Swine dysentery eradication – medication programmes

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March is that time of year to start thinking about swine dysentery and should we try to eliminate it from our farm this summer. With BPEX encouraging the East Anglian farmers, vets, hauliers and feed producers to sign up to their Swine Dysentery Charter, following the outbreak of dysentery in over 20 farms, isn't time for all producers and weaner suppliers in the UK to consider cleaning up their herds?

The summer is always considered the best time for eradication, because *Brachyspira hyodysenteriae* does not like dryness and heat and instead of surviving for 60 days in the winter, in slurry and muck, it only lives for a couple of weeks, improving your chances of complete eradication. However, over the last two summers the August weather has been atrocious, so we have had to take chances with starting programmes when we could and alter the medication programmes accordingly.

The basic programme is divided into 3 stages: -

1. **Clean up** – get rid of all the muck and rubbish lying around the farm, which harbours rodents. Start a rodent cull, as mice especially can carry *B. hyodysenteriae*. Introduce a fly control programme, as flies spread it around on their feet. Ideally, get rid of old and sick stock and preferably move any growing stock to alternative sites, other than suckling pigs on the sows. This gives the opportunity to clean up the farm, repair floors and buildings and have a good wash and disinfection. Improve biosecurity to prevent the infection from returning.

2. **Medication** – usually, faeces samples have been taken before and the strain isolated, so that we can test the susceptibility of the *B. hyodysenteriae** to the various antibiotics that are available. Frequently, the farm is successfully using one product to control the disease and this is also helpful to know.

   The original medication programme was usually based on 2 weeks' high-level treatment in the feed with either tiamulin or valnemulin (Denagard® or Econor® – Novartis) to eliminate the organism from the animals, followed by another 2 weeks intermediate level, to treat any still infected after the first 2 weeks and to prevent reinfection. A low, preventative level was then used for a further 4 weeks to stop reinfection and allow the organism to die out in the farm's environment should the cleaning and disinfection not be 100%. These programmes can be altered to suit the circumstances on the farm (see Figure 1).

Figure 1. Various sow medication programmes with tiamulin

Week	1	2	3	4	5	6	7	8
Original	H	H	M	M	L	L	L	L
Adapted	H	H	H	H	M	M	M	M
Low level	L	L	L	L	L	L	L	L
					↑			
				Denagard injection				

Key: H = High dose; M = Intermediate dose; L = Low dose
**Denagard in feed: H = 6-10mg tiamulin/kg; M = 5mg/kg; L = 2-3mg/kg bodyweight. Denagard injection: 10mg/kg bodyweight
**Econor: H = 5mg/kg; M = 3-4mg/kg; L = 1.25-2mg/kg bodyweight

3. **Observation period –** the pigs and progeny were monitored for a further 6 months to see if dysentery had been eliminated. Swabs from scouring pigs were usually checked, just in case. Ensure biosecurity protocols are observed.

In the last couple of years, a variety of programmes have been introduced. The first was a 700 sow weaner producer, which is ideal, as there are usually no growing pigs on farm. In this case the facilities were difficult to clean thoroughly and biosecurity was limited. The adapted programme was used on the sows (4 weeks high followed by 4 weeks intermediate level) and the piglets were injected with tiamulin each week for 4 weeks until 'clean' pigs were coming through. This increased the medication cost from the original programme from approximately £10 to £15/sow.

In a second case, a 1000-sow outdoor unit with separate nurseries and finishers was also treated with the adapted programme. It was a primary breakdown in the sows and the nurseries were just breaking, so these and the finishing houses were also treated, as the infection might have been developing for a couple of months and already spread down the pyramid.

In a third case, a breeder-finishing unit with a chronic dysentery problem decided to clean up but could not get rid of all the growing pigs before treatment. The sows were treated with the adapted programme. The finisher pigs that could be sold were sent off and the remainder were blanket treated until the grower pigs had gone through the system and finished.

In a fourth case, Neto (2008) described the use of tiamulin in an outdoor unit for two months at a low rate but used tiamulin injection in all the breeding stock after 4 weeks to eradicate the infection.

