

Pharmacology for the pet pig

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Pet pigs, especially those living in North America, have relatively few pathogens to contend with when they live in small groups and experience lots of fresh air. This does not mean that the pathogens that cause problems in commercial units are not present, but many of these pathogens only become a clinical problem when there are large numbers of pigs in a group and generally affect the pig while it is young. Once the pig becomes an adult, at 9 months of age, these pathogens become less of a concern. This is typical in all mammals. Specific pathogens may then become a problem in the older pig as its defense mechanisms weaken, for instance swine influenza may become a potential risk. The main area of pet pig pathogen concern related to shelters and breeders. For this reason these areas need to enhance their biosecurity awareness.

If your pig has access to wild pigs, especially in Europe, they may be a risk of the pig meeting a novel pathogen agent, but this occurrence is rare. In North America, the major risk may be from the Collared Peccary – *Pecari tajacu*



The collared peccary – which is common in the southern states – Central Arizona, Texas to Northern Argentina.

The major problem that owners and veterinarians caring for pet pigs have is that the treatment routines used to treat the common conditions of arthritis etc are untested in pigs and generally unlicensed. Therefore, care has to be practiced in deciding therapy. In addition, veterinarians have to be aware that, pet pigs belong to the species *Sus scrofa*, (along with all the commercial pigs) and that any legislation governing the pig (AMDUCA) also related directly to pet pigs. This particularly relates to the use of Baytril (enrofloxacin) and chloramphenicol which are specifically forbidden to be used for any reason in pigs.

This paper is divided into sections, which may be useful to your veterinarian.

General medicine control

Antibiotics that may be useful in the pet pig

Vaccines that can be used in the pet pig

Other medications – antihelmintics and reproductive control

Medications that may be used for sedation and anaesthesia

Prevention of clinical problems

Vaccination

Some diseases can be prevented by regular vaccination together with routine annual or six-monthly boosters. These diseases include:

For all pigs:

Erysipelas: An initial course of two injections, followed by a six-monthly booster will prevent the appearance of this disease. Vaccination against this disease is a must for all pig pets, especially those kept outdoors. Unfortunately the vaccine does not protect against lameness associated with Erysipelas.

For breeding gilts and sows:

Parvovirus: This causes very small litters to be born, together with several mummified piglets. Again, the disease can be prevented by regular vaccination. Ensure the vaccine is completed before the gilt is bred for the first time.

Piglet enteritis

Six and 3 weeks before farrowing, vaccinate the pregnant sow against E. coli. This can be fatal for piglets less than 10 days of age. However, this disease is generally only seen with very large groups of piglets and failure of management to provide individual piglet care, or when the air temperature and humidity fluctuate too widely for the newly-born piglets.

Other diseases

There are numerous other vaccines available. These should be considered when pet pigs are kept in groups larger than 6. Most of these vaccines are to protect growing pigs. Adult pigs (over 18 months of age) generally only require Erysipelas.

Diarrhea (Scours)

This commonly occurs with overfeeding, especially just after weaning time and also if the piglets are weaned too early. As a rule of thumb, it is better to allow piglets to continue to suck their mums for 5-8 weeks, whilst at the same time eating the same food as the sow, which will encourage the piglets to eat whilst she is eating. If diarrhea is present in all piglets in the litter, then you need to call your vet for advice because there are also infectious causes of diarrhea, which may require antibiotic therapy.

Worming

Pigs that live outdoors and pigs that are exercised outside need to be dosed for worms every 4-6 months. The decision when to dose can be helped by taking a fresh dung sample to the vet, who will examine it for worm eggs and decide which is the best treatment to use and when to use it.



A worm egg

Pneumonia

This infection of the lungs will occur usually in housed pigs when they are subjected to cold draughts or rapid changes in environmental temperature and if the pigs are allowed to sleep on damp, wet or cold floors. The pig will have a high temperature and you will need to call your vet to give it some antibiotics.

Feet maintenance



A pen with nice clear dry straw – but not abrasive surface. This pig's feet will get very little wear.



A pen which includes an area of gravel – this pig's feet will require little maintenance if the pig exercises.

