

ARTHRITIS IN SLAUGHTER PIGS

G V TURNER*, M G COLLETT**, C M VEARY* and CHARLOTTE KRUGER*

ABSTRACT

Joints obtained from 192 pig carcasses were examined by means of standard microbiological and macro- and histopathological procedures. Approximately 32% of the joints were considered normal; 35,5% showed lesions consistent with osteochondrosis and a non-specific synovitis was present in 24,4%. Only 6,1% of joints were arthritic and yielded either *Staphylococcus aureus* or *Streptococcus* spp. The remainder (2,3%) had periarticular lesions such as abscesses. The study emphasises that an accurate diagnosis and correct evaluation of pig carcasses showing joint lesions, is absolutely essential if a high standard of meat inspection is to be obtained and unnecessary economic losses are to be avoided.

Key words: Pigs, arthritis, osteochondrosis, meat inspection

Turner G.V.; Collett M.G.; Veary C.M.; Kruger C **Arthritis in slaughter pigs.** *Journal of the South African Veterinary Association* (1991) 62 No. 3, 107-109 (En.) Department of Veterinary Public Health, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, 0110 Onderstepoort, Republic of South Africa

INTRODUCTION

Arthritis has been a common cause of the total and partial condemnation of pig carcasses in the Republic of South Africa (RSA)¹. *Erysipelothrix rhusiopathiae* was found to be responsible for 48% of the cases of arthritis and *Streptococcus* spp., *Actinomyces (Corynebacterium) pyogenes* and *Staphylococcus aureus* for 20%, 4% and 2% respectively, whilst in 26% of the arthritic joints, no micro-organisms could be cultured in spite of marked pathological changes in the joints². Consequently, farmers were advised to vaccinate their pigs against swine erysipelas and it was considered imperative that both the *Lnn. iliaca mediales et laterales* and the *Lnn. axillares primae costae* be examined during the meat inspection of pig carcasses if the correct diagnosis of arthritis was to be made. In subsequent

years, the incidence of arthritis, when measured against abattoir condemnation figures, decreased⁵.

In 1987 and 1988 there was an increase in the number of total and partial condemnations of pig carcasses, which were recorded by personnel of the meat inspectorate as being due to arthritis. In one instance, the condemnation rate for arthritis was as high as 55% of the total number of pig carcasses condemned at an abattoir in a particular month (Table 1)⁵. The economic and pig health implications associated with these excessive condemnations, prompted an investigation into the problem.

The aim of this study was to determine which micro-organisms were involved in infectious arthritic lesions and to describe the patho-anatomical nature of the joint lesions.

MATERIALS AND METHODS

A total of 262 joints which had been condemned as being arthritic by the meat inspectorate, were obtained from 192 pig carcasses from 4 Grade A abattoirs in the Pretoria/Johannesburg area. Each joint was opened and examined and macroscopic changes were recorded. Specimens for

histopathology were taken from articular surfaces and synovial membranes. Swabs were taken aseptically from joints and plated on tryptose blood agar and incubated aerobically at 37°C for 72 h.

RESULTS

No changes in the joint cartilage or capsule were noted in 31,7% of the joints, and these were considered to be normal. Macroscopic lesions of osteochondrosis were recorded in 35,5% of the joints examined. Articular cartilage in these joints demonstrated buckling, full thickness cartilage flaps and ulcers, while synovial villi showed feathery hypertrophy. Microscopically, the synovial villi contained occasional lymphoid cuffs, haemosiderin-laden macrophages and embedded cartilage chips. A non-specific synovitis, characterised by mild to severe hyperaemia of the joint capsule, with or without periarticular bruising, and by the histological presence of embedded cartilage chips in many of the synovial membranes, was found in 24,4% of the joints. Only 6,1% of the joints were found to have pathology typical of infectious arthritis³. *Staphylococcus aureus* or *Streptococcus* spp. were isolated from these joints and no *E. rhusiopathiae* organisms were found. These joints showed a progressive subacute to chronic sero-fibrinous to fibrinopurulent arthritis with marked hypertrophy of the synovial villi and fibrous thickening of the joint capsule with or without pathology of the articular cartilage. The increase of synovial fluid varied from negligible to copious and varied from yellowish-brown to red. Periarticular lesions, mainly abscesses, were found around 2,3% of the joints otherwise diagnosed as being normal.

DISCUSSION

The reason why many of the joints in this study were regarded as being arthritic at meat inspection, was because of the increased and discoloured synovial fluid and prominent synovial villi. A significant number of joints (24,4%) showed a synovitis which was possibly traumatic in nature with the inflammation of the synovial membranes being induced by

*Department of Veterinary Public Health, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, 0110 Onderstepoort, Republic of South Africa

**Department of Pathology

Received: October 1990 Accepted: May 1991

Table 1: Pig carcase condemnations due to arthritis for months January-August 1988 at 4 Grade A abattoirs⁶

