Guide to the recognition and treatment of disorders of Pigs

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Contents of the course notes:

Introduction

Clinical examination skills

Normal Behaviour

The major disorders of the pig

The major disorders of the pig are presented by the body system which is most significantly affected from a gross clinical examination view.

Skin

Head

- Clinical gross anatomy of the head
- Progressive atrophic rhinitis
- Congenital tremor
- Conjunctivitis
- Meningitis
- Post-weaning sneezing
- Other conditions:
  - Middle Ear
  - Aural Haematoma

Chest

- Clinical anatomy of the chest
- Actinobacillus pleuropneumonia
- *Actinobacillus suis*
- Enzootic (Mycoplasma) pneumonia
- Glasserôs Disease
- Mulberry Heart
- Pneumonia Pasteurellosis and Streptococci
- Porcine Reproductive and Respiratory Syndrome
- Porcine Respiratory Coronavirus
- Swine Influenza

Intestinal tract

- Anatomy of the intestinal tract
- Abdominal catastrophe
- *Ascaris suum*
- Brachyspira colitis
- *Clostridium dificile*
- *Clostridium perfringens*
- Coccidiosis of piglets
- Non-specific colitis
- *Escherichia coli* ï general
- Bowel Oedema
- Pre and post-weaning diarrhoea
- Pre-weaning diarrhoea treatment
- Gastric ulceration
- Porcine epidemic diarrhoea
- Porcine proliferative enteropathy (Ileitis)
- Post-weaning illthrift syndrome
- Pig parasites
- Rectal stricture
- Rotovirus
- Salmonellosis
- Swine dysentery
- TGE

Reproductive tract

- Anatomy of the reproductive tract
- Abortion in the pig
- Aujeszkyôs Disease (Pseudorabies)
- Brucellosis
- Common developmental abnormalities
- Milk production and suckling problems
- Analysis of returns
- Leptospirosis
- Parvovirus
- Rectal and vaginal prolapses
- Stillborn and mummified piglets
- Tumours of the pig
- 14-21 days post-service vulval discharges
  - Also see: Erysipelas, Swine Influenza and Swine Fever(s)
- Surgery of the reproductive tract
  - General introduction

- Castration in the piglet
- Castration in the adult male
- Vasectomy
- Epididectomy
- Ovariohysterectomy
- Caesarian section

Urinary Tract

- Clinical anatomy of the urinary tract
- Pyelonephritis and cystitis

Lymphatic system

- Clinical anatomy of the lymphatic system
- Porcine Circovirus Associated Diseases
- Post-weaning Multisystemic Wasting Syndrome
- Leukaemia - See Tumors of the pig in Diseases of the Reproductive tract

Locomotor system

- Anatomy of the locomotor system:
- Young lameness:
  - Mycoplasma arthritis
  - Joint ill
  - Trauma
  - Skin abrasion in the piglet and weaner
  - Ulceration and erosion injuries
  - Bursitis
- Splay leg
- Adult lameness:
  - Bush foot
  - Osteocondrosis desicans (OCD)
  - Femoral head fracture ï epiphyseolysis
  - Split hips
  - Shoulder sores
  - Ulcerated granuolma
  - Overgrown feet
  - Erysipelas and adult arthritis
  - Broken legs
  - Infected joints
  - Conformation problem
  - Growing stock
- Lameness in pet pigs

Diseases reportable to the OIE and Zoonotic diseases

- Diseases notifiable to the Office International des Epizootics (OIE ï World Organisation for Animal Health)
  - Zoonotic diseases of Pigs
- Other Pathogens
  - Anthrax
  - Enterovirus encephalomyeltitis
  - Japanese Encephalomyeltitis virus
  - West Nile Virus
  - Nipah
  - Parasites
  - Rabies
  - Rinderpest
  - Toxoplasmosis

Disease treatment and control concepts

- Maintenance of healthy pigs through management
- Treatment by medication
  - Use of medicines on farm
  - Use of vaccines through the water supply
  - Feed bin management to eliminate medication residues
  - Common medication problems
- Treatment guidelines
  - Use of antibiotics in pigs
  - Use of vaccines in pigs
  - Control of reproduction
  - Withdrawal times
  - Examples of treatment programmes
    - Piglets
    - Nursery
    - Grow/finishing
    - Adults
    - Boars
  - Using Statistical Process Control to help decision making
- Care of the compromised pig
  - Design of a hospital area
  - Health alarm
  - Care of the compromised grower
  - Care of the compromised adult
- Reduction of pathogens on a farm
  - Basic biosecurity
  - Managing all-in/all-out ï Pig Flow
  - Use of Early Weaning to Reduce Pathogen Load
  - Room cleaning protocols
  - Partial depopulation
  - Depopulation and repopulation

