

2009 Commentary on non-compliant results

1. [National Surveillance Scheme \(NSS\)](#)
2. [Additional testing on NSS samples](#)
3. [Bovine QA Scheme](#)
4. [Meat Inspection Scheme](#)
5. [Pigs Testing Scheme](#)

1. National Surveillance Scheme (NSS)

Samples collected under the UK National Plan may be taken at abattoirs or on-farm, and provide retrospective surveillance data. As a consequence, carcasses are not detained pending the laboratory result.

a) Prohibited and unauthorised substances

1. Zeranol. Zeranol is a growth promoting hormone and taleranol is its principal metabolite. The administration of zeranol and taleranol to food-producing animals is banned in the EU. However both compounds can be found naturally in urine from various animal species, if their feed contains zearalenone (or other related metabolites), a chemical produced naturally by certain fungi. Zeranol and taleranol were detected in three bovine urine samples. A statistical model, developed at VSD in cattle, indicated that these results were due to metabolism of the naturally-occurring fungal metabolites, and probably not as a result of zeranol abuse.

2. Progesterone. Progesterone is a naturally-occurring female hormone that can also occur at low concentrations in male animals. It is illegal in the EU to administer progesterone to food-producing animals to promote growth. Residues of progesterone in urine, in excess of an in-house Action Limit, were detected in a sample from one male bovine. The animal had been purchased the day before slaughter.

3. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal to administer nortestosterone to food-producing animals in the EU. α -Nortestosterone, the main metabolite of nortestosterone in cattle, was detected in two female bovine urine samples above the VMD advisory limit for females. In one case, the animal was probably pregnant (based on the presence of very high oestradiol concentrations). In both cases, nothing untoward was found at the on-farm follow-up and all of the samples collected at follow-up were compliant. α -Nortestosterone was also found in a urine sample taken from a male bovine sampled at slaughter. This hormone can occur in injured or severely ill cattle, but there was nothing untoward recorded for the sampled animal. However, five male bovine urine samples collected from this farm during the on-farm follow-up tested compliant. α -Nortestosterone was also detected in the urine of five sheep, one in combination with β -nortestosterone. There is increasing evidence that α -nortestosterone can occur naturally in sheep. Although trace concentrations of both α - and β -nortestosterone were found in 2 out of 10 follow-up samples collected in response to the finding of both compounds, it is considered unlikely that this would have resulted from misuse. In the other cases, all follow-up samples similarly suggested that no abuse had occurred.

5. Boldenone. Boldenone is a growth-promoting hormone. It is illegal to administer boldenone to food-producing animals in the EU. However, it is known that boldenone can occur naturally if certain natural chemicals are present in the animals' diets. In addition, it can occur in urine samples, especially those taken on farm, if faecal contamination of urine has occurred. The EU has set criteria against which to interpret boldenone results. α -Boldenone was detected in one bovine and one ovine urine sample. Analysis to measure free and conjugated boldenone suggested that no abuse of this hormone had occurred and no further action was taken.

6. Phenylbutazone. This non-steroidal anti-inflammatory painkiller is licensed only to be given to horses that are not intended to be slaughtered for human consumption. It is not licensed for use in cattle. Residues of phenylbutazone were detected in blood samples from two steers. In one case, the farm visit found that horses were present on the farm. There was evidence of the presence of the drug on the farm. However, previous experience has shown that phenylbutazone can readily occur by accidental cross-contamination. Five follow-up samples were compliant. In the other case, sachets of suxibusone (a phenylbutazone pro-drug) were found on the farm. These had been incorrectly prescribed by the owner's vet for use in cattle. Five follow-up samples (including one taken from a lame animal) were taken. All were compliant. Letters were issued to the farmer – reminding him of the need to keep accurate medicines treatment records – and to his veterinarian – reminding him that the use of suxibusone is not permitted in cattle.

7. Thiouracil. Administration of all thyrostats to food-producing animals has been prohibited within the EU for more than 20 years. No animals have ever previously tested positive for thiouracil in Northern Ireland. There is, however, a possibility that it can occur naturally as a result of consumption of diets rich in cruciferous vegetables (e.g. cabbages). Thiouracil was detected in urine samples taken from three cattle. In none of these cases was any evidence of abuse detected. However, neither was there any evidence of Brassicas being fed to the animals. Despite this, it is possible that a batch of rape oilseed cake, a common feed ingredient, had been imported with higher than normal levels of these goitrogenic contaminants. None of the follow-up samples that were collected contained thiouracil.