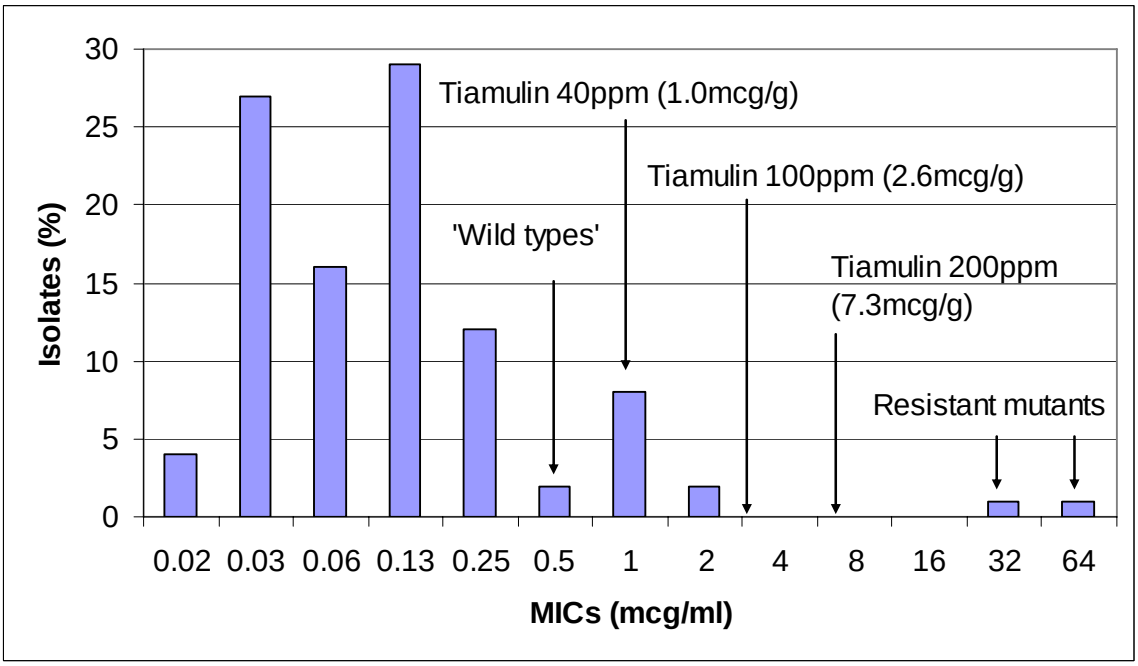
Swine dysentery is one of the few diseases that can be successfully eradicated and with our three-site production systems being so popular, there is a good opportunity to focus on breeding herds and eliminate the disease without complete depopulation. Some authors McOrist & Bennett (2006) also described the elimination of enzootic pneumonia

(caused by *Mycoplasma hyopneumoniae*) at the same time. It could be the time to consult your vet to review the options.

***Susceptibility and dose selection of Denagard**

For isolation of *Brachyspira hyodysenteriae*, fresh samples of faeces or large intestine must be sent to the laboratory for isolation of the organism and susceptibility testing. This is quite a complex procedure so check that the laboratory can do this. Once they have isolated a *B. hyodysenteriae* strain it can be checked against a number of antimicrobials to assess its minimum inhibitory concentration (MIC), which is the level of antibiotic that will inhibit the growth of the organism. This is normally done by doubling dilutions of the drug and gives an idea of how sensitive the bacterium is to the antibiotic. If the MIC is determined on an agar plate test this is close to its bactericidal concentration. I f grown in broth, the concentration is usually one dilution lower. The MICs can be related to drug concentrations achieved in the large intestine. Normally, we are looking for 4-5 times the bactericidal concentration to achieve a good kill of the bacterial strain found and this can then lead to bacterial elimination from the gut and a successful chance of eradication (see Figure 1) provided that re-infection does not take place.

Figure 1. Drug concentration in the large intestine and MIC relationship for tiamulin (Denagard) (Burch, 2008a & b)



If the MIC for the bacterium is very high, above the drug concentrations in the colon it might suggest that it is a resistant mutant and therefore an alternative should be sought.

***Dosing rates may vary from country to country and should be checked first. Extended withdrawal periods may be required*

References:

Burch, D.G.S. (2008a) Tiamulin activity against *Brachyspira hyodysenteriae*. Veterinary Record, December 6, 2008, p698

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McOrist, S and Bennett, C. (2006) Eradication of swine dysentery on large-scale breeder farms by partial depopulation/medication. Proceedings of the 19th International Pig Veterinary Society Conference, Copenhagen, Denmark, vol 1, p 319

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