poor water intake or pipes and filters getting blocked. In this case, refer to the more in-depth standard operating procedure (SOP), which is available on the AHDB Pork website.

It is recommended that three samples are taken at each point, as variation is common when testing for bacterial organisms; this will enable a mean to be established and reduces the risk of an abnormal reading distorting the conclusions and inappropriate action being taken as a result.

Check what is required with your assurance scheme and/or consult your veterinary surgeon/adviser before sampling to ensure the most effective and efficient approach is taken.

It is essential that the following steps are undertaken prior to sampling:

- Before handling or using any chemicals, make sure you are familiar with the Material Safety Data Sheet (MSDS). Take necessary safety precautions and ensure chemicals are kept out of reach from children
- If necessary, speak to your veterinary surgeon or adviser to agree that they will be happy to interpret the results and for advice as to which biological organisms to test for, eg Red Tractor Assurance specifies coliforms and Total Viable Count (TVC). TVC is normally determined at 22°C and 37°C
- Produce a full map/plan for your water system
- Use your system map/plan to identify where to take samples from, establish the most effective sampling regime and for interpretation of results
- Obtain the correct number of sample bottles – it is advisable to take a minimum of three samples at the entry point and any other critical points
- Clarify the analyses to be undertaken with the laboratory; they will usually supply the correct sample bottles. Often pre-payment is required and you will also need to confirm with the laboratory where the results are to be sent
- All water sample analyses are time-critical and must reach the laboratories within 24 hours of sampling. Decide if you wish to transport samples to the laboratory or a convenient drop-off location, or if

you wish to have the samples collected, in which case the laboratory will arrange for a courier. If you are arranging transportation, check when the facility closes and allow plenty of time to get there. **If the samples fall out of the 24-hour period, they will have to be re-taken**

- Do not sample acidified or medicated water as this will affect the results

Key things to remember

- Check that the sterility seal on the bottle cap is unbroken
- Keep the sample bottle unopened until just before it is filled. All blue-capped bottles must be opened by turning the cap to split the seal, rather than attempting to peel it off. If the seal is broken prior to sampling, discard the bottle and do not use
- Take care not to spill or tip out the fluid from the micro (blue-lidded) bottles as this is a preservative
- Do not touch the mouth of the bottle, the cap or inside the bottle at any point
- Do not rinse bottles out before taking a sample
- Any gloves that are heavily contaminated must be discarded before filling subsequent bottles: gloves should be changed between sample points
- Fill the bottles to 2cm below the lip, being careful not to overfill them and lose the preservative; if you do overfill a bottle, discard it

Equipment list

- Sterile sample bottles; these will be provided free by the testing laboratory – standard boxes hold 12 bottles, which contain a chlorine-neutraliser chemical and are often identified by a blue lid
- Disposable gloves
- Permanent marker pen
- Labels (completed in advance but not attached to bottles until filled)
- Clean scoop or small bucket
- Submission form from the laboratory
- Something to dry the outside surface of the bottles
- Containers for carrying bottles on farm (eg cardboard wine carrier, not the box they were delivered in)
- Container for transporting bottles upright (this could be the box the bottles were delivered in for biosecurity reasons) to the testing laboratory
- Surgical spirit or sodium hypochlorite solution in a spray or wash bottle. Sodium hypochlorite is corrosive. Read the MSDS for chemicals and ensure necessary safety precautions are taken before handling



Figure 2. Equipment for water sampling

- Tools to dismantle pipe, drinkers, etc as necessary
- Something (eg a brush) to clean around the surface of the pipe or drinker fitting to be dismantled, to remove surface contamination such as rust and debris
- Spare parts, PTFE tape, or pipe sealant in case emergency repairs are necessary

- Determine the code you will use to identify the location where each sample is to be taken. Make a note of this on your water system map/plan for future reference and to assist with interpretation of results
- Bottles must be labelled with the date, as well as the farm name and your client reference number (see confirmation from lab for this)

Sampling points

If it is not possible to sample easily at point of entry onto the unit (this is the point at which the water comes onto the farm, as close to the mains boundary/borehole/tee-off as possible), take the sample from a suitable point further in the system. It is important that the point chosen is as near the point of entry as possible so that a true interpretation of incoming water is achieved. A clean tap, drain point, or specifically installed sampling point should be considered first.

If you have a point where water is taken off, such as a tank where contamination may be able to enter the supply, it is essential to establish a true reading for supplied water; therefore, take a sample from the float valve outlet, not by dipping the tank.

Drinkers and troughs in occupied pens will be contaminated by the mouths of pigs and with other debris. If sampling from nipple or other drinkers, the surfaces should be cleaned first, **but not disinfected**.

The risk of surface contamination can be reduced by sampling from a drop pipe or line end.

If a pipe or drinker has to be dismantled, clean the area of pipe either side of where you intend to make the break to prevent any dirt or other contamination mixing with the sample as it is taken or falling into the bottle.

Samples should preferably be taken in triplicate.

Sampling procedure for nipple drinkers, tank float valves, taps or sample points

If you need to break the line, turn off the water first.

