



SCHOLARSHIP REPORT

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Topic: Animal Welfare Within The Pork Industry &
Evaluating Alternative Sow Housing Systems. Disease
Management Systems And Producer Integration

Sponsored By: NUFARM AND HI-FERT



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Executive Summary

To quote an English rural journalist:

“Prerequisites of being a Pork Producer are: have deep pockets, boundless enthusiasm and eternal optimism, I suspect the really clever ones have even mastered the art of pushing water uphill”. (Stuart Lamb, July 2005).

Similar phrases have also been used in a general sense for Australian agriculture. If I could use Stuart’s symbology but rephrase with a more positive approach,

“A careful and more strategic decision process combined with boundless enthusiasm will create a very optimistic and exciting future” (Andrew Johnson, 2005).

Our industry has and will continue to change in order to survive, I am passionate about Agriculture and specifically the pork industry, in the way we adopt new techniques. We as producers have to become more consumer conscious, developing production systems that step by step moves us further up the supply chain capturing market share. For the vast majority of farmers we don’t produce food, but raw materials, whilst someone else turns this into food and capitalises on that.

It is also said that we as farmers have the most marketable products, but are the poorest marketers. We need to be conscious of cost and invest in systems that will give returns for the markets we pursue. Animal welfare is an open ended discussion which can be very marketable, but needs much education from producer to consumer on what is best for our livestock, to be responsible producers and lift public perception towards our industry. The initial perception of high animal welfare is not always correct and many facets of the production process need to be analysed to implement strong management systems from technology to education. Just banning the sow stall will have other serious animal welfare implications and needs to be a management process, rather than a band aid regulation, as sow reproductive performance is paramount for commercial viability.

My topic of study started broad, to gain an understanding of policies and future directions, then narrowed looking at alternative housing systems, including electronic feeding, incorporating good health outcomes and to see how other countries manage disease within piggeries.

It was my intention to become more channelled with the study, but realised one subject can't be done alone, for all are linked as important considerations in the whole production process.

My study gave me the opportunity to visit many countries with different cultures, political platforms, forming many different perspectives particularly when it comes to animal welfare, disease management, associated systems and the way they structure their business competing on this global market. I visited the United Kingdom, Holland, Denmark, Sweden, Germany, Canada and the United States, incorporating all aspects of the study in each country. Each country had various pressures from consumer groups in relation to welfare and environment creating strategic production techniques to remain efficient. One country, while having relatively a large market but imports significant quantities of pork has seen nearly 50% reduction in domestic production in less than ten years, WHY???

Pressures on pork production and marketing will continue, with international market trends dominating production outcomes worldwide. Clearly my study shows the only way to survive is to manage the pressures, increase in scale or in operating partnerships – to increase market share, sustain margins and hence viability.

Acknowledgments

I would like to thank the Australian Nuffield Farming Scholars Association for my selection and ongoing support. The scholarship, a unique opportunity, has given me great personal development, world wide friends and contacts and I look forward to continuing involvement in the Association.

I would also like to thank Nufarm and Hi-Fert for their sponsorship, for all sponsors of the Nuffield Association, the opportunity for farmers like myself to have a truly international experience would not be possible. For their support and understanding of my study and my business has supported those companies.

In particular, my parents Chris, Elizabeth and brother, Alastair for their encouragement and support in firstly gaining the scholarship, but more particularly managing the business in my absence. The family business is a formidable force and fortunately have I a family willing to develop our business, who believes in myself and the Nuffield experience. I also thank the Mt. Boothby team for coping with the workload. Our operation runs 365 days of the year and their diligence was very much appreciated.

The International Nuffield Network, particularly the Australian Association for their organisation with the Global Focus Program and the colleagues I travelled with, all of whom have become great friends.

The Worshipful Company of Farmers, Seale Hayne University and the Challenge of Rural Leadership team, for the opportunity and encouragement in the course I was able to participate in.

Nick Green, Meryl Ward and Mike Varley in the UK for helping with contacts and my itinerary, they were able to set up many meetings which otherwise wouldn't have been available. Martin Bussink and his veterinary company in the Netherlands for his fine hospitality. Jan Dahl and the Danske Slagterier, I was in awe of the Danish Industry and believe their co-operative approach and research is testament to their efficiencies. Bernard Peet and Ben Woolley in Alberta Canada, Harold Gonyou in Saskatoon, Dickson Gould in Manitoba, who are all very respected and influential within the North American Pork Industry, and were able to develop a very diverse and informative study influenced by their high reputations. With the exception of the UK contacts, no others had any direct links with the Nuffield system but were

extremely interested about Nuffield, generous with their time and I appreciated their openness and opinions, particularly with their business approach.

To all the People, Business's, Boards and Research Organisations who were generous with their time, hospitality and supportive of my study. Like all scholars, it is those we meet that help form our opinions and I'm extremely grateful. A detailed list of all meetings is at the end of this report and thankyou to all.

Finally, all the friendships I have developed around the world, I'm much indebted, the many who invited and treated me like family, your hospitality and generosity will be everlasting and I am looking forward to having the opportunity to return the favour.

I thank you all very much.

Aims

The aim of my study was to use the unique opportunity of a Nuffield Scholarship to expand my knowledge, and by forming opinions of the agricultural sector as a whole, to improve my ability.

Removing myself from the day to day operations of my business allowed me to look at issues affecting marketing, production, decision making, investment and management. My study lasting 19 weeks, put me on a balcony with other landscapes to see all areas of the supply chain and production centre, which has allowed me to evaluate our systems. Not typically from a producers view point, but understanding the changing consumer and everyone in between. I now firmly believe in the bigger picture issues and have a greater understanding of how international policies are made, beyond my industry.

The Nuffield experience gave me the opportunity to develop a global viewpoint on issues affecting Australia and other countries, not only on welfare, but environmental, research and projections. A particular interest evolved on world trade, such as bilateral agreements and the Common Agricultural Policy. All are important in the decision process, but it inspires me to think outside the square.

Most importantly I was able to use the Nuffield network to unlock doors and meet with many people in production, policy, research, processing and retail. Many of these contacts would not have been available, or as open, without the Nuffield reputation for which I'm truly grateful. I have developed an international contact base within the cutting edge of industry, and formed many hopefully lifelong friendships.

Objectives

The objectives of my study were to understand many areas of the pork industry, from production to consumer, to give the producer a clearer appreciation of the drivers, which will affect management, and hopefully to promote thought for future investment within the industry.

My study can be broken down into four key areas;

1. Animal Welfare; Future policies driven by the consumer and government through the retail sector, which already has and will continue to affect the way we, as producers, develop our production systems and manage our livestock enterprises.
2. Disease Management; Australia has a very high health status in pork production. The emergence of diseases such as PMWS (Post weaning Multi-systemic Wasting Syndrome), PDNS (Porcine Dermatitis and Nephritis Syndrome), PRRS (Porcine Reproductive and Respiratory Syndrome) have become hot topics in recent times. Understanding the diseases and their impact on trade. With recent suspected outbreaks in Australia, producers need to understand best production techniques that are vital in any future investment. Along with Mycoplasma and APP (Actinobacillus Pleuro Pneumonia) which are prevalent in our herds, management systems can be put into place to minimise or eradicate the effects of such diseases, managing these will be integral to animal welfare, cost of production and probable future marketing of our products - without the widespread use of antibiotics.

Our disease status must be protected and precautionary measures must be implemented to minimise cost of production to compete on the world market. The pork industry in Australia is further advanced than many other protein industries on the definition of the open market. We have been competing in it for many years, and imported pig meat from the European Union and North America have generally capped our farm gate price. Some regulations currently in place supporting producers may also be restrictive in striving for global competitiveness when effectively we are exposed to the world price currently. One example is genetics.

3. Housing Systems; there are many alternatives to housing systems and investment decisions need to be based on a number of broad factors such as; -

- Cost
 - Current and future regulations
 - Production performance
 - Management capacities
 - Disease control
 - Marketing Strategies
 - Location
4. Producer integration; Due to the high capital cost and management required to effectively compete in the production process, we need to look at strategies which will enable us to grow and remain viable. Particularly with the labour shortage in regional Australia, sharing capital and management expertise whilst enjoying private ownership and profitability will be the future strategy in sustainable pork production and possibly many other agricultural enterprises.

Study Goals

The cost of capital infrastructure has rapidly increased in Australia over recent years, in what ever form of building we erect, as there is no such thing as a cheap piggery anymore. Unstable feed prices, coupled with depressed market prices, has created some of the finest profit margins for an extended period of time. This has caused a lack of producer confidence in re-investing in their business' and continuing a pattern of industry exodus, rather than a systematic and business approach to sustainable farming. All these factors have to be considered if and when investment becomes a requirement.

Being a successful pork producer now and in the future we have to be proficient in a whole range of technical issues including marketing, technology adoption and human resource management. We as producers need to step out of the pen and look at the bigger picture. There are many alternatives to the production process and the more we can understand about the drivers which force change upon us, the clearer we can pave the direction of our futures. There will be a continuing decrease in producers in the future, but having more control and a combined approach in production, processing and marketing processes, by forming alliances and moving beyond the farm gate will make the difference in profitability.

My study goals were to explore and highlight some of these areas so I can make more informed decisions for my business and industry, giving a clearer direction now and in the future.

Introduction

The Australian Pork Industry has undergone significant change over the last 10 years driven by the pressures of globalisation, trade reform, food safety and technical developments. Until the mid 1990's the main focus was almost solely on the domestic market and the world market had little effect on the industry's competitiveness or profitability. Today's industry is far different with strong global competition, we have been able to develop export markets, but at the same time have been exposed to imports which seem to place a ceiling within the market place.

The Australian industry is quite small internationally, and nationally - comparative to other agricultural industries - which influences support, trade decisions and competitiveness. We import from the EU, Canada and the US. We have a little over 2200 producers totalling about 330,000 sows being 0.4% of world pork production, accounting for 1.4% of world exports, and will struggle to compete on volume internationally under the traditional supply basis. However the industry is extremely important to the Australian agricultural sector having a gross value of production of all but 1 billion dollars. Studies undertaken by the Western Research Institute, calculated the broader economic impact of the industry through the value chain generated a total value of \$2.576 billion to the Australian economy and provides nearly 34,000 jobs.

Advantages of the industry:

- Our high health status and freedom of most exotic diseases with our oceanic borders,
- Proximity to the Asian market and capability to export fresh chilled pork,
- Relatively favourable exchange rate,
- Domestic market in relation to total production, that is, it's similar,

Disadvantages:

- Australia's small population - preference to lamb and beef, but also low tax base,
- Harsh climatic conditions - creating unstable feed grain price, quality and security of supply,
- Relative isolation - cost of capital infrastructure,
- Shortage of skilled and unskilled labour - comparative to major competitors,
- Spread of the industry - creating a lack of scale of economies in production and processing, and a lack of integration at the same level.

