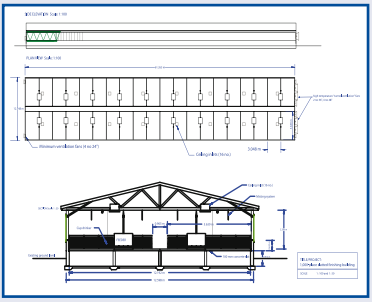
BPEX
Knowledge Transfer



British Pig Project

A housing blueprint for the British pig industry

British Pig Project

contents

opportunities

There are significant opportunities in the British pig industry. We have nearly 60 million consumers on our doorstep, and they are prepared to pay a premium for British pork, which is in short supply. But first we need to improve performance on our pig units...

The British pig industry is suffering from a lack of reinvestment in nursery and grower/finisher accommodation. Integrators and large scale independent producers are continually competing for existing contract finishing sites, which often have buildings reaching the end of their useful life, or in many instances use building conversions that do not provide optimum conditions for efficient performance.

This also applies to many breed-to-finish units, where reinvestment in buildings has been limited or non-existent during the period of price uncertainty that followed the need, in the late 1990s, to invest in alternative sow accommodation to comply with United Kingdom legislation.

Consequently pig performance on many pig units is deteriorating, which increases the cost of production and undermines the competitive position of producers. Identifying and helping deliver strategies to reduce cost of production is a key objective of the BPEX 'Road to Recovery' policy.

It is also recognised that pig health has in many cases become a significant barrier to achieving efficient production, such that a move to segregated and specialised two- or three-site production systems is an essential requirement to achieving improved health and performance without recourse to routine use of antibiotics and other medication.

A return to more stable pig prices and the need to establish secure supply chains to meet specific market requirements is beginning to encourage producers to think about investment programmes to ensure the sustainability of their businesses.

The objectives of the British Pig Project are therefore to create a comprehensive and objective guide to improving production by investing/reinvesting in modern finisher buildings.

The project is designed to benefit existing producers and

about this booklet

This booklet introduces the outcomes of the British Pig Project, which is funded by the British Pig Executive (BPEX). The British Pig Project has been delivered for BPEX by independent pig industry consultants Pork Chain Solutions in conjunction with the integrated pig production company British Quality Pigs (BQP)

a leaner, fitter more vibrant industry

In recent years the British pig industry has undergone a metamorphosis and re-emerged a leaner, fitter, more vibrant industry with a can-do attitude. It is against this background that businesses are now considering investing in pig grower/finishing buildings and – by following best-practice – to benefit from the commercial opportunities that are readily available

contract growers *and* potential new entrants to the industry. The potential benefits for new investors in pig production, such as arable farmers, are:

- An increase in business turnover.
- Provision of a broader business base through diversification.
- Generating a regular year-round income.
- Producing valuable organic fertiliser to reduce fertiliser costs and improve soil condition and crop yields.

structure of the industry

There is no shortage of opportunity... many reputable companies and individuals are seeking contract-finishers for mutually beneficial long-term relationships

The opportunities highlighted in this project involve pigs from weaning to slaughter weight.

