

**SURVEY FOR SPONGIFORM ENCEPHALOPATHY IN HOUNDS
REPORT TO THE SEAC**

INTRODUCTION

1. The report of the Working Party on BSE stated page 13, para 5.2.4, line 14 "..... surveillance of the health of domestic pets are items that should be brought to the attention of the Consultative Committee on Research and the veterinary profession. Hounds that are often fed uncooked carcasses would particularly be appropriate for study". On page 20, para 8.5.2 (iv) the report states that one of the "areas of research which the Working Party believes should be considered is "the possibility of formal monitoring of the health of pigs and domestic pets".
2. The interim report of the Consultative Committee on Research into SEs also referred to hounds (page 11, para A3a) -

Monitoring the health of other species fed offal, carcasses or meat and bone meal; principally pigs, domestic cats and dogs, poultry Formal study might be possible on animals with particularly high exposure, such as hounds traditionally fed fallen livestock".

This monitoring was included in the highest priority classification.

3. These recommendations have been implemented in the following ways:-
 - A. General monitoring of the health of dogs and hounds by:-
 - the private veterinary practitioner network (almost 100% clinical)
 - the veterinary schools (clinical and pathological)
 - private veterinary laboratories (pathological)
 - MAFF (VIC's, CVL, Lasswade) (pathological)
 - B. A specific survey of hound packs.

The following is a summary of the findings to date (November 1993) with options for further study.

RESULTS

A - MONITORING

1. There has been no report of a naturally occurring scrapie-like transmissible spongiform encephalopathy in the canine species in the veterinary literature anywhere in the world since 1980.

2. We do not know how many adult dogs with neurological signs which might result from TSE have been submitted by practitioners or owners to veterinary schools or laboratories for clinical examination and necropsy, or necropsy alone, but 12 brains from such animals are known to have been examined in MAFF Veterinary Investigation Centres since 1980, and no diagnosis of a scrapie-like SE has resulted.

B - SURVEILLANCE

1. A survey of brains from culled hounds in packs throughout GB was conducted during 1990 and 1991, the brains being examined at the Thirsk VIC. The report of that study is appended. The following is a brief summary:

- i. 441 brains were examined by conventional light microscopy. No positive histological diagnoses were made.
- ii. 410 brains were examined by electron microscopy for the presence of fibrils characteristic of scrapie-like diseases. None were found.
- iii. Three pools of brains of various diagnostic categories:
 - negative EM/negative histology;
 - inconclusive EM/negative histology;
 - inconclusive EM/unresolved histology

were examined by Western blotting using three anti-PrP sera. There was no convincing evidence of binding to any of the three extracts of hound brain.

2. The study suffered from a number of weaknesses, including:

- inadequate clinical neurological study of cases;
- poor quality of the material submitted (damage and/or autolysis)
- absence of negative controls
- spinal cords not collected
- absence of positive controls, and of anti dog PrP sera.

As a result there were 19 inconclusive EM diagnoses, 45 inconclusive histological diagnoses and 155 unresolved histology diagnoses.

3. Some brains presented alternative diagnoses or other lesions of interest (eg 28.4% contained suspected Toxoplasma gondii cysts; and vacuolar change was observed in the medulla of some), some of which would have merited further study had the preservation of tissue been satisfactory.

DISCUSSION

1. A meeting of officials was held on 1 November 1993 to discuss the results of the hound survey. The following conclusions were drawn:

- Lesions consistent with a diagnosis of a scrapie-like spongiform encephalopathy had not been identified.
- The significance of some lesions found in some brains was uninterpretable, and some additional study should therefore be considered. Potential studies that might be of value included:-

a) Attempts to transmit disease to mice

Transmission of a scrapie-like disease would probably necessitate further research, even if the strain typing characteristics were not typical of BSE. It was recognised that if no transmission to mice occurred it would not prove that the canine brains used were uninfected. Attempted transmission to dogs would eliminate the species barrier but is nevertheless not considered to be justified at present.

A suggested draft experimental design would use brains from three unrelated hounds of different ages, from different parts of GB, which each had 'lesions' furthest removed from the negative end of the diagnostic spectrum. These would be chosen by the VIO at Thirsk VIC in consultation with CVL staff and would be inoculated into the full panel of mice at NPU. The presence of suspected Toxoplasma gondii in just over a quarter of all brains, and the probability that only formalin-fixed brain is available were noted. Three brains from the negative end of the diagnostic spectrum would also be selected, and retained as controls for later transmission studies if required.

- b) Collection of control CNS tissue of high quality from 2/3 year old and 6/7 year old dogs, to establish the normal histological profiles at pre-determined anatomical sites and the presence or absence of fibrils by electron microscopy. Whilst this might enable some further interpretation of the brain material collected during the survey the main purpose would be to establish a baseline for comparison with any brains submitted in the future from dogs suspected to have a scrapie-like disease. Possible sources of control brains have been investigated and some progress has been made. These would be subjected to EM and microscopic examination, the former at CVL, the latter at Thirsk.

2. Should study 1a prove positive animal and public health must be protected and any new infections (excluding direct hound to hound transmission if it occurred) must be prevented.

To this end the following was confirmed to be the current situation:

- SBO cannot be fed to hounds or dogs (SBO ban from September 1990)
- Almost without exception, the carcasses of hounds and dogs are not rendered: they are either incinerated or buried.
- Hounds and dogs are not used to prepare biological materials or for food, processed or otherwise.

On this basis any risk of transmission of TSE infection from a dog to any other species was considered negligible.

REQUEST

The SEAC is invited to:

1. Comment on the hound report.
2. Comment on the adequacy of the present surveillance of hounds and dogs for SE and even though we have no evidence of any positive diagnosis of a TSE in canidae, to consider whether a questionnaire survey of veterinary schools and private laboratories should be carried out to confirm the accuracy of this information.
3. Consider and recommend one of the following options:
 - a) do nothing further;
 - b) conduct one or both of the studies described in para 1a or 1b of the discussion above;
 - c) conduct other studies (if so, what studies?).

In order to fund any studies which the committee may recommend it may be necessary to discontinue some research which is already in progress.

4. Agree that current statutory and voluntary animal and public health controls are adequate to prevent any hypothetical risk from TSE infection in hounds or dogs.
5. If transmission studies in mice are recommended, agree that after selecting three brains for retention as controls and three for inoculation, the remainder be disposed of by destruction or submission to other bona fide institutes for further studies connected, or unconnected, with TSE diseases.

Animal Health and Welfare Veterinary Group
Tolworth
24th January 1994

SEAC 16/4
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HOUND SURVEY

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BACKGROUND

In its report dated June 1989, the Consultative Committee on Research into Spongiform Encephalopathies (Tyrrell Committee) commented that whilst natural spongiform encephalopathies had not been recognised in domesticated species other than cattle, sheep and goats, other species might prove susceptible to the unconventional agent of bovine spongiform encephalopathy (BSE). The Tyrrell Committee recommended that the health of animals fed offal, carcasses or meat and bone meal, principally pigs, domestic cats and dogs, and poultry, should therefore be monitored.

As a consequence of that recommendation, it was decided that the State Veterinary Service should undertake a survey of hound packs as these represented a group of animals which were often fed bovine/ovine offals and meat and could therefore have been inadvertently exposed to the BSE agent in recent years.

Approximately 300 hound packs are thought to exist in Great Britain. Of these 250 are Foxhound packs and the remainder comprise packs of Beagles, Bassetts, Deerhounds, Staghounds, Draghounds and Fell packs.

Young hounds enter packs at approximately nine months to one year of age and have an expected working life of 7-9 years. Accurate data is not available on mortality rates in hounds but it is estimated that there is an annual replacement rate of approximately 20%. The first major culling period is between 2-4 years of age, predominantly because of behavioural problems (colloquially known as "wickedness") i.e. hounds fail to chase foxes, are generally disobedient, or fail to bay/bark. Thereafter pack numbers remain relatively static until old dogs 7-10 years of age are replaced by younger recruits. Culling usually takes place towards the end of the hunting season, generally March to June. A small number of hounds may die or be destroyed as a result of accidents and disease.

The diet of hound packs will vary considerably, depending on local condition and food availability. Most hound packs are fed on raw or cooked meat obtained from carcasses of fallen farm livestock, mainly cattle and sheep with some horse and goats. Bones and offals from these animals usually go direct for rendering. Offals and meal may be fed, particularly when fallen carcasses are in short supply.

THE SURVEY

The purpose of the survey was to examine the brains of all hounds over two years of age, which died or had to be destroyed, for histological evidence of spongiform encephalopathy (SE) and for scrapie associated fibrils (SAF) by electron microscopy. With the agreement of the Hound Pack Associations, Masters of Hounds in charge of individual hunt kennels agreed to notify their local Animal Health Office (AHO) whenever a hound had died or was due to be culled for any reason. The Divisional Veterinary Officer (DVO) then arranged for a field Veterinary Officer (VO) to visit the kennel as soon as possible to humanely euthanase any live cull animals and arrange transport of all carcasses to the nearest Veterinary Investigation Centre (VIC). Under no circumstances were live

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71/3

hunt

hounds to be removed from ~~hound~~ kennels. A form VISE 2 (Appendix 1) was completed by the VO, giving details of the animal's age, sex, hound type, duration in pack, previous history, diet, and present clinical condition with particular emphasis on any neurological signs. A unique hound survey number, prefix HSE, was allocated to each hound carcase.

On receipt of the carcase at the local VIC, the whole brain was removed as soon as possible and placed in approximately 10 times its volume of 10% formal saline. After a minimum one week period of primary fixation, all brains were forwarded to Thirsk VIC for light microscopic examination by a designated Veterinary Investigation Officer (VIO) with specialist histopathology training to try to ensure standardised histological assessment.

For SAF studies, approximately 10 cms of unfixed cervical spinal cord posterior to the atlanto-occipital junction, was collected at necropsy and sent either chilled or frozen to Central Veterinary Laboratory (CVL) Weybridge for examination by electron microscopy. After testing, any residual spinal cord was retained by CVL at minus 70°C for possible protease resistant prion (PrP) detection by immuno blotting technique.

Spinal cord was not collected for histological examination.

At Thirsk VIC each whole brain was sliced transversely at 5 mm intervals and any gross lesions noted. Any physical trauma or mutilation accidentally caused during brain removal was noted, particularly if it involved proposed examination sites. Five standardised neuro-anatomic sites were selected for processing.

- i) Medulla oblongata at the level of obex.
- ii) Medulla oblongata through caudal cerebellar peduncles to include vestibular nuclei and reticular formation.
- iii) Sagittal cerebellum.
- iv) Mid-brain to include superior colliculus and red nucleus.
- v) Cerebrum through frontal cortex to include basal ganglia.

Secondary fixation was carried out for one week on an orbital shaker to enhance penetration.

Standard histological processing and staining was carried out as for suspect BSE bovine brains.

DIAGNOSTIC CRITERIA

A scrapie-like SE had never been identified in dogs. The following guidelines were therefore proposed, based on the accumulated knowledge of scrapie/BSE and the very recent but limited experience of feline spongiform encephalopathy (FSE).

POSITIVE: open to the histopathologist's interpretation for SE in general, depending on vacuolation, astrocytosis and amyloid plaque formation. Vacuolation would be likely to affect grey matter neuropil and neuronal perikarya with a systematic and usually bilaterally symmetrical distribution.

NEGATIVE: Absence of significant spongiform lesions or other vacuolar change.

INCONCLUSIVE: Inadequate submission of material such that some target sites were either physically damaged or absent, or autolytic changes were too advanced for accurate histopathological interpretation.

