

2007 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 a urine sample taken from one sheep. 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 Action Limit were found in blood samples from two male bovines in 2007. No evidence of abuse was found at either of the farms of origin. Follow up sampling at one of the farms gave negative results. Samples from the other farm have been obtained recently and are awaiting analysis.

3. 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 Action Limit for females, but was considered to be naturally occurring as this animal was four years old and pregnant when sampled. β -Nortestosterone was also found in four ovine urine samples, two of which also contained β -nortestosterone. three of the sheep were male, one was of unknown gender, and two of the samples also contained testosterone. No evidence of hormone abuse was found at investigation; follow-up samples where available tested compliant, and more will be sought next season.

b) Veterinary medicines

1. Nicarbazin. Nicarbazin is a coccidiostat, licensed for 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 µg/kg) as an interim measure, pending the establishment of an EU MRL. Samples of broiler liver from three farms that supply two integrators were found to contain residues of nicarbazin at concentrations above the MRL. (The corresponding muscle samples tested compliant). Follow-up investigation revealed that all three farms had completed at least double the mandatory nicarbazin withdrawal time (5 days) and the bulk feed bins were in good condition and well managed. There was no obvious cause for these results. At one farm, however, it was speculated that feed line cross contamination was a possible factor, as the line had not been cleared at diet changeover. At another farm, a low level of nicarbazin contamination was found in the retained sample of the broiler finisher diet (that should have been nicarbazin-free). Follow-up samples tested compliant.

2. Doramectin. Doramectin is a broad spectrum anthelmintic (wormer) and acaricide (mange 'scab' treatment) licensed for cattle and sheep with a long withdrawal period in meat of 70 days. It was detected at slaughter in an ovine liver sample above the MRL. The farmer had recorded treatment of another group of animals 6 days before the sampled animal was slaughtered, and suggested that this animal had escaped from the treated group. He agreed to mark treated animals in future.

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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. It is anticipated that, starting in 2008, the whole of the UK NSS will be carried out using a similar multi-residue method and this category of result will be incorporated into the main NSS results section.

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 ten cattle. Statistical analysis developed at VSD for cattle indicated that nine results were due to metabolism of the naturally-occurring fungal metabolites, and not as a result of zeranol abuse. The profile in one sample taken from a male did not fit the statistical model. A follow-up visit reported that the farmer considered the sampled animal to have been 'bullish' in temperament and appearance. The farm kept good medicines records, and there was no evidence of abuse. Five follow-up samples tested compliant.

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 nineteen male bovine urine samples at a concentration greater than the laboratory's tentative Upper Limit of Normality. It was established that at least eleven of these animals had almost certainly been bulls, or had been incompletely castrated. Guidance was issued to herd keepers on castration, and stock registration with the APHIS database. In three of these eleven animals, high testosterone was accompanied by oestradiol above the laboratory's tentative Upper Limit of Normality. One sample also contained α -boldenone (see below). A further four males were probably completely castrated, and it was speculated that the stress of gathering one indoors the day before slaughter had contributed to its high result. Follow-up samples tested compliant. Investigation of the remaining three male urine results is underway.

3. Oestradiol. Oestradiol is a naturally-occurring female hormone. It is illegal in the EU to administer oestradiol to food-producing animals to promote growth. Oestradiol was detected in a seven year old breeding bull above the laboratory's tentative Upper Limit of Normality. This animal's fertility had been in doubt, and it was speculated that the test result could have been caused by a testicular tumour. Oestradiol was also found above this tentative limit together with high levels of testosterone in urine samples from six other male

cattle, three of which were probably bulls (see above). The sample from the fourth animal also contained β -boldenone (see below). Only high oestradiol was found in a subsequent sample from this animal; investigation into this result continues and the herd remains flagged for follow up sampling at slaughter.

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. In 2007, α -boldenone was detected in three bovine & one ovine urine samples above the EU Action Limit for further analysis (2 ppb). One of the steer samples also contained testosterone and oestradiol above the laboratory's tentative Upper Limits of Normality. Further analysis found high levels of bound and free β -boldenone, suggesting that all four results were a result of faecal contamination of the sample.

5. 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 ten bovine and seven ovine urine samples. Three bovine samples were from steers; follow-up samples to two of these tested compliant, and the third case was an animal imported from Great Britain for slaughter (GB authorities were notified). Of the seven female bovine samples, it was established that five animals had been pregnant when sampled, one was slaughtered as a TB reactor, and the remaining one was a mature, breeding cow. These factors are likely to account for these results. Three of the ovine samples were from males. Follow-up samples to one of these cases contained β - and α -nortestosterone. Three ovine samples were of unknown gender; one of these also contained β -nortestosterone. (See also section 4.1).

