

Chapter 5.2 Antimicrobial Resistance (AMR) Monitoring Programme

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1. Overview

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1.1 Introduction

1.1.1 Survey overview

The Veterinary Medicines Directorate (VMD) oversees the monitoring programme of AMR in indicator and zoonotic bacterial species from fattening pigs, broilers and fattening turkeys at slaughter.

1.1.2 Co-ordination and collection

The Antimicrobial Resistance Team at the VMD is responsible for the co-ordination of the AMR monitoring programme:

Emails: amr@vmd.gov.uk

The contractors for the monitoring programme are Animal Plant and Health Agency (APHA). APHA will be responsible for the testing of samples submitted and determining the total number of samples required from selected abattoirs. APHA will send sampling schedules and kits to participating abattoirs.

FSA AO (Authorised Officer) will undertake the collection of samples from approved abattoirs participating in the monitoring programme.

The survey requires the collection of samples from a number of different slaughtered batches / producers for each species.

APHA send the sampling kits to participating abattoirs. Sampling schedules are sent from APHA to FSA, which are in turn forwarded on to the relevant contact at participating abattoirs.

Samples will be collected on the following annual basis:

Species	Year
Broiler/Turkeys	even years
Pigs	odd years

1.2 FSA role

1.2.1 Target population

Broilers, fattening turkeys and fattening pigs.

1.2.2 AO requirements

The AO must:

- ensure continuity of evidence when samples are collected, prepared, labelled, stored and despatched, and
- always obtain evidence for the origin of the samples collected
- ensure the data collection forms, AMR1 (for Turkeys), AMR2 (for Pigs) and AMR3 (for Broilers) are fully completed, and three copies are taken (see annexes 1, 2 and 3 for examples of the forms)
- ensure one copy of the AMR form is sent with the samples, the second copy is given to the named FBO contact (which will be supplied by SLA and Contracts Team) and the third copy is retained by the FSA team.

1.2.3 Relevant establishments

These instructions apply to FSA staff at plants participating in the monitoring programme on AMR in indicator and zoonotic bacterial species in pigs, broilers and turkeys.

1.2.4 Time coding

All work undertaken as part of this survey in the collection, storage, packaging and despatch of samples is to be coded to GFSA.

2. Sampling

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2.1 Sampling programme

2.1.1 Sampling requests

FSA AOs in plant will receive a sampling schedule prepared by APHA, from the SLA and Contracts Team, which will list the number of batches that need to be sampled during the sampling period (the schedule will be sent in advance either monthly or quarterly, as appropriate).

The schedule will provide details on the date of sampling, the number of batches that need to be sampled on a given day and the ID of the batch to sample (with first and second reserves).

Please note that as the sampling schedule is weighted according to plant throughput, larger processing plants will sample more regularly than smaller processing plants.

Note: The ID batch number refers to:

- the sequence of slaughter batches going through the abattoir on the day of sampling (for broilers and turkeys)
- the sequence of slaughtered animals (for pigs)

For example, ID batch 2 would be the second batch of turkeys slaughtered on the given sampling day or the second pig killed on the slaughter line on the given sampling day.

2.1.2 Monitoring definitions

A 'slaughter batch' is defined as, a quantity of broilers/turkeys which have been raised on the same farm premises, in the same house, and delivered to the abattoir in the same vehicle.

Pig Kill Number is the actual pig kill number of the sampled pig at the start of the slaughter line on that particular day of sampling.

2.1.3 Exclusion criteria

Slaughter batches / loads from more than one house or from more than one farm (mixed batches) are to be excluded from the monitoring programme.

2.1.4 Selection of slaughter batches

To avoid bias, slaughter batches must be randomly selected for sampling.

When collecting broiler or turkey samples, beside each allocated sampling day on the schedule there are three numbers per sampling batch labelled 'ID of batch to sample', 'ID batch (1st reserve)' and 'ID batch (2nd reserve)'. These are random numbers generated using the average number of batches processed during the abattoir's working day and represent the particular batch that must be identified and sampled.