MEDICINE CONTROL AND STORAGE

Control	
1	The veterinarian should prescribe and be aware of all treatment medicines
3	All medicine data sheets should be easily available for consultation and emergency use, e.g. self-injection.
4	The veterinary surgeon is required to check and advise on medicine usage, documentation and storage regularly
5	Record storage temperature weekly using a Max/Min thermometer
6	Check your medicine store regularly for amounts and expiry dates
7	Do not hold more than one months supply on the farm at any time
8	Make sure all medicines are locked away, out of the reach of children and secure at all times
Store in a Refrigerator (2-8°C) Have a maximum and minimum thermometer in the 'fridge	
1	All vaccines
2	Hormones e.g. oxytocin
3	Iron
4	Part-used bottle tops should be cleaned before returning to fridge
5	Practice good hygiene and cleanliness in the fridge
6	No food is to be stored in the fridge
7	Place a list of all medicines in the fridge on the door
Store in a Dark Cupboard (8-25°C) Have a maximum/minimum thermometer in the store	
1	Antibiotics
2	Sedatives
3	Stimulants
4	Vitamins and minerals
5	Disinfectants
6	Part-used bottle tops should be cleaned with alcohol before returned to the cupboard
7	Cupboards to be clean and either locked or the room locked
8	Do not leave medicines in your farrowing or other houses
9	Place a list of all medicines stored on the door of the cupboard

**Note that all medicines must be used within their expiry date
Keep a record of all medicines used in each pig**

Pathogen	Spectinomycin	Gentamicin	Neomycin	Ceftiofur	Tiamulin	Enrofloxacin	Lincomycin	Tilmicosin	Tulathromycin	Tylosin tartrate	Valnemulin	Ampicillin	Penicillin	Sulfonamides	Trimethoprim/ Sulfamethoxazo	Florfenicol	Tetracycline
<i>Lawsonia intracellularis</i>																	
Leptospirosis																	
<i>Metastrongylus apri</i>																	
<i>Mycoplasma hyopneumoniae</i>																	
<i>Mycoplasma hyosynoviae</i>																	
<i>Oesophagostomum dentatum</i>																	
Parvovirus																	
<i>Pasteurella multocida</i> (Toxigenic)																	
Pasteurellosis																	
PMWS																	
PRRSv																	
Ringworm																	
Rotavirus																	
Salmonellosis																	
<i>Sarcoptes scabiei</i>																	
Spirochaetal colitis																	
<i>Staphylococcus hyicus</i>																	
<i>Stephanurus dentatum</i>																	
Streptococcus abscess																	
Streptococcus arthritis																	
<i>Streptococcus suis</i> joint ill																	
<i>Streptococcus suis</i> meningitis																	
<i>Strongyloides ransomi</i>																	
Swine Influenza virus																	
Swine pox virus																	
TGE																	
<i>Toxoplasma gondii</i>																	
<i>Trichonella spiralis</i>																	
<i>Trichuris suis</i>																	



Indicates that the antimicrobial is unlikely to work.



Indicates that the pathogen is likely to be sensitive.



Where the row is blacked out – antimicrobials are generally not available for therapy. They may still be useful to control secondary pathogens. PRRSv and Tilmicosin is an example of an exception. Antimicrobials do not generally include antiparasitics – *Isospora suis* or *Toxoplasma gondii* are examples of exceptions ** *Isospora suis* – use Toltrazuril

Tulathromycin is a new antibiotic (2005) trading as Draxin

**SUSCEPTIBILITY PROFILE OF SWINE PATHOGENS
BASED ON SAMPLES RECEIVED AT ISU/VDL USA IN 2003**

Family	Antimicrobial*	<i>Actinobacillus pleuropneumoniae</i>	<i>Actinobacillus suis</i>	<i>Bordetella bronchiseptica</i>	<i>Escherichia. coli</i>	<i>Haemophilus parasuis</i>	<i>Pasteurella multocida</i>	<i>Salmonella choleraesuis</i>	<i>Salmonella typhimurium</i>	<i>Streptococcus suis</i>
Aminocyclitols	Spectinomycin									
Aminoglycosides	Gentamicin									
	Neomycin									
Cephalosporins	Ceftiofur									
Diferpines	Tiamulin									
Fluroquinolone**	Enrofloxacin									
Lincosamides	Lincomycin									
Macrolides	Erythromycin									
	Tilmicosin									
	Tylosin tartrate									
Penicillins	Ampicillin									
	Penicillin									
Sulphonamides	Sulfonamides									
	Trimethoprim/ Sulfamethoxazole									
Tetracyclines	Florfenicol									
	Tetracycline									