8. Clenbuterol. Clenbuterol was detected at 0.2 ppb in a urine sample from a 21 month old female bovine. This β -agonist is licensed for use at parturition in cattle. It is, however, banned for use as a growth promoter within the EU. No progeny were recorded for this animal, but if she had calved shortly before sampling, this drug could have been prescribed to assist with this. A farm follow-up visit, this suckler herd reported beef production on slats, medicines recorded in line with the legislation and no record of clenbuterol treatment for this animal. Nothing untoward was detected in 5 follow-up urine samples taken during the visit.

b) Veterinary medicines

1. Dexamethasone. Dexamethasone is an anti-inflammatory corticosteroid, licensed for use in a wide range of food-producing animals. An MRL of 2 $\mu\text{g}/\text{kg}$ has been established in bovine liver. The licensed injectables have differing beef withdrawal times (ranging from 7 to 21 days). This animal had been sold through

a market the day before slaughter (this may have contributed to a breakdown in food chain information). The carcass was condemned at post mortem inspection for abscess/pyaemia, and fascioliasis was also reported. No further action was taken.

c) Contaminants

1. Cadmium. Cadmium was detected at a concentration of 1.7 mg/kg in a kidney sample collected from a cow. In the EU, a Maximum Permitted Limit of 1.0 mg/kg has been established for this heavy metal. No obvious sources of environmental contamination were found at an on-farm investigation. It was concluded that the result was most probably due to the age of the animal (12 years old) as tissue cadmium concentrations tend to increase with age. No further action was taken, other than to flag the herd for further sampling at slaughter.

[\[Top\]](#)

2. Additional testing on NSS samples

The analytical method used to detect hormones in the NSS in Northern Ireland is capable of detecting a wide range of hormones, in addition to the compound(s) specifically targeted in the NSS. This section details those positive results found as a result of this “non-target” analysis.

a) Prohibited and unauthorised substances

1. Zeranol. Zeranol is a growth promoting hormone and taleranol is its principal metabolite. Administration of zeranol and taleranol to food-producing animals is banned in the EU. However both compounds, and other related metabolites, can be found naturally in urine from various animal species, if their feed contains zearalenone, a chemical produced naturally by certain *Fusarium* fungi. Zeranol/taleranol and the *Fusarium spp.* toxins were confirmed in urine samples taken from three cattle. A statistical model, developed at VSD for cattle, indicated that three results were due to metabolism of the naturally-occurring fungal metabolites, and probably not as a result of zeranol abuse. No further action was therefore taken

2. Testosterone. Testosterone is a naturally-occurring male hormone. It is illegal to administer testosterone to food-producing animals to promote growth in the EU. Residues of testosterone were detected in ten male bovine urine samples at a concentration greater than the laboratory’s statistically-based upper limit of normality for steers. At farm follow-up visits, no evidence of hormone abuse was found, and it was established that at least three of the sampled animals had been a bull, and no further action was taken. Follow-up samples from the remainder of the farms tested compliant and no further action was taken.

3. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal to administer nortestosterone to food-producing animals in the EU. Residues of α -nortestosterone, the main metabolite of nortestosterone in cattle and sheep, were detected one young and one older (over 30 month) female bovine urine samples, above the VMD Action Limit. Nothing untoward was found in follow-up samples, and the older animal was pregnant at the time of sampling, when α -nortestosterone can occur naturally. It was found in another older (over 30 month) female bovine below the VMD Action Level. This was followed up on farm because a low concentration of β -nortestosterone (the parent drug, which is not known to occur in pregnancy, but which can occur as a result of injury) was also detected. All follow-up samples, including hair were compliant.

4. Boldenone. Boldenone is a growth-promoting hormone. It is illegal in the EU to administer boldenone to food-producing animals. However, it is known that boldenone can occur naturally if certain natural chemicals are present in the animals’ diets. In addition, it can occur in urine samples, especially those taken on farm if faecal contamination of urine has occurred. The EU has set criteria against which to interpret boldenone results. A complex set of findings of 1,4 androstadiene-3,17-dione (ADD) and/or boldenone was observed in the urine of five male and one female cattle. All samples were collected on farms. No evidence of hormone abuse was found at any of the farms, and follow-up samples were compliant.

b) Veterinary medicines

No non-compliant results.

[\[Top\]](#)

3. Bovine QA Scheme

Bovine QA samples are taken at abattoirs, and are designed to provide retrospective surveillance data. As a consequence, carcasses are not detained pending the laboratory result.

a) Prohibited and unauthorised substances

1. Zeranol. Zeranol is a growth promoting hormone and taleranol is its principal metabolite. Administration of zeranol and taleranol to food-producing animals is banned in the EU. However, both compounds can be found naturally in urine from various animal species, if their feed contains zearalenone (and/or other related metabolites), a chemical produced naturally by certain *Fusarium* fungi. Zeranol/taleranol and the *Fusarium* spp. toxins were detected in three bovine urine samples. A statistical model, developed at VSD, indicated that these results were due to metabolism of the naturally-occurring fungal metabolites, and probably not as a result of zeranol abuse.