Structure of the pig industry

The pig provides around 40% of the meat consumption globally ï 108 million tonnes. It is interesting to note that of the ñintensiveò industries rearing meat ï poultry and aquaculture combined with pork results in over 70 % of meat consumption on the planet ï and this does not include feedlot cattle ï which is certainly not extensive. Germany consumes 60kg/head of capita, Australiaôs fresh pig meat consumption is only 8kg per head of capita.

Pigs are farmed throughout the world in all climates from the extreme cold of Canadian winters to the tropics of Asia.

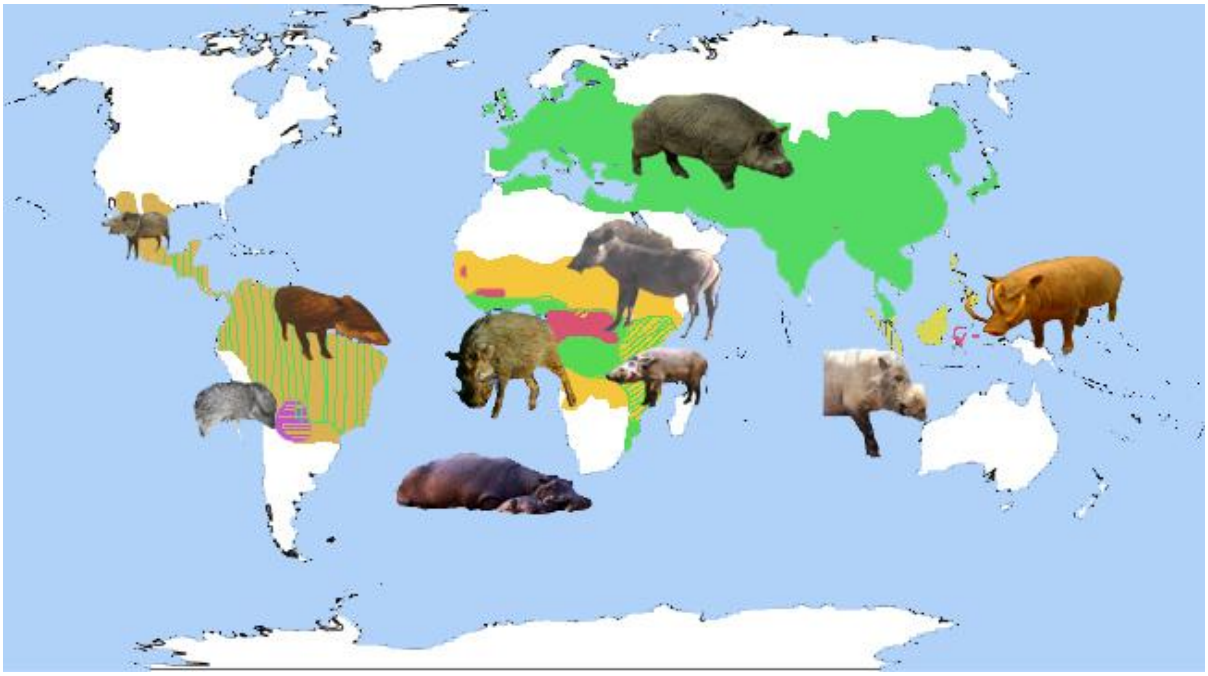
The pig (*Sus scrofa*) itself has colonized the entire planet below the snow line. This global colonization now includes manôs help ï Australia and New Zealand and the New World ï North and South America ï and includes countless numbers of small islands around the world.

