Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

Journal of the Department of Agriculture, Western Australia, Series 4

Volume 2
Number 1 *January, 1961*

Article 15

1-1-1961

Virus pneumonia of pigs

J Craig

N. MacIntyre

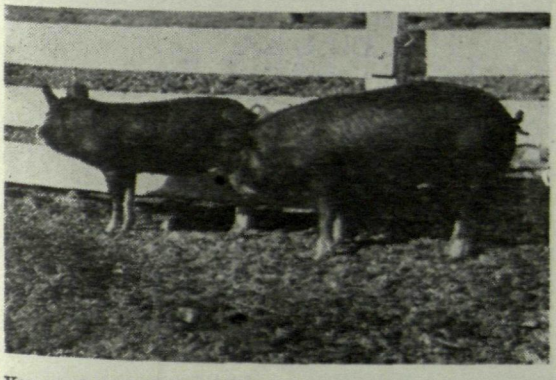
VIRUS PNEUMONIA OF PIGS

By J. CRAIG, M.R.C.V.S., Senior Veterinary Surgeon and
N. MACINTYRE, M.D.A. (Hons.), Pig Husbandry Instructor, Muresk

THIS disease is widespread in Western Australia and is undoubtedly a most serious source of economic loss to the pig industry. The effects of virus pneumonia are such that in badly managed herds, widespread pneumonic outbreaks and deaths are common. By contrast, in well managed herds, there is the more insidious problem of low or nil death rates, accompanied however by an appreciable fall in animal production.

It has been clearly shown in many scientific observations, that pigs affected with infectious pneumonia have—

(a) their growth depressed by 16 per cent.,
(b) their weaning weights depressed by 23 per cent.,
(c) their feed utilisation and conversion abilities depressed by 22 per cent.



Young Berkshire slips of the same age but from different litters. One is pneumonia free whilst the other is affected with virus pneumonia and shows a markedly reduced growth rate

In effect, whereas it takes pneumonia affected pigs 6-6½ months to reach dressed bacon weights of 135-140 lb., pneumonia free pigs can reach this weight in 5-5½ months.

It is quite clear that even in its less obvious forms, virus pneumonia not only reduces the margin of profit in each pig but limits the number of profitable pigs the farmer can turn over yearly.

CAUSE

The disease is caused by a virus which has an affinity for lung tissue. Until fairly recently it was believed, quite wrongly, that a mixed bacterial infection was responsible for the symptoms seen, but it is now known that these bacteria are merely secondary invaders. They cannot produce the disease in the absence of the virus, although they do appear to increase its severity.

The infection is spread from pig to pig following the act of coughing, when fine droplets of moisture in which the virus is present, are disseminated through the air.

Although pigs which have recovered from the active phase of the disease may appear quite healthy, the virus persists in their lungs and they remain a potent source of further infection where other pigs are concerned. In this symptomless carrier status, breeding sows with pneumonic lesions readily transmit the infection to their litters, whilst similarly affected store pigs may introduce and perpetuate the disease in any piggeries into which they happen to be introduced.

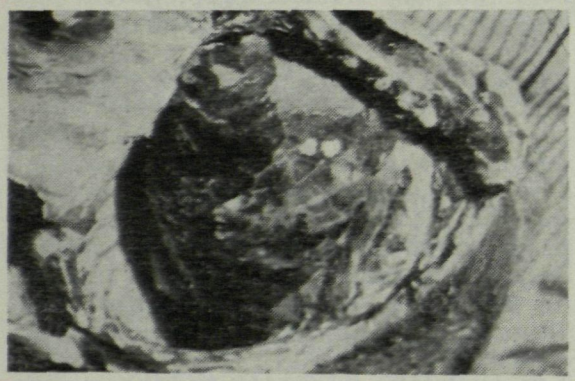
The general incidence of the infection can be best judged at post-mortem, and observations at abattoirs indicate that at least one third of the pigs that are slaughtered show lung damage typical of virus pneumonia.