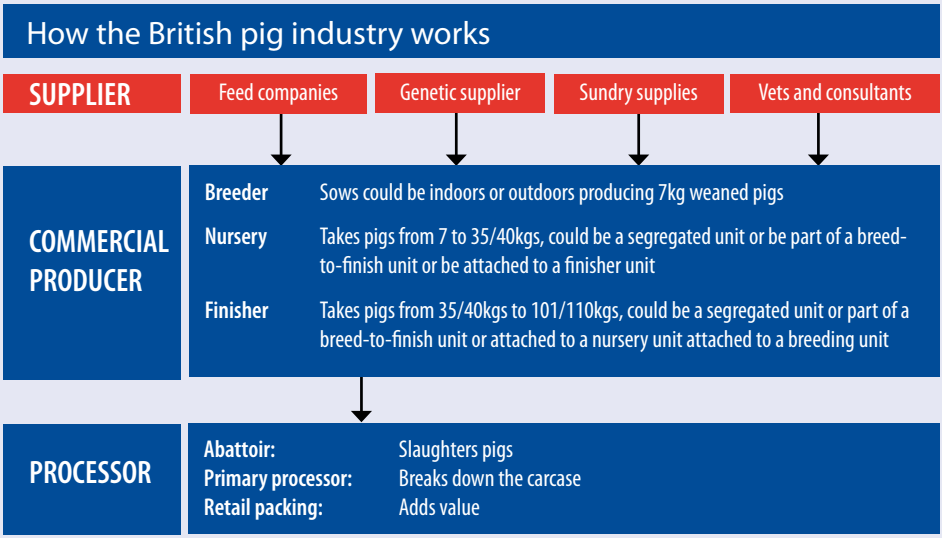
Whilst it is feasible for producers to locate sources of pigs for themselves, typically these opportunities will arise in conjunction with existing businesses that are breeding pigs and need additional capacity to finish pigs.

These businesses are likely to be already successfully operating in well-established supply chains with regular processor customers and strong links to specific outlets and retailers.

Different supply chains will have different requirements for production and building type. Some will need to be straw -based; others may be slatted.

It is important to realise that new buildings are not the only component required for a successful enterprise – a source of healthy stock from a planned production system is essential.

All-in all-out stocking, preferably by site or at least by building, is also considered essential for success.



opportunities available

For new entrants, capital employed in growing pigs may be split between the company supplying the pigs and the farmer housing and caring for them

Those running established pig businesses can recognise and evaluate the benefit that additional pig grower/finishing accommodation might bring to them. If required, professional advice is available to help with such evaluations.

New entrants often enter into a Contract Growing Agreement. In these arrangements, the capital employed in growing pigs is split between the company supplying the pigs and the farmer housing and caring for them. The company could range from an independent breeder of pigs to a fully integrated pig processing business.

A list of the major pig contracting companies is available from BPEX and the National Pig Association. Farmers should also make themselves aware of any local or new opportunities that might arise from time to time.

building designs

Is the British preference for tailor-made housing such a good idea? Other countries don't think so...

Due to the lack of significant investment in the British pig industry, it has become common practice for every producer to request a tailor-made building to suit his or her personal preferences and to fit in with existing accommodation on the farm.

Large-scale producers in other major pig producing countries have taken the opposite approach. They have developed standardised designs for nursery and finisher or wean-to-finish accommodation and then remodelled production systems to supply the appropriate number of pigs per week. For example the United States-style 1000-place fully-slatted finishing house has been of a similar design since the early 1980s and is used to finish

structure of a typical pig contract grower agreement

Each company will have its own variation, but the relationship between the company (contractor) and the producer (contractee) are broadly similar.

What the contractee does

- Owns an existing unit or erects a new pig building
- Is responsible for building maintenance and repairs
- Provides utilities including water, gas and electric as required
- Provides straw if required by the housing system
- Provides labour to effectively manage the pigs
- Provides machinery and equipment as required

What the contractor does

- Supplies weaner or grower pigs
- Supplies and arranges delivery of feed
- Is responsible for haulage of pigs into and out of the unit
- Provides veterinary input and medication
- Is responsible for registration and audit fees regarding quality assurance
- Is responsible for carcass disposal arrangements
- Provides technical support and training from experienced field staff
- Pays the contractee a fee for looking after the pigs (the fee is usually based on a headage payment and is also part performance related with bonuses for factors such as feed efficiency and/or finished pig selection to ensure optimum returns.)