The pigs on the planet – the suina

Kingdom: - Animalia. **Phylum**: Chordata. **Class**: Mammalia. **Order**: Artiodactyla. **Suborder**: Suina

American Peccaries	**African Pigs and Hippos**	**Eurasian Pigs**	**Island Pigs**
Catagonus wagneri	*Hylochoerus meinertzhageni*	*Sus salvanius*	*Babyrousa babyrussa*
Tayassu pecari	*Phaeochoerus aethiopicus*	*Sus scrofa*	*Sus barbatus*
Pecari tajacu	*Phaeochoerus africanus*		*Sus cebrifrons*
Pecari maximus	*Potamochoerus larvatus*		*Sus celebensis*
	Potamochoerus porcus		*Sus phillippensis*
	Hippopotamus amphibious		*Sus verrucosus*
	Hexaorotodon liberiensis		

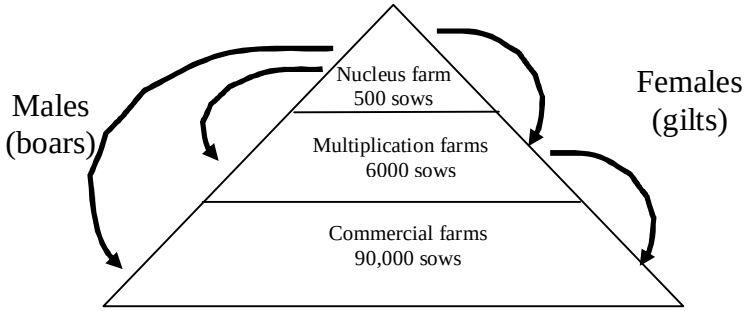
Hippos



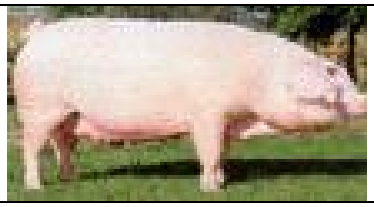
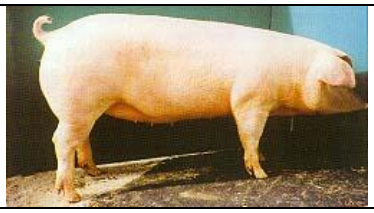
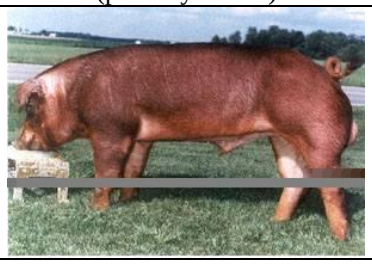
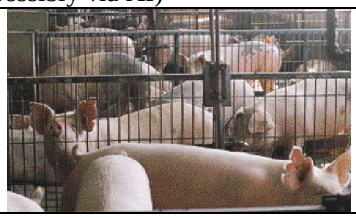
Peccary		
Warthog		
Babirusa		

The pig industry

Worldwide the pig industry is structured on pyramidal concepts with pure bred breeding stock supplying cross bred commercial stock with hybrid vigour.



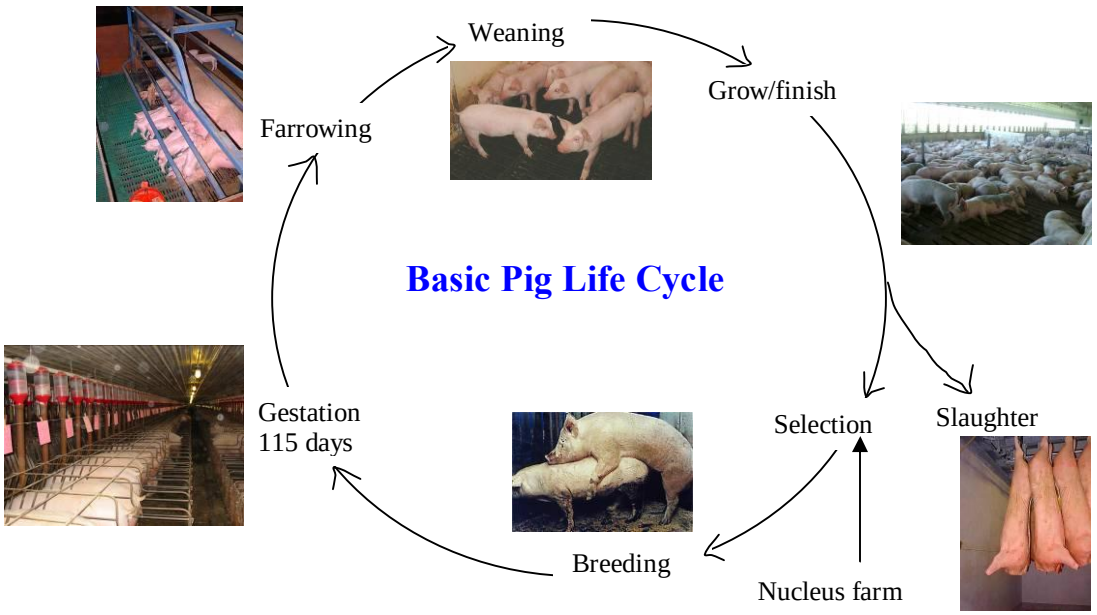
There are hundreds of pig breeds globally; however, the important breeds are limited to three ï the Landrace (mother), the Large White (father) the Duroc (meat quality) ï together with minor contributions from other largely male lines ï Pietrain and Hampshire for example.