The future needs to be focussed on developing our domestic market and niche export markets, by improving product specifications, capturing market trends and preferences by consumers. At the same time we must remain globally competitive, by implementing efficient systems not only in production, but business systems such as more contractual alliances and producer integration.

Three of these focus areas will be:

- Animal Welfare - by means of aiding and differentiating marketing,
- Maintaining our “world’s best health status” - through rigorous biosecurity controls and high levels of on farm management in disease management, keeping our industry internationally competitive as well individual business,
- Business Structures – integration at all levels.

My study will explore these areas with the view of expanding these focus areas at the producer level, promoting thought and integrating the processes for business development.

I manage with my family a diversified business, Mt. Boothby, at Tintinara in the Upper South East of South Australia. Incorporating 3 properties totalling 10500 acres, we crop 4000 acres per year, primarily to produce feed for a 600 sow farrow to finish multi-site production unit. A broad acre grazing operation of 200 breeders and 3200 merino ewes, self replacing, and to prime lambs. Our pork enterprise is the main focus with various profit centres, such as grain production, storage, feed preparation and the pork production facility. Mt. Boothby has latest production techniques, and facilities, all through the production process from milling and distribution, innovative high welfare grow out, climatically controlled farrowing house, and the adoption of the “Batch Farrowing” technique. These efficiencies are continued through the other enterprises such as “No-Till” farming, and GPS technology.

Mt. Boothby is conscious of change and continually strives for improvement. We have opened our doors to the industry, and given countless hours of free time educating producers with production alternatives. We work closely with our alliance partners, Coles and Primo Meats, with production education to aid marketing, as well, welcoming Singaporean Butchers, helping maintain export markets, through Australian Pork Limited (APL).

Mt Boothby was recognised in 2003, by winning at the state Meat Industry Food Awards, as well, runner up in the Premiers Food Awards. Our business is community minded, through support, sponsorship and aiding regional development.



What Is Animal Welfare?

Animal Welfare for the pork industry is a global issue with varying regulations between countries, which greatly affect the production process, capital cost of infrastructure and management levels within the farm. Welfare from a producers perspective is extremely important, not only from the animals well being, but the industry's perception publicly which will further develop in the market place, an example is the "Ban the Ham" advertising that seems to pop up at Christmas time, driving consumers away from a traditionally important marketing period for producers.

Most welfare pressures directed at the pork industry in Australia are associated with the use of sow stalls. With the growing of pigs most producers have developed their own systems that satisfy any welfare criticism, because there are many options that won't affect the efficiency and performance of the animals while being welfare compliant. However the breeder or sow is far more complex creating conflicting arguments between responsible stock control, "what is" actually best for the sow and a system which maintains international competitiveness. The ideal high welfare system is a process involving a high level of animal well being, management and selective intensive capital infrastructure. Because of this my study has been directed towards issues facing the gestating sow rather than growers.

Animal Welfare is internationally viewed and accepted within the framework known as the "Five Freedoms" developed by the Farm Animal Welfare Council. These form a logical basis for assessing animal welfare within any husbandry system, together with the actions necessary to safeguard animal welfare within the limitations of an efficient livestock industry. When considering sow or any animal welfare we must aim to encourage the highest standards of husbandry. No matter how acceptable a system may be in principle, without competent, diligent stock persons, the welfare of the animals cannot be adequately catered for. Obviously higher levels of training and more rigorous quality assurance programs will need to be developed for all staff.

The Five Freedoms

1. Freedom from hunger and thirst – by ready access to fresh water and a diet to maintain full health and vigour.
2. Freedom from discomfort – by providing an appropriate environment including shelter and a comfortable resting area.
3. Freedom from pain injury or disease – by prevention or by rapid diagnosis and treatment.
4. Freedom to express most normal behaviour – by providing sufficient space, proper facilities and company of the animals' own kind.
5. Freedom from fear and distress – by ensuring conditions and treatment to avoid mental suffering.

To adopt the “Five Freedoms” in a practical production process we need to go beyond the bold print and fully interpret the whole terminology, it is paramount to conform but also to maintain an efficient sow.

Current protocol and acceptance of high sow welfare is associated with outdoor production, primarily because it broadly captures the five freedoms. However if we analyse them fully we will clearly see, an outdoor system has serious limitations to welfare and equally important production inefficiencies which has seen a world wide trend returning sows inside. This trend has been inconsistent within the United Kingdom where outdoor sows accounts for nearly 40% of production. The UK industry has gone through much upheaval over the last 10 years but particularly in the last 5, firstly because of regulation driven politically by the power of the vote through the consumer, then through transport restrictions because of Swine Fever and Foot and Mouth which alone was enough but exacerbated the effect of Post weaning Multi-systemic Wasting Syndrome (PMWS). There is little industry confidence contributing to a lack of investment and nearly a 50% reduction in domestic production. Producers have looked at outdoor systems as a cheaper investment option, and reduced cost if and when exiting the industry. But I can see the trend of exodus continuing as they have lost their efficiencies. Sadly the UK has a market premium comparatively to other major European producing countries. Emphasis on remaining internationally competitive. Unfortunately some major constraints within the UK, have been out of the producers control. However outdoor pigs are a short term solution.

Analysing the Five Freedoms

Freedom 1.

It is relatively simple to keep a sow from hunger and thirst but to maintain full health and vigour is another matter. From a welfare and production sense we must have the ability to individually feed a sow through all stages of the reproductive process. Because of varying dietary needs and the bullying behaviour at feeding time we can't guarantee each sow is adequately fed. In a group feeding situation some sows will over eat and others will be limited. Hence outdoor sows, doesn't really capture this freedom without an elaborate feeding system, which will invariably make it cost inhibitive, let alone the high feed wastage.

Freedom 2.

Particularly in Australia due to our extreme weather conditions and particularly in summer it is imperative appropriate shelter is available. To avoid sunburn shelter must be available constantly. It is not a photogenic site on warm days when a sow is farrowing in a wallow with most piglets drowning. If a sow is uncomfortable, she won't eat satisfactorily increasing the incidence of summer infertility, which is a natural time of year (February/March) to go out on reproductive strike. Many outdoor herds suffer significantly from this but with good housing and feed management this can be minimised. Most regions of Australia require intensive indoor production, there are various and elaborate housing systems which can offer naturally or climatically controlled environments.

Freedom 3.

The best stockpersons are rapid in detection and diagnosis of injury and disease and are able to treat the situation hopefully before any real welfare issue or financial impact. With higher welfare comes more professional management, which in any case is irreplaceable. An intensive system can be argued against as the incubating environment for disease, so it becomes important we adopt best management practices to minimise or prevent out-breaks, such as biosecurity controls, "all in all out" systems, to separate age, definite breaks between batches and a correct well maintained hygiene program. We are preventing rather than curing.

Freedom 4.

This is the freedom which brings the greatest debates, a sow stall does not allow the animal to express most normal behaviour or interaction with the animals own kind. It is the single freedom which contributes the most regulation and pressure. Sows are very aggressive at times of mixing to a group, and feeding, to a point it can have serious welfare implications and production losses. All scientific studies argue that isolating or confining the sow for the initial period of gestation, to allow for maximum embryonic implantation to the uterus wall has significant production benefits. Also it protects the sow from fighting, through a typically aggressive and stressful period, thus preventing lameness, wounds and even death - let alone the production loss. Countries such as the UK and Sweden have some of the highest welfare regulations which have increased the cost of production, through capital outlay and decrease in performance. They can't use stalls for housing sows on a permanent basis. The Danish and Dutch industries regulation, unless capturing the UK market for a premium, allows the use of stalls for 4 weeks post mating as a compromise trying to satisfy the public, whilst maintaining production efficiencies. Particularly Denmark, which exports 90% of its production, must remain globally competitive thus it does not follow the UK entirely on a stall ban. Another major efficiency the Continental Europeans have is they are generally smaller owner operated farms, with modest and highly skilled stockpersons. The North American industry, which is mainly corporately owned, has no welfare policy and for the vast majority of production, sees sows retained in the stall for their productive life. I as a producer can see the financial advantage and simplicity in management of this system, but don't see the benefits in meeting the sows complete needs. My producer alliance TOP PORK consisting of 23 producers is pro-active on welfare, implementing a separate welfare code of practice by maintaining the use of stalls for 6 weeks after mating, then grouped housed till 1 week prior to farrowing, thus, improving public perception.

A pig operation runs each day of the year and a solid return is required to reinvest, it is what you make out of it while in operation, the asset is depreciating and quite often very hard to sell. The consumer (voter) who has a large voice in production systems and regulation, also wants generally cheap food. I believe, it's a developed world expectation that we shouldn't pay exorbitant prices for food even though it is one of our greatest necessities of life. Within the European Union (EU) and the US farmers are greatly supported in subsidies through the tax payer, which is justified or accepted by them, "under my belief a false premise" that they will then pay less for their food. Once again producers are forced to operate efficient systems just to remain viable, not just what is perceived to be "friendly and fuzzy".

Freedom 5.

Freedom from fear and distress impacts on management systems. Any agricultural business, but in particular, intensive industries, requires close management. My business has seen it very difficult to cut corners on capital infrastructure. At all times high levels of piggery management is required to have consistent and smooth flowing production. Not only do we as producers need good systems, but continued along the supply chain from transport operators and livestock facilities at abattoirs. The Australian Pig Industry Quality Assurance Program (APIQ), outlines the Code of Practice, to which most producers adhere today. It covers a wide range of procedures, principally for the benefit of the stock. Higher welfare practices do increase the level of management and therefore some differing Codes will need to be introduced.

The Five Freedoms which broadly outlines the welfare requirements needs to be put into practice on farms, while considering current and future regulations. We also have to be careful to adopt a production process that actually captures all the freedoms to the fullest extent. If we can implement such a practice, we then may be able to improve our marketing options by branding products based on the welfare, which is extremely marketable. Coles Supermarkets continually receive opinions from concerned consumers based on intensive animal production particularly in egg and pork production. Speaking with many within the pork industry from around the world, those who have had regulation forced upon them wished they could have marketed the new system more successfully to help cover the increase cost of production. Those who haven't regulations, eg the North Americans, don't want to change as the consumer isn't prepared to pay for the product making them internationally uncompetitive, currently, the best returns on investment within the pork industry was in the US. Piggeries selling 20 pigs per sow per year were returning about 20%, the Danes producing upward of 25 were more like 8-10% return. In Australia 20 pigs sold would return somewhere between 2% and 6%.

Currently Australian Pork Limited (APL) is negotiating a new and improved welfare code in Australia, I suspect probably based on some compromise, similarly to the Danish current regulation. This is what has happened in New Zealand, and it allows stalls for the initial gestation period. That system is undeniably a good compromise which is already in practice at Mt. Boothby, maintaining high production levels.

When considering branded products we need to do something special which will capture the consumer, but also understand the market and size we are targeting. There's not much point having an elaborate high cost operation which can only supply 2 boutique butcher shops at a high premium which might only represent 2% of your production. With the country's population only being 20 million we need to align ourselves with major retailers to capture a share of the whole population, for it is only a small percentage that will pay a premium.