Batches of broilers or turkeys from mixed houses, or from more than one farm, must be excluded. Therefore, if the selected batch is from a mixed house or from more than one farm, then the reserve batch should be sampled if that is not a mixed batch. The ID of the batch sampled should be marked clearly on the data collection form, AMR1 or AMR3.

Example:

Allocated sampling days	ID of batch to sample	ID batch (1st reserve)	ID batch (2nd reserve)
08/11/18	5	7	15
13/11/18	2	6	24
13/11/18	3	9	17
05/12/18	7	2	5

When collecting **pig** samples, if the selected animal on the schedule is from a mixed batch / load or from more than one farm, select a pig from a single producer and sample. The ID (kill number) of the pig sampled should be marked clearly on the data collection form AMR2.

Sampling for the surveillance programme will only be carried out Monday to Friday. If broilers, turkeys or pigs are not slaughtered on the specified sampling day, please sample the same ID batch number allocated but on the next processing day.

The revised sampling date and the ID of the batch sampled should be marked clearly on the data collection forms, AMR1, AMR2 or AMR3.

Reference: See annex 1 for a sample copy of form AMR1, annex 2 for a sample copy of form AMR2, annex 3 for a sample copy of form AMR 3 and annex 5 for guidance notes on arranging the delivery to APHA laboratories.

Note: If the samples cannot be despatched on the same day as collection, or if there are any questions on the sampling schedule, contact the SLA and Contracts Team at sla.contracts@food.gov.uk.

2.1.5 Repeat sampling

When preparing to take a sample, please ensure the 'previously sampled report' from APHA is reviewed to prevent repeated sampling of the same flocks or holdings. This report is usually sent on a monthly basis.

2.1.6 Selection process

The following table outlines the slaughter batch selection process:

Step	Description
1	If the batch identified for sampling is not eligible (it is not from a single house or cannot be sampled) sample the 1st reserve batch for broilers and turkeys or select a suitable animal to sample from for pigs.
2	If the 1st reserve batch is not eligible or cannot be sampled, sample the 2nd reserve batch (Note: for broiler or turkey sampling only).
3	If the 2nd reserve batch is not eligible or cannot be sampled, sample the next available eligible batch on the same processing day (Note: for broilers and turkeys only).
4	Mark the sampled ID batch number on the AMR1, AMR2 or AMR3 forms
5	If there are no more eligible batches processed on the same day, sample the first available eligible batch on the next processing day (and mark the date and batch number clearly on the AMR1, AMR2 or AMR3 forms). Please notify APHA Weybridge by email to advise them of the despatch delay: AMR Survey@apha.gov.uk

2.2 Sampling equipment

2.2.1 Introduction

APHA will provide the relevant establishments with sampling kits and the data collection forms (AMR1, AMR2 or AMR3). The SLA and Contracts Team will contact FSA staff at the establishments to inform them of delivery arrangements for the sampling kits.

2.2.2 Non-delivery of sample kits

Sampling kits and forms should be received at least four days before sampling begins. If the kit and form are not received, or if any of the equipment listed below is missing, contact the SLA and Contracts Team at sla.contracts@food.gov.uk.

2.2.3 Sampling kit contents Broiler and Turkey kit:

- 1 x Biotherm shipping box
 - Broilers – Biotherm 7
 - Turkeys – Biotherm 5 and 7
- Sample pots
 - Broilers – 2 x 300ml screw cap sampling pot
 - Turkeys – 300 ml screw cap sampling pot
- A4 pathoseal absorbent bags for sample pots

- sterile gloves
- grip-seal bags
- AMR1 and AMR3 forms
- 2x Biochills (frozen) - these must be kept away from direct contact with the samples using the bubble wrap (for broiler samples) or the polystyrene spacers (for turkey samples)
- 1 or 2x Biochills (chilled)
- bubble wrap (Broilers)
- polystyrene spacer (Turkeys)
- security seal
- UN3373 label

Note: Larger boxes for multiple samples may contain four Biochills. Two Biochill packs must be completely frozen when packed in the sampling box, ensure that they are placed in a freezer at least 48 hours before sampling. In addition, one (or two, depending on the size of the box) Biochill packs should be chilled in the refrigerator.

