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Tuberculosis in Cattle: Lesions Seen at Slaughter

John D. Collins and John Hannan ¹

Introduction

The diagnosis of tuberculosis in cattle at slaughter may be approached in two ways, viz. (1) the direct examination of tissues for macroscopic lesions and (2) the collection of intact tissues (lymph nodes, suspect lesions) for detailed laboratory examination. The latter approach is particularly well suited to the investigation of single animal breakdowns in which the true status of a single animal reacting positively in the course of a tuberculin test requires to be determined. As a standard procedure, all suspect lesions seen at slaughter in attested cattle are submitted for laboratory verification.

Detection of gross lesions of tuberculosis in slaughter cattle

The detection of suspect lesions of tuberculosis in cattle slaughtered under commercial conditions is subject to constraints relating to, *inter alia*, line speed, inspection facilities (e.g. lighting, space, time), examination technique and the ability of the veterinary inspector to recognise pathological evidence of tuberculosis in the organs and tissues under examination. One of the beneficial effects of the Bovine Tuberculosis Eradication Scheme to date has been the effective removal of most infected cattle before they reach the clinical stages of the disease and before the major organs show overt signs of involvement. Consequently the detection of lesions of tuberculosis is more difficult than was formerly the case in the earlier phases of the scheme because lesions are now likely to be more discrete and fewer in number.

Examples of the types of lesions of tuberculosis encountered in Irish cattle at slaughter are shown in Plates 1 - 13. The respiratory system and related tissues (e.g. pleura, lymph nodes) are particularly prone to infection, due to the preponderance of infection *via* the respiratory route.

Table 1. Distribution of tuberculous lesions in 245 cattle in which only one lesion was disclosed. (After Comer *et al.*, 1990).

Site	% cattle*
Retropharyngeal ln's **	29.8
Mediastinal ln	28.2
Bronchial ln	18.0
Lung	9.8
Mesenteric ln's	2.9
Parotid lymph node	2.4
Caudal cervical ln	2.4
Iliac ln's	1.6
Other sites, combined	4.9

* Based on the detailed examination of the carcasses of 374 cattle, of which 245(65.5%) disclosed a single lesion of tuberculosis on detailed examination.

** ln: lymph node(s)

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Corner *et al.* (1990) found that the detailed examination of three pairs of lymph nodes associated with the respiratory tract, *viz.* mediastinal, retropharyngeal and bronchial lymph nodes, led to the detection of tuberculous lesions in 76 *per cent* of 245 cattle which were found to have only a single lesion at slaughter (Table 1). In a further 9.8 *per cent* of these cattle the sole lesion was found in the substance of the lung, indicating the importance of palpation of this organ in the course of routine inspection. Furthermore, examination of two additional sets of lymph nodes which are routinely examined at slaughter, *viz.* the parotid and mesenteric lymph nodes, led to the detection of tuberculous lesions in a further 5.3 *per cent*, while the examination of two sets of carcase lymph nodes, *viz.* the iliac group and the caudal cervical (prescapular) lymph nodes disclosed lesions in an additional 4.0 *per cent* of these animals (Corner *et al.*, 1990).

The apparent absence of gross lesions of tuberculosis in tuberculin reactor cattle and their subsequent classification as non-visible lesion (NVL) reactors is not an indication that such animals are not infected. *Mycobacterium bovis* has been recovered from tissues taken from up to 10 *per cent* of these animals (Corner, 1994). In such cases the history of the herd of origin of the animal, its own tuberculin testing history and evidence of other likely causes of reactivity to bovine tuberculin, such as the presence of skin tuberculosis in the herd (Plate 14), are of relevance when coming to a conclusion regarding the true tuberculosis status of the animal and its cohort.

Lesions of tuberculous lymphadenitis, in particular those found in the lymph nodes of the head and thorax of cattle, require to be differentiated from pathological changes caused by other agents, notably *Actinobacillus lignieresii* (Plate 15). In such cases direct microscopic examination

may be of some assistance (Plates 16, 17).

Conclusion

Meat plant surveillance for tuberculosis in cattle at slaughter can be expected to increase in importance as a means of monitoring the tuberculosis status of the national herd in the future (Report, 1994). In the case of attested cattle the procedure offers a means for the early detection of herds recently infected. Detailed examination of tuberculin reactor cattle at slaughter can lead to the detection of tuberculous lesions in a high proportion of cases and thereby ensure a better understanding of the nature of the problem on the part of the herd owner and his/her advisers. Consequently the careful examination *post-mortem* of lymph nodes and of the lungs, represents an important element of the eradication programme, as well as being an integral part of the veterinary meat inspection programme.

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Australian Veterinary Journal **67**: 389-392.
- Report (1994).
In " Livestock Disease Eradication: Evaluation of the Cooperative State-Federal Bovine Tuberculosis Eradication Program", p. 78. National Research Council. Washington D.C. : National Academic Press.

DIFFERENTIAL DIAGNOSIS OF TUBERCULOSIS IN CATTLE AT SLAUGHTER

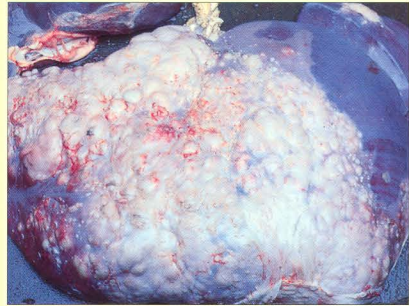


Plate No.1
Tuberculosis of the liver and associated peritoneum.

