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Module PILA for Pigs

Accredited Training Course
for Personal Licence Applicants



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PILA elements

- Principles of care and use
- Biology and husbandry of relevant species.
- Common diseases in the relevant species.
- Recognition of wellbeing, pain, suffering and distress in relevant species.
- Health monitoring and disease prevention and control.
- Handling and restraint of relevant species.
- Conduct of minor procedures.
- Introduction to anaesthesia and analgesia.
- Humane methods of killing

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LO: 3.1.1

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Pig Supply and ASPA

Pigs are not listed in Schedule 2 of ASPA meaning they can be obtained from sources which do not purpose breed them for use in research procedures

All pig keepers must be registered with DEFRA

Structure of Industry



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Uses in research

- Organ system very similar to humans
- Cardiovascular system – models for myocardial infarction, atherosclerosis,
- Digestive models
- Urinary models
- Skin and plastic surgical procedures
- Transplantation studies – often organ donors for xenograft procedures

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Taxonomic classification of pigs

- Kingdom: Animalia
- Phylum: Chordata
- Class: Mammalia
- Order: Artiodactyla (even-toed ungulate)
- Family: Suidae
- Genus: Sus



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LO: 3.1.7

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Breeds of pig

Most commercial pigs are hybrids

Pure breeds are becoming rare

- Large White
- Landrace
- Duroc
- Pietrain
- Saddleback
- Tamworth
- Gloucester Old Spot
- Meishan



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Other pig breeds

Miniature pigs (mini-pigs)

Yucatan
Göttingen
Minnesota



Pet pigs

Vietnamese pot-bellied
KuneKune



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Yucatan mini-pigs

Purpose-bred, socialized, and vaccinated.

Darkly pigmented skin with little or no hair.

White hairless line for dermal studies.

Ventricular Septal Defect (VSD) line also available.

DNA samples from the Biotech colony are banked and available.

MHC haplotype defined for transplantation studies

Free from common domestic swine diseases; e.g. leptospirosis, brucellosis, pseudorabies, transmissible gastroenteritis, porcine reproductive respiratory syndrome, toxoplasmosis, etc.

The Yucatan are particularly known for their docile temperament and ease of handling.



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Pig Terminology

- Piglet : baby pig
- Gilt : young female pig that has not had a litter
- Sow : female pig that has produced a litter(s)
- Hog : young/sexually immature male pig
- Boar: Sexually mature male pig

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BIOLOGY

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Skin and Hair

Large Fat layer

Not much hair

Good for skin studies



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Digestive system

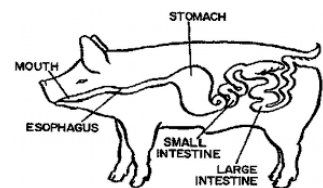
Omnivore

Simple stomach

Small intestine:
main site for digestion

Caecum

Large colon –
absorption of water



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Reproductive system

Two ovaries
 Long uterine horns
 Cervix
 Vagina
 Average 12-14 teats



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Reproductive Biology

Mated at 6-8 months of age
 Served by boar or AI
 Semen resilient

Gestation length 113-115 days
 (3 months 3 weeks, 3 days)

Litter size 8-14

Litters weaned at 28 days
 Sow re-mated at 4-5 days after weaning
 Oestrus cycle – every 21 days



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LO: 4.2

Husbandry



Home Office

Code of Practice for the housing and care of animals
 used in scientific procedures

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Pig keeping in UK

Most sows are kept indoors, but there are many outdoor herds in central England and northern Scotland



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Commercial Pig housing



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LO: 4.2

Husbandry

Housing and environment

Temperature - Optimum range 15- 24°C
 Humidity - Optimum range 45 - 65%
 Ventilation - 10-12 room changes/hour (odour)
 Lighting - Natural or 12/12 with dusk/dawn
 Noise - <50 decibels

Care of animals

Stocking densities - usually groups of 15-20 animals
 Food and water - Omnivorous
 Bedding - Deep straw preferable
 Exercise - Desirable
 Environmental enrichment

