

2008 Commentary on non-compliant results

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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. 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 fungi. Zeranol and taleranol were detected in one bovine urine sample; statistical analysis developed at VSD in cattle indicated that these results were probably due to metabolism of the naturally-occurring fungal metabolites, and 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. Serum residues of progesterone slightly above the VMD's advisory limit for male cattle were found in blood samples from four male bovines. No evidence of abuse was found at the farms of origin, and follow-up samples taken at three of the farms tested compliant. There were no male cattle available at the fourth farm, which was flagged for further sampling at slaughter.

3. Testosterone. Testosterone is a naturally-occurring male hormone. It is illegal in the EU to administer testosterone to food-producing animals to promote growth. Residues of testosterone were detected in one female bovine serum sample at a concentration greater than the VMD's advisory limit for female cattle. A farm visit reported that the sampled animal was 14 months old and was undergoing antibiotic and toxoid vaccine treatment for 'blackleg' at the time of sampling. No evidence of hormones abuse was found, and 5 follow-up samples tested compliant. It was concluded that this result was related to the animal's condition at the time of sampling (near puberty and severe illness).

4. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal in the EU to administer nortestosterone to food-producing animals. α -Nortestosterone, the main metabolite of nortestosterone in cattle and sheep, was detected in a bovine urine sample above the VMD advisory limit for females, but was considered to be naturally occurring as this animal calved 6 weeks after sampling. (An array of other hormones related to late pregnancy was also found in this sample). 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 no meat inspection record available for the sampled animal; however, four male bovine urine samples from this farm tested compliant. It was also found together with testosterone in a urine sample from a male sheep at slaughter. No evidence of hormones abuse was found at the source farm.

5. 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. The EU has set criteria against which to interpret boldenone results. α -Boldenone was detected in two ovine urine samples, from unknown gender and female animals, below the EU action limit of 2 ppb for further analysis. (Testosterone was also detected in both, and progesterone in the female sample). It was also detected at above 2 ppb, together with testosterone and progesterone, in another ovine urine sample from a female lamb at slaughter. No evidence of hormones abuse was found at the source farm, and follow-up samples tested compliant

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 was detected in a blood sample from a steer. The farm visit report indicated that an equine oral medicine (Pro-Dynam powder, Dechra) had been given to another older animal at the farm, that was kept in another pen in the same shed as the sampled animal. It was concluded that cross contamination had led to this result. The treated animal was sampled at slaughter under the Meat Inspection Scheme (see below) and found to contain phenylbutazone (this carcass was excluded from the food chain). The CVO contacted veterinary practitioners to remind them that phenylbutazone preparations are not licensed to be given to food-producing animals

b) Veterinary medicines

1. Nicarbazin. Nicarbazin is a coccidiostat, licensed for in-feed use in poultry. Whilst there is currently no EU Maximum Residue Limit (MRL) for this compound in broiler liver, the UK has adopted an international MRL (200 $\mu\text{g}/\text{kg}$) as an interim measure, pending the establishment of an EU MRL. Samples of broiler liver from seven farms that supply three integrators were found to contain residues of nicarbazin at concentrations above the MRL. (The corresponding muscle samples tested compliant). Farm follow-up investigation revealed that the seven farms had completed the drug's withdrawal period (Maxiban, Elanco, broiler withdrawal time 5 days) and the bulk feed bins were in good condition and well managed. House sizes were recorded for 5 sites, and were relatively small (5,000 to 20,000 birds), and feed bins were relatively old (8-16 years); these factors were associated with tissue nicarbazin levels in the 2007 survey. However, no obvious causes were found for these results. Follow-up samples from two farms tested compliant; samples from the other five are awaited.

2. Chlortetracycline. There are several in-feed and in-water preparations of this tetracycline antibiotic that are licensed to be given to poultry, with poultrymeat withdrawal times between 1 and 3 days. It was found above the MRL in a broiler muscle sample taken at slaughter. A farm investigation reported that in-feed treatment was recorded (Aurofac, Alpha, withdrawal period 48 hours) for the

sampled flock; this had been fed until 4 days before slaughter. The retained feed samples of the medicated diet and the subsequently fed unmedicated diet for the flock were analysed, and this drug was found at the correct level in the medicated diet only. It was speculated that when the feed line was withdrawn just before slaughter, birds may have scratched the bedding and been contaminated with previously spilt medicated feed. The farm was flagged for further sampling at slaughter.

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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 fungi. Zeranol/taleranol and the *Fusarium spp.* toxins were confirmed in urine samples taken from six cattle. Statistical analysis developed at VSD for cattle indicated that three results were due to metabolism of the naturally-occurring fungal metabolites, and not as a result of zeranol abuse. The profile in three samples did not fit the statistical model. Follow-up visits reported no evidence of abuse at the farms of origin, and follow-up samples from two farms tested in line with the statistical model. At one of the farms, 2 of 5 animals sampled during the visit tested out of line with the statistical model, and the farm was flagged for further sampling at slaughter.