UNRESOLVED: A fourth category had to be added to cover cases in which target sites were not mutilated, absent, or autolysed, but in which there was evidence of vacuolar change of unknown aetiology and indeterminate pathogenesis. Selected cases were subsequently referred to pathology department CVL for more detailed histological evaluation.

ELECTRON MICROSCOPY FOR SCRAPIE ASSOCIATED FIBRILS (SAF)

Since first reported by Merz and Co-workers (1981) SAF are a consistent feature of transmissible spongiform encephalopathies due to unconventional pathogens or "prions." They are demonstrated by transmission electron microscopy (TEM) in detergent treated extracts of affected brain. SAF have been reported in natural scrapie (Dawson and Others 1987, Gibson and Others 1987, Rubenstein and Others 1987, Scott & Others 1987) as have similar fibrils in BSE (Scott and Others 1990) and FSE (Wyatt and Others 1990, Pearson & Others in press). For TEM 1gm samples of cervical spinal cord were extracted by modification of the method of Hilmert and Diringer (1984) as described by Scott & Others (1987). The grids were examined by a Philips 410 LS transmission electron microscope at magnifications above 25,000 and at an accelerating voltage of 80 kv. Each grid was examined for a minimum of 20 minutes.

DIAGNOSTIC CRITERIA

POSITIVE: Presence of fibrillar material typical of that encountered in cases of BSE/scrapie.

NEGATIVE: Absence of fibrils.

INCONCLUSIVE: Presence of fibrillar material of indeterminate composition.

Results of individual histological and SAF examinations were forwarded when available to Senior Veterinary Officer (SVO) Tolworth who evaluated all relevant case data. The overall result for each hound submission was passed back to the local DVO who subsequently informed the Master of Hounds at the submitting hunt kennel.

RESULTS

The Hound Survey ran from October 1990 to August 1991. During 1990, 91 hounds were submitted with a further 353 during 1991, giving a total of 444 brains for examination. Monthly submission rates and percentages are shown in appendix 2. All except six hounds which died naturally were euthanased by intravenous injection of pentobarbitone. The geographical distribution of submissions based on AHO location is shown in appendix 3. Clinical histories as stated on the VISE 2 form are summarised in appendix 4. Hound type, sex and age distribution are shown in appendices 5, 6, and 7. Details of the diet being fed at the 101 participating hunt kennels are shown in appendix 8. The number of hounds received at VICs and their submitting AHOs are summarised in appendix 9.

Light microscope observations were made in each case without prior knowledge

of the results of TEM and vice versa.

Results of histopathological and SAF examinations are tabulated in appendix 10. These have also been summarised by month (table 1) and by year (table 2). An overall summary sheet detailing all hound submissions for each AHO is shown in appendix 11.

PATHOLOGICAL OBSERVATIONS

Significant gross lesions were not detected with the exception of mild hydrocephalus in two brains (91/75 and 91/206).

Based on the criteria previously outlined for SE, no positive histological diagnoses were made in any of the 441 hound brains examined. An overall negative diagnostic rate of 54.3% was established. The reasons for inconclusive histological cases (10.1%) are summarised in table 3. Diffuse white matter vacuolation and intramyelinic oedema of unknown pathogenesis was recorded in one inconclusive case (91/202).

The unresolved category had to be used in 155/441 animals (34.9%). In these brains a variable degree of vacuolar change was present predominantly involving gracile, cuneate, accessory cuneate and lateral reticular nuclei of the medulla oblongata, often with some degree of symmetry. Much of this vacuolar change was clearly artefactual and associated with more generalised features of sub-optimal tissue preservation but the degree of autolytic change was judged insufficient to invoke the inconclusive category. Whilst most of the vacuoles appeared to be perineuronal, others were definitely located within the perikaryon. Vacuolation of perikarya in some instances and eosinophilic spheroid-like bodies indicating neuronal degeneration, probably represented an authentic pathological process, but they were not accompanied by detectable glial changes, nor other evidence of a systematic SE. Although vacuolation of neuropil was concentrated in the same anatomical areas of the medulla, there was frequently widespread/generalised distribution of sparse vacuoles in grey and white matter throughout the brain.

Amyloid deposits were not detected in any of the brains by birefringence in polarised light or by the use of specific Benhold's congo red staining.

Analysis of these unresolved histological cases by age and breed of hound is shown in appendix 12.

A common microscopic finding (28.4%) associated with gracile and cuneate nuclei was the presence of small numbers of protozoan bodies morphologically resembling *Toxoplasma gondii*. In most cases no host cellular response was observed. In some instances, however, these parasites showed degenerative change, possibly associated with aging or host immunological response which further complicated accurate interpretation of the previously described vacuolar and neurodegenerative changes in the medulla. The seven cases of sub-acute to chronic non-suppurative encephalitis could have been related to this toxoplasma infection but recognisable protozoan parasites were not *always* usually identified within the inflammatory and degenerative foci. In only one of these animals (90/80) was the histological findings of encephalitis related to clinical neurological signs of blindness. Analysis of all cases where

toxoplasma cysts were visible shows an almost even distribution, between negative and unresolved histological categories (appendix 13).

Three Basset hounds (91/246, 247 and 249), showed a diffuse encephalopathy with prominent intracytoplasmic basophilic inclusion bodies in many neurones and glial cells and apparent loss of cerebellar Purkinje cells. Special stains showed that these structures were periodic acid-Schiff (PAS) and Alcian blue positive and stained metachromatically with toluidine blue. On the basis of these findings, a diagnosis of Lafora's disease (Holland and Others 1970, Jian and Others 1990) was made although no clinical ^{signs} had been reported.

ELECTRON MICROSCOPY FOR FIBRILS

SAF results are summarised in table 2. Overall 88.3% of hound brains were negative for SAF based on single spinal cord sample examination. In 7.4% of cases material was not submitted for examination at CVL. In the remaining 4.3% representing 19 cases ~~in~~ there was an inconclusive result. The fibrils observed were generally slightly narrower than conventional scrapie/BSE fibrils but in other respects closely similar. In all cases they were present in low concentrations. They could be differentiated from systemic amyloid and paired helical filaments of Alzheimer's disease.

Cases with inconclusive fibril results were only seen in hounds aged seven years or older, with the majority occurring in eight or nine year old animals (table 4). When breed incidence was examined (Foxhound 11, Beagle 7, Harrier 1) Beagles appeared somewhat over-represented.

When these cases were compared with the corresponding light microscope findings there was no absolute correlation with fibril detection (table 5), although the majority of cases did fall into the unresolved ^{histological} category. However fibrils were not detected in the remaining 141 unresolved histological cases.

IMMUNO BLOTTING STUDIES

Immuno-blotting of hound brain extracts was performed at CVL using pooled surplus cervical spinal cord as follows:-

Pool H+ = brains scored inconclusive by EM and unresolved histopathology.
Pool H? = brains scored inconclusive by EM and histopathology negative.
Pool H- = brains scored negative by both EM and histopathology.

Brain from a confirmed BSE case labelled B+ served as a positive control.

All four extracts (B+, H+, H?, and H-) were blotted and probed separately with each of four rabbit antisera.

1. Pre-immune rabbit sera.
2. Serum 1B3 ex neuropathogenesis unit (NPU) raised against mouse PrP.
3. Serum SP40 ex Institute of Psychiatry raised against sheep PrP peptide sequence.
4. Serum 6/N/Po ex Pocchiari raised against hamster PrP.

RESULTS

The three anti-PrP sera all bound to the extract of BSE affected brain, but there was no convincing evidence of binding to any of the three extracts of hound brain. This exercise therefore failed to provide conclusive evidence of the existence of SE related PrP in any of the hound spinal cord samples assayed.

DISCUSSION

The objective of the survey was to determine whether a previously unrecognised transmissible SE existed in hounds. Histopathological changes consistent with a florid SE similar to that recently reported in cats (Wyatt & Others 1990, 1991, Leggett & Others 1990) were not observed.

Interpretation of the light microscopic observations was limited by the design of the survey and resulted in the high percentage of unresolved/inconclusive cases. Inadequacies of design were firstly that no control material from hounds housed and fed under different environmental conditions was available. Secondly, that spinal cord was not collected to complete histopathological examination of the central nervous system. Thirdly, that the method of sampling and primary fixation was inadequate for critical assessment of any pathological vacuolar change which was most pronounced at the level of obex, a neuro-anatomical site often of particular importance in SE diagnosis. In the first half of the survey, insufficient priority was given to the rapid removal, careful handling and prompt primary immersion fixation of brain. As a direct consequence, gross physical damage to the brain and widespread artefactual microscopic changes were commonly encountered. In an effort to overcome this, more detailed instructions emphasising the need for rapid removal and prompt fixation of brain were issued in March 1991 including recording of exact time intervals between euthanasia and brain removal and subsequent immersion in fixative. This latter request was clearly frequently not always carried out or the data incompletely or inaccurately recorded, resulting in only a marginal improvement in the quality of formalin fixed brain tissue received at Thirsk VIC during the second half of the survey. Handling artefact may also have contributed to the occurrence of vacuolar changes observed in the obex.

An analysis of the degree of histological artefact in those brains from multiple submissions of carcasses to local VICs (appendix 14) showed a high percentage of unresolved/inconclusive histological cases among them, suggesting common causative factors within such batches (appendix 15). There were four such multiple submissions where 100% of cases were unresolved/inconclusive on histopathology.

The majority of post-mortem change was attributable to the period up to primary fixation. Prolonged secondary fixation appeared to have no beneficial effect when attempted in a small number of cases. The undertaking not to remove live hounds for euthanasia at local VICs where immediate brain removal and fixation could have been carried out proved therefore an unsurmountable handicap in the design of the survey. Only in those brains where primary fixation was judged satisfactory could interpretation of any

vacuolation or neurodegenerative change be facilitated. Despite these reservations, there was a small number of hound brains which did show genuine vacuolation with some intraneuronal vacuoles which could not be ascribed to artefact.

A review of relevant published veterinary literature would also have been pertinent when planning the survey. Hound ataxia, a condition of unknown aetiology has been recognised for many years in Foxhound, Beagle, and Harriers fed an almost exclusive diet of ruminant fore stomachs (Palmer and Others 1984). Clinically affected hounds showed weakness and hindlimb incoordination. Pathologically, Wallarian type degeneration was reported in spinal cord white matter especially at the cervical and thoracic level. Secondary and relatively mild white matter degeneration occurred in ascending tracts of medulla oblongata and mid-brain, particularly medial lemniscus, medial longitudinal fasciculus, spinothalamic, and spinocerebellar tracts. A further report (Palmer and Medd 1988) indicated that hound ataxia had spontaneously disappeared in one hunt kennel after a change to a mainly meat-based diet, possibly suggesting a nutritional deficiency. A recent detailed clinical, biochemical and neuropathological study of ataxia in Irish Foxhounds and Harriers (Sheahan and Others 1991) classified the pathological lesion as a spinal myelinopathy. There was again a clear association with the feeding of ruminant fore stomach and biochemical data implicated methionine deficiency as the likely cause. In the present Hound Survey, the neurodegenerative changes detailed earlier in the medulla are not those described in hound ataxia/spinal myelinopathy, but the failure to examine spinal cord renders any accurate interpretation impossible. The pathogenesis of the neurodegenerative changes identified could not be determined within the limitations of the present survey but they may represent age-associated or incidental pathology. Their clinical significance must remain unknown since there was no thorough clinical neurological examination prior to euthanasia.