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Environmental Enrichment

- Look at natural pig behaviour.
- Rooting, so provide substrate or substrate substitute.
- Toys
- Noise - talking & music.
- Rotate stimuli



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Environmental Enrichment



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LO: 4.1

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Environmental Enrichment



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LO: 4.1

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Hierarchy

- Pigs develop a dominance hierarchy and mixing new members into a stable group will result in fighting and possible deaths



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Pig feeding

- Omnivores – eat anything!
- Mainly fed commercial pig feeds – dependant on stage of development
 - Weaning feed
 - Lactation feed
 - Fattening feed
- Antibiotic in feed banned in the UK
- Ad-lib water needed



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Personal safety

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LO: 3.1.1

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Behaviour

Intelligent, stubborn and very vocal

Poor eyesight – can be easily frightened

Poor temperature control – can become hyperthermic if stressed

Difficult to restrain – can be aggressive



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Injuries

When aggressive, pigs will use razor sharp teeth

Adult sows and boars can inflict severe injuries

Will come to the rescue of a distressed herd mate!
Beware!

Always have an escape route when working with pigs!

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LO: 4.10 7.1

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Pig Boards

Flat, solid pieces of wood or plastic, large enough to cover the handler's legs and prevent bite wounds

Use as barrier to move pig in direction you want

Make sure board is touching ground, otherwise pig will put nose under it and charge through



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LO: 4.10 7.1

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Restraining younger pigs

V- trough can be used for placing smaller pigs on their back.

Useful for venepuncture from the jugular or anterior vena cava



Can also lift pigs under 10 kgs

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LO: 4.10 7.1

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Restraining larger pigs

Pig Snatch - long pole with cable loop

– Use for larger pigs > 20kgs

– Dangle loop in front of pig's snout; when pig opens mouth, push loop into mouth behind tusks and tighten

– Must move quickly, or pig will escape



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LO: 7.5 & 8.1

Routine tasks

Iron injection for young pigs
Worm control for outdoor pigs
External parasite control – mange and lice
Vaccination

No longer carried out:

*Tail clipping
Teeth clipping
Castration*



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Health and disease

Biosecurity

Conventional – high health status
- unknown health status

Specific pathogen free (SPF)

Gnotobiotic

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Health examination

Rectal Temperature 38.6-39.2C
Respiratory rate 12-20 / minute
Heart rate 50-100 / minute
Blood volume 65ml/kg

- Check eating/drinking/urinating/faeces
- Check weight or BCS
- Check skin
- Rectal examination if required

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Signs of illness

- Loss of appetite
- Lethargy
- Social isolation
- Hunched/abnormal posture
- Lameness



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Health status

Health checks

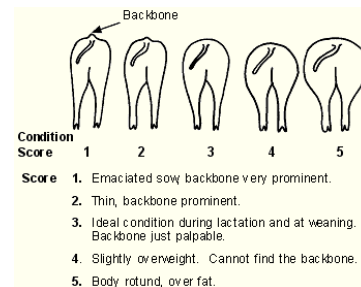
- 1) History
- 2) Clinical examination – body condition score
appearance
lameness
breathing
diarrhoea
- 3) Laboratory tests - blood, faeces, skin scraping

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LO: 5.2

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Body Condition Score



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LO: 5.2

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Signs indicating system affected

Respiratory - Coughing and sneezing, Ocular-nasal discharge, Raised temperature, Increased respiratory rate

Gastrointestinal – chronic weight loss, diarrhoea, dehydration, low temperature

Locomotor – lameness, joint swelling

Nervous – tremor, head-tilt, circling, seizures



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Zoonotic diseases

- Not common
- Skin – ringworm
- Gastrointestinal – Cryptosporidiosis, salmonellosis, E.coli O157
- Respiratory – Influenza
- Nervous – streptococcal meningitis