Abattoir	Month	Number pigs slaughtered	Number carcasses condemned	% carcasses condemned due to arthritis
A	January	5 575	155	15
	February	5 565	180	19
	March	7 073	170	21
	April	4 628	79	27
	May	*	*	*
	June	5 879	170	25
	July	*	*	*
	August	6 189	161	25
B	January	4 115	150	38
	February	4 824	121	37
	March	5 429	116	24
	April	4 750	144	55
	May	5 243	277	41
	June	4 780	232	43
	July	4 805	201	46
	August	5 510	106	46
C	January	*	85	20
	February	*	92	29
	March	*	122	16
	April	*	72	21
	May	12 176	123	12
	June	12 345	139	36
	July	10 496	100	27
	August	12 123	76	38
D	January	10 629	69	42
	February	12 589	59	34
	March	14 539	68	44
	April	11 156	61	54
	May	12 690	32	44
	June	13 577	39	49
	July	12 360	65	23
	August	13 765	66	41

* = Figures not obtainable

damaged articular cartilage. It was considered that early stages of osteochondrosis played a significant role in many of these cases. Since many of these joints also showed periarticular bruising, trauma from loading, transport or pre-slaughter handling probably also contributed to the increased synovial fluid.

Osteochondrosis, a non-infectious condition which is usually bilaterally symmetrical, is characterised by focal disruptions of articular cartilage at the chondro-osseous junction resulting in full-thickness cartilaginous folds, buckles, flaps or ulcers². The regional lymph nodes associated with joints showing osteochondrosis are normal².

In some cases this could have been as a result of mild peri-articular bruising and joint concussion with a concomitant increase of joint fluid, which may have been blood-stained. With these joints being opened at the abattoir, any increased synovial fluid had possibly drained away

by the time they were examined in the laboratory.

The incidence of infectious arthritis was relatively low. In contrast to previous findings³, *E. rhusiopathiae* did not appear to be an important aetiological agent in this study. Joints with infectious arthritis characteristically contain an exudate, have thickening of the synovial membranes, articular erosions and possibly pannus². Synovial villi show moderate to severe polypoid hypertrophy and inflammation with occasional infarction of villus tips. A most important finding is that the regional draining lymph nodes are usually enlarged due to lymphoid hyperplasia and possible suppuration². It is essential that the relative lymph nodes be examined when judging whether a carcase has infectious arthritis or not. This includes the *Lnn. axillares primae costae*, the main lymph nodes draining the fore-limb, which are not routinely examined at abattoirs³. A high percentage of the joints

(75,0%) in this study were elbow joints.

It was felt that the non-infectious joint conditions (91,6%) noted in this study did not, in most cases, warrant partial condemnation of the limb. This led to unnecessary mutilation of the carcase and economic loss to the producer as a result of carcase mass loss and downgrading. The downgrading of arthritic pig carcasses that have been subjected to partial condemnation of the forelimb, appears to be unrealistic. This aspect of grading pig carcasses needs to be investigated further.

Pigs likely to have osteochondrosis are those that walk on their toes with a stilted gait, have carpal and elbow joints which are flexed, rear limbs which are hyper-extended, an arched back or walk with excessive lateral swaying^{1 2}. Further research should be conducted into the occurrence and economic implications of this condition in the national pig herd. However, it is imperative that both the *Lnn. iliaci mediales et laterales* and the

Lnn axilares primae costae be examined when inspecting pig carcasses and that this should play an integral role in the differentiation of infectious and non-infectious joint lesions. The functions of the meat inspectorate should also include protecting the producer from unnecessary economic losses, by not carrying out unjustified partial and total condemnations of carcasses at the abattoir. This study confirms previous recommendations concerning condemnations at abattoirs^{3 4}. The accurate diagnosis and correct evaluation of a porcine carcass showing joint lesions, is absolutely essential if a high standard of meat inspection and meat hygiene is to be obtained. This must be performed by a

suitably qualified veterinarian. In addition, data on economically important conditions diagnosed at abattoirs, should be utilised in disease surveillance programmes to the best advantage of the livestock industry in the RSA.

ACKNOWLEDGEMENTS

The authors would like to express their sincere thanks to Drs Schoeman, Oendaal, Eisenhammer, Louro and their staff (Directorate Meat Hygiene, Chief Directorate Veterinary Services) for collecting the material for this study as well as the Meat Board for financial assistance and Mrs J Klingenberg for typing the manuscript.

REFERENCES

1. Hogg A 1981 Lameness in swine. *Modern Veterinary Practice* 62: 689-693
2. Johnstone K M, Doige C E, Osborne A D 1987 An evaluation of nonsuppurative joint disease in slaughter pigs. *Canadian Veterinary Journal* 28: 174-180
3. Turner G V S 1977 Porcine arthritis and meat hygiene in South Africa. *Journal of the South African Veterinary Association* 49: 40-44
4. Turner G V S 1986 The use of abattoir condemnation data in a pig herd health programme. *S A Pig Journal* 16: 21-22
5. Standing regulations: The Animal Slaughter, Meat and Animal Products Hygiene Act, 1967 (Act 87/1967). Government Notice R3505 9 October 1969
6. Standing regulations: The Animal Slaughter, Meat and Animal Products Hygiene Act, 1967 (Act 87/1967). Schedule 8 monthly returns: Chief Meat Hygiene Officer