Nucleus farm pure breeds Landrace Yorkshire/Large White Duroc as example This is a closed herd		**X**	
	Landrace Father	↓	Landrace Mother
Multiplication farm		**X**	
	Large white Father (possibly via AI)	↓	Landrace Mother
Commercial farm		**X**	
	Duroc Father (possibly via AI)	↓	F1 hybrid Mother ï Landrace/Large White cross
Slaughter generation male and female			Landrace / Large White / Duroc Cross Other breeds may be involved as well ï the Hampshire for example

Life cycle of the pig

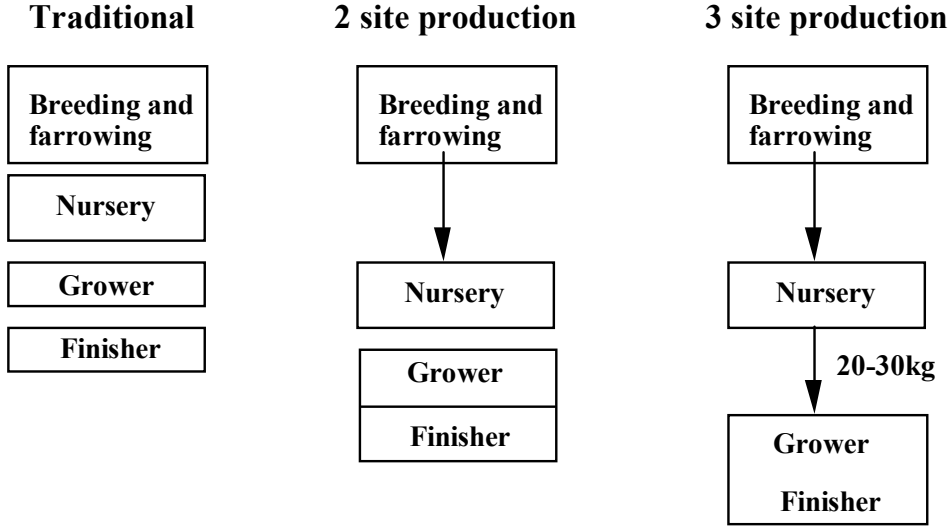
Some basic facts:

Age at breeding ï varies: for a gilt 220 days; for a boar about 7 months
Oestrus cycle ï 18-24 days ï three weeks
Gestation ï 115 days ï three months, three weeks and three days
Breeding season ï generally none ï poorer in the summer and early autumn
Slaughter weight ï about 114 kg (250-280 lbs) at about 26 weeks of age