The frozen Biochills are placed on top of the polystyrene separator (which comes in the biotherm 5 and 7 boxes). The chilled Biochill pack(s) can be placed alongside the sample. See details for packaging in section 2.7.3.

Updated [Pig kit: for sampling 1 caeca per fattening pig:

- 1 x Biotherm shipping box
- 1 x 90ml screw cap sampling pot
- disposable scalpel
- A4 pathoseal absorbent bag (with absorbent lining)
- sterile gloves
- grip-seal bags
- AMR2 form
- 2x Biochills (frozen) - these biochills will be labelled “freeze”. These frozen biochills must be kept away from direct contact with the samples using the polystyrene spacer
- 1x Biochill (chilled) - supplied for larger biotherm boxes and/or in summer when weather is hot, to aid in maintaining a cool temperature during transport). These biochills will be labelled “chill (2-8°C) only”. When used these must be placed in contact with the samples polystyrene spacer (to separate samples from frozen Biochill packs)
- bubble wrap (to stop pot moving around in the bottom of box)
- security seal
- UN3373 label

Note: Two Biochill packs must be completely frozen when packed in the sampling box, so ensure that they are placed in a freezer at least 48 hours before sampling. Any additional Biochills supplied (one or two, depending on the size of the box or time of year for example in summer) must be chilled in the refrigerator for 48 hours before sampling. Each biochill will be labelled with either ‘freeze’ or ‘chill’ pending its intended use.]

2.3 Broiler and Turkey: Collecting samples

2.3.1 Caeca samples

For turkeys:

One pair of full and intact caeca will be sampled at the evisceration point from one bird per slaughter batch. The pair of caeca will be put into the appropriate sampling pot.

Turkey sampling is to be carried out at the time of evisceration. Birds are to be sampled at random during the selected batch avoiding the first part of the batch.

Depending on the line speed, and facilities available in each establishment, the paired caeca taken from each bird can be separated from the eviscerated intestines either on the slaughter line, or alternatively the whole offal can be removed and carried in a tray or similar receptacle to a separate area before removing the caeca.

Note: It is important that full and intact caeca are collected.

For broilers:

10 pairs of full and intact caeca from 10 birds within the same slaughter batch will be sampled and each pair of caeca put into the appropriate sampling pots (two pots provided per sample).

Sampling is to be carried out at the time of evisceration. Birds are to be sampled at random during the processing of the selected batch but avoiding sampling the first birds slaughtered in the batch. Consecutive birds must not be sampled but a random interval between the 10 birds sampled is the aim. The birds need not be collected from the entire batch; sampling 10 birds at random from approximately 50 or 100 birds slaughtered within the batch is acceptable.

Depending on the line speed, and facilities available in each premise, the paired caeca taken from each bird can be separated from the eviscerated intestines either on the slaughter line, or alternatively the whole offal can be removed and carried in a tray or similar receptacle to a separate area before removing the caeca.

Note: It is important that full and intact caeca are collected.

2.3.2 Sample handling

Samples must:

- be allowed to cool down in the pots prior to packing
- be packaged according to the instructions in this topic (an A4 guidance sheet will be provided in each sample kit)
- be despatched, on the same day of collection (where possible)
- samples should aim to arrive at APHA Weybridge within 36hrs of sampling and 48 hrs at the latest (if the sample is collected on a Thursday or Friday and arrives over the weekend, the sample can be suitably stored and then tested on the Monday, i.e. within 96 hours).

Reference: See topic 2.7 on 'Storage, packaging and despatch of samples' in for additional information.

Caution:

- Samples must be kept in a cool dark place until collected by Topspeed.
- Samples must not be frozen.
- Keep box out of direct sunlight.
- Despatch Monday to Friday only.

