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PATHOLOGICAL LESIONS IN SWINE AT SLAUGHTER

II. CULLED SOWS*

By

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FLESJÅ, K. I. and H. O. ULVESÆTER: *Pathological lesions in swine at slaughter. II. Culled sows.* Acta vet. scand. 1979, *20*, 515—524. — The same computerized recording system as described in Part I of this publication (*Flesjå & Ulvesæter* 1979) was applied to sows slaughtered at Sentralslakteriet, Forus, Stavanger.

In the three-year period 1975—1977 a total of 10,051 apparently healthy sows were brought to the abattoir. About 17 % of the carcasses had one or more pathological lesions. Of the total number of lesions 89 % were confined to 18 of the available 57 disease codes. Pyaemia and abscess/-es occurred at a rate of 1.5 and 3.2 %, respectively. This comprised 21 % of all registered lesions. Scabies and numerous white liver spots came to another 21 %, occurring in 3.3 and 1.5 % of the animals, respectively. About 15 % were chest lesions, of which pleurisy was diagnosed in 1.4 % and pericarditis in 1.3 % of the slaughtered sows. Other lesions recorded in 1 % or more included perihepatitis and other non-parasitic liver lesions, arthritis and decubitus.

Only code 31 — numerous white spots in the liver showed a convincing seasonal variation.

Significantly higher frequencies of pyaemia and abscess/-es occurred in culled sows than in baconers, but no such difference could be found for peritonitis, polyarthritis and arthritis. For all other commonly observed lesions significantly lower frequencies were seen in sows compared to baconers.

Various theories are suggested to explain the observed difference in the distribution of lesions between baconers and sows.

disease recording; slaughter-house; post-mortem findings; sows.

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In Part I (*Flesjå & Ulvesæter* 1979) we described and discussed the distribution and frequencies of lesions in bacon swine at slaughter. This paper presents the results of a similar study in culled sows.

MATERIAL AND METHODS

The material consists of apparently healthy sows brought to Sentralslakteriet, Forus, Stavanger, in the period 1975—1977. Emergency-slaughtered sows, which constitute 1.7—2.5 % of the total number, are excluded for technical reasons. A sow in this respect is a pig which has farrowed at least once. The meat inspection routines, recording system and data processing were performed in the same way as described in Part I.

RESULTS

During the recording period about 3,300 sows were slaughtered annually (Table 1).

Table 1. Number of sows slaughtered per year and the relative frequencies of carcasses having none, one, two, three and four lesions.

Year	Number slaughtered	Number of lesions per carcass (relative frequencies)				
		0	1	2	3	4
1975	3212	81.8	9.8	4.7	2.5	1.2
1976	3311	84.5	8.1	3.6	2.0	1.4
1977	3528	84.0	8.8	4.0	2.1	1.1
Total	10051					

Table 1 shows that about 83 % of the animals had no lesions, and that of the 17 % affected, more than half of them had only one lesion. Moreover, of those affected, there is an approximate bisection of frequencies between each column.

It became apparent that a clear predominance of certain lesions occurs in the material, and detailed information is restricted to these. In Table 2 are listed pathological lesions occurring at rates of 0.3 % and above.

Table 2 shows that about 89 % of the total number of lesions are contained in 18 disease codes. Of the remaining 39 codes

Table 2. The most common disease codes and their frequencies.

Codes	1975		1976		1977		Total	
	number	%	number	%	number	%	number	%
06 Pyaemia	49	1.53	48	1.45	54	1.53	151	1.50
07 Abscess/-es	125	3.89	100	3.02	94	2.66	319	3.17
12 Mild/moderate pneumonia	16	0.50	17	0.51	28	0.79	61	0.61
13 Pleurisy	48	1.49	43	1.30	52	1.47	143	1.42
14 Pericarditis	67	2.09	40	1.21	25	0.71	132	1.31
21 Tuberculous lesions in the cervical lymph nodes	16	0.50	8	0.24	6	0.17	30	0.30
24 Peritonitis	11	0.34	19	0.57	16	0.45	46	0.46
31 Liver white spots (condemnation)	61	1.90	34	1.03	57	1.62	152	1.51
39 Other liver lesions	35	1.09	40	1.21	33	0.94	108	1.07
50 Polyarthritis	8	0.25	19	0.57	21	0.60	48	0.48
51 Arthritis	57	1.77	44	1.33	46	1.30	147	1.46
52 Lesions in claws	15	0.47	9	0.27	16	0.45	40	0.40
53 Fractures	13	0.40	11	0.33	13	0.37	37	0.37
60 Scabies	112	3.49	101	3.05	120	3.40	333	3.31
61 Decubitus	36	1.12	44	1.33	32	0.91	112	1.12
62 Tail lesions (cannibalism)	18	0.56	5	0.15	18	0.51	41	0.41
80 Anaemia	16	0.50	13	0.39	22	0.62	51	0.51
81 Emaciation	17	0.53	11	0.33	20	0.57	48	0.48
Total (18 lesions)	720		606		673		1999	
% of all noted lesions		91.6		84.6		89.4		88.6
Other lesions (39 lesions)	66	8.4	110	15.4	80	10.6	256	11.4
Total number of lesions	786	100	716	100	753	100	2255	100