An independent watchdog such as the RSPCA has been used successfully in the egg and pork industries, by conforming to an endorsed code of production and using the RSPCA logo as the main marketing focus. Other marketing aids can be used such as, no growth hormones or GMO's etc but those standing alone may only have a short marketing life span. The current RSPCA pork production code of practice only allows for outdoor production, which can easily be disputed as not necessarily welfare compliant, let alone inefficient and globally uncompetitive. More importantly there are very few areas of Australia that have an environment suitable for outdoor pigs, either because of summer temperatures or environmental regulations on effluent control disallowing the practice of outdoor production such as in the Lower South East of South Australia. We need to develop an indoor intensive high welfare code that can be audited and marketed for those who wish to chase, "a probably increasing market", but remain relatively efficient thus providing a product that would be affordable to a larger consumer base.

Regulation

Presently like the US and Canada, Australia has very little welfare regulation other than the size of the sow stall which is only enforced in South Australia, and various stockperson, shelter, feed and water requirements. As a producer I can choose the system of my choice. With fine margins, nearly all producers operate stalls through all or part of the gestation period, to maximise and simplify production. If there were to be a stall ban there would be a transition period of about 7 to 10 years (as in other countries) to conform, which would result in further exodus of the industry as many wouldn't be prepared to re-invest. I can only assume that stalls in that regulation will be retained at least for 4 weeks of early gestation, but may change in the future to a total stall ban. At this stage we can only speculate on any time frames.

I believe Australia is closer to the EU on welfare policies with pork production than North America, once again driven by the vote. There appears to be more awareness and movement focussed on welfare which will force change and policy. Pressure groups are active within North America and it will eventually happen there, but they have a current government attitude very much supporting business, agriculture and efficient production in order to develop exports. It is for this reason I looked at policy within the EU and where the industry is going, to gain an appreciation where we might be in 10 years time and the possible housing alternatives required.

EU Directives

The European Commission through the European Parliament in Brussels sets out broad laws with agricultural production and policy, these laws are called directives. Our RSPCA is very familiar with the EU Directives in relation to intensive farmed animals.

Council Directive 91/630/EEC - laying down minimum standards for the protection of pigs.

These standards are amended overtime as technology and practices are developed and perception changes.

The protocol on protection and welfare of animals annexed to the treaty requires that in formulating and implementing the Community Agriculture Policy, the Community and the Member States shall pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage.

The Commission submitted a report on intensive pig rearing systems taking into account in particular the welfare of sows reared in varying degrees of confinement and in groups and has made proposals for adjustments to the rules.

The opinion of the Scientific Veterinary Committee of 30 September 1997 concluded that pigs should benefit from an environment corresponding to their needs for exercise and investigatory behaviour and that the welfare of pigs appeared to be compromised by severe restrictions of space.

Sows prefer to have social interactions with other pigs when provided with freedom and movement and environmental complexity. The current practice of keeping sows in continuous close confinement should therefore be prohibited. It is however appropriate to allow producers sufficient time to make the necessary structural changes to their production facilities.

A balance must be kept between the various aspects to be taken into consideration, as regarding welfare including health, economic and social considerations and also environmental impact.

It is appropriate for the Commission to submit a new report taking into account further research and practical experience in order to improve further the welfare of pigs, in particular as regards aspects not covered by Directive 91/630/EEC.

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive. They shall forthwith communicate to the Commission the text of those provisions. When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

Within the EU there is quite some diversity with regard to welfare policy as seen from above, it largely becomes political and we see the difference in welfare standards from the highest in Sweden where they can only confine lactating sows in stalls for 4 days to probably Spain the lowest, which still allows considerable confinement of sows.

Examples of EU Directives

Freedom From Aggression

- *EU Council Directive*

“Pigs.... Which are particular aggressors (or) which have been attacked by other May temporarily be kept in individual pens”.

Control Over Individual Feed Intake

- *EU Council Directive*

“Sows and gilts Must be fed using a system which ensures that each individual can obtain sufficient food even when competitors for the food are present.”

Freedom From Aggression

A severe case of post-regrouping injuries from aggression



Aggression

Sows can be quite harmful together at times of:

- Grouping
- Feeding
- Weaning
- Onset of oestrus
- Incorrect group size and dynamics

Feeding

It is important as producers we individually feed sows to maintain maximum health and vigour. It is very awkward feeding in a group sense simultaneously without some isolation from aggressor sows, for example a feeding stall or an electronic sow feeding crate.

Weaning and Oestrus

I don't believe there is an alternative at this period with regard to welfare, stock handling and ease of management, that is, a sow should be confined to a stall. A stressful period, which if housed in groups would see much aggression, lameness due to riding at oestrus, resulting in a welfare problem. That period of confinement would typically last 7 to 10 days. That management period is quite intense and stalls make it easier and safer for the stock person.

Group Size and Dynamics

Pigs develop a social structure within a group from the dominant hierarchy to the stressed and beaten tail end. Observing pigs at grouping or feeding highlights this very clearly particularly in smaller groups, however once we start to expand the group beyond about 50 animals, the structure and dynamics of the group changes, and tends to be diluted, to an extent where the dominance isn't as strong, and the weak can run away, provided correct space allowances have been used. A stable group is one which doesn't change from initial grouping till completion of gestation, a dynamic group is one which typically, on a weekly basis changes, that is some are departing and some are introduced.

Grouping

Any pigs grouped together at anytime will undergo stress through aggression of some sort, the severity and potential production loss will vary depending on size, structure and timing of grouping. Typically sows of late gestation tend to be more docile than sows at weaning and early gestation. It is important as stock persons, when grouping sows, we use correct space allowances and size sows evenly into the group making sure there is adequate feeding space and preferably a feeding barrier. Sows need to have sufficient lying space and walls to lie against. It is preferred that nesting material such as straw be available in lying areas, which is mandatory in some countries within the EU. However this increases the labour requirements in procurement and management of the straw, adding to the cost of production.

Being aware that sows are aggressive towards one another at time of grouping, when is the most efficient, "in terms of production and welfare" the best time to group? This question is definitely the toughest to ask and implement, whilst giving a satisfactory compromise on welfare and efficient viable production.

Post Implantation

To prevent the possibility of losing embryos due to “stress” it is best to not move or mix mated sows during the first 28 days after service. A study in the United Kingdom reported that sows (166) group housed (25-50 per pen) during the first week after mating had a 20% return to service rate and 10.5 piglets per litter compared with 10% and 10.7 respectively, grouped during the forth week after mating.

There have been numerous trials performed around the world based on this scenario resulting in undeniable and conclusive evidence that grouping prior to 4 weeks after mating will result in production loss. That is why Denmark at this stage has retained the use of sow stalls during this period to remain so internationally competitive.

Pre Implantation

If sows have to be grouped before 28 days after service, when should they be mixed? This is a very difficult question to answer because of the following.

Does stress during the first 2 to 3 days after service cause the embryos to enter the uterus early? The uterus is a “hostile” environment for embryos during the first two days after ovulation. The majority of females will ovulate 24 to 56 hours after the onset of oestrus and the embryos normally enter the uterus about 48 to 56 hours after ovulation.

Does stress immediately after insemination interfere with sperm transport to the oviduct? Normally, within 15 to 30 minutes after artificial insemination, viable spermatozoa are in the oviduct? A rapid transport through the uterus and the storage of sperm in the oviduct seems to be necessary to protect spermatozoa against immunological attack.

Does stress during days 10 to 12 after service interfere with embryonic survival? Maternal recognition of pregnancy in pigs occurs between days 10 to 12 after insemination

Does stress during implantation decrease embryonic survival? Attachment commences around day 13 to 14 with a loose contact between trophoblast and uterine membranes and is completed by day 28 after service.

If the answer to all four questions is yes, then the only time to group mated sows might be from day 5 to day 9 after service.

In simpler terms soon after mating we should group sows if they have to be, normally because of regulation or a marketing strategy which will compensate for lost production. "An example is" if we seed a paddock today and tomorrow we re-till the same paddock, there might be some loss but the seed hasn't germinated and the crop will still come up albeit in a different spot. If we re-tilled the paddock in 10 days when most seed has germinated we would see, lost production.

Trial results from Prairie Swine Research Centre Saskatchewan Canada

Preliminary Results: Farrowing Rate (% , 5 cycles)

	Stalls	Pre-implant		Post-implant	
		Static	Dynamic	Static	Dynamic
1 st parity	84.7	81.7	85.6	87.6	86.7
2 nd parity	83.8	81.4	81.7	80.0	89.2
Mature sows	87.8	83.7	79.5	86.1	88.3
Adjusted	86.0	82.6	81.6	85.1	88.1

Preliminary Results: Live Piglets/100 Sows Bred

	Stalls	Pre-implant		Post-implant	
		Static	Dynamic	Static	Dynamic
1 st parity	898	874	865	929	910
2 nd parity	922	879	956	896	1008
Mature sows	948	898	890	982	980
Adjusted	928	886	899	947	968

If we use stalls as the control or target performance, the text shows there is little difference in post implantation grouping. However with pre-implantation grouping there is a 5% reduction in farrowing rate and 30-40 less live piglets born per 100 sows bred. At this rate my 600 sow piggery would potentially lose \$80000 per annum on just lost piglets, let alone the reproductive loss of 5%, for more unproductive sows

cost another \$20,000 in extra sow purchase, feed and husbandry costs. It is a \$100,000 potential loss in an already tough industry. Are the Australian consumers, retailers, processors going to financially support producers if they dictate our production policies? Our imports won't be as safe or friendly.

What can we build?

To build a greenfields site piggery, "that is from the absolute beginning" it will probably cost somewhere between six to seven thousand dollars per sow place including the breeders and feed until 9 months, or first farrowing. Excluding land cost which needs to be more than just the area of the capital infrastructure, but also allowances for regulatory buffer zones. It is a costly exercise, generally precluding the average farmer that wants to diversify or even an existing pork producer that needs to re-invest. Rather the industry is becoming more corporate orientated with investors, and hence the rapid exodus of producers, from the industry combined with other management pressures.