The role of toxoplasma infection in some of these changes is also unknown. The common observation of toxoplasma cysts was to be expected, given the dietary exposure to uncooked meat from grazing livestock. Since most hound packs are protected against canine distemper virus by regular vaccination it is tempting to implicate toxoplasma in the pathogenesis of non-suppurative encephalitis although protozoan bodies were not always recognisable in the inflammatory lesions. The fairly even distribution between negative and unresolved histological categories suggests that the role of toxoplasma in exacerbating non-specific vacuolar change in the brain stem was not important.

As in the light microscope study, the absence of suitable control material for TEM fibril detection was a handicap. Fibillar material of unknown significance was detected in 19 cases (4.3%) from 15 different hunt kennels.

The correlation between the small number of inconclusive fibril cases and the unresolved histological category was incomplete since fibrils could not be detected in the remaining 141 unresolved histological cases. There was no obvious explanation for either clustering of cases with inconclusive fibrils in the earlier part of the survey or the age incidence (seven years plus).

Although not part of the original survey protocol, some immuno-blotting

studies were subsequently carried out to try to resolve the nature of this fibrillar material. This exercise failed to provide conclusive evidence of the existence of SE related PrP in any of the hound spinal cord extracts assayed. However, without knowledge of canine PrP sequence, it is possible that the three antisera used (anti-mouse, anti-sheep, anti-hamster) would fail to recognise PrP in hound brain. After EM and immuno-blotting had been carried out on these equivocal cases, there was no fresh spinal cord material available for further tests. However detection of PrP might be attempted immunocytochemically on formalin fixed paraffin embedded material from this survey, but again would require technical development since no such work has been previously carried out in this species.

Material collected for the survey appeared to be geographically representative involving 101 hunt kennels in England, Wales and Scotland. Submissions were predominantly Foxhounds and Beagles with small unrepresentative numbers of the minor hound breeds. Age distribution correlated well with predicted or known hunt culling policies. Clinical histories were diverse but must be considered largely anecdotal in the absence of a thorough veterinary examination to include sound clinical neurological expertise. The large number of submissions with no specified clinical signs were presumably culls simply on the basis of age rather than disease.

The ability to detect a potential SE in working hounds may be seriously compromised because of the vigorous culling programme usually operated in hound packs. Any incipient SE affecting performance would almost certainly result in early disposal from the pack at a stage when the condition could be poorly manifest clinically and pathologically. This is in contrast to the situation which would pertain in companion cats and dogs, where owners would seek veterinary advice and the case would be monitored through a substantial part of the clinical course. At death or euthanasia in such cases there would therefore be a far greater probability of detecting the disease.

SUMMARY

A total of 444 hound brains of mixed breeds from 101 hunt kennels widely distributed through England, Wales and Scotland were collected during October 1990 - August 1991. Histological examination of formalin fixed brain failed to reveal evidence of a florid SE likely to be associated with infection by an unconventional BSE/scrapie agent. 54.3% of brains examined were negative and 10.1% inconclusive due to autolysis or damage to target sites. Vacuolar changes involving certain anatomic nuclei in the medulla were commonly observed but were impossible to interpret because of sub-optimal tissue preservation and/or intercurrent neurodegenerative changes of unknown pathogenesis. As a result 34.9% of cases had to be classified as histopathologically unresolved.

EM studies of cervical spinal cord revealed fibrillar material of unknown composition and significance in 4.3% of cases. Immuno-blotting of selected cases including those with fibrillar material and/or unresolved pathology failed to detect PrP. Serious flaws in the design of the survey included the absence of control material, failure to examine spinal cord histologically, and excess artefactual vacuolation arising directly from inadequate care in handling of brain tissue and frequent delays in primary fixation.

RECOMMENDATIONS

1. Because of the inadequacies of fixation already highlighted, it is unlikely that a further more detailed histological study of the formalised brain material collected in this survey is warranted.
2. Further work to define the nature and significance of fibrillar material recognised by TEM may be warranted. Alternatively immunoperoxidase techniques for PrP detection in situ could be pursued on the formalised paraffin wax embedded material, particularly in unresolved histology/inconclusive fibril cases. However the sensitivities of this method used in other species are very variable and often do not detect PrP convincingly where it is present in low concentrations. Furthermore the technique requires development for use in the dog and thus far there is no positive control in this species. No fresh material remains for further fibril studies or transmission experiments. A third option would be to attempt mouse transmission (intracerebral and intraperitoneal routes) using residual formalised tissue pooled from inconclusive fibril/unresolved histology cases.
3. Any proposal to carry out a future survey for novel SE in domesticated animals must take full account of the lessons to be learned from this hound survey.
 - a) A histological component in such a study would be essential, but cannot achieve its aims unless greater attention is paid to the collection of artefact-free formalin fixed tissue. Ideally this would involve perfusion techniques but if impractical, non-traumatic euthanasia must be followed by rapid brain removal and immersion fixation within minutes, using well-trained staff under direct veterinary supervision.
 - b) Spinal cord must be examined histologically to ensure a complete neuropathological assessment of the central nervous system.
 - c) The veterinary pathologist must have an appropriate level of expertise in neuropathology and have adequate laboratory technical resources.
 - d) Appropriate control material must be obtained.
 - e) Accurate clinical neurological examination prior to euthanasia should be an integral feature.
 - f) A small scale pilot study should be carried out to identify unforeseen factors, particularly subclinical neurodegenerative change, intercurrent neurological disease, and an assessment of artefactual changes in the central nervous system.
 - g) Fresh material must be collected for fibril detection, immuno-blotting and possible transmission studies.

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Spongiform Encephalopathy - Hound Survey

Head / Brain for examination

Please use BLACK INK and BLOCK LETTERS

Submitted to Veterinary Investigation Centre

Date received Laboratory Reference No.

Name and address of kennel

 Postcode

Veterinary Practice

Type of hound Age Sex

Duration in pack Origin

Died Destroyed Date

Clinical history and diet

Where fostered and diet

DVO notified Brain sent to Thirsk

Brain received at VIC

Date

Lab. Ref.

Result: BSE Positive
 (Tick appropriate box) Negative
 Inconclusive

Signature Date

Comment if applicable

For HQ (Tolworth) Use Only Tick appropriate box

Date report received YES NO

Signature Disease confirmed

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HSE SURVEY

APPENDIX 2

MONTHLY SUBMISSION RATE/PERCENTAGES

	Numbers	%
Oct 90	6	1.4
Nov	53	11.9
Dec	32	7.2
Jan 91	47	10.6
Feb	42	9.4
Mar	64	14.4
Apr	48	10.8
May	48	10.8
Jun	50	11.3
Jul	50	11.3
Aug	4	0.9
	—	—
TOTAL	<u>444</u>	<u>100%</u>

HSE SURVEY

APPENDIX 3

ANIMAL HEALTH OFFICES

No. examined. No. of Hunt Kennels

ENGLAND & WALES

Beverley	3	1
Caernarfon	11	3
Cardiff	12	2
Carlisle	5	2
Carmarthen	45	5
Chelmsford	6	2
Crewe	11	3
Dorchester	5	2
Exeter	29	7
Gloucester	12	2
Guildford	3	1
Huntingdon	22	6
Leeds	9	2
Leicester	8	3
Lincoln	4	2
Llandrindod Wells	3	1
Maidstone	5	2
Newcastle	10	7
Northallerton	12	6
Norwich	12	2
Nottingham	3	2
Oxford	15	3
Preston	17	3
Stafford	3	1
Taunton	48	6
Trowbridge	26	5
Truro	20	5
Winchester	37	4
Worcester	15	6

SCOTLAND

Dumfries	6	1
Galashiels	8	1
Inverness	7	2
Perth	12	1

444

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HSE SURVEYAPPENDIX 4CLINICAL HISTORY

No specified reason	218
Old age	76
Behavioural problems	67
Locomotor problems	35
Surplus to requirements	15
Poor body condition	13
Blindness	7
Tumours (various)	7
Dental problems/jaw abnormality	5
"Can't keep up with hunt"	5
Respiratory problems	3
Poor conformation	3
Suspect poisoning	3
Sudden death	2
Passing blood	2
Posterior ataxia	2
Nervous signs	1
Road traffic accident	1
Abscess	1
Peritonitis	1
Infertility	1
Hernia	1
Renal disease	1

HSE SURVEYAPPENDIX 5HOUND TYPE

	1990	1991	% overall
Foxhound	54	234	(64.8%)
Beagle	27	68	(21.4%)
Harrier	3	22	(5.6%)
Basset	3	5	(1.8%)
Welsh	2	6	
Buckhound	-	3	
Buckhound Cross (X)	-	4	
Basset X Beagle	-	1	
Beagle X	-	1	
Fell X	-	1	
Welsh X	-	4	
Sheepdog X	-	1	
Not specified	2	3	
TOTAL	<u>91</u>	<u>353</u>	

HSE SURVEY

APPENDIX 6

SEX DISTRIBUTION

	1990	1991	Overall	
FEMALE	48	185	233	(52.4%)
MALE	43	154	197	(44.5%)
NOT SPECIFIED	-	14	14	(3.1%)
	<u>91</u>	<u>353</u>	<u>444</u>	<u>100%</u>

BOV 92 H

HSE SURVEY
APPENDIX 7
AGE DISTRIBUTION

	1990	1991	<u>Overall</u>	<u>%</u>
Less than 1 year	1	0	1	0.2
1 year	0	8	8	1.8
2	11	40	51	11.5
3	8	52	60	13.5
4	9	33	42	9.5
5	9	25	34	7.7
6	12	39	51	11.5
7	15	49	64	14.4
8	15	45	60	13.5
9	8	24	32	7.2
10	1	11	12	2.7
11	0	8	8	1.9
12	-	4	4	0.9
13	-	1	1	0.2
17	-	1	1	0.2
'Aged'	2	-	2	0.4
Not specified	-	13	13	2.9
TOTAL	<u>91</u>	<u>353</u>	<u>444</u>	<u>100%</u>

HSE SURVEYAPPENDIX 8DIET OF SUBMITTING KENNELS

Raw meat	34
Raw meat/offal	17
Meat (Unspecified)	12
Offal	5
Fallen stock (unspecified)	10
Raw/cooked meat	12
Raw/cooked meat/offal	1
Cooked meat	3
Cooked meat/offal	2
Swill/raw meat	2
Dried meat	2
Proprietary dog food	1
Waste catering food	5
Fish farm waste	1
Dry feed	1

HSE SURVEYAPPENDIX 9VIC SUBMISSIONS

<u>ENGLAND & WALES VIC</u>		<u>ORIGINATING AHO</u>
Aberystwyth	10	Carmarthen
Bangor	11	Caernarfon
Bristol (Langford)	82	Dorchester, Gloucester, Taunton, Trowbridge
Cambridge	28	Chelmsford, Huntingdon
Carmarthen	50	Cardiff, Carmarthen, Llandrindod Wells
Lincoln	4	Lincoln
Newcastle	10	Newcastle
Norwich	12	Norwich
Penrith	5	Carlisle
Preston (Barton Hall)	17	Preston
Reading	15	Oxford
Shrewsbury	14	Crewe, Stafford
Starcross (Exeter)	29	Exeter
Sutton Bonington (Nottingham)	12	Leeds, Leicester, Nottingham
Thirsk	23	Beverley, Leeds, Northallerton
Truro	20	Truro
Winchester	40	Guildford, Winchester
Worcester	24	Gloucester, Worcester
Wye	5	Maidstone
<u>SCOTLAND</u>		
Auchincruive	6	Dumfries
Inverness	7	Inverness
Perth	12	Perth
St. Boswells	8	Galashiels
TOTAL	<u>444</u>	

BOV 92 H

HOUND SURVEY 1990
APPENDIX 10

Histology

N = Negative
IC = Inconclusive (autolysis or mutilation)
NR = Not Received
UR = Unresolved

SAFs

N = Negative
IC = Inconclusive

T = Toxoplasma

RESULTS

<u>MONTH</u>	<u>HSE REF 90/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>
OCT	1	Dorchester	N	N
	2	"	N	N
	3	"	N	N
	4	Gloucester	N	N
	5	Trowbridge	N	N *
	6	Inverness	N	N
NOV	7	Worcester	N	N
	8	Huntingdon	IC	N *
	9	Winchester	N	N
	10	"	N	N
	11	Carmarthen	N	UR *
	12	Huntingdon	N	N *
	13	"	N	N *
	14	"	N	N *
	15	Newcasatle	IC	UR *
	16	Chelmsford	N	IC
	17	Newcastle	N	N
	18	Gloucester	IC	UR *
	19	Exeter	IC	UR *
	20	"	IC	UR *
	21	Huntingdon	N	N
	22	Gloucester	N	N
	23	"	N	N
	24	Newcastle	IC	N
	25	"	N	UR
	26	"	N	N
	27	Cardiff	N	N
	28	"	N	UR
	29	"	N	UR
	30	Northallerton	N	UR
	31	"	N	IC
	32	Worcester	N	N
	33	Leeds	N	N
	34	"	N	N
	35	Oxford	N	N
	36	"	N	N
	37	"	N	UR
	38	Chelmsford	N	UR
	39	"	N	N
	40	Lincoln	N	N
	41	"	N	N
	42	"	N	N
	43	Perth	N	N
	44	"	N	N

Enceph
T
T

T
T
T

T
T

NOVEMBER (Contd.)