seven occurred at frequencies between 0.1 and 0.3 %. Some codes, such as 09 — unfit, maltreated, 15 — endocarditis, 20 — lesions in the mouth, 42 — uraemia, and 54 — rickets, were never used. In the 90 groups only code 94 — erysipelas was in use a few times.

The average number of sows slaughtered per month was 280, ranging from 177 to 409. The monthly variation in carcasses with lesions is presented in Fig. 1. The relative figures range from 9.8 to 24.4 % with a mean of 16.4. The average curve has the lowest figure in November and the highest in December. There are, however, considerable divergencies between the curves, making a seasonal variation unlikely.

The mean occurrence of abscess/-es and pyaemia was 3.2 and 1.5 %, respectively. Together they accounted for nearly 21 % of

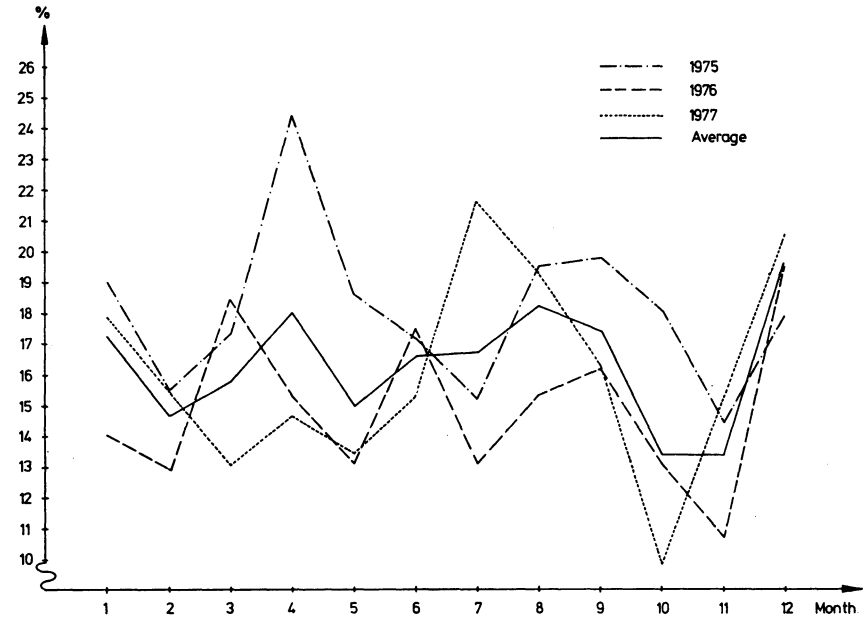

Figure 1. Frequency of culled sows having one or more lesions.

the total number of recorded lesions. Occurrence of abscess/-es in the recording period gradually declined whereas the frequencies of pyaemia were relatively constant (Table 2). The monthly figures of pyaemia varied between 0 and 4.1 %, and of abscess/-es between 1.4 and 4.8 %. The average curve of pyaemia (Fig. 2) may indicate a seasonal variation with peaks in the spring and the autumn. Abscess/-es show low frequencies in

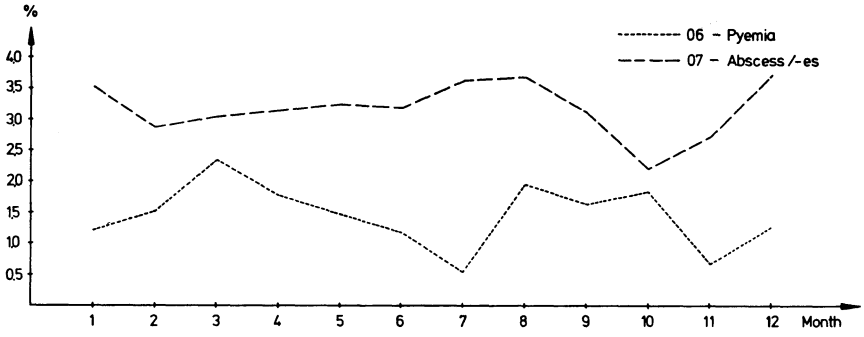

Figure 2. Frequencies of code 06 — Pyaemia and of code 07 — Abscess/-es (averages of three years).

late autumn. The single year curves, however, show great variations.