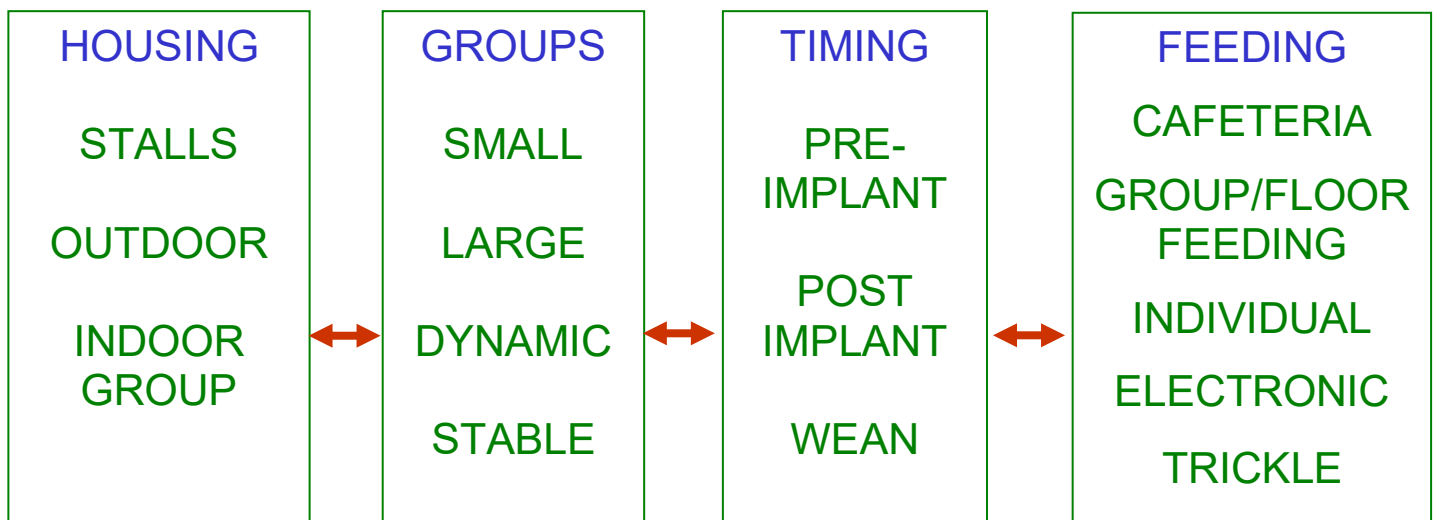
To build a new piggery, I would try to invest in a system that catches all Five Freedoms and one which allows the most efficient production. Unless for marketing reasons I would retain the sow stall for at least the first 5 weeks after service, as the potential loss of production which is also a welfare issue is too real. However, I would build a system which would give me options in the future to market high welfare or a change in regulation that might prohibit the use of stalls. The investment needs to be beyond a 10 year project, and to cover market flexibility options, will only increase the capital cost.

Key points,

Apart from the many decisions to be made of piggery investment, the key points to consider affecting efficiency and welfare are: -

- Capturing the Five Freedoms,
- Considering marketing options,
- Considering future regulation,
- Understanding your management capacities,
- Timing of grouping of mated sows,
- Flexibility to easily change the system and to expand in the future,
- Financial limitations

There are about 80 alternative production systems



There are essentially 5 main housing systems and weighing them against the five freedoms illustrates their conformance to animal welfare. Some freedoms still could be debated on individual housing systems, but my conclusions have resulted from an analysis on each, whilst fully interpreting the whole Freedom or welfare point.

A tick conforms, a cross doesn't, with a line middle ground. Considering individual stall with fear and distress, it could easily be debated either way, however my observations overseas combined with a range of experiences in Australia lead me to the conclusion that there is more distress and fear with unsatisfactory grouping systems.

HOUSING	HUNGER & THIRST	DISCOMFORT	PAIN INJURY OR DISEASE	TO EXPRESS MOST NORMAL BEHAVIOUR	FEAR & DISTRESS
INDIVIDUAL STALL	✓	—	✓	✗	✓
OUTDOOR	✗	✗	—	✓	✓
INDOOR ESF	✓	✓	✓	✓	✓
COMBINATION INDOOR GROUP FEEDING	✗	✓	✓	✗	✓
CAFETERIA	—	✓	✓	✓	✓

Individual Stall



The traditional system for housing sows is the stall. This system is still widely used today, particularly in North America; this picture taken in Nebraska is typical of most piggeries with the sow spending its whole productive life confined to the stall. This particular shed, only half in view, houses over 1000 sows

Benefits

- Good space utilization,
- Ease of management, being able to handle larger numbers more efficiently,
- Cheaper infrastructure cost,
- High production performance,
- Individual control of the animals.

Problems

- Concern on future housing/marketing regulation,
- Doesn't comply with Freedom of Movement,
- Its cruel to house any animal like this in a permanent situation,
- Poor public perception,
- Probably the highest welfare concern.

Outdoor



Very common in the United Kingdom with about 180000 sows housed outside, sows spend 100% of their time free to walk outdoors, including mating, gestating and lactation. Sows are kept in groups in paddocks with huts for shelter. Success of this system is dependent on a suitable site, dedicated stock people and appropriate genetic quality of the stock. It is popular within the UK as the capital cost is low compared with intensive systems, and as the UK industry is lacking confidence has become an option as the cost of exiting the industry is greatly reduced. This however has had the negative effect of increasing their cost of production and a loss of their international competitiveness. This was supported by a large scale producer, using various production systems, including outdoor, who is also an accountant, with whom I was fortunate to meet with.

Site Requirements

Soil type should be light and free draining, sites should be managed to avoid leaching of organic material and soil erosion.

- Average rainfall should be below 750mm, though this depends on soil type.
- Paddocks should provide natural shelter from the wind and elements and have flat areas for the siting of huts
- Sites should have good access but close to staff housing for security

- Sites are generally moved every 1 or 2 years, depending on soil type and stocking density. At least 2 years should be left before pigs are returned to the same site, so provision of this should be factored in the decision process.
- Sows can be moved onto stubble or bare soil, but established grass is the preferred option.

Feeding

Sows are fed in groups with the feed distributed onto the ground, either by hand or mechanically from bulk implements.

- There is normally no facility to feed sows individually. Feed should therefore be spread over as wide an area as possible to help ensure each sow receives an adequate share and minimise bullying. Common practice is to distribute feed in a line allowing at least 2 metres per sow.
- Individual rationing is not possible so average daily feed allowance is typically higher to ensure all sows achieve an adequate intake, which is reflected in higher total feed use per sow per year compared to indoor herds. Where possible sows should be grouped by size and condition. Extra feed should be provided in the winter.
- Food in the form of a cob, roll or nut, that shouldn't break will reduce wastage.
- Food must always be put on a dry area, which should be varied if necessary.

Paddock Layout

The layout of paddocks will depend on the size of herd and shape and size of the fields. The two main systems are the traditional and radial paddock layouts.

- Traditional layouts are very flexible and can be any shape or size. Paddocks are normally square or rectangular and arranged in blocks with wide roadways on one or two sides. This layout is suitable for herds of any size.
- The radial layout is more suited to a medium sized herd of, approximately 150 – 300 sows and requires large open fields. Wedge shaped paddocks are laid out in a circle with a roadway around the outside to allow feeding and servicing the watering points. In the centre a series of gates and handling facilities makes the movement of sows relatively straight forward. Activity becomes very centralised and has limited flexibility, those areas need to be well managed.

- Stocking density will typically vary from 15 – 25 sows per hectare.
- Group size depends on the herd size, but is usually 5 -20 sows per paddock.
- Paddocks are normally divided using electric fencing. For dry sows 2 strands should be sufficient, positioned about 200mm and 500mm above the ground. Where mains power is not available, a heavy duty battery operated fencing unit will be adequate.
- Water should be provided in a trough in each paddock with sufficient wallowing areas to cool and protect the sow.

Service Management

Outdoor herds normally adopt one of four options for service management.

- Conventional indoor housing systems based on supervised services with sows returned to the field after service. This system would be; just about mandatory to maintain some efficiency.
- Group serving. Sows are introduced to a group of boars at weaning with the numbers of sows introduced, equal to the number of boars. Groups of sows are introduced to the service paddock at intervals not less than 3 -4 days, normally over a 2 week period and then the boars are rested for 1 week. Boars operating within this system need to be grouped reared. Overall boar to sow ratio for the herd is approximately 1 to 12.
- Boars may be housed in individual paddocks with single sows introduced for service.
- Dynamic serving groups. Sows are grouped together at weaning and fed ad lib. At oestrus they are moved into a large dynamic group according to their body condition of about 30 sows, with 3 boars and 3 sows being added and removed each week. They are served within the group and stay there for the first 10 weeks of pregnancy before being remixed into weekly groups.
- In all cases boars should be run with groups of sows around 3 weeks after service to detect any returns.

Management

The management of sows kept outdoors requires different skills than for indoor systems due to the extensive nature of the system and the need to cope with the extremities of weather.

- Skilled staff that are fit and willing to work in all conditions are essential.
- Adequate shade and wallows need to be provided to avoid heat stress and sunburn in hot weather, which is essentially the main limiting factor in Australia. Within Europe I found more problems associated with hot weather than cold.
- Huts should be adequately bedded with straw at all times to ensure a warm dry lying area.
- Clear and large sow identification is essential to ensure easy management and as a basis for recording management.
- A mobile handling pen or trailer is required for movement of stock.
- Nose rings are often applied to prevent sows rooting and damaging the paddocks, but this practice raises serious welfare considerations. Boars should not be rung.
- A preventative health program for outdoor sows should be implemented in conjunction with a veterinary surgeon.

Gilt Management

- Typically gilts are kept in separate paddocks and introduced to the main herd at or after first farrowing.
- For gilts and sows new to the system a training paddock should be constructed that includes a visible fence outside the electric fence.

Costs

The capital requirement is obviously significantly less than an indoor system with most of the costs tied up in the grower department, which is consistent with an indoor herd. The capital cost would be about \$2500 a sow place, compared with 5 to 6 thousand dollars a sow place for an indoor system.

Positives

- Low set up and equipment cost,
- Simple systems with little equipment to breakdown,
- Low aggression in the sows, particularly if there is good feed distribution,
- Reasonably good public perception even if it is ill-informed.

Negatives

- Feed costs are significantly higher,
- High variability of sow productivity, especially where service and farrowing is outdoors,
- Low feed intake during lactation resulting in a greater impact of summer infertility,
- Extremes of weather will cause management problems,
- Inability to individually feed and ration,
- Skilled staff and higher labour component,
- Sows aborting will be impossible to detect,
- Environmental issues, particularly in effluent control,
- Managing piglets from fostering, feeding and weaning,
- A general lack of control in most areas of management and production resulting in decreased performance.

Electronic Sow Feeders (ESF)

Large Dynamic ESF

Sows are kept in large groups (30-200+) and fed individually in a computer controlled feeding station.



System Components

- A transponder/responder carried on an ear tag to identify each individual sow,
- A receiving aerial to identify the transponder number,
- A computer to store details of daily feed allowance and the amount of feed dispensed daily to each sow, with a data printout facility,
- A dispensing mechanism to deposit the correct number of equal sized feed drops to the sow whilst in the feed station,
- A feed station or crate to isolate the sow from the rest of the group while feeding.

The Feeding System

Electronic Identification (ID)

- The ear tag carries a unique ID number which identifies the sow,
- The ear tags transponder number is picked up by the aerial in the feed station when the tag in the sow's ear enters the ID field in the feed trough,
- All new systems involve transponders carried in ear tags,
- Electronic ID systems have proved very reliable, far better than the earlier experiences,
- Ear tag loss is very low when tags are correctly placed inside the ear. Tagging well before mixing may reduce tag loss during bouts of aggression.