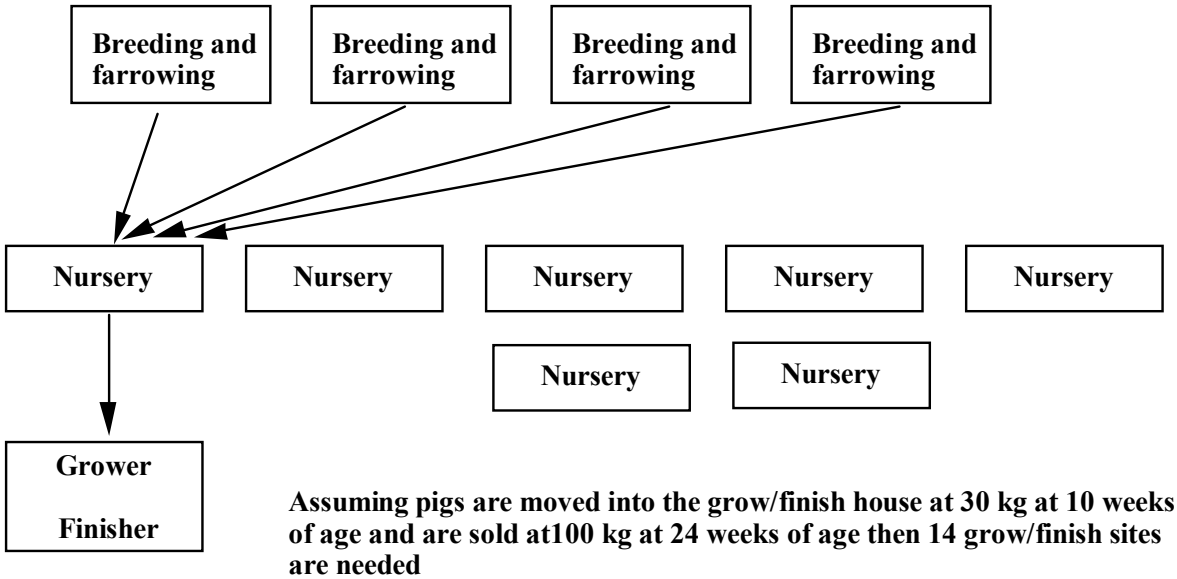


Pig farms have become larger in the last 20 years; however, the basics remain exactly the same. But the individual components of the system have become more specialized, thus creating multisite systems where animals are removed to the next phase of production.

The typical family farm evolves into the corporate farm:



Mutisite production (company or cooperation)

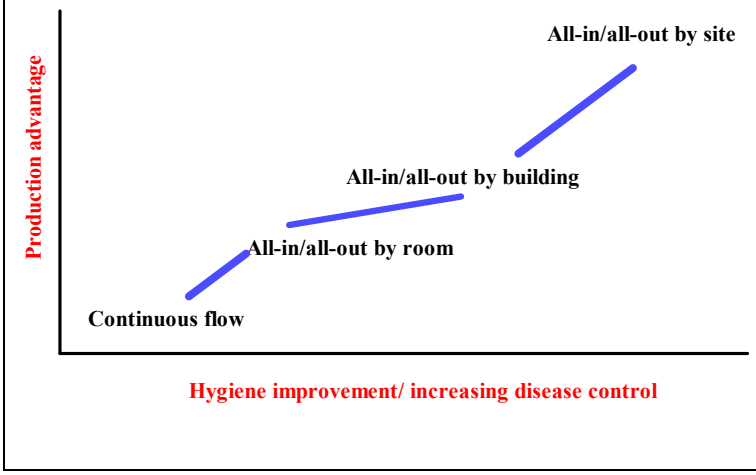
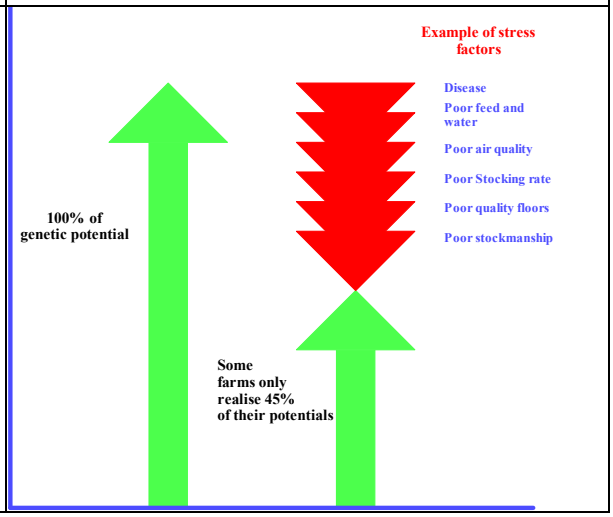


Assuming pigs are moved into the grow/finish house at 30 kg at 10 weeks of age and are sold at100 kg at 24 weeks of age then 14 grow/finish sites are needed

The most complex system today is the parity segregated farm where gilts are farmed on a separate unit and only move to the breeding unit at first pregnancy diagnosis of parity 1 sows.

