



## THE TREATMENT AND CONTROL OF RESPIRATORY DISEASE IN PIGS

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### INTRODUCTION

Respiratory disease is a major cause of morbidity and mortality in all countries where pigs are kept. It is particularly important because it affects growth rates and food conversion throughout the growing period. The conditions under which pigs are kept favour the spread of infectious respiratory diseases and these are particularly important in the young growing pig. The effects on growth and feed conversion efficiency have a marked affect on profitability and affect the value of the carcasses produced directly as a result of condemnation and indirectly by reducing carcass quality and by the presence of the residues of drugs which are unacceptable in international trade.

Diseases which increase costs and reduce carcass quality are particularly important to pig producers in the situation which is present in México and Europe. Disease free pigs growing fast to produce healthy low cost meat are essential to ensure that our producers can compete with meat produced in the US and sold freely under GATT/NAFTA rules. As importers of grain and/or soya, we are operating at a cost disadvantage and must be able to produce meat which is suitable for international trade in order to prevent complete destruction of our markets. This means that it must not only be of high quality but that it must pass the numerous on-line inspection techniques which are revolutionising meat inspection and being applied increasingly in international trade. Chief amongst these are the tests for residues of the antimicrobials which are used in the treatment and control of respiratory disease.

This paper describes the treatment and control of respiratory disease in terms of herds with emphasis throughout on the enhancement or at least maintenance of meat quality.

### DESTOCKING AND REPOPULATION

Where a unit has major problems with disease, is able to finance the operation, has access to clean stock and is located far enough from other herds to be free from aerosol transmission of the major respiratory diseases, destocking and repopulation is possible. The major respiratory diseases are caused by relatively delicate organisms and disinfection and cleaning the farm should pose no major problem. The buildings need to be surrounded by a barrier and plans developed to run the unit to maintain disease security. Once all the barriers and procedures are in place, then restocking can commence. The cleanest source of pigs would be hysterectomy-derived piglets reared on site, but many breeding companies can supply high health animals of breeding age. The actual level of health and the agents present depend upon the availability and price of the stock. The certification of freedom from disease of such pigs is a contentious area which can be discussed. Another source of pigs would be those produced from the original herd by medicated early weaning (MEW). These have the disadvantage that they may have one or more of the original diseases and are younger, requiring longer for production to resume, as with hysterectomy-derived pigs.

The operation of a clean herd differs from that of a conventional herd as pigs grow much faster and the accommodation and routines must be altered to take account of this. Similarly, there should be no need for routine medication or vaccination for many infectious diseases. The reduction in costs may repay those of repopulation in a relatively short time.

### MEDICATED EARLY WEANING

This technique has been demonstrated to eliminate a number of infectious diseases from pig populations. The principle involves the use of immune sows (vaccinated or naturally-immune) which are then treated to reduce the carriage of any remaining respiratory pathogens for a period prior to entering a clean isolated farrowing house. Treatment is maintained while piglets are sucking the sows. The piglets are also treated daily after birth, weaned and moved to clean accommodation where the treatment continues for a further 5 day period.

Aujeszky's Disease, Streptococcal Meningitis, Enzootic Pneumonia, Atrophic Rhinitis, Bordetella infection and pleuropneumonia have all been eliminated by this technique along with other non-respiratory diseases. The procedure is complex and requires motivated staff and appropriate premises and losses in young piglets weaned at 5 days of age may be high. They may be reduced by fostering piglets onto sows already in a clean herd, but the opportunities for this are limited.

### ALL IN ALL OUT PROCEDURES

For many years the principle of stocking buildings or sites with pigs of the same age and emptying them at the same time has been practised. Animals may be weaners, growers or finishers and treatment may be given on entry to the unit/building. Recently there has been a tendency for these principles to be marketed under the trade name Isowean.

Separate siles can be used to rear weaners weaned at 3 weeks and free from many of the diseases otherwise present in the growing and finishing herd. The best results are obtained if the animals all come from the same farm, but it is possible to mix batches from different units. The recipient sites must be cleaned and disinfected to reduce the possibility of carryover of infection from earlier batches. When this is carried out, certain diseases such as PRRS and pleuropneumonia may not occur in the batches weaned and managed in this way. Treatment with appropriate antimicrobials may improve the results obtained for the bacterial diseases.