Sequence of events leading up to a new house being stocked for the first time

- The contractee expresses interest to the contractor in becoming a contract producer
- The contractor visits the contractee's proposed site to advise on suitability
- The contractor provides the contractee with the complete British Pig Project Blueprint
- The contractor takes the contractee on a visit to an existing contract production site
- The contractee submits the plans to the local authority for approval.
- Plans are approved
- The contractee agrees finance for the new building/s
- The building specification is agreed with a building supply company and a firm quotation is obtained
- The contractee is provided with training as required
- The building is completed
- Contracts are exchanged
- The first batch of pigs and supplies are delivered

the progeny of millions of sows in different countries around the world.

Standardisation allows building companies to purchase materials competitively and eliminate the redesign time required in one-off projects. In addition excavation contractors and concrete and construction teams can become very efficient at their job through repetition, resulting in further cost savings for the producer.

The British model has traditionally been based on a building package and suppliers have maintained the integrity of that package by using materials and methods which have been within the comfort zone of typical Northern European producers. Other models around the world are often based on 'in-house supervised' projects where products from a variety of suppliers are bulk purchased and assembled to a standardised design.

The British Pig Project blueprint is a *standard for design* rather than a single standardised option. The blueprint examines the pros and cons of the models available to British producers.

british pig project options

560-place straw-based wean-to-finish building

This wean-to-finish building has been designed to meet the requirements of that particular segment of British pig production seeking to finish outdoor reared pigs on a simple, flexible/adaptable, cost-effective straw-based system. Construction costs could be reduced through use of farm labour to construct block walls as an alternative to the use of prestressed concrete panels and plastic panels as specified in the blueprint.

Traditional British 1,000-place slurry -based finisher building with supported roof-truss construction

This option is typically constructed from factory-made laminated wall and ceiling panels providing a high standard of insulation, with controlled mechanical ventilation. A number of United Kingdom pig building suppliers have developed this type of structure, with some individual variations, with

summary of british pig project options

- 560-place straw-based wean-to-finish
- Traditional British 1,000-place slurry-based finisher building with supported roof-truss construction
- 1,000-place slurry-based finisher with clear-span portal-framed construction
- US-style 1000-place slurry-based finisher building

british pig project blueprint package

The project package includes the construction of new buildings which have been designed to meet the requirements of different segments of the British market

There are two standard designs.

- A 560-place straw-based wean-to-finish building

  This type of building would be typically used in a supply chain supplying a premium product, and therefore commanding a premium price, usually linked to outdoor sows and other specific production/ genetic constraints.

- A 1,000-place totally-slatted finishing building

  This type of building would be typically used in a supply chain where efficiency of production would be the major driver. The efficiency of this building is designed to allow the British farmer to compete with his European colleagues.

In some situations farmers have existing buildings that may be capable of adaptation for pig growing. In such instances an approach to a contracting company would result in an assessment of their suitability being undertaken and the prospect of introducing another profit centre for the farm business.

- The standardised designs conform to current planning and environmental legislation and production and welfare codes
- They can be operated to a standard production plan as part of existing farms or as new contract production facilities
- The buildings have been designed to operate as all-in all-out facilities which match large scale sow systems or units where batch production is practised. For example, 560 would be the expected weekly output from say 1,300 sows, or 430 sows on a three-week batch system, and 1,000 would be the expected weekly output from 2,400 sows, or 800 sows on a three-week batch system.
- The 1,000-place slurry-based option gives examples of three very different styles of construction designed to suit different farming enterprises
- There is scope for some personal preferences in terms of feeding system, feeders, drinkers and penning but potential users should be aware that variation costs money as it undermines the concept of potential cost savings through standardisation.

an increased emphasis on greater control of the construction process in controlled factory conditions. This helps to reduce on-site construction time, and the need for specialist subcontractor labour, whilst also minimising the increasing demands of on-site health and safety issues.

1,000-place slurry-based finisher with clear-span portal-framed construction

Some sections of the British pig industry feel they need to maintain flexibility and use portal-frame type structures which may be converted for other uses in years to come. This may be particularly relevant in areas of the country where such structures have appreciated in value considerably over the last 20 years and light industrial land values have increased ten-fold. This type of portal-frame fully-slatted finishing house with an eaves height of 3.65m again gives the investor a flexible design which is readily adaptable for other agricultural or light industrial uses in future years.