2. Testosterone. Testosterone is a naturally-occurring male hormone. It is illegal in the EU to administer testosterone to food-producing animals to promote growth. Residues of testosterone were detected in three male bovine urine samples at a concentration greater than the laboratory’s statistical upper limit of normality for steers. At farm follow-up visits no evidence of hormones abuse was found, and it was established that at least two of the sampled animals had been bulls. Follow-up samples from two of these farms tested compliant, and the third farm kept only uncastrated bulls. (Advice on APHIS animal registration was issued to the farms).

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 in three female bovine, and one male ovine, urine samples. It was established that the three cattle had been pregnant at the time of sampling. Their samples also contained oestradiol, and in one cow that had been in early pregnancy, testosterone, α -boldenone and the boldenone metabolite ADD were also detected. The sheep result continues to be investigated.

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. The EU has set criteria against which to interpret boldenone results. ADD, a metabolite of α -boldenone was detected in three female bovine urine samples. In one of these, which was pregnant, it was found together with α -boldenone, α -nortestosterone and an array of female hormones (see above). No evidence of hormones abuse was found at the source farms, and follow-up samples to the two non-pregnant animals’ results tested compliant.

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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 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 fungi. Zeranol/taleranol and the *Fusarium* spp. toxins were detected in four bovine urine samples. Statistical analysis developed at VSD indicated that these results were probably due to metabolism of the naturally-occurring fungal metabolites, and 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 above the VSD statistical upper limit of normality in steers were found in urine samples from two male bovines. No evidence of abuse was found at the farms of origin, and follow-up samples taken at the farms tested compliant.

3. Testosterone. Testosterone is a naturally-occurring male hormone. It is illegal to administer testosterone in the EU to food-producing animals to promote growth. Residues of testosterone were detected in six 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 it was established that at least 5 of the animals had almost certainly been bulls. ADD, a metabolite of boldenone was also found in two of the samples; follow-up samples taken at these and at a third of the farms tested compliant. (Advice on APHIS animal registration was issued to the farms).

4. 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, were detected in one male bovine urine sample. No evidence of hormones abuse was found at the farm of origin, and follow-up samples from this farm tested compliant.

5. 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. The EU has set criteria against which to interpret boldenone results. ADD, a metabolite of α -boldenone was detected together with testosterone in urine samples from two animals recorded to be steers, but which had probably been bulls. (See above). No evidence of hormones abuse was found at the source farms, and follow-up samples tested compliant.

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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. 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 was detected in a blood sample from a steer (see NSS above). The farm visit report indicated that an equine oral medicine (Pro-Dynam powder, Dechra) had been given to another older animal at the farm, that was kept in another pen in the same shed as the sampled animal. It was concluded that cross contamination had led to this result. The treated animal was sampled at slaughter under the Meat Inspection scheme and found to contain phenylbutazone (this carcass was excluded from the food-chain). The DVO contacted veterinary practitioners to remind them that phenylbutazone preparations are not licensed to be given to food-producing animals

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 two cattle and one sheep carcass. Farm follow-up investigations reported that 1-2 days before slaughter, the sheep and one of the cattle had been bought into the source farms, where they had not been treated. The sheep farmer regularly buys in groups of hoggets from market for fattening and at the time of sampling, individual lamb identification and food-chain information rules were not implemented; it was not possible to trace the sampled animal's previous holding. The other bovine sample was submitted together with an injection site for analysis. The farm investigation reported that this animal had received daily injections with this antibiotic (Engemycin 10%, Intervet, beef withdrawal 35d) following a caesarean procedure. The last injection was given 11 days before slaughter, and treatments were not recorded. The DVO wrote to advise the farmer about both issues. Further details for the 2nd cow? Seem to be missing further info re cow referred to in 3rd sentence?

2. Marbofloxacin. Marbofloxacin is an antibiotic that is licensed for use in a wide range of animal species. Residues of marbofloxacin above the MRL were found in the muscle of a steer. A farm investigation noted that the last treatment (Marbocyl 10%, Vetoquinol, beef withdrawal 6 days), had been given about 7 days before slaughter. However, the animal had been overdosed by about 50%. The DVO wrote to advise the farmer about dosing correctly.

3. Sulfadiazine. Sulfadiazine is an antibiotic that is licensed for use in a wide range of animal species. A high level of sulfadiazine above the MRL was detected in a muscle sample from a cow that was found to be dull and toxic at ante mortem meat inspection. A farm investigation noted that an employee had recorded treating this animal (Norodine 24, Norbrook, beef withdrawal 12 days) the day before it was slaughtered. The farmer said that he had not known that the animal was unwell or had been treated when he took it to the abattoir.

4. Flunixin. Flunixin is a non-steroidal anti-inflammatory painkiller that is licensed for use in a range of animal species. It was detected above the MRLs in a muscle and a liver sample from a steer. An investigation is underway into this result.