SYMPTOMS

The symptoms seen, broadly fall into two patterns—acute and chronic.

The acute disease is most often seen in young pigs—weaners and slips—which show symptoms of listlessness, refusal to eat, high temperature, laboured breathing and coughing. The death rate in some instances is quite high, whilst animals which do survive are slow to recover and frequently remain unthrifty and stunted.

The chronic disease is the form most commonly encountered, the predominant symptom being spasmodic coughing; this can usually be induced with little difficulty after forced exercise. Such pigs are frequently bad doers and fail to thrive; others appear fairly normal, but their growth rate is so retarded that a much longer period and a greater feed intake is necessary for the pigs to reach marketable weights.



Post mortem lesions of virus pneumonia

POST MORTEM

At post mortem, the affected lungs are seen to contain consolidated areas of pneumonia; these are firm and solid to touch, their colour varying from dark red to grey. The pneumonic parts are clearly demarcated from normal healthy lung tissue which is spongy, soft to touch and pink.

In some cases pleurisy is present, the lungs being firmly adhered to the chest wall.

PREDISPOSING FACTORS

The influence of environmental stress factors favour the spread of virus pneumonia. Exposure to inclement conditions and failure to provide adequate nutrition are important predisposing causes, and the incidence of infectious pneumonia is especially high in herds where there are shortcomings in management, nutrition and hygiene.

Yet another important factor may be the injuries inflicted by the migrating larvae of the common round worm (*Ascaris lumbricoides*). During the migration of these larvae through the lungs, tissue damage may be so great as to lower the resistance of these organs to micro-organisms such as the virus of swine pneumonia.

Due emphasis must therefore be directed towards efficient management, adequate housing, high standard feeding and internal parasitic control.

Whilst sties and shelters need not, under W.A. conditions, be elaborate, they must be warm, well ventilated and free from draughts, and the floors must be above ground to avoid dampness. The ration fed must be adequate both in quality and quantity, and should approximate departmental recommendations where protein, minerals and vitamins are concerned. Vitamin A is particularly important, and in the absence of green feed during the long dry W.A. summer period, a proprietary Vitamin A supplement must be made available.

By increasing the resistance of the pigs these measures will minimise the effects of the infection but they cannot prevent its spread or eliminate losses. These ends can only be achieved by total eradication of the disease.

ERADICATION MEASURES

The control of infectious pneumonia by conventional methods of quarantine and slaughter of the affected pigs was attempted, unsuccessfully, many years ago. Even the use of such modern miracle drugs as the anti-bacterials and anti-biotics, fail to check and eliminate the infection from the herd; nor can any reliance be placed on commercial "pneumonia vaccines," which incidently, are merely cultures of the secondary lung bacteria and not made up of the actual virus which causes the disease.

Fortunately, recent research in Great Britain and Australia has thrown new light on the problem, and indicate steps, which if carefully carried out, can lead to the eventual control and complete elimination of this disease from pig herds.

Once free of the infection, a herd can be relied upon to remain so, provided the disease is not re-introduced.

Two methods are available there.

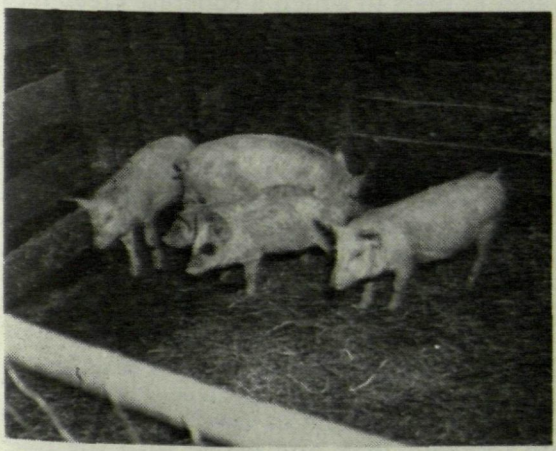
The first involves the complete sale of all pigs from the property followed by complete restocking, after a brief interval, with stock from a known virus pneumonia free herd. This method is an attractive one, but unfortunately there are no certified pneumonia free herds in W.A. from which to restock at the present moment.