All-in/All-out

The principle of health management on a pig farm relies on the simple principle of all-in/all-out which albeit is simple to understand appears extremely difficult to put into practice.

All-in/All-out in principle	Why do pigs fail to achieve their genetic potential?
	

The commercial pig industry

There are about 940 million pigs worldwide:
Asia 550 million, Europe 300 million, Americaôs 140 million and Africa 3 million.

In Asia ï our major market:

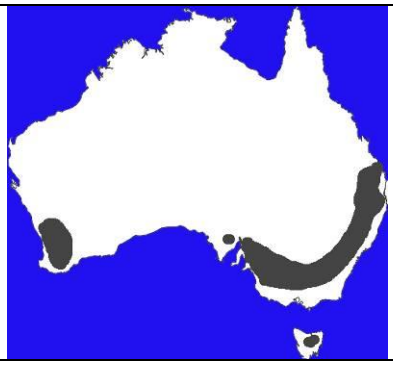
Country	Millions of pigs
China	460
Viet Nam	22
India	17
Philippines	12
Korea South	9
Taiwan	7
Thailand	7
Indonesia	6
Myanmar	4
Korea North	3
Australia	3
Malaysia	2
New Zealand	0.4

There are around 270,000 sows farmed in Australia giving a total of around 3 million pigs on the ground (growing pigs have around a 6 month lifespan). Other countries production is greater ï Iowa in Central USA finishes 25 million pigs a year ï with 2% of Australian landmass.

There are however, 20 million pigs in Australia ï one pig per person on the continent. Feral pigs are a serious threat to the Australian wildlife.

Where are the commercial pigs in Australia?

State	Percentage
NSW	30
Queensland	21
Victoria	19
South Australia	17
Western Australia	12



Western Australia

Based on the WAPPA submission to the Productivity Commission Safeguards Inquiry into the Importation of pig meat 2007

Western Australia has the natural resources and geographic location to be a long term supplier of quality fresh pork to the Australian and Asian markets. The WA industry has grown the export market for pork from 65 tonnes in 1997 to an average of 12,000 tonnes in 2007. Currently approximately 25% of annual production from WA is exported ï mainly to Singapore. Maintaining and growing this export market for fresh chilled product is crucial to the future of the WA industry.

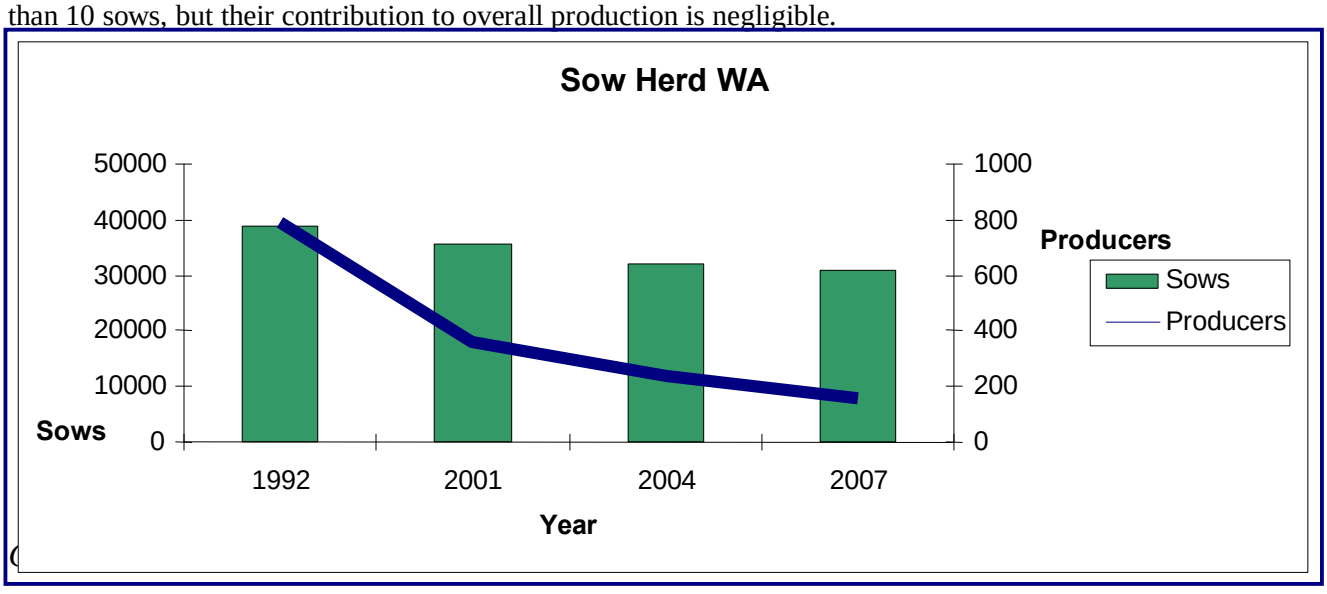
Western Australia is also a reliable supplier of grains (wheat and barley) for the animal feed industry. Total grain production in WA averages in excess of 8 million tonnes per year, and with the grain growing regions covering a wide range of climatic zones the risk of crop failure due to drought is relatively low. Grain prices in WA are on average lower than those in the Eastern States where lack of supply due to drought is a major concern. Recent increases in grain prices on the world market associated with the advancement of other uses of corn (*Maize zea*), namely the impact of ethanol production, has had a direct impact on the profitability of producers in WA.