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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 three 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. 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 sixteen male bovine urine samples at a concentration greater than the laboratory's tentative Upper Limit of Normality for steers. It was established that at least 12 of the animals had almost certainly been bulls. Guidance was issued to herd keepers on stock registration with the APHIS database, and follow-up samples tested compliant. One male had been castrated, and follow-up samples were compliant. Further samples are awaited from another farm. In two cases it was found together with oestradiol above the laboratory's tentative Upper Limit of Normality (see below); follow-up samples from these farms tested compliant.

3. Oestradiol. Oestradiol is a naturally-occurring female hormone. It is illegal to administer oestradiol in the EU to food-producing animals to promote growth. Oestradiol was detected in three male bovine urine samples above the laboratory's tentative Upper Limit of Normality; in two of these samples, testosterone was also detected above the laboratory's tentative Upper Limit of Normality. Follow-up samples from all three farms tested compliant.

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. Follow-up samples from this farm 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. Nortestosterone. Nortestosterone is a growth-promoting hormone. It is illegal to administer it to food-producing animals in the EU. This hormone is known to arise naturally in female ruminants during some reproductive stages, but was not considered to occur naturally in male cattle and sheep. Abattoir sampling of casualty bovine carcasses for hormone residues was started in early 2006 in Northern Ireland, and led to the finding of this hormone in a significant proportion of injured male cattle. This cohort had not previously been sampled for this hormone. In 2007, α -nortestosterone was detected in urine samples from 39 injured male cattle (β -nortestosterone was also detected in 3 of these). Confirmed positive male carcasses continued to be condemned until 23 March 2007, at which point DARD (in light of the evidence noted in the 2006 commentary) discontinued the routine sampling of all injured animals and OFES carcasses at abattoirs for nortestosterone. All follow-up samples were confirmed as compliant. α -Nortestosterone was detected in a urine sample from a male bovine for which only a swelling over the shoulders was reported at *ante mortem* meat inspection. This animal had been imported from the Republic of Ireland for slaughter, and the result was notified to ROI authorities.

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 three cattle. Follow-up investigations reported inadequate medicines recording in all three cases. One sample was from an animal slaughtered the day after it was bought at a market. The vendor had treated it two weeks earlier but had not recorded this. Another result was from an animal for which hepatic fascioliasis (liver fluke lesions), multiple carcass injection sites and a low carcass weight were recorded at meat inspection. This farmer did not record treatments, and had recently expanded his operation. The third animal was found recumbent in the abattoir lairage, and arthritis was recorded at post mortem inspection. This farmer reported that he had previously treated the animal with another medicine, but did not write it down and did not understand the computerized farm records kept by another family member. All three farmers were instructed to maintain adequate medicines records and ensure that they complied with relevant withdrawal periods. Note: "Food Chain Information": In 2010, food safety regulations already being implemented for chickens and pigs will be extended to cattle, whereby vendors will be required to forward their animals' medicines records to the abattoir.

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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).

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 range of species, including injectable, in-water and in-feed preparations for pigs. It is nearly always given in combination with trimethoprim (several preparations with withdrawal times between 5 and 10 days). It was detected at levels above the MRL in 9 Phase 1 kidney samples from 5 different producers. Good medicines recording was reported at follow-up visits to 4 NI producers, but one of these had used a medicine prescribed by a RoI-based veterinary practitioner that is unlicensed in the UK (Sultrim, Olab 10d withdrawal time). Feed line breakdowns and/or errors may have resulted in medicated feed intended for other stock being fed to fatteners in 3 of these cases. One farm reported not having used this medicine; the source of the residue remains unknown. The fifth producer was in the Republic of Ireland; RoI authorities were notified. These farms were allocated to Phase 2 sampling which was completed for 3 producers by mid 2008; these 3 were returned to Phase 1 sampling.

2. Chlortetracycline. Chlortetracycline is an antibiotic that is licensed for in-feed use in a range of species, including pigs (Several preparations exist, with withdrawal times between 10 and 14 days). It was detected at levels above the MRL in two Phase 1 kidney samples from different producers. Follow-up visits reported that one farm was using the same feed line for different animal stocks, with the potential for diet mixing. The other farm filed feed prescriptions but was not recording individual treatment episodes; and it was speculated that this could have resulted in medicated feed being given to fatteners. These producers were allocated to Phase 2 sampling which was completed by mid 2008; these producers were returned to Phase 1 sampling.

Previous Phase 1 producers still on Pigs Testing Scheme Phase 2

In 2006, Phase 2 sampling and testing was delayed. By the end of 2007, all outstanding Phase 2 sampling in respect of 6 Phase 1 positive results from 2006 and 2005 was completed; the six producers were returned to Phase 1 sampling.

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