1. Complete labels for each bottle but do not affix until the sample has been taken and the bottle has been dried
2. Put on a pair of disposable gloves
3. Remove any obvious contamination/grease/slime from the tap/drinkers/float valve/sampling point
4. Wearing appropriate personal protective equipment (PPE), spray surgical spirit or sodium hypochlorite solution (or apply using a wash bottle – Figure 3) to sterilise surfaces

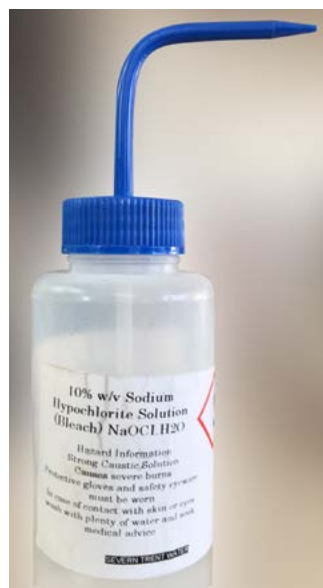


Figure 3. Sodium hypochlorite wash bottle

5. Put on fresh, disposable gloves before handling the sample bottles
6. Keep the sample bottles unopened until just before they are filled; do not touch inside the mouth of the bottle at any point
7. If sampling from a header tank or trough fill valve, firstly scoop some water out of the tank/trough using a clean scoop or small bucket so that there is sufficient space to take the sample without risk of contamination from standing water
8. Open the sampling point and let water flow for 30 seconds; this cleans out debris, washes out the cleaning solution and ensures the sample is from within the line
9. Open the bottle and place the cap clean side up on the cleanest convenient surface but do not touch inside it. **Do not empty any preservative from the bottle**
10. Fill the bottle from a gentle stream of water, which should come directly from the sampling point. The water and bottle must not come into contact with pipework or surfaces and bottles should not be overfilled (fill to 2cm below the bottle lip)

Do not let the water flow over your fingers into the bottle. If you overfill the bottle, it should be discarded and a new bottle used to re-take the sample.

11. Screw the cap on tightly
12. Gently invert the bottle three times to mix the contents

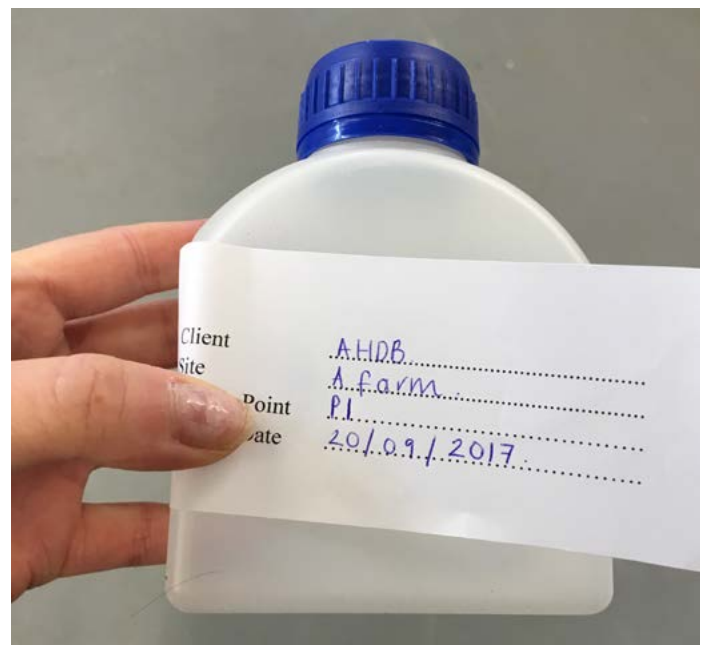


Figure 4. Labelling sample bottle

13. Once all bottles are filled from a sampling point, dry them and affix labels (Figure 4)
14. Reassemble waterline/drinker components, turn water back on and check water delivery at drinkers
15. While samples are awaiting transport/collection, chill in a fridge (3–5°C) where possible. **Do not freeze**

and do not put in a fridge that contains food for human consumption. If this is not possible, store out of direct sunlight. Ideally, send/transport the samples to the laboratory in an insulated box/bag to maintain temperature

16. Complete the form from the laboratory if one has been supplied
17. Send the plan of where you took the samples and results to your veterinary surgeon/adviser if agreed

Sampling procedure for bowl or nudge bar drinkers

For these types of drinker, it may not be possible to get the sample bottle directly into the water flow. The preferred process is to take a sample directly from the waterline before the drinker. However, this may not be practicable and in such cases an improvised, indirect method has to be used.

Avoid using a jug or other vessel to transfer water as this may result in contamination, which raises the recorded levels, producing an incorrect reading. Food-grade polythene bags, clean and unused, make a good improvised tube or funnel to fill the bottle.

1. Follow steps 1–8 on previous page
2. Take a clean, unused polythene food bag and use a clean knife or scissors to cut a corner off the bottom
3. Place the bag over the cleaned surface and allow water to run through the bag and out of the cut corner for seconds (Figure 5)
4. Fill the bottle from a gentle stream of water directly from the corner of the bag, without touching the bottle onto any pipe or surface and without overfilling (fill to 2cm of the bottle lip)
5. Screw the cap on tightly
6. Follow steps 11–15 on previous page
7. Remember to take away the polythene bag and dispose of it safely

Further information

- A more detailed SOP is available from AHDB Pork which covers sampling for minerals, flow rate and water temperature in addition to microbiology. Visit pork.ahdb.org.uk/environment-buildings/water-soil-and-air/water-quality-and-quantity for SOP and other information on water quality and quantity.

Health and safety statement

Before carrying out any water sampling, conduct a health and safety risk assessment; this will cover, for example, working with water under pressure, chemicals and proximity to electrical equipment and supplies. A Control of Substances Hazardous to Health (COSHH) assessment will be needed where any chemicals are involved.



Figure 5. Sampling using clean food bag

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