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Notifiable diseases

- A **notifiable disease** is any disease that is required by law to be reported to government authorities.
 - REPORT TO DEFRA
- Anthrax
- Aujeszky's disease
- Rabies
- Classical and African swine fever.
- Swine vesicular disease (SVD)
- Foot and mouth disease (FMDV)



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Common porcine diseases

- Skin – Lice, mites, ringworm, erysipelas
- Locomotor – joint ill, trauma
- Respiratory - Mycoplasma hyopneumoniae, PRRS, Influenza, APP hypopneumonia
- Gastro-intestinal – bacterial, viral, parasitic
- Viral – PWMS, parvovirus



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Vaccination

Vaccines are available against:

- Erysipelas
- E. Coli enteritis
- Strep suis type II
- Atrophic Rhinitis
- Glasser's disease
- M hyo pneumonia
- APP pneumonia
- Parvovirus
- PMWS
- PRRS



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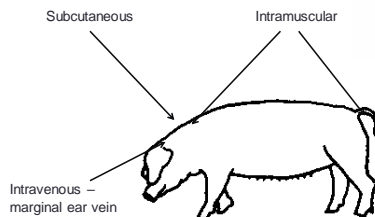
Minor procedures

- Oral
- Subcutaneous
- Intramuscular
- Intravenous
- Intranasal



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Minor procedures



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Blood sampling

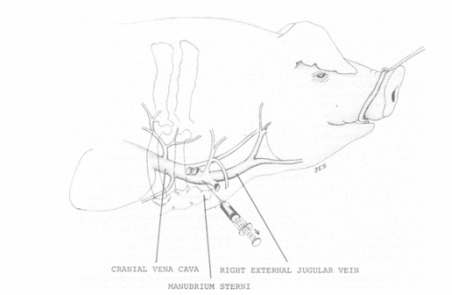


Marginal ear vein

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Venous sampling



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Anterior vena-cava bleeding



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Needle selection

Influencing factors:

- Age – pig v piglet
- Route of administration IM (longer) v subcutaneous (shorter)
- Viscosity of liquid to be injected – wider gauge needed for thick substances

Type of Pig	Intramuscular (IM)		Subcutaneous (SQ)	
	Needle Gauge	Needle Length	Needle Gauge	Needle Length
Baby pigs	18 or 20	5/8" or 1/2"	--	--
Nursery pigs	16 or 18	3/4" or 5/8"	16 or 18	1/2"
Finishing pigs	16	1"	16	3/4"
Breeding stock	14 or 16	1" or 1 1/2"	14 or 16	1"

*Source: NPPC Pork Quality Assurance Guidelines

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LO: 20.5 47

Anaesthesia



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Pre-anaesthesia considerations

- Acclimatisation – check local guidelines
- Health examination
- Fasting - 12 hours
- Pre-medication



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Pre-medication/sedation



Azaparone 2mg/kg Midazolam 0.5mg/kg

This combination is the sedative of choice for pigs

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Inhalation agents



Note the Halothane gene in some pig breeds

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Analgesic agents

Opioids

- Buprenorphine (Vetergesic)
- Morphine/pethidine



Non-steroidals

- Ketoprofen
- Meloxicam



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Injectable agents

Alphaxalone (Alfaxan) I/V



Propofol I/V



Ketamine and xylazine I/M



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Anaesthesia protocol

- Sedation – Azaparone +midazolam
- Induction – Alphaxalone IV
- Maintenance – isoflurane inhalation



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Post-op recovery

- Warming
- Fluids
- Wet food
- Soft bedding



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Euthanasia

Adults

Overdose of anaesthetic

Shooting with a free bullet (vet only)

Electrical or captive bolt stunning
(vet or licenced slaughterman only)

Foetal

Overdose of anaesthetic

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LO: 1.12

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Confirmation of death

- 1) **Permanent cessation of the circulation** /destruction of the brain
- 2) Dislocation of the neck
- 3) **Exsanguination**
- 4) **Onset of rigor mortis**
- 5) Instantaneous destruction of the body in a macerator

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