The Feed Station

There are two types of feed station, Sow Operated and Computer Operated:

Sow Operated Systems

- The sow controls entry to and release from the feeding crate. Sows can stay in the crate ready to leave. The gate is locked by the sow on entry and released on exiting. Typically a sow will stay in the feed station for 20 minutes.
- Small sows can sometimes find it difficult to lock the gate systems and may have difficulty closing the rear gate. The system must be checked to ensure that all sows can operate the locking mechanism.

- The crate does receive a high level of wear and tear. Avoid gaps around the rear gate where sows can gain purchase and rattle the gate.
- Typically sow operated feed stations will cater for 40 sows. This is a lower number than for computerised systems as the sow tends to stay in the feed station longer when left to decide when to leave.

Computer Operated Systems

- Some manufacturers offer the feature of computer control of exit gates and/or opening the rear gate to admit a sow to the feed station.
- Gate closing speed can be adjusted so that the gates can close slowly for training sows and gilts and more quickly for trained animals.
- A timer dictates the release of the sow from the feeding crate after she has received her last drop of feed. She can leave the station at any time by pushing the exit gate open. The system needs careful adjustment to ensure that all sows have sufficient time to consume their ration before the rear gate opens. Gilts take longer to feed than sows. Training sows and gilts need to be allocated a longer feeding time.
- A typical time allocation for feeding for a 2.3kg feed allocation would be 12 – 15 minutes, with a delay of 2 minutes before the gate opens following last feed delivery.
- As a guide a computer operated feed station will feed 50 sows on a daily basis.

Exit Race

- A passageway or race should be used to bring the sow back into the dunging area at least 2m away from the feed station. This means that sows in the dunging area do not have direct access to the feed station exit and they cannot interfere with sows leaving the station. The exit gate must incorporate a sow proof non-return gate.

Feed Delivery

- Volumetric feed dispensing has been shown to be accurate to plus or minus 5% provided the bulk density of each load is checked.
- Breaker switches should be used to identify hoppers that are running out of feed. All hoppers should store enough feed to last overnight.
- A water system needs to be incorporated only providing enough to assist eating.
- Both pelleted and meal feed can be fed, however meal is consumed more slowly than pellets
- The system can be adapted for liquid feed.
- An emergency plan should be prepared to list actions the stock person should take in the event of a system failure.

Starting the Feeding Cycle

Close monitoring of the feeding activity of the sows from the computer records and the operation of the equipment is essential.

- Experience has indicated that starting the feed cycle in the evening for overnight feeding may reduce activity behind the feeder with benefits of lower aggression levels. This feeding strategy means that the bulk of sows feed overnight and sows which have not been through the feed station can then be dealt with during the working day. It also means that the feed stations are not so busy in the day facilitating training of sows and gilts.
- When new batches of sows are introduced it may be useful to add them to the group at the start of the working day to allow adequate time for feeding/training before the next feed cycle starts.

Computer Facilities

Feed Allocation

- Daily feed allowance is allocated by the stock person on an individual basis to every sow.
- Overall feed allocation can be programmed to fit feeding curves as specified on an individual or herd basis.

Selection of Individual Sows

- Some manufacturers' systems can incorporate a shedding or capture facility. This will divert sows which have been selected by the stock person, such as sows required for transfer to the farrowing shed. This is mainly applicable to larger or dynamic groups
- Some producers feel that capture facilities are essential, whilst others see it as an unnecessary complication and removing sows from the group has not proved to be a problem.
- Automation can assist a stock person, but not reduce the overall level of sow observation.
- Automatic spray marking of sows in the feeder to indicate sows requiring management attention (such as, removal to farrowing house or vaccination) is a useful aid in identifying individual sows.

Action Lists

- Action lists are produced by the computer on demand to indicate which sows have not consumed any or all of their feed.
- It doesn't give warning of an empty feed hopper.
- Regular calibration of feeders is required to ensure that computer records of feed consumption are accurate.

General Management Features

- Stock persons must be particularly diligent in observing sows when the system is installed.
- A back-up system of visual sow identification is required.
- Tags must be checked regularly.
- Staff needs to be trained to use the computer, calibrate the feeders and maintain the equipment.
- Action lists must be monitored at least daily and remedial measures should be implemented promptly so that no sow goes without feed for more than 24 hours.
- Daily checks are required on the operation and state of repair of the crate.
- A first class repair and technical back-up service will be essential including same day service for breakdowns.
- Some sows may prove to be untrainable.
- Contingency plans, specifying action in the event of system failure must be in place. An emergency action plan must specify procedures for removing sows from the feeding area.
- The full daily feed allowance should be available to the sow at a single visit even though she may not elect to consume it at one visit, unused feed is weighed off, and supplemented for the next sow.

Building Design

New Building or Conversion

- Buildings can often be converted but all group housing systems adopting the correct design principles is essential for a successful system. Any conversion should not compromise the design principles
- The system can be installed in a general purpose type building or an insulated, controlled environment house.
- Typically natural ventilation with thermal comfort in the lying area and correct pen usage must be assured.
- A straw based system is common for lying areas with a scrape through system of the dunging area.
- Experience suggests that a fully slatted floor does not generally work well for loose housed sows, as levels of lameness and leg damage can be high.
- Experience also suggests that maintaining high production efficiencies with our Australian climate and using a climatically controlled environment, straw facilities become unmanageable, so the combination of partial slatted floors being at the dunging area and solid floor at the lying area is a good compromise.
- It is essential to train sows to use the system. Specific arrangements are required for training purposes. Alternatively a separate training pen is required.
- Initial training sows/gilts can be time consuming and some sows may prove untrainable.
- Sows coming back into the system after service may require a few days of re-training before they are re-introduced into the main group
- Minimum total space required for lying, dunging, exercise and feeder access is likely to be 2.3 – 3.0m per sow. Being about 1.5m square per sow for lying area and 0.8m square for the combined other areas.

Group Size

Group size should be no less than 40 - 50 per group with commercial operations using multiple feed stations, feeding 200+ sows in a group. Larger groups can minimise levels of aggression but sow observation and location of individual sows is more difficult. Training pens are an exception to the rule.

General Design Features

- Adapting the correct design principles is essential for a successful system.
- Aim for a one way flow of sows from the dunging area, through the feed station, back out into the dunging area, to the water and back to the lying area.
- Do not install feed stations in a restricted space.
- Allow a minimum of 3m unobstructed space behind each feeder.
- Feed stations should be situated with adequate space between them to prevent sows guarding 2 entrances.
- The use of exit races which take the sows away from the feed stations is recommended, with a one way gate.
- The feed station will lie empty for a large portion of the day. This is an essential feature of the system to allow sows to feed at anytime. Producers should not be tempted to add more sows to the system.

Pre-access Gate

This involves the use of an electronically operated gate which identifies the sow's transponder and prevents sows which have already fed entering the feeding area. This option may increase the throughput of the feeder and may reduce levels of aggression associated with dominant sows revisiting the feed station but will increase the capital cost, although wear and tear on the feed station is reduced. Some producers consider the pre-access gate to be an essential feature.

Gilt Management

- Separate training facilities are required for gilts. They should not be trained with sows.
- Gilts can find it difficult to compete at the feed station and they should be housed in a separate group from the sows' yard until their second pregnancy. This may require a separate feed station or sharing one.
- Gilts generally take longer to eat their feed than sows.

Boar or Heat Detection Pens

Pens containing boars can be strategically placed in the system to detect oestrus in returning sows. The pen must be solid walled with a hole to entice sows. A transponder reader with a paint marker to automatically mark sows who stay stationary at the hole for an extended period of time.

Stock Handling

- Managing an ESF demands a high level of skill from the stockperson, involving detailed stock observation and equipment monitoring.
- Staff must be trained to use the computer, calibrate the feeders and maintain the equipment.
- Staff should be involved in designing the layout before the system is installed.
- Individual sow monitoring both physically and via the computer printout is essential.

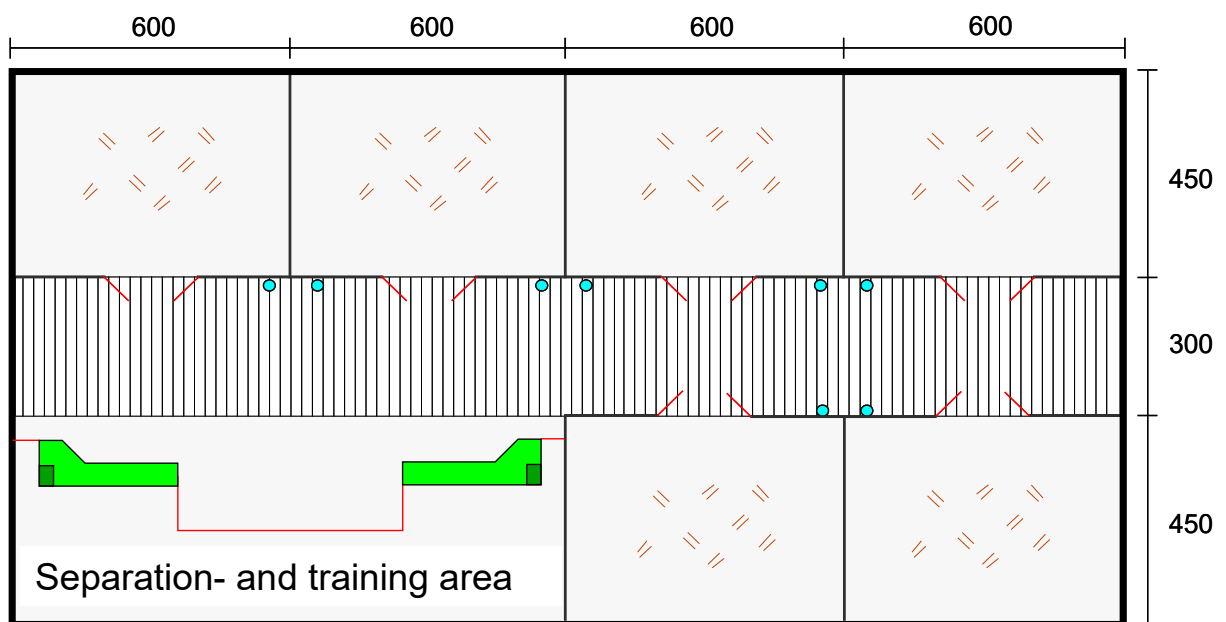
Positives

- Low level of aggression and sows are generally very docile and easy to handle
- Sow can be individually fed and also protected from aggression at feeding time.
- Individual sow rationing.
- Sow observation and treatment relatively simple, such as pregnancy testing.
- Low levels of manual work, creating a better working environment.
- Great public perception and this system captures all the "Five Freedoms"

Negatives

- Reliance on technical equipment, and is difficult to feed sows if problems occur. Good maintenance and back-up is essential
- Unique labour requirements, good stock persons who are technically minded also are required.
- Requirement to train sows and gilts to use the system.
- Sow observation can be difficult, finding abortions for example and locating individual sows.