Moderate pneumonia (Fig. 3) was diagnosed in 0.6 % of the slaughtered sows, ranging from 0 to 1.6 %. The highest figures were noted in August—October.

Pleurisy and pericarditis occurred in approx. 1.4 and 1.3 %, respectively. The frequencies of pleurisy varied between 0.3 and 3.3 %, and of pericarditis between 0.2 and 4.3 %. The records display no seasonal variation or any parallelism between the two lesions.

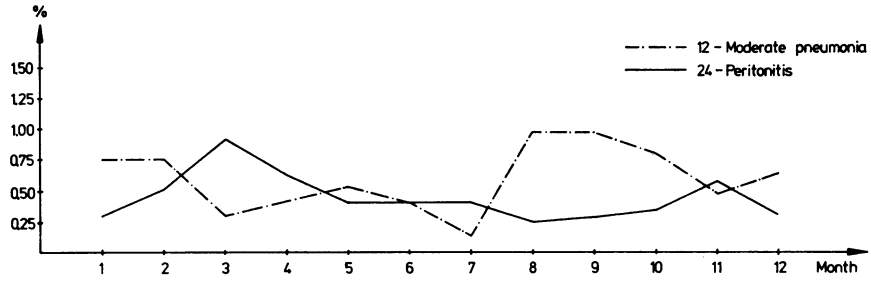

Figure 3. Frequencies of code 12 — Moderate pneumonia and of code 24 — Peritonitis (averages of three years).

Altogether chest lesions made up about 15 % of the total number of lesions.

Code 21 — tuberculous lesions in the cervical lymph nodes were 0.3 %. Monthly variations ranged from 0 to 1.2 %. An annual drop in the frequencies was noted in the recording period (Table 2).

Peritonitis (Fig. 3) was found in about 0.5 % of the carcasses, the monthly frequencies ranging between 0 and 1.2 %. The highest frequencies, averaging 0.75 %, were seen in March—April, thus indicating a top season in this period.

Fig. 4 shows the frequencies of multiple white spots in the livers. This lesion was noted at a mean of 1.5 %, varying between 0 and 3.5 %. The diagram indicates a seasonal variation, with autumn being the high season.

Code 39 — perihepatitis and non-parasitic liver lesions were found in about 1.1 % of the material, varying from 0 to 2.8 %. The lowest numbers were seen in August and December—

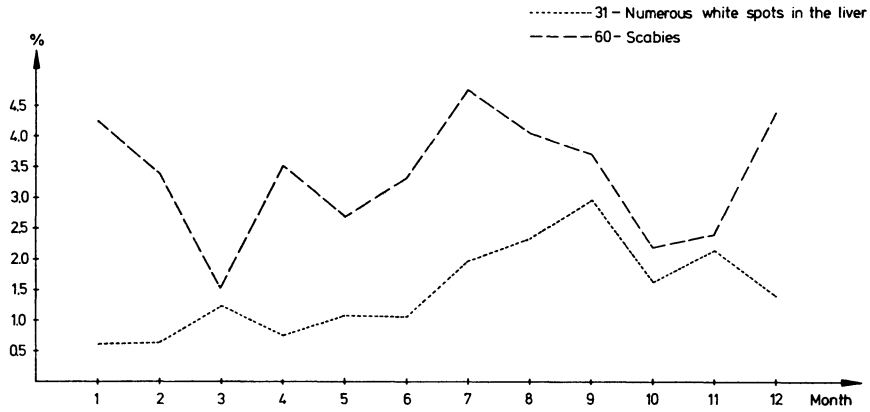

Figure 4. Frequencies of code 31 — Numerous white spots in the liver and of code 60 — Scabies (averages of three years).

January, but the monthly records of the respective years show considerable discrepancies making a seasonal variation unlikely.

Polyarthritis and arthritis were seen in about 2.6 % of the carcasses. This is about 8.5 % of the total number of pathological lesions. The frequencies of polyarthritis ranged from 0 to 1.6 % and arthritis from 0.4 to 2.9 %. Table 2 indicates an annual increase in polyarthritis, with an opposite trend in the figures for arthritis. No seasonal variation is detected for these two lesions.