45	Taunton	IC	UR *
46	"	IC	UR *
47	Taunton	IC	UR *
48	"	N	N
49	"	N	N
50	"	N	N T
51	Exeter	NR	IC
52	"	NR	IC
53	"	NR	IC
54	"	NR	N
55	Crewe	NR	N
56	"	NR	N
57	"	NR	N T
58	"	NR	N
59	Maidstone	NR	N
60	Chester	N	UR
61	"	N	UR T
62	Huntingdon	NR	N
63	Carmarthen	N	UR
64	"	N	N
65	Truro	N	UR T
66	"	N	N T
67	Trowbridge	N	UR T
68	Leicester	N	N T
69	"	N	N
70	"	N	N T
71	Maidstone	N	N
72	"	N	N
73	Worcester	N	UR
74	Taunton	IC	UR T
75	"	N	UR T
76	"	N	UR T
77	"	N	UR * T
78	"	N	UR T
79	"	N	IC
80	Truro	N	N T Enceph
81	"	N	N
82	"	N	UR
83	"	IC	UR T
84	Llandrindod Wells	N	N
85	" "	N	N T
86	" "	N	N T
87	Perth	N	N
88	Northallerton	N	N
89	Huntingdon	N	N T
90	Exeter	NR	IC
91	"	NR	UR T

DECEMBER

HOUND SURVEY 1991 APPENDIX 10 (Contd.)

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>		
<u>JANUARY</u>		1	Caernarfon	IC	UR	T	
		2	Gloucester	N	N	T	
		3	"	N	N	T	
		4	"	N	UR	T	
		5	"	N	UR		
		6	"	N	N	T	
		7	Carmarthen	N	N	T	
		8	"	N	N		
		9	"	N	UR		
		10	"	N	UR		
		11	"	N	N		
		12	"	N	N		
		13	"	N	UR	T	
		14	Huntingdon	N	IC	T	
		15	"	N	IC	T	
		16	"	N	IC	T	
		17	Maidstone	N	UR	T	
		18	"	N	UR	T	
		19	Chelmsford	N	N		
		20	"	N	N		
		21	"	N	UR		
		22	Newcastle	N	N		
		23	Worcester	N	IC		
		24	"	N	IC		
		25	"	N	IC	T	
		26	"	N	IC	T	
		27	Preston	N	UR		
		28	"	N	UR	T	
		29	"	N	UR	T	
		30	"	N	UR		
		31	Gloucester	N	N		
		32	"	N	N		
		33	"	N	N		
		34	Galashiels	N	UR		
		35	"	N	UR		
		36	"	N	N		
		37	"	N	N	T	
		38	"	N	UR	T	
		39	"	N	UR		
		40	"	N	UR	T	
		41	"	N	UR		
		42	Huntingdon	NR	UR		
		43	"	NR	UR	T	
		44	"	NR	N		
		45	"	NR	NR		
		46	"	NR	NR		
		47	"	NR	NR		
	<u>FEBRUARY</u>		48	Worcester	NR	N	
			49	Lincoln	N	IC	
			50	Caernarfon	IC	UR	T
			51	"	IC	UR	T
			52	"	N	N	
			53	"	N	N	
			54	"	N	N	
			55	"	N	IC	
			56	Exeter	N	UR	

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>	
<u>FEBRUARY (Contd.)</u>	57		Exeter	N	N	
	58		"	N	UR	
	59		"	N	IC	
	60		"	N	IC	
	61		Leicester	N	N	
	62		Exeter	N	UR	T
	63		Leicester	N	N	
	64		"	N	N	
	65		Inverness	N	N	T
	66		"	N	N	T
	67		"	N	UR	T
	68		"	N	UR	T
	69		Stafford	N	N	T
	70		Winchester	NR	N	
	71		"	NR	N	
	72		"	NR	N	
	73		"	NR	UR	
	74		"	NR	UR	
	75		"	NR	N	Hydrocephalus
	76		Northallerton	N	UR	
	77		Carmarthen	N	N	
	78		"	N	N	
	79		"	N	IC	
	80		"	N	N	
	81		"	N	N	
	82		Preston	IC	N	T
	83		"	N	N	
	84		"	N	N	T
	85		"	N	UR	
	86		Northallerton	N	UR	T
	87		"	N	UR	
	88		"	N	UR	
	89		"	N	UR	T
	<u>MARCH</u>	90		Preston	N	T
		91		Winchester	N	UR
92			"	N	N	
93			Trowbridge	N	N	T
94			"	N	N	
95			"	N	UR *	
96			"	N	N	T
97			Carmarthen	N	UR	T
98			"	N	UR	T
99			"	N	IC	
100			"	N	UR	
101			"	N	UR *	T
102			"	N	UR *	
103			"	N	UR	
104			Stafford	N	N	
105			"	N	N	
106			Crewe	N	UR	
107			"	N	UR	T
108			"	N	UR	T
109			"	N	UR	
110		"	N	N		
111		"	N	N	T	
112		Cardiff	N	N		
113		"	N	N		

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>
<u>MARCH (Contd.)</u>		114	Cardiff	N	N
		115	"	N	N
		116	Exeter	NR	N T
		117	"	NR	UR
		118	Northallerton	N	IC
		119	"	N	N
		120	"	N	N
		121	Oxford	N	UR *
		122	"	N	N
		123	"	N	N T
		124	"	N	N
		125	"	N	N
		126	"	N	N
		127	"	N	N
		128	"	N	N
		129	"	N	N
		130	Norwich	N	IC
		131	"	N	IC
		132	"	N	N
		133	"	N	N
		134	"	N	N
		135	Perth	N	N T
		136	"	N	UR
		137	"	N	UR
		138	"	N	N
		139	"	N	IC
		140	"	N	UR
		141	"	N	UR T
		142	"	N	IC
		143	"	N	UR
		144	Winchester	N	N T
		145	"	N	N
		146	"	N	N T
		147	Dumfries	N	IC
		148	"	N	IC
		149	"	N	IC
		150	"	N	IC
		151	"	N	IC
		152	"	N	IC
		153	Newcastle	N	N T
<u>APRIL</u>		154	Winchester	N	UR T
		155	"	N	UR
		156	Leeds	N	UR
		157	"	N	N
		158	"	N	N
		159	"	N	UR T
		160	"	N	N
		161	"	N	N T
		162	Trowbridge	N	UR T
		163	"	N	N
		164	"	N	N T
		165	"	N	N T
		166	"	N	UR
		167	"	N	N T
		168	"	N	N
		169	"	N	N T
		170	"	N	N
		171	"	N	UR

<u>NORTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>
<u>APRIL (Contd.)</u>		172	Truro	N	N
		173	Caernarfon	N	N T
		174	"	N	N
		175	"	N	N T
		176	"	N	N
		177	Leicester	N	IC
		178	"	N	N
		179	Oxford	N	N
		180	"	N	N
		181	"	N	N
		182	Huntingdon	N	N T
		183	"	N	N
		184	"	N	UR T
		185	Carlisle	N	N T
		186	"	N	N
		187	"	N	N
		188	"	N	N T
		189	Winchester	N	N
		190	"	N	IC
		191	"	N	N T
		192	"	N	UR T
		193	"	N	N
		194	"	N	N T
		195	"	N	UR T
		196	Trowbridge	N	N
		197	"	N	N T
		198	"	N	N
		199	"	N	N T
		200	"	N	UR T
		201	"	N	N T
<u>MAY</u>		202	"	IC	IC WM OEDEMA
		203	Carlisle	IC	UR
		204	Guildford	N	N
		205	"	N	N
		206	"	N	UR Hydrocephalus
		207	Norwich	N	N T
		208	"	N	N
		209	Carmarthen	N	N T
		210	"	N	N
		211	Taunton	NR	N
		212	"	NR	UR
		213	"	NR	N
		214	"	NR	N
		215	"	NR	N
		216	Exeter	N	N
		217	"	N	N
		218	Northallerton	N	UR T
		219	"	N	N T
		220	Exeter	N	UR T
		221	"	N	UR T
		222	"	N	N
		223	"	N	UR Encephalitis
		224	"	N	UR
		225	"	N	N Enceph.
		226	"	N	UR
		227	"	N	IC

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>	
<u>MAY (Contd.)</u>		228	Exeter	N	N	
		229	Taunton	IC	IC	
		230	"	N	N T	
		231	"	N	N	
		232	"	N	N Encephalitis	
		233	"	N	N	
		234	"	N	N	
		235	"	N	IC	
		236	"	N	UR	
		237	"	N	UR	
		238	Truro	N	N	
		239	"	N	N	
		240	"	N	N T	
		241	"	N	N	
		242	Leeds	N	IC T	
		243	Nottingham	N	N	
		244	"	N	UR	
		245	Worcester	N	UR	
		246	"	N	N Lafora	
		247	"	N	N Lafora	
		248	"	N	N	
		249	"	N	N Lafora	
	<u>JUNE</u>		250	Truro	N	UR
			251	"	N	UR
			252	"	N	UR
			253	"	N	UR
			254	"	N	UR
			255	"	N	UR
			256	"	N	UR
			257	"	N	UR
			258	Taunton	N	UR
			259	"	N	N
			260	"	N	N
			261	"	N	N
			262	"	N	UR
		263	"	N	N	
		264	"	N	N	
		265	"	N	UR	
		266	"	N	UR	
		267	"	N	UR	
		268	"	N	N	
		269	"	N	N	
		270	"	N	UR	
		271	"	N	N	
		272	"	N	UR	
		273	"	N	N	
		274	"	IC	UR *	
		275	"	N	UR *	
		276	"	N	UR *	
		277	"	N	UR	
		278	"	N	UR	
		279	"	N	N	
		280	Northallerton	N	N T	
		281	"	N	UR	
		282	Carmarthen	N	N	
		283	"	N	UR	