2. Oestradiol. Oestradiol is a naturally-occurring female hormone that can also occur at low concentrations in male animals. It is illegal in the EU to administer progesterone to food-producing animals to promote growth. Residues of progesterone above the VSD statistical upper limit of normality in steers were found in urine samples from one male bovine. No suspects were identified at the farm, and urine samples from six randomly selected male animals tested compliant.

3. Testosterone. Testosterone is a naturally-occurring male hormone. It is illegal to administer testosterone to food-producing animals to promote growth in the EU. Residues of testosterone were detected in two male bovine urine samples at a concentration greater than the laboratory's statistical upper limit of normality for steers. Farm follow up visits found no evidence of abuse and follow-up samples tested compliant.

4. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal to administer nortestosterone to food-producing animals in the EU. α -Nortestosterone is the main metabolite of β -nortestosterone in cattle. α -Nortestosterone and, to a lesser extent, β -nortestosterone can occur naturally in bovine urine in response to injury. However, an unusual finding of β -nortestosterone, on its own, was reported in urine taken from a male bovine. No evidence of hormone abuse was found at the farm of origin, and follow-up samples from this farm (urine & hair) tested compliant.

b) Veterinary medicines

1. Sulphamethazine. The antibiotic, sulphamethazine was detected at an extremely high concentration in the muscle of a steer. The animal had spent a year at a previous holding before transfer to the presenter's holding 5 days before it was slaughtered. This is less than the beef withdrawal period (18 days) for the only UK licensed formulation for cattle. On the previous owner's farm there was no indication that the animal had been treated with sulphamethazine. However, the animal had been sold with incomplete Food Chain Information records as, at

the time of sale, it had been treated with an anti-inflammatory agent (meloxicam), which has a withdrawal period of 15 days, only 3 of which had passed.

[\[Top\]](#)

4. Meat Inspection Scheme

The carcass is detained at sampling, and excluded from the food chain if a non-compliant result is obtained.

a) Prohibited and unauthorised substances

1. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal to administer nortestosterone to food-producing animals in the EU. Residues of α -nortestosterone, is the main metabolite of β -nortestosterone in cattle. α -Nortestosterone and, to a lesser extent β -nortestosterone can occur naturally in bovine urine in response to injury. Residues of α -nortestosterone were detected in a urine sample taken from a bull. A farm follow-up visit reported that this animal had been slaughtered on farm, as a result of a leg injury. Medicines records were kept in line with the legislation, no evidence of abuse was found. Samples from five heifers tested compliant; the bulls being reared on farm at the time of the visit were not sampled for safety reason. No further action was taken.

2. Phenylbutazone. This non-steroidal anti-inflammatory painkiller is not licensed for use in food-producing animals. Phenylbutazone was detected a plasma sample from a young male bovine that was found to be lame on one hind leg at ante mortem inspection. A farm visit reported that this animal had been treated 2-3 weeks before being sent for slaughter with a phenylbutazone-containing product. The farmer said that his PVP had advised him that this product could be given under the Cascade, with a beef withdrawal of "a couple of days". Medicines were not recorded at the farm. Advisory letters were issued to the farmer about medicines recording, and to his PVP about his incorrect advice concerning prescribing of this drug.

b) Veterinary medicines

1. Oxytetracycline. Oxytetracycline is an antibiotic that is licensed for use in a wide range of animal species. Residues of oxytetracycline above the MRL were found in the muscle of five cattle. A range of causes for the residues was identified. In two cases, there had been a breakdown in communication between the farmer and either his PVP or the herd keeper, that resulted in the animals being presented for slaughter before the withdrawal period had expired. In a further two cases, the animal had been purchased shortly before they were submitted for slaughter and accurate Food Chain Information was not supplied. In the fifth case, the animal had received a slight overdose (2 x 20 ml injections, instead of the maximum of 10 ml per site, recommended by the manufacturer.

2. Chlortetracycline. Chlortetracycline is an antibiotic that is licensed for use in a wide range of animal species. Residues of chlortetracycline above the MRL were detected in a muscle sample from the carcass from a young male bovine that had been slaughtered on farm because of a broken bone. There is no licensed injectable chlortetracycline in the UK, and antibiotics are not usually given orally to ruminating cattle. (In-water, milk and feed medications are licensed to treat calves). A farm visit reported that the sampled animal had been treated with a chlortetracycline-containing oral drench. As a result of a communication breakdown the animal was sent for slaughter inside the 25 day withdrawal period.