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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).

Non-compliant 2008 Phase 1 samples.

a) Prohibited and unauthorised substances

No positive samples were found.

b) Veterinary medicines

1. Sulphadiazine. Sulphadiazine is an antibiotic that is licensed in combination with trimethoprim for use in a range of species, including injectable and in-feed preparations for pigs. It is usually given to pigs in-feed (several preparations with withdrawal times between 5 and 10 days). It was detected at levels above the MRL in 7 Phase 1 kidney samples from 4 different producers, who were allocated to Phase 2 sampling. At one of the farms, noncompliant levels of this antibiotic were found in a further 33 carcasses at Phase 2 sampling (these were excluded from the food chain). This was ascribed by the farmer to feeding error by recently appointed staff. A further three Phase 2 sampling rounds tested compliant, and this producer was returned to Phase 1 sampling later in 2008. At a second farm, despite good medicines handling and recording, a breeding animal undergoing treatment had mistakenly been selected for culling. At a third farm it was speculated that a leaking feed line (which had since been repaired) and same day delivery of medicated and unmedicated feed could have resulted in contamination of unmedicated feed. The fourth farm was in the Republic of Ireland. The authorities there were notified. Phase 2 samples were compliant and these producers were returned to Phase 1 sampling in 2009.

2. Chlortetracycline. Chlortetracycline is an antibiotic that is licensed for in-feed or in-water use in a range of species, with pig meat withdrawal times of 7 – 10 days for in-feed, and 6 days for in-water preparations. It was detected at concentrations above the MRL in two Phase 1 kidney samples from different producers. Follow-up Investigations reported that recent treatment of these animals was recorded with another tetracycline antibiotic, oxytetracycline, by injection and in-feed respectively at the two farms; but not with chlortetracycline. The source of these results has not been determined; the most likely being feed cross contamination, or unrecorded administration of medicated feed. Phase 2 samples were taken in 2009. Three rounds were compliant for one producer who was returned to Phase 1 sampling. Two samples in one Phase 2 sampling round from the other producer were non-compliant for sulfadiazine (these carcasses were excluded); this result was discussed with the farmer. Three further rounds of Phase 2 sampling were compliant, and this producer was returned to Phase 1 sampling.

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Previous Phase 1 and other producers on Pigs Testing Scheme Phase 2 2007 Phase 1 positives.

In 2008 five Phase 2 sampling rounds from two producers tested compliant for sulfadiazine residues; one producer was returned to P1 sampling, and further samples are awaited from the other.

ROI notifications

1. Enrofloxacin and ciprofloxacin. Enrofloxacin is an antibiotic that is licensed for use in a wide range of animal species. Residues of enrofloxacin, and its metabolite ciprofloxacin above the MRL in the carcass of a sow from a Northern Ireland farm that was slaughtered in the Republic of Ireland, were notified to DARD, but the sampled animal's identity wasn't available. The farm had recorded treatment with this drug for an animal in the consignment. The withdrawal period had been completed, but the dose had been injected at one site, rather than according to the manufacturer's instruction to divide it. Phase 2 samples were compliant and this producer was returned to Phase 1 sampling.

2. Penicillin. Penicillin is an antibiotic that is licensed for use in a wide range of animal species, usually in combination with dihydrostreptomycin. Penicillin residues above the MRL in the carcass of a sow slaughtered in the Republic of Ireland that was culled from another Northern Ireland farm were notified to DARD. The sampled animal's identity was not available. The farm's well-kept medicines records did not include treatment of this consignment; it was speculated that the sampled animal may have originated from another farm and been regrouped with this farm's animals at export. Phase 2 samples were compliant and this producer was returned to Phase 1 sampling.

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6. Follow-up sampling to earlier non-compliant results

Results available in 2008 for follow-up samples to earlier, non-compliant samples

a) Prohibited and unauthorised substances

1. 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. Serum residues of progesterone above the VMD advisory limit for male cattle were found in two follow-up blood samples taken from male cattle. One of these was a follow-up to a 2006 NSS result. As a result of the nortestosterone-related Emergency response that occurred in that year, the farm wasn't visited, but in 2008, 9 follow-up samples were taken on two occasions at slaughter. On the first occasion only, 1 sample was above the VMD advisory limit. The other non-compliant sample was 1 of 5 samples taken in 2008 as a follow-up to a 2007 NSS result, but no evidence of hormones abuse was found at the farm of origin.

2. 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 were detected in 7 follow-up ovine urine samples; together with beta-nortestosterone in 4 of these. However, 2 of the 7 samples were from female sheep (this hormone is considered to occur naturally in some stages of the female reproductive cycle in cattle and sheep, and can also arise naturally in injured cattle). These were follow-up samples to 1 NSS and 3 ANSS results for this hormone in 2007. No evidence of hormones abuse was found at the four farms concerned.

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