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>	
<u>JUNE (Contd.)</u>	285		Carmarthen	N	N	
	286		"	N	UR	
	287		"	N	UR	
	288		"	N	N	
	289		Norwich	N	N	
	290		"	N	N	
	291		"	N	UR T	
	292		"	N	N	
	293		"	N	IC	
	294		Exeter	N	UR T	
	295		Truro	N	UR	
	296		Inverness	NR	UR	
	297		"	NR	UR	
	298		Worcester	N	UR	
	299		"	N	UR	
	<u>JULY</u>	300		Preston	N	UR
		301		"	N	IC
		302		"	N	N
		303		"	N	N T
304			"	N	UR	
305			"	N	UR	
306			"	N	N	
307			"	N	UR T	
308			Winchester	N	N	
309			"	N	IC	
310			"	N	N	
311			Cardiff	N	UR	
312			"	N	UR	
313			"	N	N	
314			"	N	N	
315			"	N	N	
316			Huntingdon	N	UR T	
317			"	N	UR T	
318			"	N	UR	
319			"	N	UR	
320			Winchester	N	N	
321			"	N	IC	
322			"	N	IC	
323			"	N	N	
324			"	N	N	
325			"	N	IC	
326			"	N	IC	
327			"	N	N	
328			Exeter	N	N Encephalitis	
329			"	N	N T Encephalitis	
330			Winchester	N	N	
331			"	N	N	
332			"	N	N T	
333			"	N	N	
334		Carmarthen	N	N		
335		"	N	N		
336		"	N	N		
337		"	N	N		
338		"	N	N		
339		"	N	N		
340		"	N	N		

BOV 921

<u>MONTH</u>	<u>HSE REF</u>	<u>91/-</u>	<u>AHO</u>	<u>SAFs</u>	<u>HISTOLOGY</u>
<u>JULY (Contd.)</u>		342	Carmarthen	N	UR T
		343	"	N	UR
		344	"	N	UR T
		345	Newcastle	N	N
		346	"	N	UR
		347	Carmarthen	N	N T
		348	"	N	N
		349	"	N	N
<u>AUGUST</u>		350	Trowbridge	N	UR T
		351	"	N	UR
		352	"	N	N
		353	Newcastle	N	UR

BOV 92f

APPENDIX 11

<u>REF NO.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>BEVERLEY AHO</u>						
91/118	Hunsley Beacon Beagles	4	Thirsk	3/91	IC	NEG
119	" " "	4	"	"	NEG	NEG
120	" " "	4	"	"	NEG	NEG

DIETS

Hunsley Beacon Beagles - Fallen stock (flesh/offal)
Biscuit

TOTAL SUBMISSIONS: 3

~~307~~

1

BOV 92 H

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>CAERNARFON AHO</u>						
91/1	Pen Yr Arfa Nebo (Hughes)	12	Bangor	1/91	IC	UNR
91/50	Treriffi Hounds	9	"	2/91	IC	UNR
51	" "	9	"	"	IC	UNR
52	" "	2	"	"	NEG	NEG
53	" "	7	"	"	NEG	NEG
54	" "	2	"	"	NEG	NEG
55	" "	8	"	"	NEG	IC
91/173	Anglesey Foxhounds	7	"	4/91	NEG	NEG
174	" "	3	"	"	NEG	NEG
175	" "	11	"	"	NEG	NEG
176	" "	9	"	"	NEG	NEG

DIETS

Anglesey Foxhounds - Flesh, offal, but not head/brain - 9 months.
Meal - 3 months.

Pen Yr Arfa Nebo (Hughes) - Beef, maize.
Treriffi Hounds - Meat, meal.

TOTAL SUBMISSIONS: 11

- ~~34~~ -

BOV 921

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>CARMARTHEN AHO</u>						
90/11	Emlyn Beagles	2	Carmarthen	11/90	NEG	UNR
63	Pembrokeshire Hunt	3	"	"	NEG	UNR
64	"	7	"	"	NEG	NEG
91/7	Llanybri & St. Clears Hunt	5		1/91	NEG	NEG
8	"	4	"	"	NEG	NEG
9	"	5	"	"	NEG	UNR
10	"	6	"	"	NEG	UNR
11	"	7	"	"	NEG	NEG
12	"	7	"	"	NEG	NEG
13	"	9	"	"	NEG	UNR
77	Llangeitho Hunt (Dix)	4	Aberystwyth	2/91	NEG	NEG
78	"	8	"	"	NEG	NEG
79	"	8	"	"	NEG	IC
80	"	8	"	"	NEG	NEG
81	"	6	"	"	NEG	NEG
97	Pembrokeshire Hunt	6	Carmarthen	3/91	NEG	UNR
98	"	7	"	"	NEG	UNR
99	"	8	"	"	NEG	IC
100	"	5	"	"	NEG	UNR
101	"	2	"	"	NEG	UNR
102	"	2	"	"	NEG	UNR
103	"	7	"	"	NEG	UNR
209	Llangeitho Hunt (Cotswold)	9	Aberystwyth	5/91	NEG	NEG
210	"	9	"	"	NEG	NEG
282	Teifiside (Tivyside) Hunt	7	Carmarthen	6/91	NEG	NEG
283	"	5	"	"	NEG	UNR
284	"	3	"	"	NEG	NEG
285	"	3	"	"	NEG	NEG
286	"	2	"	"	NEG	UNR
287	"	4	"	"	NEG	UNR
288	"	2	"	"	NEG	NEG
334	"	3	"	7/91	NEG	NEG
335	"	2	"	"	NEG	NEG
336	"	3	"	"	NEG	NEG
337	"	3	"	"	NEG	NEG
338	"	2	"	"	NEG	NEG
339	"	3	"	"	NEG	NEG
340	"	3	"	"	NEG	NEG
341	"	3	"	"	NEG	NEG
342	Llangeitho Hunt (Dix)	17	Aberystwyth	"	NEG	UNR
343	"	10	"	"	NEG	UNR
344	"	10	"	"	NEG	UNR
347	Teifiside (Tivyside) Hunt	3	Carmarthen	"	NEG	NEG
348	"	NS	"	"	NEG	NEG
349	"	3	"	"	NEG	NEG

BOV 921

CARMARTHEN AHO Contd.....

DIETS

Emlyn Beagles - Animal Carcasses
Llangeitho Hunt - Raw and cooked horses, cattle (sheep before 1988)
Offal
Some proprietary meal
Llanybri & St. Clears Hunt - Carcasses (sheep, calves)
Waste food ex Chinese Restaurant
Pembrokeshire Hunt - Flesh/bone from fallen stock (no offal/heads)
Teifiside (Tivyside) Hunt - Raw meat (sheep, cattle), offal.

TOTAL SUBMISSIONS: 45

- 32 -

4

BOV 92 H

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					SAF	HIST
<u>CARDIFF AHO</u>						
90/27	Llangeinor Hunt Kennels	7	Carmarthen	11/90	NEG	NEG
28	" " "	7	"	"	NEG	UNR
29	" " "	7	"	"	NEG	UNR
91/112	" " "	4	"	3/91	NEG	NEG
113	" " "	8	"	"	NEG	NEG
114	" " "	8	"	"	NEG	NEG
115	" " "	5	"	"	NEG	NEG
311	Banwen Miners Hunt	6	"	7/91	NEG	UNR
312	" " "	11	"	"	NEG	UNR
313	" " "	5	"	"	NEG	NEG
314	" " "	3	"	"	NEG	NEG
315	" " "	2	"	"	NEG	NEG

DIETS

Banwen Miners Hunt - Flesh ex fallen stock.
Llangeinor Hunt Kennels - Raw flesh.

TOTAL SUBMISSIONS : 12

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>CARLISLE AHO</u>						
91/185	Bewcastle Kennels	11	Penrith	4/91	NEG	NEG
186	" "	7	"	"	NEG	NEG
187	" "	9	"	"	NEG	NEG
188	" "	9	"	"	NEG	NEG
203	Ullswater Foxhounds	12	"	5/91	IC	UNR

DIETS

Bewcastle Kennels - Butcher's offal.
 Ullswater Foxhounds - Raw meat, cooked meat.
 Meal.

TOTAL SUBMISSIONS : 5

BOV 92 H

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>CHELMSFORD AHO</u>						
90/16	East Hertfordshire Puckeridge Hunt	6	Cambridge	11/90	NEG	INC
38	" "	AGED	"	"	NEG	UNR
39	" "	AGED	"	"	NEG	NEG
91/19	Newmarket Beagles	3	"	1/91	NEG	NEG
20	" "	4	"	"	NEG	NEG
21	" "	3	"	"	NEG	UNR

DIETS

East Hertfordshire Puckeridge Hunt - Tripe/cow viscera.
Newmarket Beagles - Raw meat ex butcher's off cuts.
Occasional meat ex farm (calves, sheep).
"Valumix."

TOTAL SUBMISSIONS: 6

BOV 92 H

<u>REF NOS.</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>CREWE AHO</u>						
90/54	Forest & District Beagles	3	Shrewsbury	11/90	NR	NEG
55	" " "	3	"	"	NR	NEG
56	" " "	5	"	"	NR	NEG
57	" " "	5	"	"	NR	NEG
58	" " "	6	"	"	NR	NEG
91/106	North Staffordshire Moorland /*11		"	3/91	NEG	UNR
107	" " " / *10		"	"	NEG	UNR
108	" " " / **9		"	"	NEG	UNR
109	" " " 7		"	"	NEG	UNR
110	" " " /***12		"	"	NEG	NEG
111	" " " /*/***10		"	"	NEG	NEG

* Previously at Cheshire Forest
 ** " " Brocklesby Park
 *** " " High Peak

DIETS

Cheshire Forest - Meat (more adult cattle).

Forest and District - Raw meat (sheep, cattle, mainly calves) 90%
Cereal 10%.

North Staffordshire Moorlands - Meat (calves, sheep, occasional cow) 80%.
Protein mix 20%.

TOTAL SUBMISSIONS: 11

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>DORCHESTER AHO</u>						
90/1	Cattistock Hunt Kennels	4	Bristol	10/90	NEG	NEG
2	" " "	5	"	"	NEG	NEG
3	" " "	5	"	"	NEG	NEG
60	South Dorset Hunt Kennels	6	"	"	NEG	UNR
61	" " " "	5	"	"	NEG	UNR

DIETS

Cattistock Hunt Kennels - Raw meat, liver, heart.
Maize.

South Dorest Hunt Kennels - Cooked/raw meat ex fallen stock.

TOTAL SUBMISSIONS: 5

BOV 92 H

REF NOS	NAME OF HUNT	AGE	VIC.	MONTH	RESULTS.	
					SAF	HIST
<u>EXETER AHO</u>						
90/19	Taw Vale Beagles	8	Starcross	11/90	IC	UNR
20	" " "	8	"	"	IC	UNR
51	Dulverton East Foxhounds	6	"	11/90	NR	IC
52	" " "	6	"	"	NR	IC
53	" " "	6	"	"	NR	IC
90	Cotley Harriers	10	"	12/90	NR	IC
91	" " "	9	"	"	NEG	UNR
91/56	Spooners & West Dartmoor	2	Starcross	2/91	NEG	UNR
57	" " "	3	"	"	NEG	NEG
58	" " "	3	"	"	NEG	UNR
59	" " "	3	"	"	NEG	IC
60	" " "	8	"	"	NEG	IC
62	" " "	9	"	"	NEG	UNR
116	North Devon Beagles	9	"	3/91	NR	NEG
117	" " "	6	"	"	NR	UNR
216	South Tetcott Kennels	5	"	5/91	NEG	NEG
217	" " "	5	"	"	NEG	NEG
91/220	Dulverton East Foxhounds	6	"	"	NEG	UNR
221	" " "	2	"	"	NEG	UNR
222	" " "	3	"	"	NEG	NEG
223	" " "	6	"	"	NEG	UNR
224	" " "	7	"	"	NEG	UNR
225	" " "	8	"	"	NEG	NEG
226	" " "	4	"	"	NEG	UNR
227	" " "	1	"	"	NEG	IC
228	" " "	7	"	"	NEG	NEG
294	Holcombe Rogus Beagles	9	"	6/91	NEG	UNR
328	Dulverton East Foxhounds	1	"	7/91	NEG	NEG
329	" " "	1	"	"	NEG	NEG

DIETS

Cotley Harriers - Flesh ex fallen stock, cereal.
Dulverton East Foxhounds - Raw meat, tripe.
Holcombe Rogus Beagles - Flesh (sheep, calves, occasional cow).
Paunch (calves), liver lights.
North Devon Beagles - Raw flesh (no offal).
Occasional cooked meat.
Biscuit once daily.
South Tetcott Kennels - Raw fallen stock.
Spooners & West Dartmoor - Raw flesh (no offal).
Taw Vale - Tripe and bibles.
Calves/sheep from one local farm.