Fig. 5 demonstrates the average frequencies of code 52 — claw lesions, 53 — fractures, and 61 — decubitus. Both 52 and 53 were seen at low frequencies with a mean about 0.4 %, range

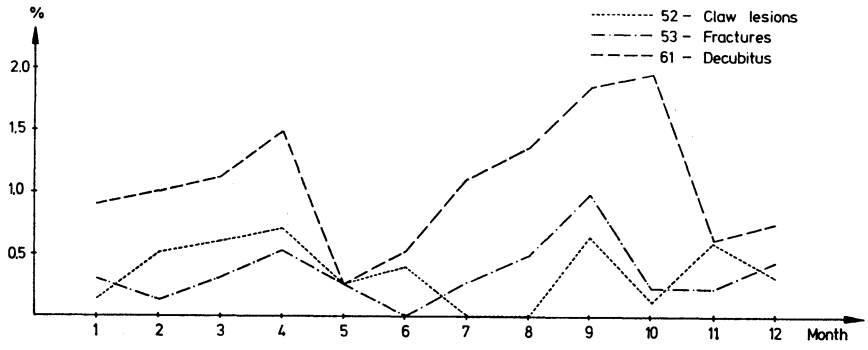

Figure 5. Frequencies of code 52 — Claw lesions, code 53 — Fractures and of code 61 — Decubitus (averages of three years).

between 0 and 1.2 %, while code 61 occurred at an average of 1.1 %, the lowest record being 0, the highest 3.6 %. A trend is traced in all three towards a seasonal variation with the lowest frequencies noted in the summer.

Fig. 4 presents the occurrence of scabies. This lesion was recorded in about 3.3 % and constitutes nearly 15 % of the total. The frequencies vary between 1.2 and 7.8 %. Low figures were observed in March and October—November indicating a high winter and summer season. However, the annual records show considerable disparities weakening such a statement.

Tail lesions were noted in about 0.4 % of the sows, varying between 0 and 0.9 %. The records demonstrate no seasonal variation but considerable disparities between years (Table 2).

Anaemia and emaciation were both observed in about 0.5 %. The figures range between 0 and 2 %. Both have their highest average figures in the spring and the autumn.

DISCUSSION

All reservations emphasized in Part I also apply to this study. Moreover, it should be noted that many lesions occur in small numbers, hence the data must be interpreted with care.

There is, however, a clear-cut difference between breeders and baconers as to the number of affected animals. The figures are about 17 and 40 %, respectively. A further comparison shows that these differences are present in most observed lesions. It may be asked whether these disparities have their origin in different breeding systems and environments of the two groups of animals. Most producers of baconers buy their piglets without knowledge of previous ownership and the health status of the herd. Breeding animals, on the other hand, are to a great extent recruited from the owner's combined herd. To elucidate this point, 37 combined herds were randomly selected from the material for comparison. In the period 1975—1977 the 37 herds had brought 30,700 baconers and 2,050 sows to the slaughter-house. A two-way variance analysis undertaken in the material from the 37 herds on the occurrence of codes 06, 07, 12, 13, 14, 21, 24, 31, 39, 50, 51 and 60 showed significant ($0.001 < P < 0.01$) and highly significant ($P < 0.001$) differences between baconers and breeders for all except codes 24 — peritonitis, 50 — polyarthritis and 51 — arthritis. This observation may be interpreted in two ways:

a) Some lesions heal completely in the course of time.
b) Affected animals are not chosen for breeding.

The former could probably be true for abscess/-es, lung inflammation, tuberculous lesions in the lymph nodes, white liver spots and scabies, but seems rather unlikely in chronic fibrous pleurisy, pericarditis, perihepatitis and arthritis. An ordinary stock owner who wants to renew parts of his breeding stock usually inspects his fatteners and, bearing in mind the ancestors' breeding qualities, chooses the leanest and most fast growing pigs. Many of the recorded diseases have a mild or subclinical course which may escape the owner's attention. Our results, however, would indicate that the pigs are influenced in such a way (for example by growth retardation) that an affected animal is not readily chosen for breeding.

The results of the post-mortem examination indicate that the sows are less susceptible to many diseases than young pigs. A closer look at the different lesions shows, however, that pyaemia and abscess/-es occur at higher rates in sows than in baconers. This is surprising considering the absence of castration wounds and the low frequency of tail lesions in sows. Other conditions, however, such as mastitis, metritis, claw lesions, decubitus and neck wounds (ties) are more common and may serve as portal entry for pyogenic processes. It should be stressed, however, that the uterus is not regularly inspected at slaughter, and that a purulent mastitis is recorded as an abscess. This may partly explain the low recordings of metritis and mastitis in our survey.