White – more than 70% of the isolates were **sensitive**

Grey between 50 and 70% isolates are sensitive

Black – Up to 50% of the isolates were **resistant**

- *In vitro* antimicrobial test results do not represent therapeutic applicability.
- Extra/Off label usage of an antimicrobial which is limited/prohibited for certain species may result in legal action by government control bodies
- Note: the use of Fluroquinolones is strictly illegal in pigs within the USA.

The use of Vaccines in Pet Pigs

The following vaccines are practical for healthy Pet Pigs
These notes assume that there are less than 5 Pets in the herd/household

Control of:	Comments about use
Atrophic rhinitis vaccine	Not necessary
Clostridial vaccine <i>Clostridium perfringens C</i> <i>Clostridium novyi</i>	Generally not necessary – gilts pre-farrowing No necessary
<i>E. coli</i> vaccine F4 and F5 F18	To gilts and sows pre-farrowing or at weaning for piglets via colostrum Not necessary
<i>Mycoplasma hyopneumoniae</i> vaccine	Not necessary
Erysipelas vaccine Gilt Sows Boars Growing pigs	Available via injection or water At 100 kg Twice a year Twice a year After 30 kg
<i>Haemophilus parasuis</i> vaccine	Not necessary
Ileitis	Not necessary
Leptospirosis	Not necessary
Parvovirus vaccine	Not necessary - To gilts before first breeding
Pleuropneumonia vaccine	Not necessary
PRRSV vaccine	Not necessary
Pseudorabies vaccine	Where legally required
Rabies	Every three years – use dog vaccine
Rotovirus	Not necessary
Salmonella	Not necessary
Swine Influenza	Not necessary – in the face of a local outbreak
TGE	Not necessary

It is essential to make yourself acquainted with the local legal situation.

Parasite control by medication in the pig

Active Principle	Some trade Names	Presentation / Dose Levels *	Roundworms	Red stomach worms	Lice	Lungworms	Mange mites	Nodular worms	Kidney worms	Thread worms	Ticks	Muscle worms	Whip worms
			<i>Ascaris suum</i>	<i>Hyostromyilus rubidus</i>	<i>Haematopinus suis</i>	<i>Metastromyilus</i>	<i>Sarcoptes scabiei</i>	<i>Oesophagostomum dentatum</i>	<i>Stephanurus dentatus</i>	<i>Strongyloides</i>	<i>Trichonella spiralis</i>	<i>Trichuris suis</i>	
Amitraz 12.4%	Taktic	Topical liquid concentrate 40ml to 10l water											
Amitraz 2%	Topline	Pour on to skin											
Doramectin	Dectomax	Injection. 1ml/33kg liveweight. (300mcg doramectin/kg liveweight)											
Febantel	Bayverm	In feed pellets											
Fenbendazole	Panacur	Pellets for top dressing. In feed for 1 day											
Flubendazole 5%	Flubenol	Powder. Top dress or in feed for 10 days											
Ivermectin 1%	Ivomec injection	1ml/33kg. (300mcg ivermectin/kg liveweight)											
Ivermectin 0.6%	Ivomec premix	Powder in feed 330g to 1kg premix/tonne											
Levamisole 7.5%	Levacide/Levadin	Injection											
Oxibendazole 2-20%	Loditac	In feed for 10 days or pellets for top dressing											
Phosmet 20%	Porect	Topical liquid pour onto skin 1ml/10kg liveweight											
Thiophanate 22.5%	Nemafax 14	Powder in feed for 14 days											

Indicates that the parasite is likely to be sensitive.

Where the row is blacked out – the parasite is resistant

Green the product is generally active against the parasite
 Red the product is inactive against the parasite.