The temperate climate in the southern part of WA is ideally suited to pig production, and with adequate supplies of water in these areas either from natural aquifers or state managed distribution systems there are good opportunities for the industry.

The pork industry contributes $105 million annually in gross value (farm gate) to the WA economy, while continuing to provide direct and indirect employment for an estimated 2,500 people from production to retail. Sales of pork products at retail are estimated to be worth $525 million with wages estimated at $120 million annually.

Change in the WA sow herd since 1992

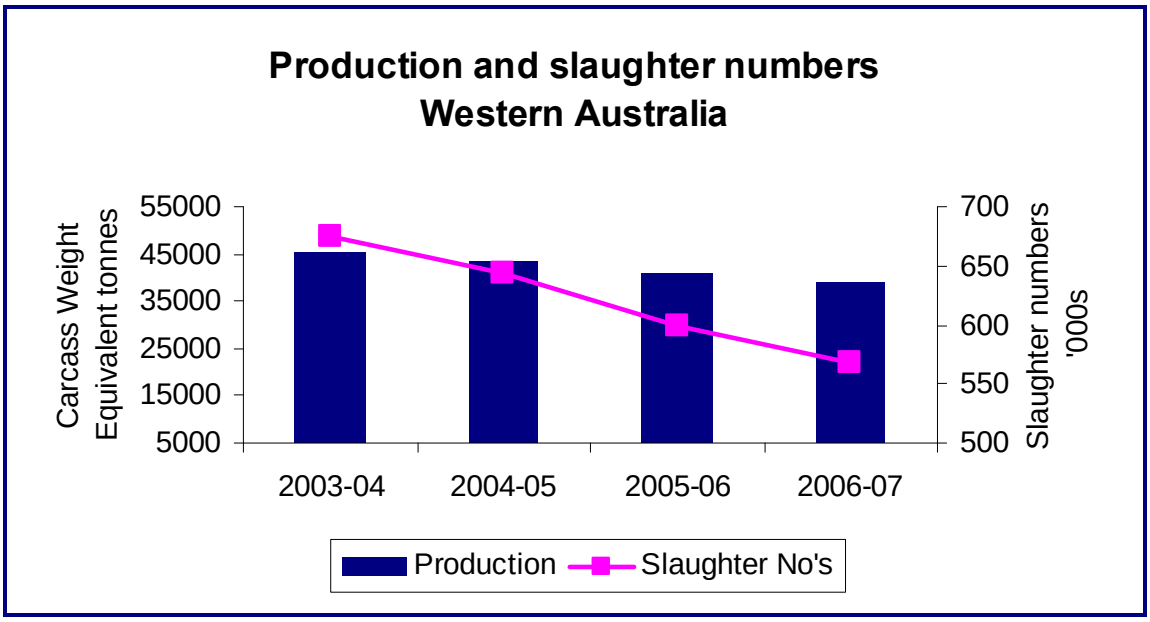
The composition of the sow herd and the number of producers in WA has changed significantly in the last fifteen years (Figure 2). In 1992 there was an estimated 38,900 sows with 789 producers; this has declined to approximately 160 producers with 30,000 sows. There are still a number of small producers with less than 10 sows, but their contribution to overall production is negligible.