There is no significant differences in the frequencies of peritonitis between baconers and sows. This may imply that peritonitis does not influence the growth and thriftiness of the young animal, or more likely, that the condition has been acquired at a later stage in life, e.g. related to metritis.

The frequencies of polyarthritis and arthritis do not differ statistically from those observed in baconers. No attempt has been made to differentiate between arthrosis/osteochondrosis and arthritis. It has been demonstrated that the former is frequently seen in young sows and is reported to be an important culling factor (*Reiland* 1972, *Nielsen* 1973, *Grøndalen* 1974). *Reiland* pointed out that osteochondrosis and other joint lesions may cause a Locus minoris resistentiae, leading to a secondary bacterial infection. *Nielsen* (1966) and others have isolated Erysipelotrix insidiosa in the majority of arthritis joints. It is as-

sumed that the pigs mostly acquire this infection at a relatively young age, that there is a predilection for carpal and tarsal joints, and that the affected animals become unthrifty and show growth retardation. It seems unlikely that such animals will become breeders. Moreover, arthritis in sows is most frequently observed in larger joints such as elbow, shoulder, knee and hip.

The parasitic lesions of Ascaris suum and Sarcoptes scabiei (Table 2) are seen less frequently in sows than in baconers. This might be expected bearing in mind current theories on resistance and immunity. Other factors, however, may influence the parasitic condition. Many herd owners, for example, care more for their breeding sows than for their baconers, a fact which will often result in a more intensive anti-parasitic programme in the former.

Fig. 4 demonstrates a similar seasonal variation of white spots in the livers of sows as shown in Part I for baconers, and is probably the result of a seasonal embryonation of eggs (*Connan* 1977). There is not the same corresponding curves for scabies. The reason for this deviation is not clear, but several of the factors discussed in Part I do not generally apply to breeding sows, i.e. seasonal relative overcrowding and omission of cleaning in the cold season.

The frequencies of claw lesions, fractures and decubitus are low, but are indicative of a low season in summer. There is a probable relation between these lesions, i.e. both claw lesions and fractures may lead to decubitus. *Reiland* points at a relation between these lesions and osteochondrosis, but an interaction of environmental factors is also probable (*Nielsen* 1973). Grazing is not very common, hence outdoor life is probably not the main reason. Herd owners, however, do often feed their sows grass in the warm season, and this may have a favourable effect on the animal's constitution. Usually spring and early summer are also the driest seasons, and dry, sunny weather will to some degree reduce the humidity in the pig sties, making the concrete floors less slippery.

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SAMMENDRAG

Patologiske funn på svin ved slakting. II. Purker.

Parallelt med sjukdomsregistreringen på slaktegris, som er beskrevet i Del I (*Flesjå & Ulvesæter* 1979), foregår også en tilsvarende registrering på utrangerte avlsdyr.

I perioden 1975—1977 ble det normalslaktet 10.051 purker ved Sentralslakteriet, Forus, Stavanger. Ca. 17 % av disse hadde fra en til fire patologiske forandringer. Av systemets 57 sjukdomskoder forekom 18 med frekvenser over 0,3 %. Disse utgjorde tilsammen ca. 89 % av de avgitte anmerkninger. Pyemi og abscess/-er forekom på henholdsvis 1,5 og 3,2 % av slaktene og utgjorde ca. 21 % av de registrerte sjukdomsfunn. Skabb og multiple hvite leverflekker utgjorde også 21 % av anmerkningene. Skabb ble påvist på 3,3 % av slaktene, leverflekker på ca. 1,5 %. Sjukelige forandringer i brysthula utgjorde 15 % av samlet anmerkningstall. Hyppigst forekom pleuritter, som ble registrert på 1,4 % av skrottene, og pericarditter som ble påvist hos 1,3 %. Andre forandringer som forekom med gjennomsnittsfrekvenser over 1 % var arthritter, perihepatitter og andre non-parasitære leverlidelser, og decubitus. Bare kode 31 — multiple hvite leverflekker viste en overbevisende sesongmessig opptreden.

En sammenligning av frekvenser mellom purker og slaktegris (Del I), viste en høyere frekvens av pyemi og abscess/-er blant purkene, ingen signifikant forskjell når det gjaldt peritonitt, polyarthritt, arthritt, men en sikker lavere frekvens for de øvrige vanlige forekommende koder.

Mulige forklaringer på den ulike fordeling av patologiske forandringer hos slaktegris og utrangerte purker blir presentert.

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