US-style 1000-place slurry-based finisher building

The United States design model uses a standardised building which has been in use without significant change for over 20 years but is very different from the insulated panel structures common in Britain. The building is typically erected onto a slurry pit with poured concrete base, walls and slat supports.

Timber stud walls are fixed on top of 630mm -high poured concrete side walls and support clear-span timber roof trusses which are clad externally with galvanised or coated metal sheets. Coated metal sheets are also fixed to the underside of the trusses to form a flat ceiling with blown fibre insulation above. Plastic bird netting and curtains complete the uninsulated side walls and weldmesh is fixed to the inside of the stud wall to protect the timber from the pigs. Gable end walls are insulated with rockwool and clad internally and externally with coated metal sheeting.

slurry storage and basework construction

At present, the minimum storage requirement for slurry is four months, as determined by the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991, as amended 1997. However, subsequent legislation, and in particular the current review of the Nitrates Directive with its implications for extended closed periods on all soil types for spreading slurry and manure, make it prudent to consider a minimum storage period of six months.

For a site with less than 2,000 places for finishing pigs over 30kg, which is below the current threshold for Integrated Pollution Prevention and Control (IPPC), this slurry storage could be under the slats within the building. However, this would not apply to larger sites that fall within IPPC, which would be required to comply with 'Best Available Techniques' and therefore require the 'regular' removal of slurry from under the slats to an external covered store.

The traditional method of basework construction, i.e. concrete block walls, when used for slurry storage, as opposed to a 'channel' for temporary holding capacity prior to storage, would only be compliant with the Silage, Slurry and Agricultural Fuel Oil Regulations if it is impermeable and protected against corrosion as described in BS 5502 Part 50. This requires that concrete blockwork surfaces in contact with slurry should be rendered and painted with a suitable acid-

typical building costs

Typical building costs are included in the blueprint, with a breakdown of the component costs of foundations, building superstructure, penning and divisions, ventilation and electrics, plumbing and feeding system

British Pig Project typical costs show that:

- 560-pig place straw-based wean-to-finish building: might cost **£162/pig place to construct**[1].
- Traditional UK-style 1000-place slurry-based finisher building: might cost **£156-£180/pig place.**
- 1000-place slurry-based finisher using clear-span portal building: might cost **£180/pig place.**
- US-style 1000-place slurry-based finisher building: might cost **£122/pig place**[2].

When the US model is compared to the lowest cost United Kingdom option there is a difference of £34/pig place in building cost (the pig places are based on 1000 and 960 for the US and UK buildings respectively).

Assuming that the contractee finds 30 percent equity and the building is paid off over ten years, this results in the contractor having to pay the contractee £1.02 less per pig to fund building repayments, although there is the possibility that some of this difference will be offset by higher maintenance costs.

Personal preference and local conditions will influence choice of system. Potential investors will want to take advice from those with experience in the operation of the different types of buildings and systems as well as those who use them and supply them before making a final choice.

[1] This option allows for savings of approximately £40/pig place if local contractors and sourcing of materials can be made and semi-skilled farm labour is employed for some of the works and the construction is supervised `in-house' by the producer.

[2] Please note this costing is based on 'in-house supervision' of baseworks and the erection of the building package. This is substantially diferent from the 'turnkey' cost provided for the other slurry-based building options.

resistant coating (*Synthaproof* or similar product). It should also be noted that many existing structures, whilst in widespread use and therefore deemed to be stable and fit for purpose, are not fully compliant with various British Standards.