Pig Production in WA

The number of pigs slaughtered in 2003/04 was 674,419, up 24% on the 542,585 head in 2000/01. The volume increase in tonnage was similarly up by 23% from 36,782 tonnes of carcass to 45,190 tonnes.

Since June 2004 the decline in slaughter numbers are down 106,357 since 03/04 with the decline in production since the same period being down 6,289 tonnes. Note in WA, the carcase weight calculation is unusual as it does not include the head resulting in a net dead weight of 70 kg.



Production and slaughter numbers (Source APL/ABS)

Slaughter numbers through the PPC/Linley Valley abattoir on a weekly basis have declined with the current weekly slaughtering of about 9,500 animals.

Despite trend increases in per capita consumption of pork products and population growth, an industry analysis conducted in 2004 projected a fall in production of 3% over the next three years. Projected import volumes would result in increased import market share. The import share of the domestic processed market increased from 40% to over 50%.

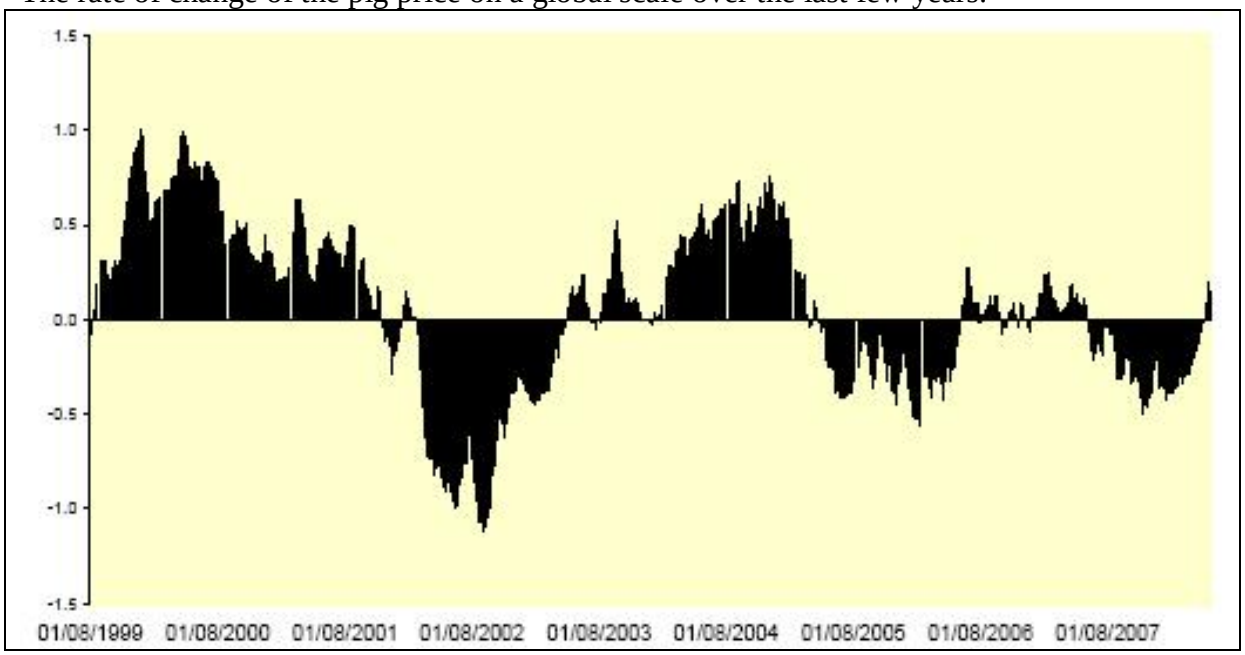
Pig Cycle

The ability to mass produce a product 20 x a year results in a perpetual cycle of over and under production.

Thus creating a cycle of profit and loss which pigs as a cash crop are classic examples. When the price of pig meat is high this results in an increase in producers entering the market. Their product hits the market a year later resulting in an over production thus the price falls forcing producers out for the market. The cycle in pigs take 5-7 years from one peak to another.

This variance is slightly dependent on external factors ï corn price, disease outbreaks in major competitive markets etc. The cycle has continued for over 100 years.

The rate of change of the pig price on a global scale over the last few years:



The major pork cuts

Note these changes throughout the world.