The batches of pigs reared in this way can then be split up and used to stock other cleaned grower and finisher units, on an all in, all out basis. Even in the absence of elements of this complex system, it is possible to obtain some of the benefits of separate site rearing. Individual buildings on a unit may be stocked as one unit even where there are no walls and animals may be treated into them so that infection status is similar for all the pigs placed there. Vaccinations may also be used in the same way as medications, with animals entering a building or an air



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space all being vaccinated against a particular disease at an earlier age. These precautions will reduce markedly the prevalence and intensity of respiratory disease. Care must be taken in designing and operating all in, all out policies on existing units. It is easy to incur serious costs in modifying accommodation for all in, all out operation. Recent UK figures suggest a 6 year pay back time, longer than that for depopulation, but ignore the potential benefits in terms of labour, medicine use, and improved quality of product. Partitions and new airspaces do not need to be constructed from brick or solid walling. It is quite possible to modify buildings using cloth or plastic barriers to movement of infection from one section to another.

### WHOLE HERD TREATMENTS

The use of efficient vaccines for Aujeszky's Disease has enabled the condition to be eliminated from herds. The mechanisms for this are well known and involve vaccinating sows and maintaining their protection. Piglets are protected by two or even three vaccinations from 10 weeks of age to reduce the disease in the finishing herd and the factors to GI ELISAs can be eliminated by slaughter or sale. Vaccination can then be discontinued providing that disease free stock is available and that the herd is not at risk from neighbouring infected stock. Similar reductions in infection have been attempted against the other respiratory diseases. Consistent reports of the eradication of enzootic pneumonia using tiamulin have been published but only for herds of 100 sows or less. Whole herd treatment has implied partial depopulation and the maintenance of antimicrobial treatment of the remainder of the herd until the infected finishers have all left. In general there has been separation of the clean piglets from older, infected stock and the best results have been achieved when there is a balance between immunity and infection with low levels of infection prior to treatment. It is possible that the use of the vaccines may improve the success rate of whole herd treatment. Attempts to eradicate A. pleuropneumoniae have not been very successful as yet and infection may require the use of efficient vaccines and the capacity to eliminate tonsillar carriers.

### STREAMING OF STOCK AND LOCAL MANAGEMENT OF INFECTION

A technique developed for Aujeszky's Disease management may aid the control of other respiratory diseases. In this form of animal management stock already immune to the disease concerned are maintained in a block which remains free from susceptible animals which might develop clinical disease and overcome immunity of the remainder. Breakdown of immunity and treatment of animals approaching slaughter is reduced in situations where it is not possible to separate animals into distinct airspaces. This technique demands a clear appreciation of the aims of the exercise from stockmen so that diseased or susceptible animals are not added to the group, where vaccines are available, the procedure is much more effective as the immunity is more uniform.

Transmission of disease by contact may be stopped by installing solid partitions between pens and preventing troughs containing water and respiratory secretions from passing from one group to another. Even if organisms may still pass from pen to pen by aerosol, the heaviest of infection may be reduced by this means. Cleaning pens will also reduce the possibility of secretions passing from one group to the next to enter the pen.

### ENVIRONMENTAL CHANGES

The importance of respiratory disease is reduced by correct environmental management. If air temperatures are within the appropriate range for the age group and ammonia levels are low, then the effects of respiratory disease will be reduced. A major problem arises when housing has no capacity to control the environment and when temperature cannot be controlled. The installation of such controls is a major cost and may not be feasible in many situations. It is, however, important to realise that control is possible in certain situations such as recently-weaned pigs and sucking pigs where the duration of control is relatively short and where the animals concerned are small.

### CONTINUOUS MEDICATION

A final option for the control of respiratory disease is the use of low levels of medication in order to reduce the amount of background respiratory disease. Macrolides and especially tiamulin may be used in some countries at less than therapeutic levels and, because of their ability to concentrate in the lung, have an effect on the severity and extent of enzootic pneumonia and hence of the incidence of other diseases. Pulse medication may also achieve the same effect where other means of suppressing respiratory disease cannot be used. In this system, the day of the week when animals go for slaughter is identified and a programme of medication developed around it. A pulse of treatment is given at therapeutic level for two days and then no treatment is given.

The period between the end of the treatment and the despatch of the animals for sale must conform to the withdrawal period of the product used or there may be residues in the meat. This system may be of value as an interim measure until more satisfactory methods can be adopted.

### CONCLUSIONS

The control and treatment of respiratory disease in the pig is more easily carried out than ever before because of new vaccines, new products and new methods of pig management.

Regardless of these developments, there are at present, and will probably always be, units with problems with respiratory disease which reflect management, buildings.