These are guidelines, rather than a legal requirement at present, but it should be noted that if at some point in the future Building Control Regulations were applied to agricultural buildings, as they have been in Scotland for some time, then it is likely that the British Standards would be used as reference documents. This could well involve some additional design details at the joints between the base concrete and walls to accommodate horizontal loads and movements, as assessed by a qualified structural engineer.

important considerations

Feeding systems, planning permission, environmental compliance, quality assurance, nutrition

- **Feeding systems**
  The buildings options described in the project manual could incorporate dry or

wet feeding systems. The choices of either will substantially depend upon personal preference and local situation, *e.g.* availability of co-products in a format suitable for use via wet feeding equipment.

- **Planning permission** In most cases planning permission will be required prior to the construction of new buildings and detailed guidance and advice is provided.
- **Environmental compliance** A wide range of guidelines for compliance with current and pending legislation is provided. As stand-alone buildings the designs included in the blueprint would not require an IPPC permit (i.e. they are less than 2,000 finishing pig places), but where this threshold is exceeded on a site then the design, and in particular the issue of slurry storage under the building will need to be considered in order to comply with 'Best Available Techniques'.
- **Quality assurance** With the exception of some small niche-market outlets it is likely that most producers will need to become a member of one of the farm assurance schemes. The main requirements of the principle schemes in Britain, and a comprehensive list of reference publications, codes of practice, etc. is provided.
- **Nutrition** The main nutritional factors likely to affect pig performance and carcass grading are summarised in the British Pig Project blueprint, together with a review of the major nutrients, recommendations of feeds and feeding programmes, and some example diet formulations.

veterinary health plan

Herd health status is a vital component of production efficiency and must be given a high priority

An example Veterinary Health Plan which contains information required by the quality assurance schemes is provided with the British Pig Project blueprint. It summarises some of the management protocols essential for maintenance of the health and welfare of pigs.

The Veterinary Health Plan is designed to provide an easily-audited framework specific to each individual farm. It must be produced annually and updated as necessary as part of the Quarterly Veterinary Visit Report.

Many of the requirements relating to the health and welfare of pigs are addressed within existing farm policy statements and quality assurance scheme requirements. Hence the aim is to avoid duplication wherever possible.

A number of vet practices go beyond the basic requirements of the Veterinary Health Plan and provide template protocols, examples of which are appended to the British Pig Project blueprint. Also provided are Farm Protocols covering all aspects of unit management, including entry procedures for staff and visitors, vermin control, washing and disinfection, etc.

assessing the value of slurry

The British Pig Project blueprint provides details to assist in the calculation of the value of manurial outputs from a pig finishing enterprise and shows worked examples of how these might be calculated

The value of pig slurry (4% dry matter) applied at the rate of 50m^3/ha (4,500 gallons/acre) during February, incorporated (disced) within 48 hours, medium soil type. The estimates shown are the theoretical maximum value, depending on soil nutrient status and crop nitrogen requirement. Any surplus phosphate and potash that may have been applied in excess of crop requirement will remain available for the subsequent crop.

	kg/ha		Price (£/kg)	Value over rotation (£)
N	100	x	0.30	30
$P_2 0_5$	100	x	0.30	30
$K_2 0$	125	x	0.30	25
Total				**85**

Using this calculation, the value of slurry produced by 1000 finishing pigs over a four-month period (534m^3) is £908.

Sensitivity

Market volatility can have a significant impact on the value of slurry as a fertiliser. At a price of £172.50, ammonium nitrate fertiliser has a component cost of 50p/kg for the nitrogen. Applying this to the above examples, the value increases by £20/ha or £220 for slurry collected over a four-month period.

british pig project management manual

The wean-to-finish and finish-only phases of the pig production cycle account for most of the direct costs, principally as feed. Only at the end of the finishing period is a return on the overall investment made in the form of a payment for the slaughter pig. The main objectives are therefore to optimise pig performance in terms of rapid growth and cost per kilo liveweight gain and to maximise the final value of the slaughter pig by satisfying processor/ customer requirements

Maximum output is achieved by...

1. Ensuring that the correct numbers of pigs pass as efficiently as possible through the facilities
2. Housing the correct number of pigs in the building as specified in the design criteria – overstocking will be detrimental to feed intake patterns, control of the environment and pig health, in addition to possible infringement of legal stocking densities
3. Encouraging feed intake which is central to the development of lean meat, (muscle), and overall pig performance and is only achieved where...