Dynamic Group Design



ESF

Example;



Cafeteria Group Housing



This system which is quite popular within Europe captures all the “Five Freedoms”. The system enables the sow in various group sizes, generally up to 20 – 30 per pen to have the ability to isolate her from the group and the freedom to move about in an open area behind the stall.

The stall can be completely open from the rear or a half stall mainly protecting her head and shoulders particularly while feeding. These pictures of a piggery in Denmark were the best example of this system I saw. A new piggery, this producer spared no expense using a stall which activated by the sow, locks her inside the stall while occupied and by simply backing out, opens the stall. This type of stall will certainly capture the freedom from aggression, as there can be significant bullying from behind - particularly at feeding from quick eaters ready to remove another sow from her crate which is still feeding. This is simply done by aggressive attacks on the rear of less dominant sows who will eventually vacate the stall. This system has other benefits with the ability to lock the sow in the stall for management procedures, such as vaccination and pregnancy testing. Sows also can be confined in these stalls for the implantation period being 4 – 5 weeks, and then released to mix freely. It is noted that in these systems the sow actually chooses to spend most of her time confined to the stall, emphasising the need for their personal space and protection from dominant sows.

Because sows won't necessarily retain the same stall at feeding time, a minimum requirement of feed is dispensed through a feed system and manually topped up, via a feed cart for leaner sows, which is essential to maximise productivity by individually feeding. This will always pose problems with correct management and competent stock people and increase the manual work to some degree.

The system is very simple and quite fool proof. This particular producer did have ESF and when rebuilding completely changed to a Cafeteria system to simplify his management and the technical reliance he had used previously.

A distinct negative to this system is the high capital cost to construct, for two reasons,

1. A sow stall is required for each sow from weaning to lactation.
2. The correct amount of manoeuvring space is required behind the stall.

Both combined culminates in a very expensive shed. The North American view is "if you build a stall, they might as well stay there for the whole duration of gestation". For many others if you have all that free space then don't build stalls, but rather ESF and no topping up of feed is required.

Positives

- Can capture all the “Five Freedoms”
- Good public perception
- Simple system
- Efficient in production and labour
- Not technically reliant
- Have the ability to confine or group sows, particularly for management and flexibility of timing of grouping.
- Can wean sows straight into this system, service and gestation can all take place in the same area.

Negatives

- High cost, however there are various alternatives to this system, such as a canvas roofed, tunnelled, straw based shed with part stalls which would significantly reduce the cost but also reduce the effectiveness. Probable high repairs and maintenance later on.
- Requirement to “top up” feed to maximise individual performance and vigour.

Trickle Feeding and Part Stalls

Short Feeding Stalls or Trickle Feeding



This system dispenses feed as a trickle to keep the sow interested in her area rather than eating quickly and pushing another sow out. It was popular several years ago but generally phased out due to the inability to correctly individually feed. There becomes more reliance on stock persons to size and group sows correctly and individually monitor sows throughout the gestation period. The system captures some of the Five Freedoms but mainly the Freedom of movement but at the same time, it is questionable about the Freedom from hunger and aggression. This type of system would work well in a straw based eco-shelter style housing. Trickle feeding albeit relatively successful wouldn't be my first or second choice as a feeding/housing option.

Recommendations

Hopefully I have drawn attention to the fact there are many debating points to the welfare issue. Most producers are genuinely concerned about the perception of their industry and the well being of their livestock. I also think that most producers would re-invest in their business to a perceived better standard, if the returns were to be achieved. It is fine for the public/consumer to encourage change in production practices, for some is constructive criticism and provokes thought at producer level. But, is that consumer going to support that change from the hip pocket, and will that be passed back through the retail outlets and processors to the producer. Our industry must remain competitive and any policy will influence that, combined with correct capital expenditure and efficient production techniques. Australia's major competitors don't have any real policy and have other support structures, which already makes them more competitive than our domestic industry.

Throughout this report I have continually given my views. When most people think of welfare, it's freedom of movement they're really considering, however there are many other points of welfare which are equally important and I think consumers have to be educated.

I believe that outdoor sows are too inefficient and too many compromises in production performances to be a real consideration. I feel that with our severe climate and other deficiencies in control that outdoor operations are not that welfare friendly. It certainly is a cheaper way of entering or expanding in the industry, but I would consider once having established cash flow, investment would be made to return sows indoor. It is not internationally competitive, with the UK proving that and with

most other areas moving away from that system of production. There is potential for some niche marketing, which has already been developed.

There's much substantial evidence that grouping sows pre-implantation (4-5 weeks after service) will reduce production, not to mention the welfare consideration of lost embryos and aborting sows. Some EU countries can't use stalls by regulation, but their sale price is slightly higher to compensate. Some producers in the Netherlands and Denmark choose to supply the UK market which has such regulation and so, must comply with UK standards even though their country, allows the use of stalls for 4 weeks post service. Unless there is a marketing strategy behind grouping sows immediately post service which will pay a premium, it isn't a competitive form of production.

Importantly we need to consider our management capacities of our staff and ourselves. We also need to recognise future regulations that might be placed on us as producers. It will be certain that continued opposition from pressure groups will enforce a reduction in the use of stalls. I can only assume that the most we will be able to use stalls for in the short to medium term is 5 – 6 weeks post service, and would hope that is ongoing. When we build a piggery, it will be for above and beyond 10 years, so careful consideration should be given to a strategic plan that what is built now, could efficiently be adapted to comply in the future, - particularly if expansion is involved. I feel it's important to build it right the first time, not taking any shortcuts with careful thought to the flow and efficiency of the day to day operations. An industry problem is the shortage of skilled staff and people entering the industry, making the job easier, with limited manual work, is essential.

Straw or nesting material is commonly associated with high welfare and certainly has benefits. Within the EU it is becoming more of a requirement, even regulation in some countries that sows have some bedding. I believe in Australia we have to think deeper, particularly to ease our climatic extremes. There are purpose built straw based shelters to house sows which are very satisfactory, however as far as production is concerned the use of climatically controlled housing is extremely beneficial. These closed environments make the use of straw unmanageable from getting it in and out and clogging up concrete slats and drains. The benefits of climatically controlled environments in Australia from a welfare and production perspective would outweigh the benefits of nesting material. It should be noted that

when purchasing straw it should be of top quality, 90% of mould is fine, but some contain damaging mycotoxins which can reduce production.

There are 2 systems I have seen and would confidently recommend as far as welfare is concerned, whilst still favouring production.

Cafeteria. This system is simplistic and allows the use of stalls for management procedures while allowing the sow freedom to move. It will be compliant in the event of tightening regulations and in the short to medium term can confine the sow until implantation. This system can be used from weaning, service and gestation. It isn't technically reliant, fairly fool proof and labour friendly. It could be used in a climatically controlled environment or straw based.

ESF. The technology isn't daunting for me; these systems have improved significantly from when they were first trialled over 10 years ago. Feeding stock via a computer is the future, with the main ability to correctly individually feed. A well designed facility is very appealing publicly and essentially, is bringing outdoors indoors. Two reputable companies specialising in this area are NEDAP in the Netherlands and SKIOLD ECHBERG in Denmark. Both systems could be used with a straw based or climatically controlled indoor environment.

I'm convinced that from weaning to service, a sow must be in a stall to be properly managed through this critical time and haven't seen many other alternatives. Either just a stalled shed or a cafeteria system which then would allow sows being synchronised prior to oestrus to move freely. Many piggeries these days are mating larger numbers at one time either through expansion or Batch Farrowing techniques, combined with the use of artificial insemination, service in the stall seems the most efficient and safest. Our operation since moving this way has seen a consistent increase of 15% in conception rate.

A producer thinking only of efficient housing, production and management would build a piggery like our major competitors having sows confined to a stall permanently. I think this is irresponsible and not necessary as there are satisfactory alternatives, which can allow the sow to move freely for most of her gestating life. This is a preferred objective to meet market pressures in Australia and in other countries. It anticipates increases in these pressures and provides a marketing/education platform for consumers – improving market acceptance for the product.

Disease Management

Disease management plays a major role in the efficiency and welfare of our production units, not only from a production sense but also elevating public perception in food safety and a reduction in the use of antibiotics. Many producers have seen the benefits of “All in All out” techniques with definite age segregation which will break disease pathways, namely pneumonia, APP (Actinobacillus pleuropneumonia) and with a vaccination program can combat Mycoplasma Pneumonia. These management decisions have increased our growth rates in excess of 100gms/day, reduced mortalities and negated the use of antibiotics. Lung scores have been reduced from high levels to zero. Off site grower production (distinct separation) has also been partly responsible. I believe all producers need to adopt this type of system if they are to remain viable.

Swiss De-population

Moving to the next step beyond, “all in all out” is total eradication of pneumonia. We can achieve this by using the Swiss De-population process. In the past it was common to do a total depopulation of the piggery, giving it a short break then re-introducing clean stock which then would become disease free.

Problems with a total de-pop,

- Expensive, a complete replacement of breeders.
- Lost production in the time frame associated with this process.
- The continued concern that without correct protocols and bio-security there is always the chance that another outbreak could occur making the whole process a waste.

Any stock under 9 months of age are naïve to immunity, so this is the major disease risk zone. Off – siting growers away from the breeders, and planning that there are no breeders under 9 months on the site, we can use a medication program and eradicate pneumonia. Provided it is a successful operation the piggery could become pneumonia free, with the new production from that point on. This program is much simpler in a multi-site operation, one which is all in all out and possibly a batch farrowing system. Essentially, where there are physical barriers already, it will become easier to implement this management process.

Main points,

- Introduce more breeders prior to program so they will be 9 months at the time, to provide a barrier of 3 months of no incoming breeders.
- The breeding company to mate and hold stock, so there is no production loss.
- The requirement to find a place to grow-out existing production that is diseased, as to not infect the new high health stock beyond the Swiss De-population process.

This process is proven and reduces the loss of income through lost production and is significantly cheaper in eradicating disease. Even with our zero lung scores we will have benefits undergoing this process in slightly higher performance in breeders and growers, but mainly, not having to vaccinate which is of considerable cost, approximately \$5000 per annum for every 100 sows. Minimally, an all-in/all-out system, is a required standard today which does allow some insurance, such as management duties between sites and not having the continual worry of disease re-introduction, compared with a total disease free herd.

Post-weaning Multisystemic Wasting Syndrome (PMWS)

Most of my time understanding disease management was focussed on PMWS. It was of particular interest to me, as prior, during and on my return it has been the major topic of the Australian Pork Industry. This disease is of significant importance to our industry's health and well-being but has trade implications and also affects other rural industries? Prior to my departure there was a ban on an import licence due to PMWS and 2 suspected outbreaks in South Australia and one in New South Wales. Since my return there was a government over-ruling on the import restriction allowing imports from PMWS infected countries, leaving our industry extremely vulnerable to infection from PMWS. WHY??? Because I doubt whether this would happen to the cattle industry, it pays to have a lot more than 2000 producers.