TOTAL SUBMISSIONS : 29

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>GLOUCESTER AHO</u>						
90/4	Cotswold Hunt Kennels	5	Worcester	10/90	NEG	NEG
18	" " "	9	"	11/90	IC	UNR
22	" " "	1	"	"	NEG	NEG
23	" " "	4	"	"	NEG	NEG
91/2	" " "	6	"	1/91	NEG	NEG
3	" " "	6	"	"	NEG	NEG
4	" " "	4	"	"	NEG	UNR
5	" " "	7	"	"	NEG	UNR
6	" " "	3	"	"	NEG	NEG
31	Beaufort Hunt Kennels	4	Bristol	"	NEG	NEG
32	" " "	3	"	"	NEG	NEG
33	" " "	4	"	"	NEG	NEG

DIETS

.Beaufort Hunt - Cooked meat twice weekly.
Raw meat.
Wheat, maize.

Cotswold Hunt - Fallen stock (cattle, sheep, horses) half raw/half boiled.
Oatmeal/biscuits.

TOTAL SUBMISSIONS: 12

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>GUILDFORD AHO</u>						
91/204	Surrey & North Sussex Beagles	8	Winchester	5/91	NEG	NEG
205	" " " "	8	"	"	NEG	NEG
206	" " " "	8	"	"	NEG	UNR

DIETS

Surrey and North Sussex Beagles - Whole carcasses (cattle, sheep).

TOTAL SUBMISSIONS: 3

REF NOS	NAME OF HUNT	AGE	VIC	MONTH	RESULTS	
					SAF	HIST
<u>HUNTINGDON AHO</u>						
90/8	Pytchley Hunt Kennels	8	Cambridge	11/90	IC	NEG
12	Trinity Foot Beagles	2	"	"	NEG	NEG
13	" " "	4	"	"	NEG	NEG
14	" " "	4	"	"	NEG	NEG
21	Caxton Hunt Kennels	2	"	"	NEG	NEG
62	Horningsea Hunt Kennels	7	"	12/90	NR	NEG
91/14	Oakley Kennels	3	"	1/91	NEG	IC
15	" " "	6	"	"	NEG	IC
16	" " "	3	"	"	NEG	IC
42	Fitzwilliam Hunt Kennels	8	"	"	NR	UNR
43	" " "	7	"	"	NR	UNR
44	" " "	6	"	"	NR	NEG
45	" " "	8	"	"	NR	NR
46	" " "	2	"	"	NR	NR
47	" " "	7	"	"	NR	NR
182	Pytchley Hunt Kennels	7	"	4/91	NEG	NEG
183	" " "	7	"	"	NEG	NEG
184	Fitzwilliam Hunt Kennels	9	"	"	NEG	UNR
316	Trinity Foot Beagles	11	"	7/91	NEG	UNR
317	" " "	10	"	"	NEG	UNR
318	" " "	11	"	"	NEG	UNR
319	" " "	10	"	"	NEG	UNR

DIETS

Caxton Hunt - Raw meat.

Fitzwilliam Hunt Kennels - Offal, flesh from farms.

Horningsea Hunt - Raw flesh (cattle, horse, sheep).

Oatmeal.

Oakley Hunt Kennels - Offal.

Pytchley Hunt Kennels - Flesh

Weetabix.

Trinity Foot Beagles - Dead farm stock - few carcasses, offal.

Waste pub food.

TOTAL SUBMISSIONS: 22

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>LEEDS AHO</u>						
90/33	Ecclesfield Kennels	6	Thirsk	11/90	NEG	NEG
34	" "	6	"	"	NEG	NEG
91/156	" "	8	"	4/91	NEG	UNR
157	" "	8	"	"	NEG	NEG
158	" "	8	"	"	NEG	NEG
159	" "	11	"	"	NEG	UNR
160	" "	7	"	"	NEG	NEG
161	" "	6	"	"	NEG	NEG
242	Barlow Hunt Kennels	4	Sutton Bonington	5/91	NEG	IC

DIETS

Barlow Hunt Kennels - Raw meat.

Ecclesfield Kennels - Raw meat (cattle, sheep, pig), no head, guts, offal.
Dry feed from 12/90.

TOTAL SUBMISSIONS: 9

BOV 92 H

<u>REF</u>	<u>NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
						<u>SAF</u>	<u>HIST</u>
<u>LEICESTER AHO</u>							
90/68		Westerby Bassets	2	Sutton	Bonington	12/90	NEG NEG
69		" "	2	"	"	"	NEG NEG
70		" "	7	"	"	"	NEG NEG
91 61		Fernie Hunt	5	"	"	2/91	NEG NEG
63		" "	4	"	"	"	NEG NEG
64		" "	3	"	"	"	NEG NEG
177		Quorn Hunt	2	"	"	4/91	NEG IC
178		" "	3	"	"	"	NEG NEG

DIETS

Fernie Hunt - Meat, bones ex fallen stock.
Quorn Hunt - Raw/ cooked meat.
Westerby Bassets - Raw meat, bones.

TOTAL SUBMISSIONS: 8

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>LINCOLN AHO</u>						
90/40	Brocklesby Park Hunt Kennels	6	Lincoln	11/90	NEG	NEG
41	" " " "	6	"	"	NEG	NEG
42	" " " "	6	"	"	NEG	NEG
91/49	East Lincs Harehounds	6	"	2/91	NEG	IC

DIETS

Brocklesby Hunt Kennels - Fallen stock (calves, sheep).
East Lincs Harehounds - Cooked meat, offal.

TOTAL SUBMISSIONS: 4

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>LLANDRINDOD WELLS AHO</u>						
90/84	Brecon Farmers Hunt Kennels	2	Carmarthen	12/90	NEG	NEG
85	" " " "	7	"	"	NEG	NEG
86	" " " "	6	"	"	NEG	NEG

DIETS

Brecon Farmers Hunt Kennels - Meat, carcasses.

TOTAL SUBMISSIONS: 3

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>MAIDSTONE AHO</u>						
90/59	Pevensey Marsh Beagles	2	Wye	11/90	NR	NEG
71	" " "	2	"	12/90	NEG	NEG
72	" " "	6	"	"	NEG	NEG
91/17	East Kent Hunt Kennels	7	"	1/91	NEG	UNR
18	" " " "	5	"	"	NEG	UNR

DIETS

East Kent Hunt Kennels - Raw flesh, offal.

Pevensey Marsh Beagles - Raw meat, carcasses ex slaughter stock (calves, sheep)
Raw bibles ex slaughterhouse.

TOTAL SUBMISSIONS: 5

BOV 92 H

<u>RE</u> <u>NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>NEWCASTLE AHO</u>						
90/15	College Valley Hunt Kennels	8	Newcastle	11/90	IC	UNR
17	Tynedale Hunt Kennels	5	"	"	NEG	NEG
24	Newcastle & District Beagles	8	"	"	IC	NEG
25	" " "	8	"	"	NEG	UNR
26	" " "	2	"	"	NEG	NEG
91/22	Border Hunt Kennels	3	"	1/91	NEG	NEG
153	West Percy Hunt Kennels	3	"	3/91	NEG	NEG
345	Milvain Hunt Kennels	5	"	7/91	NEG	NEG
346	" " "	6	"	"	NEG	UNR
353	Percy Hunt Kennels	10	"	8/91	NEG	UNR

DIETS

- Border Hunt Kennels - Raw/cooked knacker meat.
Cereal.
- College Valley Hunt Kennels - Cooked meat ex fallen stock
Small amount raw meat
Meal.
- Milvain Hunt Kennels - cooked meat ex fallen stock.
Meal.
- Percy Hunt Kennels - Raw meat ex fallen livestock (no offal).
- Newcastle & District Beagles - Raw flesh.
- Tynedale Hunt Kennels - Raw flesh.
- West Percy Hunt Kennels - Raw meat ex fallen stock (no offal).
Meal.

TOTAL SUBMISSIONS: 10

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>NORTHALLERTON AHO</u>						
90/30	Claro Beagles	9	Thirsk	11/90	NEG	UNR
31	" "	9	"	"	NEG	IC
88	York & Ainsty Hunt Kennels	2	"	12/90	NEG	NEG
91/76	Saltergate Farmers Hunt Kennels	5	"	2/91	NEG	UNR
86	Bedale Hunt Kennels	4	"	"	NEG	UNR
87	" " "	4	"	"	NEG	UNR
88	Claro Beagles	10	"	"	NEG	UNR
89	" "	7	"	"	NEG	UNR
218	Goathland Hunt Kennels	9	"	5/91	NEG	UNR
219	" " " / *	9	"	"	NEG	NEG
280	Staintondale Hunt Kennels	3	"	6/91	NEG	NEG
281	" " "	8	"	"	NEG	UNR

* Previously at Glaisdale Hunt Kennels.

DIETS

Bedale Hunt Kennels - Cooked meat (Sheep, calves, cows).
 Claro Beagles - Boiled swill including fallen stock (calves, sheep)
 Complete dog food "Woofles."
 Goathland Hunt Kennels - Raw fallen stock.
 Saltergate Farmers Hunt Kennels - fish shop scraps.
 Fish innards from trout farm.
 Staintondale Hunt Kennels - Raw fallen stock.
 York & Ainsty Hunt Kennels - Cooked meat, offal.

TOTAL SUBMISSIONS: 12

BOV 92 H

<u>NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>NORWICH AHO</u>						
91/130	Norfolk Beagles	3	Norwich	3/91	NEG	IC
131	" "	3	"	"	NEG	IC
132	" "	3	"	"	NEG	NEG
133	" "	3	"	"	NEG	NEG
134	" "	3	"	"	NEG	NEG
207	West Norfolk Hunt Kennels	5	"	5/91	NEG	NEG
208	" " " "	4	"	"	NEG	NEG
289	Norfolk Beagles	4	"	6/91	NEG	NEG
290	" "	4	"	"	NEG	NEG
291	" "	8	"	"	NEG	UNR
292	" "	3	"	"	NEG	NEG
293	" "	3	"	"	NEG	IC

DIETS

Norfolk Beagles - Omasum only.

West Norfolk Hunt Kennels - Raw meat (sheep, calves, cow, horse).
Tripe, hearts.

TOTAL SUBMISSIONS: 12

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>NOTTINGHAM AHO</u>						
90/89	Grove and Rufford	5	Sutton Bonington	12/90	NEG	NEG
91/243	Meynell Hunt Kennels	6	"	5/91	NEG	NEG
244	" " "	3	"	"	NEG	UNR

DIETS

Grove and Rufford - Knackery material.
Meynell Hunt - Raw flesh
Biscuits/meal.