The second involves using the litter to determine whether the sow is a carrier of the infection, and in this respect due advantage is taken of the fact that the pneumonia virus survives only briefly in the ground or in sties, and cannot spread from infected to non-infected pigs provided a distance of at least 10 feet is maintained between the pigs.

The eradication of infectious pneumonia by the latter method is divided into three phases.

Phase 1.

The initial step is to divide the pig herd into isolated small units to halt the further spread of the infection; such a unit is made up of the sow and her litter.



In this litter of cross-bred slips affected with virus pneumonia, two obvious "runts" can be seen

These individual units must be sufficiently isolated to prevent cross infection taking place, and under paddock conditions a quarantine barrier of 10 feet between the litters is necessary. Where pigs are housed in enclosed sties it is usual to leave an empty pen between each unit, but such a quarantine space should preferably be greater than 10 feet. It is quite obvious that secure fencing must be an essential prerequisite to this programme.

Each sow farrows in isolation and remains strictly segregated with her litter until weaning. Any litter which develops symptoms of coughing must be considered for rejection and, together with the sow should be sold for slaughter. Litters which remain apparently healthy and show no evidence of coughing, are kept intact until they reach an economic slaughter weight as porkers, when at least 50 per cent. plus 1 of the litter—barrows or cull gilts—are killed and their lungs given a careful veterinary examination to determine whether or not virus pneumonia is present.

If any pneumonia lesions are seen, the sow and her remaining progeny must be sold for slaughter.

If no evidence of pneumonia is detected, it may be safely assumed that the remaining litter mates can be used for future breeding and will form the nucleus of a virus pneumonia free herd. The sow herself however, must be disposed of for slaughter as soon as practicable, since the production of one "clean" litter is no guarantee of this same process being repeated on a future occasion, e.g., some infected sows only intermittently pass on the virus infection with the result that one litter may be non-infected whilst the next may be infected.

Of particular interest in this respect are recent English observations which show that—

Young sows—55 per cent. produce infected litters.

Mixed age sows—26 per cent. produce infected litters.

Old sows—6 per cent. produce infected litters.

Phase 2.

The young apparently pneumonia free gilts kept for breeding are again tested under the same isolation procedure to make sure they are free; and final confirmation of their freedom from virus pneumonia is obtained when they later produce pneumonia free litters.

Gradually the herd will be rebuilt upon the residual progeny of the non-infected units and within 12 months should be disease free. No pigs should be introduced during this period, but if it is necessary

to introduce new blood lines, the same basic principles can be followed.

It is important to dispose of all infected units—both sows and litters as soon as possible after detection. Following their removal, the premises should be cleaned, disinfected and briefly spelled for several weeks before restocking takes place.

Phase 3.

Following the completion of Phase 2 the potentially free herd undergoes a six months proving period. At appropriate intervals during this time, culls of economic age are selected and killed, their lungs being carefully checked for evidence of pneumonic lesions.

The herd, after safely passing through this final testing period, can confidently be certified as free of virus pneumonia.

Cost.

The main cost would be the necessary erection of double fences in order to secure strict isolation, and a temporary reduction in pig numbers whilst the eradication programme was under way. However, it is considered that the eventual advantages to be gained from increased growth rates and greater efficiency of food conversion are obvious and would far outweigh this initial outlay.

SUMMARY

Virus pneumonia in pigs is so prevalent in W.A. that the time has come when a serious attempt should be made to provide disease free breeding animals. These would provide a source of healthy breeding stock which could in turn be used to repopulate the industry at large.