Note many of these products do not have any activity towards the egg.
 Note check the availability and legality of using any product in your area.

Control of the Reproductive Cycle

1	Animals not cycling or ovulating
	Inject with PG600 (a combination of 400 iu eGH and 200 iu hCG - equine and human chorionic gonadotrophin)
	Ovulation will usually occur 100 to 120 hours when administered at weaning
2	Cyclic animals
	12-14 days after last oestrus
	PGF _{2α} (prostaglandins) only work in pigs in mature corpora lutea after 12-14 days after ovulation. The female cycles 4 days after administration
	Other times
	In normal cycling females ovarian activity can be suppressed by administering oral active progesterone, by the feeding of 15-20 mg of Regumate/Matrix for 14 to 18 days. Cease feeding and oestrus occurs some 2-8 days after last feeding
	Aborting pregnant animals
	Abortion can be achieved using prostaglandins. The sows cycle 4 days after aborted.
3	Delay after weaning
	This may be useful to coordinate pig flow. Feed Regumate/Matrix from weaning until 4 days before required heat. Note normal variation in response is same as weaning ie 2-8 days with a peak at 4 to 5 days

To help sows and gilts to come into heat

Combination of PGF_{2α} and PG600

Group of synchronized animals with poor or no heats:

Day 1 Inject with PGF_{2α} prostaglandin

Day 3 inject with PG600

Rational:

A group of animals cycling out of sequence will have animals at all stages of the oestrus cycle

Those 12 – 18 days will cycle 4 days later with PGF_{2α}

Those at 18-21 days will cycle within the next 4 days anyway

Those at 0-12 days may cycle with PG600 in 4-5 days

PG600 to animals at or about ovulation will enhance the ovulation process.

Injectable anesthetics in Pigs

SEDATION		
Acepromazine Ketamine	0.5 mg/kg IM 15 mg/kg IM	Good sedation, unreliable for surgery Give acepromazine at least 10 minutes prior to ketamine
Diazepam Ketamine	0.5-2 mg/kg IM 10-15 mg/kg IM	Sedation only Good muscle relaxation
Xylazine Ketamine	1-2 mg/kg IM 5-10 mg/kg IM IV (for induction prior to inhalant anesthesia)	Moderate sedation at low doses, deep sedation at high doses Good relaxation Use ¼ to ½ dose for induction prior to inhalant anesthesia
Detomidine Butorphenol Midazolam	0.06 mg/kg IM 0.3 mg/kg IM 0.3 mg/kg IM	Sedation only; extremely expensive
Azaperaone	0.5 mg/kg 2-8 mg/kg 5-10 mg/kg	Mixing of pigs Sedations Knock-down

ANESTHESIA		
Telazol®	1-5 mg/kg IM	Sedation at low doses, anesthesia at high doses Poor muscle relaxation, intubation difficult Prolonged recovery at high doses
Xylazine Telazol®	0.5-2.2 mg/kg IM 3-6 mg/kg IM	Anesthesia with good analgesia and muscle relaxation. Intubation possible. Apnea may occur.
Telazol® Ketamine } TKX Xylazine	4.4 mg/kg IM 2.2 mg/kg IM 2.2 mg/kg IM IV (for induction prior to inhalant anesthesia) – give slowly (over 1 min) to reduce respiratory depression	Reconstitute powdered Telazol® with 250mg xylazine (2.5ml) and 250mg ketamine (2.5ml). Dose at 1ml/25-35kg (use 1 ml/ 75kg for IV induction) Intubation possible, apnea may occur. Duration: 45-90 minutes
Guifenesin Ketamine Xylazine ("Triple Drip")	IV infusion Induction: 0.6-1 ml/kg CRI : 2 – 2.5 ml/kg/hr	Mix to final concentration of 50mg/ml guafenesin, 2 mg/ml ketamine and 1 mg/ml xylazine Good for Cesarean sections because piglets are only minimally depressed
Propofol	IV infusion Induction: 2-5 mg/kg CRI : 4-8 mg/kg/hr	Rapid onset, short duration, short, smooth recovery Apnea common, intubation recommended