TOTAL SUBMISSIONS: 3

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>OXFORD AHO</u>						
90/35	Old Berkshire Hunt Kennels	8	Reading	11/90	NEG	NEG
36	" " " "	8	"	"	NEG	NEG
37	" " " "	8	"	"	NEG	UNR
91/121	Eton College Beagles	10	"	3/91	NEG	UNR
122	" " "	9	"	"	NEG	NEG
123	" " "	8	"	"	NEG	NEG
124	" " "	8	"	"	NEG	NEG
125	" " "	7	"	"	NEG	NEG
126	" " "	5	"	"	NEG	NEG
127	" " "	5	"	"	NEG	NEG
128	" " "	3	"	"	NEG	NEG
129	" " "	2	"	"	NEG	NEG
179	Faringdon Hunt Kennels	6	"	4/91	NEG	NEG
180	" " "	4	"	"	NEG	NEG
181	" " "	7	"	"	NEG	NEG

DIETS

Eton College Beagles - Flesh

Faringdon Hunt Kennels - Cooked/raw meat - no offal.
Biscuits.

Old Berkshire Hunt Kennels - Knackery flesh.

Dog biscuits, vit/mineral supplement.

TOTAL SUBMISSIONS: 15

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u> <u>SAF HIST</u>
<u>PRESTON AHO</u>					
91/27	Vale of Lune Harriers	8	Preston	1/91	NEG UNR
28	" " "	8	"	"	NEG UNR
29	" " "	8	"	"	NEG UNR
30	" " "	8	"	"	NEG UNR
82	" " "	9	"	2/91	IC NEG
83	" " "	9	"	"	NEG NEG
84	" " "	1	"	"	NEG NEG
85	" " "	9	"	"	NEG UNR
90	Holcombe Hunt Kennels	7	"	3/91	NEG NEG
300	Pendle Forest & Craven	2	"	7/91	NEG UNR
301	" " "	2	"	"	NEG IC
302	" " "	2	"	"	NEG NEG
303	" " "	4	"	"	NEG UNR
304	" " "	1	"	"	NEG UNR
305	" " "	1	"	"	NEG UNR
306	" " "	1	"	"	NEG NEG
307	" " "	7	"	"	NEG UNR

DIETS

Holcombe Hunt Kennels - Raw knacker meat (beef).

Pendle Forest & Craven - Raw flesh (sheep, calves, occasional cow).

Vale of Lune Harriers - Raw flesh ex fallen stock (cattle).

TOTAL SUBMISSIONS: 17

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u> <u>SAF HIST</u>
<u>STAFFORD AHO</u>					
91/69	(Elliot) North Staffordshire Moorlands/*8		Shrewsbury	2/91	NEG NEG
104	" " " "	3	"	3/91	NEG NEG
105	" " " "	3	"	"	NEG NEG

*Previously at Cheshire Beagles

DIETS

North Staffordshire Moorlands - Flesh.
Proprietary dog food (Vitalin).

TOTAL SUBMISSIONS: 3

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u> <u>SAF HIST</u>
<u>TAUNTON AHO</u>					
90/45	Ilminster Beagles	9	Bristol	11/90	IC UNR
46	" "	9	"	"	IC UNR
47	" "	9	"	"	IC UNR
48	" "	4	"	"	NEG NEG
49	" "	5	"	"	NEG NEG
50	" "	4	"	"	NEG NEG
74	West Somerset Foxhounds	8	"	"	IC UNR
75	" " "	7	"	"	NEG UNR
76	" " "	7	"	"	NEG UNR
77	" " "	7	"	"	NEG UNR
78	" " "	7	"	"	NEG UNR
79	" " "	8	"	"	NEG IC
91/211	" " "	7	"	5/91	NEG NEG
212	" " "	5	"	"	NR UNR
213	" " "	1	"	"	NR NEG
214	" " "	5	"	"	NR NEG
215	" " "	5	"	"	NEG NEG
229	Weston & Banwell Harriers	7	"	"	IC IC
230	" " "	7	"	"	NR NEG
231	" " "	6	"	"	NEG NEG
232	" " "	6	"	"	NEG NEG
233	" " "	8	"	"	NEG NEG
234	" " "	6	"	"	NEG NEG
235	" " "	6	"	"	NEG IC
236	" " "	6	"	"	NEG UNR
237	" " "	7	"	"	NEG UNR
258	Taunton Vale Foxhounds	2	"	6/91	NEG UNR
259	" " "	3	"	"	NEG NEG
260	" " "	3	"	"	NEG NEG
261	" " "	4	"	"	NEG UNR
262	" " "	3	"	"	NEG NEG
263	" " "	2	"	"	NEG UNR
264	" " "	3	"	"	NEG NEG
265	" " "	3	"	"	NEG UNR
266	Beacon Beagles	NS	"	"	NEG UNR
267	" "	NS	"	"	NEG UNR
268	" "	NS	"	"	NEG NEG
269	" "	NS	"	"	NEG NEG
270	" "	NS	"	"	NEG UNR
271	" "	NS	"	"	NEG NEG
272	" "	NS	"	"	NEG UNR
273	" "	NS	"	"	NEG NEG
274	(Roffe) Silvester Foxhounds	10	"	"	IC UNR
275	Taunton Vale Harriers	8	"	"	NEG UNR
276	(Roffe) Silvester Foxhounds	9	"	"	NEG UNR
277	Taunton Vale Harriers	7	"	"	NEG UNR
278	(Roffe) Silvester Foxhounds	3	"	"	NEG UNR
279	" " "	3	"	"	NEG NEG

DIETS

Beacon Beagles - Raw meat on bone (no offal).
 Ilminster Beagles - Raw flesh (cattle, sheep).

BOV 92 H

TALUTON AHO Contd...

(Roffe) Silvester Foxhounds - Raw meat on bone (no offal).

Taunton Vale - Raw meat on bone (no offal).

West Somerset Foxhounds - Raw flesh, liver, spleen, heart (no offal).

Weston & Barnwell Harriers - Meat, bone, bibles (calves, sheep).

TOTAL SUBMISSIONS: 48

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>TROWBRIDGE AHO</u>						
90/5	Wilton Hunt Kennels	8	Bristol	10/90	NEG	NEG
67	Marlborough College Beagles	7	"	12/90	NEG	UNR
91/93	" " "	7	"	3/91	NEG	NEG
94	" " "	7	"	"	NEG	NEG
95	" " "	8	"	"	NEG	UNR
96	" " "	8	"	"	NEG	NEG
162	Tedworth Hunt Kennels	5	"	4/91	NEG	UNR
163	" " "	5	"	"	NEG	NEG
164	" " "	5	"	"	NEG	NEG
165	" " "	5	"	"	NEG	NEG
166	" " "	5	"	"	NEG	UNR
167	" " "	5	"	"	NEG	NEG
168	" " "	5	"	"	NEG	NEG
169	" " "	5	"	"	NEG	NEG
170	" " "	5	"	"	NEG	NEG
171	" " "	5	"	"	NEG	UNR
196	Warminster & Infantry Beagles	2	"	4/91	NEG	NEG
197	" " "	4	"	"	NEG	NEG
198	" " "	2	"	"	NEG	NEG
199	" " "	9	"	"	NEG	NEG
200	" " "	5	"	"	NEG	UNR
201	" " "	8	"	"	NEG	NEG
202	Pimpernell Beagles	13	"	5/91	IC	IC
350	" " "	10	"	8/91	NEG	UNR
351	" " "	12	"	"	NEG	UNR
352	" " "	11	"	"	NEG	NEG

DIETS

Marlborough College - Swill ex College, raw flesh.

Pimpernell Beagles - Knacker meat, frozen mince up to 1987.

Dried meat, maize/barley 1988-90.

Tedworth Hunt - Raw meat ex fallen stock.

Warminster & Infantry Beagles - Raw meat (calves, sheep).

Wilton Hunt Kennels - Raw meat (calves, cow, sheep) - no head/offal.

TOTAL SUBMISSIONS: 26

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u> <u>SAF HIST</u>
<u>TRURO AHO</u>					
90/65	Cury Hunt Kennels	9	Truro	12/90	NEG UNR
66	" " "	7	"	"	NEG NEG
80	Four Burrows Hunt Kennels	6	"	"	NEG NEG
81	" " " "	3	"	"	NEG NEG
82	" " " "	3	"	"	NEG UNR
83	" " " "	8	"	"	IC UNR
91/172	Tetcott Hunt Kennels	4	"	4/91	NEG NEG
238	Western Hunt Kennels	9	"	5/91	NEG NEG
239	" " "	4	"	"	NEG NEG
240	St. Kew Beagles	9	"	"	NEG NEG
241	" " "	4	"	"	NEG NEG
250	Four Burrows Hunt Kennels	2	"	6/91	NEG UNR
251	" " " "	2	"	"	NEG UNR
252	" " " "	4	"	"	NEG UNR
253	" " " "	7	"	"	NEG UNR
254	" " " "	5	"	"	NEG UNR
255	" " " "	7	"	"	NEG UNR
256	" " " "	7	"	"	NEG UNR
257	" " " "	3	"	"	NEG UNR
295	Tetcott Hunt Kennels	2	"	"	NEG UNR

DIETS

Cury Hunt Kennels - Flesh (calves, sheep, occasional cow) - not heads.
Biscuit.

Four Burrows Hunt Kennels - flesh.

St. Kew Beagles - Dog mince ex abattoir.
Biscuit.

Tetcott Hunt Kennels - Flesh ex fallen stock.
Meal.

Western Hunt Kennels - Raw meat, offal.

TOTAL SUBMISSIONS: 20

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	<u>SAF HIST</u>
<u>WINCHESTER AHO</u>						
90/9	Hampshire Hunt Kennels	3	Winchester	11/90	NEG	NEG
10	" " "	4	"	"	NEG	NEG
91/70	" " "	7	"	2/91	NR	NEG
71	" " "	8	"	"	NR	NEG
72	" " "	7	"	"	NR	NEG
73	" " "	6	"	"	NR	UNR
74	" " "	6	"	"	NR	UNR
75	" " "	5	"	"	NR	NEG
91/91	Vine & Craven Hunt Kennels	7	"	3/91	NEG	UNR
92	" " " "	7	"	"	NEG	NEG
144	" " " "	6	"	"	NEG	NEG
145	" " " "	7	"	"	NEG	NEG
146	" " " "	8	"	"	NEG	NEG
154	New Forest Foxhound Kennels	7	"	4/91	NEG	UNR
155	" " " "	7	"	"	NEG	UNR
189	New Forest Buckhounds	8	"	"	NEG	NEG
190	" " " "	2	"	"	NEG	IC
191	" " " "	2	"	"	NEG	NEG
192	" " " "	3	"	"	NEG	UNR
193	" " " "	3	"	"	NEG	NEG
194	" " " "	6	"	"	NEG	NEG
195	" " " "	7	"	"	NEG	UNR
308	Hampshire Hunt Kennels	7	"	7/91	NEG	NEG
309	" " " "	7	"	"	NEG	IC
310	" " " "	2	"	"	NEG	NEG
320	" " " "	2	"	"	NEG	NEG
321	" " " "	2	"	"	NEG	IC
322	" " " "	2	"	"	NEG	IC
323	" " " "	2	"	"	NEG	NEG
324	" " " "	5	"	"	NEG	NEG
325	" " " "	8	"	"	NEG	IC
326	" " " "	7	"	"	NEG	IC
327	" " " "	7	"	"	NEG	NEG
330	" " " "	3	"	"	NEG	NEG
331	" " " "	3	"	"	NEG	NEG
332	" " " "	2	"	"	NEG	NEG
333	" " " "	4	"	"	NEG	NEG

DIETS

Hampshire Hunt Kennels - Raw/cooked meat ex fallen stock (cattle, sheep, horse).