The availability of virus pneumonia free pigs would provide an even more important sequel in that research workers in swine nutrition and genetics would have an increased opportunity for basic research through the use of a superior experimental animal.

In this light, it is considered that future pig nutrition trials at Muresk Agricultural College may be contemplated with confidence in the results that may be obtained.

MURESK AGRICULTURAL COLLEGE ERADICATION PROGRAMME

The initial step by the college to eradicate infectious pneumonia was taken in August, 1958, when a Tamworth sow farrowed and reared her crossbred litter in isolation. Five of the eight piglets of this litter were killed in November of the same year, and the lungs on examination proved to be free of pneumonic lesions.

The experience gained with this crossbred litter was helpful in determining the steps which were later taken with subsequent pure bred litters.

The number of sows and litters isolated for testing during the latter part of 1958 and early 1959 were few due to the non-availability of suitable isolation paddocks.

To help overcome this problem, work was commenced on seven paddocks separated from the existing piggery by a road and individually isolated by a 12 foot race between. However, progress was further held up by the shortage of suitable pig netting.

With the completion of the seven isolation paddocks, work was started on the reconstruction and redesigning of the layout of the old piggery with the objective of establishing a further 13 paddocks, suitable for rearing, and six larger ones in which to run brood sows.

It is intended that all rearing paddocks will be equipped with round concrete shelter pens to which a concrete creep feed area is attached.

Phase 1.

Due to the fact that there were several top quality sows at Muresk, it was decided, as an expedient, to retain temporarily those sows whose litters proved pneumonia free, so that they could farrow down a second time. Of the four sows retained, only one later produced an infected litter.

Aged sows and those of average quality were disposed of for slaughter immediately following the weaning of their litters.

The actual start of Phase 1 was made with the farrowing of two Tamworth sows in October, 1958, and ended with the testing of the last litter of the original sows in May, 1960.

During this time, 23 litters were farrowed in isolation, and 146 pigs reared to 112 days of age. Of these 146 pigs, 90 (61.6 per cent.) were killed for College rations and their lungs examined for signs of virus pneumonia infection.

Only five of the 23 litters examined showed positive indications of pneumonic

infection, the other 18 litters being quite free.

The residual progeny of the 18 unaffected litters has provided a potential breeding herd of—

Berkshires:—5 Boars and 24 Sows.

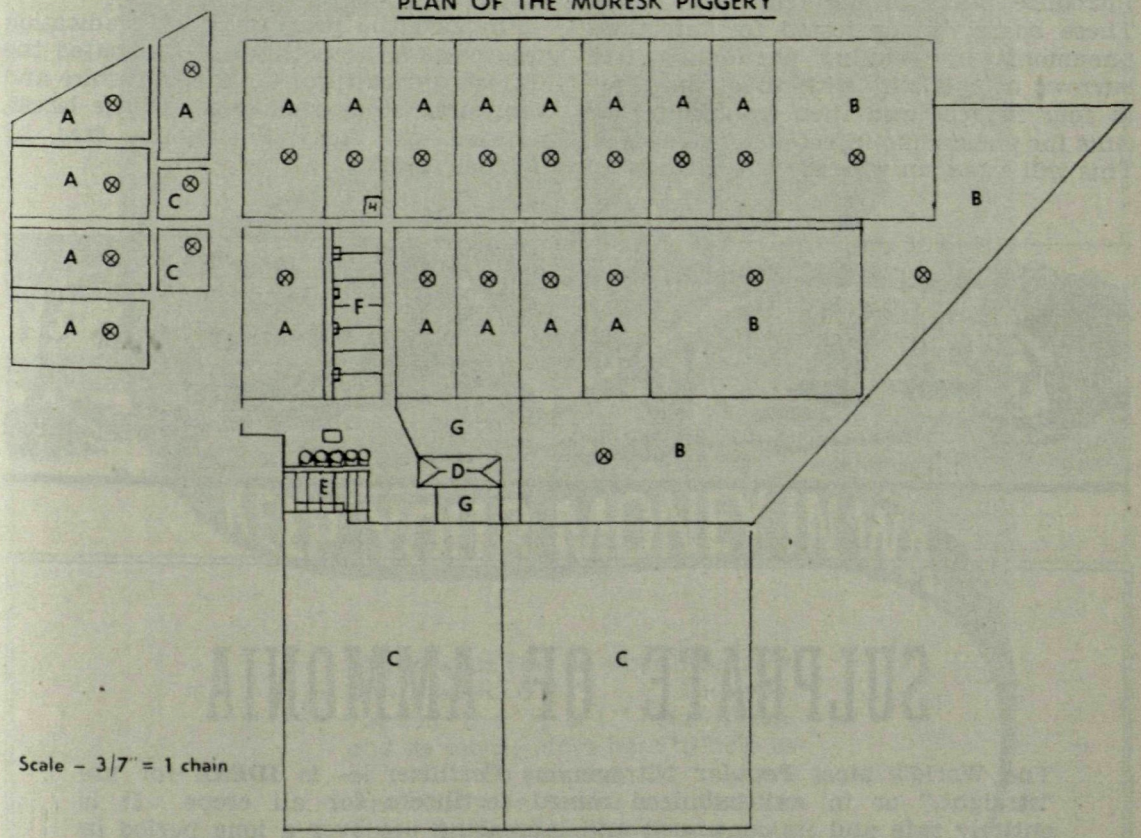
Tamworths:—3 Boars and 8 Sows.