2.4 Pig: Collecting samples

2.4.1 Caeca samples

20g of caecal content will be sampled at the green offal inspection point from one fattening pig. The caeca will be put into a sampling pot.

Pig sampling is to be carried out at the Green Offal Inspection Point. Pigs are to be sampled from the selected kill number identified at the evisceration point. Depending on the facilities available in each establishment, the caecum taken from each pig can be separated from the eviscerated intestines either at the inspection point on the slaughter line, or alternatively the whole offal can be removed and carried in a tray or similar receptacle to separate area before removing the caecum.

Note: It is important that 20g of caecal content are collected.

2.4.2 Sample handling

Samples must:

- be allowed to cool down in the pots prior to packing
- be packaged according to the instructions in this topic (an A4 guidance sheet will be provided in each sampling kit)
- be despatched, on the same day of collection (where possible)
- samples should aim to arrive at APHA Weybridge within 36hrs of sampling and 48hrs at the latest (if the sample is collected on a Thursday or Friday and arrive over the weekend, the samples can be suitably stored and then tested on the Monday, i.e. within 96 hours).

Reference: See topic 2.7 on 'Storage, packaging and despatch of samples' in part 2 for additional information.

Caution:

- Samples should be allowed to cool down before packing in the shipping box
- Samples must be kept in a cool dark place until collected by Topspeed.
- Samples must not be frozen
- Keep box out of direct sunlight
- Despatch Monday to Friday only

2.5 Minimising the risk of sampling contamination

2.5.1 Caeca sample contamination

The main objective is to collect the caeca whilst minimising any external contamination.

For **turkeys**, one pair of full and intact caeca will be sampled at the evisceration point from one bird per slaughter batch. This is best achieved by careful manual traction to the portion of intestine either side of the caeca so that both caeca are removed intact with a short length of intestine.

For **broilers**, ten pairs of full and intact caeca will be sampled at the evisceration point from ten randomly selected birds per slaughter batch.

The sampler needs to verify that the caeca are intact and full. If they are not, the paired caeca should be disregarded and a new bird selected instead.

The caeca will be put into the appropriate sampling pot. Each sampling pot should then be sealed securely and placed into a small pathoseal absorbent bag (one pot per bag).

Note: For turkeys (and pigs), caeca from different slaughter batches (or carcasses) should not be placed in the same pot. For broilers, ten full and intact caeca can be placed in the same pot (or shared between the two pots provided depending on volume).

For **pig** samples, this is best achieved by careful piercing of the caecum so that caecal contents can be collected in the sampling pots.

Caecal content should be collected per fattening pig and put into a labelled pot. Each pot should then be sealed securely and placed into a small pathoseal absorbent bag.

Note: Caecal content from different fattening pigs should not be placed in the same pot.

2.6 Completing the AMR forms

2.6.1 Details to record

The following details must be fully recorded on the AMR1, 2 and 3 forms:

- abattoir details
- sampling details including the name of the sampler and the date and time of collection
- confirmation of the type of animal slaughtered, for example, fattening turkey or fattening pig

On the AMR1 and AMR3 forms, for turkey and broiler surveys, respectively, the following details must also be fully recorded:

- producer details, for example, farm name, address, county parish holding (CPH) number
- batch details including the number of birds in the batch slaughtered, the number of birds in the house, the shed / house number, age of the birds and the average weight of the birds

On the AMR2 form, for the pig survey the following details must also be fully recorded:

- producer details, for example, farm name, address, CPH number
- animal details including the slapmark number and the weight of the carcase

Note: If an error is made when recording any of the above data on the AMR form, or if anything is unclear that might need going over again, cross through the entry and enter the correct details then initial the change. Any necessary amendments must be made before the copies of the AMR form are despatched with the sample.