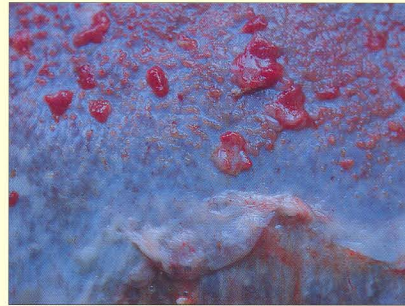


Plate No.2
Tuberculosis of the peritoneum associated with the spleen.



Plate No.3
Tuberculous pleurisy.

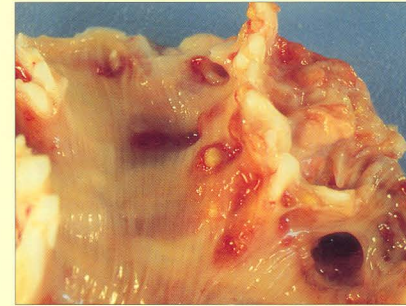


Plate No.4
Tuberculosis of the mucosa of the trachea.



Plate No.5
Tuberculous pneumonia. Extensive lesions resembling abscesses.

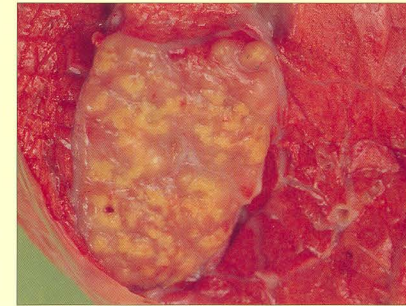


Plate No.6
Tuberculous pneumonia. Encapsulated necrogranulomatous lesion.

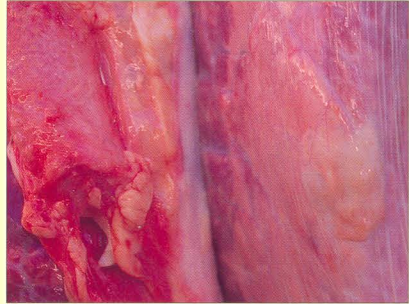


Plate No.7
Tuberculous pneumonia and localised pleurisy. Discrete lesion.

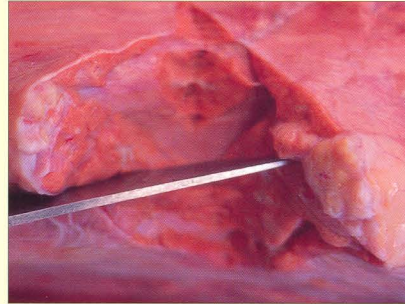


Plate No.8
Tuberculous pneumonia, shown in Plate No.7, after incision. Necrogranulomatous lesions.



Plate No.9
Tuberculosis of the mediastinal lymph nodes. Necrogranulomatous lesions.

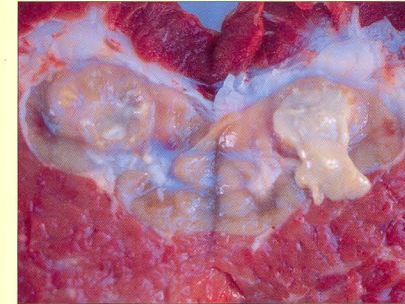


Plate No.10
Tuberculosis of the parotid lymph node. Necrogranulomatous lesions.

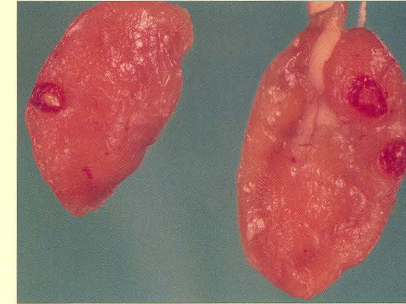


Plate No.11
Tuberculosis of the left bronchial lymph node. Early granulomatous lesions.



Plate No.12
Tuberculosis of the retropharyngeal lymph node. Encapsulated necrogranulomatous lesion.

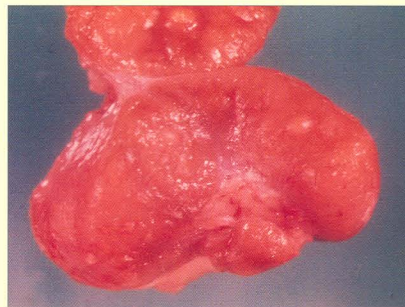


Plate No.13
Tuberculosis of the retropharyngeal lymph node. Proliferative granulomatous lesions without necrosis.



Plate No.14
"Skin Tuberculosis". Note tuberculoid granulomata along local lymphatic vessels.



Plate No.15
Actinobacillosis of the retropharyngeal lymph node. Granulomatous lesions.

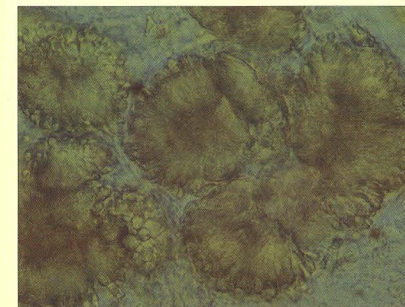


Plate No.16
"Club Formation" associated with *A. lignieresii* in Plate No.15. (X100).

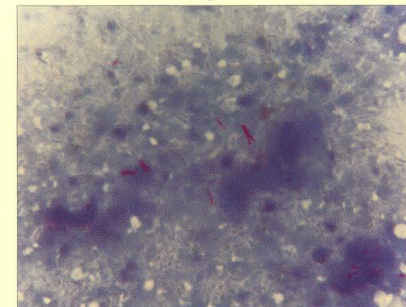


Plate No.17
Mycobacterium bovis in Plate No.9. (acid fast stain, X 1,000).