PMWS was first described in Canada in 1991 and has since been identified in many countries through out the world including all which Australia imports from.

The casual agent of PMWS is generally accepted as Porcine Circovirus Type 2 (PCV2), as all pigs affected show this virus. The more I tried to understand the disease the more confusing it became. I asked the question, could it be another virus, which some experts are also starting to think. New Zealand has just been infected with PMWS from imported pig meat finding its way to a production unit. There has been a rapid spread and significant losses, which Australia should take note. Current research by Massey University in New Zealand is showing critical new evidence of a completely new virus. Once this virus has been isolated, we can use scientific evidence to firstly understand the disease and transmission, possible vaccines and have more influence in blocking open door trade.

In past trials the more severe signs of PMWS occurred when other viruses, such as PRRS (Porcine Reproductive and Respiratory Syndrome) and Parvovirus, were found in the herd. Experience has shown that a combination of stress, adverse environment and disease can trigger more severe PMWS. Within the northern hemisphere where other diseases are prevalent and a wide range of clinical signs it has been hard to isolate and diagnose the disease and its transmission. Most piggeries including Australian units are infected with PCV2 but without the other agent/s it is just a passive circovirus. Many pathogens produce similar signs to PMWS such as ileitis, dysentery and swine fever. There are piggeries in Denmark which are infected with PMWS that don't have PRRS.

Clinical signs of PMWS

- Affects pigs between 6 and 15 weeks of age.
- Rapid weight loss
- Yellow/green scour
- Respiratory stress
- Jaundice (pale/yellow skin)
- Red spots
- Sudden death
- Enlarged lymph nodes
- 20-30% morbidity (higher in some cases)
- 8-30% mortality (higher in some cases) one producer sustained 70% for 12 months.



Trials within the UK, has shown that despite high levels of medication used, there was little response and no decrease in mortality.

A trial also within the UK showing the financial consequences of an average mortality loss (18%) to a 350 sow piggery taking their pigs to 70kg dress weight, has a financial impact in excess of Aus\$155,000. A well run 350 sow piggery in Australia with better than average prices and average feed costs would even struggle to make that as profit.

All countries have been significantly affected but the UK probably as much as anywhere. PMWS first appeared in England in 1999 and has spread significantly with a crushing impact. This has been exacerbated by transport restrictions through other disease periods such as Classical Swine Fever and Foot and Mouth. At these times when it became very difficult to transport stock, pressure was put back at the farm creating a perfect environment for the intense development of the disease.

Management of PMWS

The French had significant losses, but led by Dr. Francois Madec pulled together to implement an action plan to minimise the effects of PMWS. A 20 point plan was developed, but this plan is simply good management within a piggery, which will help control or prevent many disease manifestations.

The 20 point plan manages the pig herd and the pathogen herd.

PMWS – 20 technical recommendations

Farrowing sector

Empty pit, cleaning, disinfect between batches (all in/all out strictly applied)

Washing sows + treatment / parasites before farrowing

Cross-fostering - limited to necessity
 - within 24 hours

Post-weaning sector

Small pens preferably no more than 10 pigs, with solid partitions

Empty pit, cleaning, disinfect, all-in / all-out

Stocking density (3 pigs/m²)

Space at the feeder +7 cm/piglet

Air quality: perfect (NH₃<10ppm, Co₂<0.15%)

Temperature: perfect

No mixing of batches

Finishing Sector

Small pens, solid partitions

Empty pit, cleaning, disinfect, all-in / all-out

No mixing in-between “post weaning pens”

No mixing in-between finishing pens

Stocking density: +0.75m² / pig

Air Quality: adequate

Others

Appropriate vaccination program

Adequate flux within buildings (air, animals)

Strict hygiene (injections, teeth and tails...)

Early removal of sick pigs to hospital pens

Producer Reaction

Obviously a full range of reactions existed. Implementing this plan to most piggeries would have significant cost, firstly in capital to re-design the housing and secondly in higher input costs such as labour.

Dr. Madec's team visited severely affected farms and scored each farm on their compliance with the 20 points. Some producers chose to ignore the 20 point plan and wait for a cure to be found. The continued high mortality has forced some of these producers to close down their businesses. A feature of the success in reducing mortality was the application of the majority of the 20 point plan. Where units achieved compliance with 15 or more of the 20 points they achieved almost total control of the disease manifestations but those farms with less than 15 appeared to have no or partial success.

Whatever the cost, it is completely unsustainable to have up to, and beyond, a 20% mortality rate.

Mortality rates in France in double figures are now a thing of the past, but they are only managing the severity of the disease as they still have no cure. Even Madec admits the 20 point plan is a crude tool and not much to show for years of expensive research; however is the best tool presently available.

Massey University

This is somewhat my own words and very speculative. Since the outbreak of PMWS in New Zealand, they are achieving far more conclusive research than our Northern Hemisphere counterparts. This has been made easier because of their clean health status prior to the outbreak, which is free of PRRS and others.

As experts have speculated there is most likely another independent virus causing PMWS and Massey to my knowledge has isolated it to 4 potentials. New Zealand like Australia has PCV2 and that plus the agent which many thought was PRRS will become PMWS.

For example, originally PCV2 + PRRS or other = PMWS

Massey's research, 1 of 4 virus's + PCV2 = PMWS

Apparently the virus alone won't kill pigs, but PCV2 is the finishing touch. So minimally, we could vaccinate (if possible) for PCV2 to stop deaths but won't stop wasting until we isolate the virus. Wasting in itself is an unsustainable loss. New Zealand has an island with a population of naïve pigs to disease, when some were bought to Massey and introduced to the infected pigs they all died, with intensively raised pigs, only a percentage died. This is all consistent with research so far, involvement of PCV2, but PMWS being a whole new virus.

Recommendations

On November 18 2005 in Sydney, the High Court denied the Special Leave Application sought by APL to take our appeal against the new pig meat import protocols to the highest level. The result being disappointing, reasons were that this case was one of facts and not one relating to principles of law. Notably they did not comment on the previous judgements in the Federal Court and their correctness or otherwise.

The original CSIRO modelling showed all of us that the likelihood of a PMWS outbreak over the next 10 years is almost certain, and as an industry we should not just roll over and accept this. APL and the Government should help with funding for Massey University and the NZ Pork Industry to continue research into PMWS which will hopefully bring more clarity to all unknown questions and give scientific evidence. If we can gain more information that makes present protocols for imports scientifically invalid, we as an industry need to bring this to the attention of Biosecurity Australia and have the protocols changed.

In the mean time we as an industry, continually need to adopt better management practices to improve and prevent disease, being many of the 20 point plan. This will be for our future viability and security. We also need to have better biosecurity controls with our own farms that is, stopping entry to anyone that doesn't need to be there, including animal welfare activists who could cause larger welfare concerns than stalls by spreading disease.

I was alarmed that with the: supposed PMWS outbreak in South Australia there was confidentiality about the suspected farms. Particularly when they used delivered feed from feed mills that supply on-route to other piggeries, they are grow-outs for a mother piggery and transportation of stock to market is done by carriers who service other piggeries. All being huge risks in the spread of this still unknown disease.

Australia, a few years ago, had a mock trial exotic disease outbreak, to test the management, traceability and control of any disease. That is, of course all irrelevant, if much of the agricultural industry including NFF and government wanted to see the Pork Industry infected with PMWS.

The cattle industry is always watching the pork industry with its reactions to imports and disease control, due to the fact it doesn't want anything impeding their export markets. Maybe Australia will start importing beef, and would imagine the beef lobby would follow a similar line, blocking trade, because of disease risks. I don't believe the Free Trade Agreement with the US will have significant benefits to the beef industry, without being internationally competitive. "Just ask" Canada's Cattle Industry, which has had a bilateral agreement longer than us with the US, "what free trade is about". The US is strategic, with whom they develop trade with, in these forms, and just as well we went to Iraq. Hardships faced in the 2002 drought by farmers, and the pig industry was faced with 12 months of high feed costs and low commodity prices. Despite record beef prices, which industry was complaining about high feed costs and encouraging the importation of cheaper grain, "yes the cattle industry". Unfortunately willing to jeopardize the grains industry by cheaper imports and create a platform for lower biosecurity protocols and lose our clean and green image. Our agricultural sector must unite, with consistent arguments and a common objective to protect our industries.

As frustrated as I am, I find solace in being passionate about my industry for one main reason, the pork industry is progressive and technically advanced, comparatively with other industries, which keeps my interest.

Genetics are always an interesting debate. Australia has closed its borders since the 60's for the importing of pig genetics from overseas because of the inherent risks of disease transfer. We as an industry are obviously conscious of the financial implications of disease that we have restricted the improvement of genetics, by not accessing European genetics, which I believe are superior to ours. There are new innovations to protect the transfer of PRRS through semen but obviously we are unsure about PMWS. If our government won't protect our industry, or in the event of an outbreak of PMWS, maybe we need to access genetics to help maintain international competitiveness. This is a case study in its own right, and realise I'm stepping into a huge debate and will leave this topic at that.

Integration

Throughout this report I've highlighted positives about our industry within Australia, however, we can't deny the many constraints which will confront us to further develop our business and industry. All of these negatives are real and have certainly restrained our business.

Negatives to development

- capital
- expertise
- labour
- building costs and shortage of trades people
- housing for staff
- other infrastructure required, many regional areas are at maximum capacity with power, water etc.
- distances from feed mills, abattoirs etc
- inconsistent quality feed supply and premium feed grain producers
- poor cohesion between government, local council and development groups

The list can be carried on.

I believe the pig industry due to the high entry cost and the above list will continue to become more corporately owned. The reliance on contracts will become essential, and will be harder for the smaller producer unless there are strategic alliances to help protect some of them. The North American industry is nearly all corporate benefiting from integrated systems. The Danish industry although a collection of many small individual producers have protection in the form of co-operatives. The Danish Crown, probably one of the most successful agricultural co-ops worldwide, controls the procurement, transport, processing, rendering, distribution, research and marketing for 24 million pigs per year. It operates throughout many countries with billions of dollars invested, a new abattoir just commissioned has the capacity of 75,000 pigs a week. The Danes have been using co-ops for over 100 years and is part of their agricultural ideology, which undoubtedly makes it successful. However it's not without problems, like all countries the number of producers is decreasing, so how is the ownership evaluated. This may result in privatisation with shareholding, which will change the dynamics and ultimately the main objective of the co-op. This should sound familiar to those in the Australian grain industry?

How can we integrate?

Literally hundreds of ways! Firstly we need to look at the resources we have available including markets, expertise, and labour etc and work back from that.

Depending on which resource is limited, we focus to that direction.

For example, if it was just a capital shortage, we could simply bring in investors.