- Diets suited to the stage of growth are used
- Pigs are grouped to match the size of pens available and the equipment is matched to the stage of growth
- The environment in which the pigs are kept buffers them from climatic extremes
- The pigs are not burdened with ill-health

Detailed guidance is provided by the British Pig Project for the operation of the unit from the point prior to pigs being initially received to when the first batch has been marketed and the unit prepared to receive the next batch.

In some contract arrangements the contractee may be provided with specific operational requirements by the contractor, which would take precedence, but in the absence of such requirements, detailed management guidelines are provided.

For producers already experienced in pig production and therefore familiar with operational routines these notes may act as a useful reference source and in particular may be used for staff training.

finance options and sensitivities

Some investors may be discouraged by higher up-front capital costs and consider these restrict change and that lower specification buildings might be subject to higher repairs but that these are easily affordable as the initial capital cost is paid off quicker. Additionally, cheaper replacement buildings encourage change and redevelopment of production systems

Personal preference and local conditions will influence your choice of system. Potential investors will want to take advice from those with experience in the operation of the different types of buildings and systems as well as those who use them and supply them before making a final choice. The blueprint document provides guidance on factors influencing the sensitivities in preparing investment and budgetary documents, provides guidance on sources of finance and highlights costs of borrowing assuming stated levels of loan and interest rates over differing borrowing timescales. Impact upon taxation of capital investment is also shown.

Effect on different repayment periods at 8% average interest rate	
Costs per month, per £1000 borrowed will change as follows on amended repayment periods	
5 years	£19.95
10 years	£12.10
15 years	£9.51
20 years	£ 8.50
Effect on different average interest	
A 1% reduction in the average interest rate from 8% to 7% would result in repayments per £1000 per month, as follows	
5 years	£19.69
10 years	£11.54
15 years	£ 9.20
20 years	£ 7.87
A 1% increase in the average interest rate to 9% would result as in repayments per month, per £1000 borrowed, as follows	
5 years	£20.73
10 years	£12.66
15 years	£10.13
20 years	£9.13

**Allowance for differing calculation of interest between individual banks must be made in interpreting these indicative figures. Models exist to assist in the calculation of running costs of buildings and the BPP blueprint contains an example of a print-out from such a model.*

environmental compliance

The British Pig Project blueprint provides details on all legal obligations connected with the construction and operation of a pig enterprise. Whilst the responsibility remains with the contractee to take account of all legislation – and to remain abreast of changes to it – the blueprint provides extensive detail on the main considerations as they currently apply

Guidance is provided on how environmental legislation impacts upon...

- Planning permission.
- Protection of water, soil and air.
- Integrated Pollution Prevention and Control (IPPC).
- Land Management requirements – including the prevention of further deterioration of and protection and enhancement of the status of aquatic ecosystems and associated wetlands, the protection of sustainable water consumption and mitigation of floods and droughts together with the management of land in relation to phosphates, nitrates, sediments, organic wastes, pesticides, veterinary medicines and faecal micro-organisms.

Opportunities and challenges in estimating the value of organic manures are described and typical nutrient values detailed.

Example calculations are also provided to allow capacities of waste storage to be made to comply with the regulation, including dirty water and run-off.

Considerations in respect of welfare, dead pig disposal, medicines residues, avoiding disease spread, pig identification, health and safety and the implications of compliance under the Single Payment Scheme (cross compliance) are also covered to provide reference and guidance to investors in pig buildings.

BPEX Knowledge Transfer

The British Pig Project is funded by the British Pig Executive www.bpex.org.uk
This booklet is written by Pork Chain Solutions for the British Pig Project www.porkchain.com
Published by BPEX, PO Box 44, Winterhill House, Snowdon Drive, Milton Keynes MK6 1AX