to continue into Phase 2.

In other words there was a variation of 6 lb. (13.9 per cent.) at weaning between infected and non-infected litters and a further variation of 28 lb. (25.9 per cent.) at slaughter between these same groups.

During the early stages of the eradication programme a temporary reduction of pig numbers was inevitable, the numbers

PLAN OF THE MURESK PIGGERY



PLAN OF MURESK PIGGERY

A—Rearing paddocks; B—Brood sow paddocks; C—Grazing paddocks; D—Intensive shed; E—Round and sloping floor farrowing pens; F—Boar pens; G—Exercise yards; H—Feed shed; Circle with x inserted—Round shelter sheds.

These numbers are in excess of the normal carrying capacity of the College but will allow for culling at a later date for type and conformation.

The growth variation between free and affected litters is well marked when the average weaning and slaughter weights of the litters tested are compared.

The five infected litters averaged 37 lb. at weaning (56 days) and 80 lb. at slaughter (112 days), whereas the 18 free litters average 43 lb. at weaning (56 days) and 108 lb. at slaughter (112 days).

falling from a peak of 177 in October, 1958, to a low of 69 in March, 1960. The numbers have however since risen and could soon reach 260 should all be retained and prove free of infection.

Phase 2.

During this period the sow will remain in direct contact with her litter until the litter has been tested and certified free of pneumonia.

In this time the sow will only be separated temporarily from her litter at weaning to allow her to dry off and be

mated. This step will provide every opportunity of transmitting the infection, if present, to the progeny.

Phase 2 commenced with the farrowing of two Berkshire sows in March, 1960, and provided all 32 potential breeding sows are tested, this phase will be completed in May, 1961.

During this stage it is also hoped to introduce boars of different blood lines. These boars will be tested for infectious pneumonia by running pneumonia free barrows or cull gilts with them for three to four months and then examining the culls for pneumonic infection at slaughter. This will establish whether the introduced boar is or is not affected with virus pneumonia.

Phase 3.

During the final six months proving period, random selection of culls at fortnightly intervals will be undertaken, the lungs of these pigs undergoing veterinary examination for signs of pneumonic lesions.

Provided the programme of eradication progresses as smoothly as anticipated the Muresk Agricultural College Berkshire and Tamworth studs should be, at the latest, certified as Virus Pneumonia free by October, 1961.