New Forest Buckhounds - Raw fallen stock (cattle, sheep, horses)
Cooked meat occasionally.

New Forest Foxhounds - Fallen stock ex farms (cattle, sheep, horses).

Vine & Craven Hunt Kennels - Raw flesh (sheep, horses, cattle, goats).

TOTAL SUBMISSIONS: 37

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u> <u>SAF HIST</u>
<u>WORCESTER AHO</u>					
90/7	Croome Hunt Kennels	2	Worcester	11/90	NEG NEG
32	Albrighton & Woodland Hunt	8	"	"	NEG NEG
73	Radnor & West Hereford Hunt	3	"	12/90	NEG UNR
91/23	North Hereford Hunt	2	"	1/91	NEG IC
24	" " "	2	"	"	NEG IC
25	" " "	4	"	"	NEG IC
26	" " "	3	"	"	NEG IC
48	Worcestershire Hunt Kennels	4	"	2/91	NR NEG
245	Oliver Bassets	4	"	5/91	NEG UNR
246	" "	8	"	"	NEG NEG
247	" "	8	"	"	NEG NEG
248	" "	6	"	"	NEG NEG
249	" "	8	"	"	NEG NEG
298	North Hereford Hunt	4	"	6/91	NEG UNR
299	" " "	5	"	"	NEG UNR

DIETS

- Albrighton & Woodland Hunt - flesh (cattle, sheep, horse).
Proprietary meal since 5/90.
- Croome Hunt Kennels - Boiled meat.
- North Hereford Hunt - Carcase meat only.
- Oliver Bassets - Raw flesh (cattle, sheep).
- Radnor & West Hereford Hunt - Raw meat ex fallen stock (sheep, cattle).
- Worcestershire Hunt Kennels - Raw meat/offal.

TOTAL SUBMISSIONS: 15

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	
					<u>SAF</u>	<u>HIST</u>
<u>SCOTLAND</u>						
<u>DUMFRIES AHO</u>						
91/147	Wigtownshire Hunt Kennels	8	Auchincruive	3/91	NEG	IC
148	" " "	8	"	"	NEG	IC
149	" " "	9	"	"	NEG	IC
150	" " "	8	"	"	NEG	IC
151	" " "	8	"	"	NEG	IC
152	" " "	8	"	"	NEG	IC

DIET

Wigtownshire Hunt Kennels - Raw flesh (calves, occasional sheep, horses).
Some offal.
Hotel Waste.

TOTAL SUBMISSIONS: 6

BOV 92 H

REF NOS NAME OF HUNT AGE VIC MONTH RESULTS
SAF HIST

SCOTLAND

GALASHIELS AHO

91/34	Berwickshire Hunt Kennels	7	St. Boswells	1/91	NEG UNR
35	" " "	3	" "	"	NEG UNR
36	" " "	2	" "	"	NEG NEG
37	" " "	2	" "	"	NEG NEG
38	" " "	2	" "	"	NEG UNR
39	" " "	7	" "	"	NEG UNR
40	" " "	6	" "	"	NEG UNR
41	" " "	2	" "	"	NEG UNR

DIET

Berwickshire Hunt Kennels - Raw meat (cattle, occasional sheep).

TOTAL SUBMISSIONS: 8

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	<u>SAF</u>	<u>HIST</u>
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SCOTLAND

INVERNESS AHO

90/6	Three Straiths Fox Control Assocn	3	Inverness	10/90	NEG	NEG
91/65	" " " " " "	4	"	"	NEG	NEG
66	" " " " " "	5	"	"	NEG	NEG
67	" " " " " "	10	"	"	NEG	UNR
68	" " " " " "	3	"	"	NEG	UNR
296	Lochaber & Sunart Foxhounds	2	"	6/91	NR	UNR
297	" " " " " "	5	"	"	NR	UNR

DIETS

Lochaber & Sunart Foxhounds - Raw and cooked meat ex carcasses (sheep, cattle)
Maize.

Three Straiths F.C.A. - Dried meat after fat extraction at factory.
Maize.

TOTAL SUBMISSIONS: 7

BOV 92 H

<u>REF NOS</u>	<u>NAME OF HUNT</u>	<u>AGE</u>	<u>VIC</u>	<u>MONTH</u>	<u>RESULTS</u>	<u>SAF HIST</u>
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SCOTLAND

PERTH

90/43	Fife Foxhounds	4	Perth	11/90	NEG NEG	
44	" "	8	"	"	NEG NEG	
87	" "	4	"	"	NEG NEG	
91/135	" "	8	"	3/91	NEG NEG	
136	" "	8	"	"	NEG UNR	
137	" "	7	"	"	NEG UNR	
138	" "	7	"	"	NEG NEG	
139	" "	7	"	"	NEG IC	
140	" "	5	"	"	NEG UNR	
141	" "	5	"	"	NEG UNR	
142	" "	5	"	"	NEG IC	
143	" "	4	"	"	NEG UNR	

DIETS

Fife Foxhounds - Meat ex fallen stock (cattle).

TOTAL SUBMISSIONS: 12

BOV 92 H

HSE SURVEY

APPENDIX 12

UNRESOLVED HISTOLOGICAL CASES
AGE DISTRIBUTION

AGE

1	2
2	15
3	13
4	10
5	16
6	13
7	27
8	18
9	16
10	11
11	5
12	3
17	1
NOT STATED	4
'AGED'	1
	<u>155</u>

BREED

Foxhound	106
Harrier	15
Beagle	30
Basset	1
Sheepdog	1
NOT STATED	2
	<u>155</u>

BOV 92 H

HSE SURVEY

APPENDIX 13

POSITIVE TOXOPLASMA CASES - HISTOLOGICAL DIAGNOSES

DIAGNOSIS	1990	1991	OVERALL
Negative	12	43	55
Unresolved	15	43	53
Inconclusive	-	6	6
Encephalitis	2	5	7
	—	—	—
TOTAL	<u>29</u>	<u>97</u>	<u>126</u>
			(28.4%)

HSE SURVEY APPENDIX 14MULTIPLE SUBMISSIONS - ANALYSIS OF RESULTS

<u>SIX HOUNDS</u>		<u>UNR</u>	<u>IC</u>	<u>NEG</u>	<u>% IC/UNR</u>
Langford	90/74-9	5	1	-	100
	91/196-201	1	-	5	20
Auchincruive	91/147-52	-	6	-	100
Shrewsbury	91/106-11	-	4	2	66
Bangor	91/50-5	2	1	3	50
Winchester	91/70-5	2	-	4	33
<u>SEVEN HOUNDS</u>					
Carmarthen	91/7-13	4	-	3	57
	91/97-103	6	1	-	100
	91/282-8	4	-	3	57
<u>EIGHT HOUNDS</u>					
St. Boswells	91/34-41	6	-	2	75
Truro	91/250-7	8	-	-	100
Starcross	91/220-7	5	1	2	75
Preston	91/300-7	4	1	3	62
Carmarthen	91/334-41	-	-	8	0
<u>NINE HOUNDS</u>					
Langford	91/229-37	2	2	5	44
Perth	91/135-43	5	2	2	66
Reading	91/121-9	1	-	8	11
<u>TEN HOUNDS</u>					
Langford	91/162-71	3	-	7	30
<u>TWENTY-TWO HOUNDS</u>					
Langford	91/258-79	12	-	10	55

APPENDIX 15FACTORS WHICH IMPINGE ON METHODOLOGY

- (a) Each hound brain would have taken up to 30 minutes to remove from the cranium, depending on the skill of the operator.
- (b) Transportation delays from sometimes distant hunt kennels often resulting in hound carcasses arriving very late in the working day.
- (c) Conflicting priorities and workloads in VIC post-mortem rooms (BSE heads and chargeable diagnostic work). Late submissions, pressure of other work, and insufficient training and/or skill in brain removal were likely causes of damage to the tissue. In the earliest part of the survey, some brains received at Thirsk VIC had caudal medulla including obex missing, presumably as a result of over-enthusiastic sampling for TEM studies. This inability to distinguish between brain stem and anterior cervical spinal cord illustrated a deficiency in neuro-anatomical knowledge or veterinary supervision of lay staff in the post-mortem room.

BOV 92 H

HSE SURVEYTABLE 1SUMMARY OF MONTHLY SUBMISSIONS AND RESULTS

<u>MONTH/YEAR</u>	<u>TOTAL</u>	<u>HISTOLOGY</u>				<u>SAFs</u>		
		<u>UNR</u>	<u>IC</u>	<u>N</u>	<u>NT</u>	<u>IC</u>	<u>N</u>	<u>NT</u>
Oct 90	6	-	-	6	-	-	6	-
Nov	53	14	5	34	-	9	35	9
Dec	32	14	2	16	-	2	27	3
Jan 91	47	21	7	16	3	1	40	6
Feb	42	15	5	22	-	3	32	7
Mar	64	19	12	33	-	-	62	2
Apr	48	11	2	35	-	-	48	-
May	48	13	5	30	-	3	40	5
Jun	50	31	1	18	-	1	47	2
Jul	50	14	6	30	-	-	50	-
Aug	4	3	-	1	-	-	4	-
	<u>444</u>	<u>155</u>	<u>45</u>	<u>241</u>	<u>3</u>	<u>19</u>	<u>391</u>	<u>34</u>

KEY

Histology UNR = unresolved
 IC = inconclusive
 N = negative
 NT = not tested

SAFs IC = inconclusive
 N = negative
 NT = not tested

BOV 92 H

HSE SURVEYTABLE 2HISTOLOGY RESULTS

	<u>1990</u>		<u>1991</u>		<u>Overall</u>	
Negative	56	61.5%	185	52.4%	241	54.3%
Inconclusive	7	7.7%	38	10.7%	45	10.1%
Unresolved	28	30.8%	127	36.0%	155	34.9%
Positive	0		0		0	
Not tested	0		3	0.9%	3	0.7%
TOTAL	<u>91</u>	<u>100%</u>	<u>353</u>	<u>100%</u>	<u>444</u>	<u>100%</u>

ELECTRON MICROSCOPY - SAF RESULTS (SCRAPIE ASSOCIATED FIBRILS)

	<u>1990</u>		<u>1991</u>		<u>Overall</u>	
Negative	68	74.7%	324	91.8%	392	88.3%
Inconclusive	11	12.0%	8	2.2%	19	4.3%
Positive	0		0		0	
Not tested	12	13.2%	21	6.0%	33	7.4%
TOTAL	<u>91</u>	<u>100%</u>	<u>353</u>	<u>100%</u>	<u>444</u>	<u>100%</u>

HSE SURVEYTABLE 3INCONCLUSIVE HISTOLOGY CASES

Advanced Autolysis	9
Mutilation of target sites	21
Autolysis/mutilation	11
Not received at Thirsk VIC	3
Diffuse white matter oedema	<u>1</u>
TOTAL	<u>45</u>

BOV 921

HSE SURVEY

TABLE 4

INCONCLUSIVE SAF CASES - AGE DISTRIBUTION

No. of samples	0	0	0	0	0	0	0	1	7	7	1	0	2	1
Age of animal (Yrs.)	1	2	3	4	5	6	7	8	9	10	11	12	13	

BOV 92 H

HSE SURVEY

TABLE 5

INCONCLUSIVE SAF CASES - HISTOLOGICAL DIAGNOSES

<u>Total No. of cases</u>	<u>Negative</u>	<u>Positive</u>	<u>Inconclusive</u>	<u>Unresolved</u>
19	3	0	2	14 (73.7%)