2.7 Storage, packaging and despatch of samples

2.7.1 Chilling

Samples must be kept chilled (not frozen) from the time of sampling until delivery to APHA. Please allow time for the samples to cool down in the pots before packing the kit box. Once packed, place the closed sampling kit in a cool area and away from direct heat until the courier arrives. If a cool room is available, the entire sampling kit can be stored there until despatched to APHA Weybridge.

2.7.2 Specimen collection and handling

Analysis can be affected by the growth of other bacteria. Therefore, care must be taken to ensure that samples are taken appropriately, chilled as described above and transported to APHA Weybridge as quickly as possible.

Extreme temperatures must be avoided.

2.7.3 Packing

Packing in line with the following procedures:

Step	Action
1	Ensure that the APHA reference number at the top of the data collection form AMR1 / AMR2/ AMR3 is the same as the number on the sample sampling pot.
2	Once the sample has been placed in the pot, allow time for the sample pots to cool down to room temperature before placing it into the kit box.
3	<p>Remove 2x Biochills from the freezer (and 1 or 2x Biochills from the chiller).</p> <p>Broilers: samples to be placed at the bottom of the biotherm 7 box, then place the polystyrene divider on top with the frozen Biochill packs on top of the polystyrene divider. Chilled Biochill pack to be placed alongside the sample.</p> <p>Turkeys: samples to be placed at the bottom of the biotherm 5 or 7 box, then place the polystyrene divider on top with the frozen Biochill packs on top of the polystyrene divider. Chilled Biochill pack to be placed alongside the sample.</p> <p>Pigs: wrap the sample in bubble wrap to avoid contact with frozen Biochills. Place the polystyrene divider on top of the sample/s, then place the two frozen Biochills on top of this. Chilled Biochill pack to be placed alongside the sample.</p>
4	Slide the completed form into the plastic document pouch to protect from any leakages that may occur and place into the sampling kit.
5	The sample box must be closed securely without delay. It is important that the pack is not left open (without freezer packs) for any length of time as this may damage the samples.

Note: All frozen and chilled Biochill packs provided in the sampling kit should be used. Care must be taken not to place the frozen packs in direct contact with the specimen pots (however, the chilled Biochill packs can be placed alongside the sample). Please refer to Annex 4 for details on packing instructions.

2.7.4 Labelling cardboard outer cartons

Apply the adhesive address label provided by the carrier to the outer carton across the box flaps.

Apply the UN3373 diamond label and Biological substance category B labels to the outer carton.

Apply the security seal to the carton lid.

2.7.5 Despatching samples

Samples are to be despatched to APHA using the Topspeed next day service:

Step	Action
1	Arrange collection by Topspeed using the process at annex 5.
2	Provide Topspeed with the following information: <ul style="list-style-type: none">• number of items (boxes) in consignment• kill date and time• name of person making the booking
3	Write the barcode nos. as reference for the collection in the plant day book. Topspeed to collect as arranged.

Note: Any problems collecting samples can also be notified to the Lab by emailing the AMR Survey Team at AMRSurvey@apha.gov.uk as well as calling the SLA and Contract Team at sla.contracts@food.gov.uk.

2.7.6 Despatch of all samples

Samples are to be sent to:

Bacteriology, Building 17 Animal
Plant Health Agency
Woodham Lane
New Haw,
Addlestone Surrey
KT15 3NB

2.7.7 Despatch failure

Should despatch fail, you must contact Topspeed and make an attempt to rearrange despatch, then notify APHA Weybridge by email to advise them of the despatch failure: [AMR Survey@apha.gov.uk](mailto:AMRSurvey@apha.gov.uk)

2.7.8 Complaints procedure

Should Topspeed fail to collect samples within the agreed timeframe, contact the SLA and Contracts Team at sla.contracts@food.gov.uk, who will escalate the failure to Topspeed headquarters.

3. Annexes

N.B. These pages can only be accessed by FSA staff on FSA devices.

[Annex 1: AMR 1](#)

[Annex 2: AMR 2](#)

[Annex 3: AMR 3](#)

[Annex 4: Packing of samples](#)

[Annex 5: Sample despatch process](#)