If I use my community as an example, being a small country town of about 400 people and a surrounding district of a few hundred more. The town is fully employed, and is lacking available housing but also further electricity and other services for major development.

We have a team of progressive people trying to develop industry but are constantly hitting brick walls. A large scale investor probably won't invest in my town because of its limitations regardless of the many positives.

However there are many farms that don't have economies of scale, and buying the neighbours is financially unobtainable, compounded by the poor returns. There are farmers who would like to employ, but don't have full time work and probably can't afford it. Many of these farmers would have good equity in their business and may be interested to diversify on farm.

There is an opportunity to use local resources to develop, as an integrated business system. That is:

- Understand the market and secure with a form of contract.
- A management company and board responsible for the direction and overall management of the integrated company.
- Must have cohesion and willingness between community, investors, and local government.
- Develop various profit centres, this is of course dependant on size. If I had a 6000 sow piggery, many business's can enjoy part of the investment and profits dependant on capital raised and skills bought to the operation.
- A genetic company to provide the 6000 sow production.
- Investors/farmers could invest in 2 – 4 production centres to 3 weeks of age.

- 10 farmers could invest in separate grow outs to share investment and workload, while at the same time keeping some separation to minimize disease and large buffer zones.
- A transport company can underpin expansion by guaranteed workload, 10 by 3 decks per week to market, also the transport of weaners.
- A feed milling enterprise to procure and prepare 35000 tonnes a year, with a delivery system.
- A contract waste removal company, removing deep litter material and spreading it on paddocks.
- A contract cleaning business, responsible for the whole operation's hygiene.
- Various technical support staff for maintenance and husbandry.
- Offices with secretarial staff.
- Premium feed suppliers (farmers).
- And many other spin off operations.

Reasons and Benefits of Integration

Provide a comprehensive range of services to producers:

- site selection, environmental & council regulations
- production facility design & equipment supply
- genetics, animal health and nutrition (feed)
- employee training, payroll services
- production management,
- benchmarking and quality assurance programs
- nutrient management,
- biological reporting,
- financial book keeping,
- coordinate transport
- Production Contracts.
- Financial Support
- I T Services
- Veterinary and Disease Control services
- Biosecurity controls for all operations

Advantages of this system of true integration:

- Allows for individual farmer participation,
- Reduces individual capital investment requirements
- Low risk entry on grower program
- Increases specialization,
- Access to markets and market premiums,
- Access to high quality genetics,
- Strategic animal nutrition
- Better information and management skills,
- Private ownership

On Farm Support

- Nutrition
- Veterinary
- Development support, council proposals, site selection, planning and building advice
- Aiding expansion, sourcing contract growers
- Integrated contract control
- On farm auditing
- Human Resource Management, sourcing, training, technical staff on multiple farm contract
- Central Supply control, numbers, projections,
- Production compilation, benchmarking.
- Sourcing of materials.
- Financial advice, support, guarantee?
- Increases overall services to property, community and environment.

Recommendation

Without some strategic advantages as a small producer, it will get harder to survive. The benefits of integration in any form such as alliances, networking or to the full extent of co-operation are important, and can make the difference between profitability and loss. This has been very evident in our business, particularly in the drought of 2002. It's hard to define this topic briefly as the various options are huge. It will be very important to have partners who will unite for a common goal and develop firm contractual arrangements.

Conclusion

I feel, I have already concluded.

I have also said the Pork Industry has changed significantly and will continue to do so.

Looking beyond 2010 at the possible state of the Industry:

Unfortunately producer numbers will continue to decline. But hopefully, consumer demand domestically will increase with better marketing strategies and food quality. More equality, with profit sharing through the supply chain, and reliance on our domestic production, which will give, good producers, a healthy future. And so they should, they can't turn the light switch off, on weekends or Christmas Day. Let us hope good business prevails and a fair go with disease controls.

Or, quite likely Australia breaks down with PMWS, allowing no restrictions on the importation of pork. Countries such as Denmark, US, Canada and maybe Brazil can dump cheaper produced pork on our wharves, due to indirect subsidies and other support structures. We see a large increase of imported frozen fresh products with bone in, on our shelves, our once guaranteed market is slipping away. The impact of disease (PMWS and "hopefully only that") is too great for many producers compounded by increased costs of production and capital funding. The recent growth in regional Australia, shortage of infrastructure and labour is the final straw for more producers. What we have left, "is the best", supplying the processor's minimal requirements, domestic market and the niche markets. It further impacts on regional Australia by reduction in domestic grain use and the ability for farmers to value add. "A tough, but possible scenario".

Where will you be, as a producer, or someone who is industry dependant or someone in agribusiness or agripolitics, who can make a difference?

I have always believed we need to position our business to survive ahead, by implementing strategies and systems that secures our market. I certainly hope the first scenario is the case beyond 2010, but the truth is, we will have to be bloody good even there.

I believe I have given some tools, but more importantly, hopefully created a different thought process, which might help make more informed and better decisions into the future. Good luck.

This marks the completion of my report, March 2006, nearly two years since writing my initial application. It has been an unbelievable and rewarding experience. Thank you.

References

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Grouping Sows – Dr. Don Levis

“Raising Hogs the Canadian Way” – Elite Swine Inc. Manitoba Canada

Porcode Group Housing System – Nedap Agri – Netherlands

“Australian Pig Industry Overview” – APL publication 2003

Photographs;

Thames Valley Farms – Oxford UK

Nedap – Netherlands

Asger Krogsgaard – Ringkøbing Denmark

Nebraska Pork Partners - US

Harold Gonyou – Prairie Swine Research Centre

Mt. Boothby Pastoral Company – South Australia

List of Meetings Held Throughout Private Study,

BPQ - Tulip, Danish Crown, Large scale outdoor integrated pork Producers, Howard Revell

John Barrett, Sentry Farms, Contract Farming Group

David Laurie, Farmers and value adding products

Stephen and Meryl Ward, Nuffield Scholars, Pork and Arable Production, Lincolnshire

Ann Peterson – National Pig Association, Policy Manager London

Emma Beech – DEFRA, Pig and Welfare Specialist

Mrs. Diana Linskey – Head of Animal Health and Welfare Strategy Unit, DEFRA

Andrew Knowles – Strategy Co-ordinator, British Pig Executive and MLA

Dan Powell – Arable Farmer Cheltenham, new business development

Colin Ford – High Welfare Producer Shropshire

Roger Mercer – Nuffield Scholar, Mercer Farms, Staffordshire

Mike Varley – SCA, Provimi, Vitamins and Nutrition, Yorkshire

Michelle Sprent – Technical manager, Exports SCA

ACMC – Malcolm Stead, genetics company, Beverley Yorkshire

Richard Longthorp – National Pig Association, LKL Farming Howden Yorkshire

Professor Sandra Edwards – Newcastle University, Highly Regarded World Wide with Welfare of Pigs.

Terry Jones – National Farmers Union, London, Food Policy Section

Tony Pexton – Nuffield Scholar, pork producer Yorkshire

Clive Blacker – Precision Systems and Nuffield Scholar Yorkshire

Neil Thompson – Tennant farmer and Beef marketing strategy, Kelso Scotland

Aled Griffiths – Large Scale egg producer, Shropshire, and Nuffield Scholar

Bruce Gilbert – Farmer, Nuffield Scholar, Herefordshire UK

Michael Jones – Agribusiness, Herefordshire

Andrew Johnson

Alvis Brothers – Nick Green, diversified business and integrated supply chain.
Nuffield Scholars, Bristol

Michelle Waterman – Tesco Agriculture Manager

Margaret Scarrott – Rural based accountant, advisor and business owner

Martin Bussink – Veterinary Business Partner, Netherlands

Arjan Schuttert – Veterinary Business Partner, Netherlands

Nedap – Jan Willem de Vries, Computer Feeding, Netherlands

Rabobank – Cindy van Rijswick, Agribusiness, Netherlands

Carl Sabot – Farm Frites, potato processors, Belgium

Neils-Peder Nielson – Head of production Systems, Danske Slagterier

John Hagegaard – Swine Practitioner, Denmark

Steen Peterson – Head of Dan Bred – Massive genetic Company

Jan Dahl – Head of Epidemiology, Danske Slagterier

Danish Pig Producers – Hans Aarestrup, Hans Jorgen Tellerup

Daka Proteins – Karsten J. Sorth, Co-operative Rendering Plant

Carson Lind Pedersen – Nitro Animal Nutrition Farmer turned mineral and vitamin processor

Jens Vestergaard – Farmer and pig finisher, AIEA Developer and Agri-Politics.

Asger Krogsgaard – Large Danish Producer and board member of Danish Crown

Gerni – Benny Rasmussen, hygiene equipment, Denmark

Skiold Echberg – Carsten Sorensen, Lars Bo Adamsen, Denmark, pig feeding and computer equipment.

Skiold Saeby – Peter S. Rosenbeck, Liquid Feeding

Karin Palstam – Integrated sow loop, Sweden

Ludwig Nielsson – Quality, high welfare producer, Sweden

AGERATEC - David Frykeras, Biodiesel Plant Manufacturers

Johan Ericsson – Farmer and Agribusiness, Sweden

Paragon Pork Management Ltd. – Glenn Sharp, pork producer, Alberta.

Andrew Johnson

Sunterra Farms – Ben Woolley, large scale vertically integrated company.

Bernardo Predicala – Research and Engineering Prairie Swine Research Centre

Dr. Harold Gonyou – Research and Welfare specialist Prairie Swine Research Centre, Saskatoon

Sask Pork – Neil Ketilson, General Manager and Harvey Wagner, Production Services – Saskatoon Pork

Fast Pigs – Shannon Meyers, General Manager – Genetic Company, Saskatoon.

Cover-all – Cam Fischer, Building options and Consultant for intensive industries, Saskatoon.

Ian McPhadden – Nuffield Scholar and large grain producer – Saskatchewan.

Dickson Gould – Founding partner of Elite Swine and Large scale integrated business developer.

Phason – Electronic Control Systems, Winnipeg – David Weigelt, General Manager.

Manitoba Pork Council – Andrew Dickson, General Manager and Peter Mah, Director Community Relations and Sustainable Development. Winnipeg Manitoba.

Dr. Laurie Connor – University of Manitoba, Faculty of Agriculture and Food Sciences, Welfare Specialist.

Crystal Spring Hog Equipment – Jonathan Kleinsasser, Managing Director, Large manufacturer of Hog Equipment and Hudderite Colony, Manitoba.

Elite Swine – Brock Campbell, Director, Business Development and Scott Dick, Manager, Land and Nutrient Resources, Large Integrated Business Systems. Landmark, Manitoba.

Nebraska Pork Partners – Scott Burroughs, COO, Large scale operation, 45,000 sows. Columbus Nebraska.

Policy Directions Inc. – Steven L. Kopperud, Campaigner against Pressure Groups, such as PETA, Washington DC.

Ben Russell – Head of Food and Agribusiness Research, Rabobank, Sydney.