3. Penicillin G. Penicillin G is an antibiotic that is licensed for use in a wide range of animal species. Residues of penicillin G above the MRL were detected in a muscle sample from the carcass of a young bovine. An on-farm investigation revealed that the animal had been treated 17 days prior to slaughter with a penicillin/streptomycin-containing product, which had a 28 day withdrawal period. A farm employee had administered the drug, but had failed to record the treatment in the medicines records.

4. Dihydrostreptomycin. Dihydrostreptomycin residues were detected at a very high concentration in a muscle sample taken from a pig. Medicines records on the farm showed that the sampled animal had been receiving regular injections of a penicillin/streptomycin-containing product. The animal had been slaughtered one day before the end of the 18-day withdrawal period. It is highly unlikely that the high residue concentration found could be explained by a marginal failure to adhere to the withdrawal period.

5. Enrofloxacin & ciprofloxacin. Enrofloxacin (and its metabolite – ciprofloxacin) are antibiotics licensed for use in a wide range of food-producing species. Residues of both compounds were detected in the carcass of a pig imported for slaughter from the Irish Republic. The authorities in Dublin were informed to enable them to follow up the finding on-farm. The producer regularly slaughters pigs in Northern Ireland and, in the absence of a DARD-led farm visit, was subjected to three rounds of Phase 2 sampling (as if the original carcass had been sampled under the Pigs Testing Scheme). All samples tested compliant and intensified sampling was stopped.

[\[Top\]](#)

5. Pigs Testing Scheme

At Phase 1, the carcass is not detained at sampling, but if found to contain non-compliant residues, the producer is allocated to Phase 2 intensified sampling with carcass detention. Non-compliant carcasses at Phase 2 are condemned. (After 3 consecutive, clear rounds of Phase 2 sampling, the producer is returned to Phase 1 sampling).

a) Prohibited and unauthorised substances

No positive samples were found.

b) Veterinary medicines

1. Sulphadiazine. Sulphadiazine is an antibiotic that is licensed for use in a wide range of animal species. Sulfadiazine residues were detected, above the MRL, in two kidney samples. In one case, a farm follow-up visit showed that the pigs had been treated using an in-feed product containing sulphadiazine plus trimethoprim before slaughter. It was suggested that accidental contamination of the automated feed line had caused the problem. Medicines records were good, apart from a failure to record in-feed medication. The farmer was advised the farmer to record in-feed treatments, clean out the lines after medication and to mark clearly bins containing medicated feeds. Three batches of samples, taken under Phase 2 (20 pigs were sampled on each occasion) tested compliant. The producer was returned to Phase 1. In the second case, the medicines records were very hard to follow. Although the producer is authorised to prepare medicated feedingstuffs on farm, it considered unlikely that this was the cause of the problem. Rather, inadequate labelling of medicated feedingstuffs was considered to be the cause of the problem. A total of 20 pigs were sampled over three rounds of Phase 2 testing. All were compliant and the producer was returned to Phase 1.

2. Oxytetracycline. Oxytetracycline is an antibiotic that is licensed for use in a wide range of animal species. Oxytetracycline residues, in excess of the MRL, were detected in a kidney sample taken from a fatter pig. The on-farm visit showed that two oxytetracycline-containing products were present on the farm. It was suggested that a new foreign worker, who spoke little English, may have injected the animal. However, the medicines records that were available on the farm showed no administration of any oxytetracycline-containing product. A total of 70 pigs were sampled over four rounds of Phase 2 testing. All were compliant and the producer was returned to Phase 1.

3. Amoxicillin. Amoxicillin is an antibiotic that is licensed for use in a wide range of animal species. Amoxicillin residues, in excess of the MRL, were detected in a kidney sample taken from a sow. The on-farm visit report showed that sows are routinely injected with antibiotics after pigging and batch treatments are recorded. The farmer could not explain the result & agreed to tighten up his recording procedures. . A total of 65 pigs were sampled over four rounds of Phase 2 testing (all samples were from fattening pigs, not sows). All were compliant and the producer was returned to Phase 1.

4. Penicillin G. Penicillin G is an antibiotic that is licensed for use in a wide range of animal species. Penicillin G, at concentrations in excess of the MRL, was detected in two kidney samples. In one case (a sow), the on-farm follow-up visit showed that a wide range of VMPs were present on this farm. The only use of a long-acting penicillin preparation was on a boar. Penicillin/streptomycin was used to treat sows, but the sow had been sampled after the end of the withdrawal period. The herd keeper maintains medicines records, but does not clearly show the withdrawal period and the “clear” date. It was suggested that the animal may have been injected for lameness and accidentally loaded for slaughter. Phase 2 samples have been requested. The second case involved a pig imported from the Irish Republic. The authorities there were notified.

[\[Top\]](#)