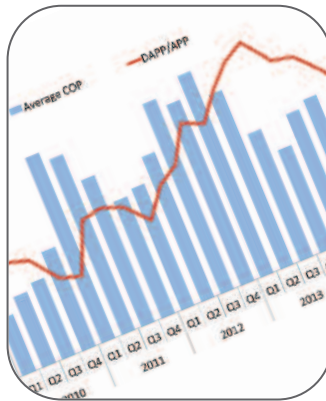


The BPEX Yearbook 2014-2015

Key industry statistics, pig performance data and details of knowledge transfer, research and development activity



AHDB
PORK

“

Vision:

A growing English pig production and primary processing industry.

Mission:

To help English pig production and processing businesses become more competitive and profitable.

”

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Preface



Politics and pig disease have joined forces and had a huge impact on the pig industry over the last year, more so than any other year.

Mick Sloyan
Director
BPEX

Those forces mean competing in Europe is the major challenge we are facing, against a background of lower prices and a weak Euro.

The main factor which resulted in the price pressure faced by British producers is the Russian ban on imports from across the EU, firstly as the result of African Swine Fever in Eastern Europe and then the embargo on imports from NATO and other countries. This caused a substantial drop in EU prices.

The situation regarding Ukraine in particular seems unlikely to be resolved quickly, leaving a lasting challenge as the analysis in the following pages of this yearbook clearly shows.

On a more positive note, the industry as a whole has already made great strides in productivity and the work to improve still further must continue.

Overall, the industry has had tremendous support from retailers, processors and within export markets, which have all made an important contribution to maintaining our premium over the prices in mainland Europe.

That premium has, however, narrowed in recent months. At its peak in January this year (2015) it was at about 40p a kilo but by spring 2015 was down to less than 30p.

Despite this, we have continued to improve, which means we are now producing more pork than at any time since 2000.

We have to maintain the support of consumers within the UK market. This means stimulating consumption among new consumers and providing them with innovative ways of cooking some of the less popular cuts such as shoulder, of which we have a surplus.

We also need to continue to exploit export markets, working to increase the range of cuts and the number of firms involved, particularly in greater China, which is now our largest market.

Exports overall are worth something in the region of £350 million, with about a quarter of that going to the Far East. The value of exports now accounts for about 30p per kilo of each pig produced, which gives an indication of just how important they are.

The industry is facing a constant challenge to find new opportunities overseas, both opening markets and developing them. This means we have to find a way of competing in the medium and long term with a relatively strong currency.

If we continue to improve our productivity as we have been, we will be in a better competitive position when the exchange rates move in our favour. This and the promotion of pork consumption will be a priority for BPEX in the coming months and years ●

A handwritten signature in black ink, appearing to read 'Mick Sloyan', with a long, sweeping underline.

BPEX board

The BPEX Board meets six times a year to determine the English pig industry strategy and to ensure that English pig levy payers' money is efficiently deployed in line with the BPEX strategy.

The BPEX Board for the period 2014-2015 comprised the following Directors appointed by Defra.

Producers



Stewart Houston
Chairman
Microware Pig Systems



Alastair Butler
Blythburgh Free Range Pork



Robert Shepherd



Ian Smith
Bedfordia Farms Ltd



Richard Hooper
Harper Adams



Simon Watchorn
Joined in January 2015



Rob Mercer
Packington Pork



Jon Easey
MJ & JA Easey



Richard Longthorp
LKL Farming

Processors



Marcus Cheale
Cheale Meats of Brentwood



Barry Lock
Cranswick



Andrew Saunders
Tulip UK



William de Klein
KARRO Food Group

Independent



Iain Wylie

Strategy and budget



Vision:

'A growing English pig production and primary processing industry.'

Mission:

'To help English pig production and processing businesses become more competitive and profitable.'

In 2014, the BPEX Board agreed the 'Going for Growth' strategy. This refocused the technical work of BPEX into a single team operating in four strategic areas of activity. The marketing strategy has also been developed to focus more on rejuvenating the image of pork as a means to stimulating demand and maintaining the premium for English pigs.

This report reviews the first full year of delivery of the technical element within the 'Going for Growth' strategy and the business plan for the continued delivery of the strategy in 2015-16.

The 5-Point Plan

The 5-Point Plan was detailed in the 2013-2014 Yearbook and is available on the BPEX website. In summary, it focuses on the following key areas of activity.

1. Close the gap

Objective: To narrow the technical performance gap between English pig producers and competitors.

- Establish a field trials programme
- Identify innovation from around the world and disseminate to pig producers
- Develop skills under the banner 'Recruit, Retain, Reward', recognising professional development of staff and demonstrating a skilled and attractive career path
- Minimise the risks from endemic and exotic disease by establishing effective biosecurity tools and technologies
- Set up regional technical forums.

2. Protect the environment

Objective: Help pig producers and processors comply with existing and emerging legislation and achieve recognition for progress made.

- Set up a business support service to advise on reducing environmental impact, compliance with planning rules and environmental regulations
- Monitor, interpret and help to inform environmental policy and regulations in both the UK and EU
- Capture the progress made by the English pig industry and help to ensure this is communicated effectively.

3. Enhance pig welfare

Objective: Help pig producers comply with existing and emerging legislation and achieve recognition for progress made in reducing environmental impact.

- Support the development of Real Welfare as part of farm assurance
- Develop the communication of welfare measures to producers and vets
- Develop support packages to help producers and vets enhance pig welfare
- Monitor, interpret and seek to inform developments in welfare regulations in conjunction with industry representative organisations.



4. Encourage safe and traceable pork

Objective: Help producers and processors produce pork that continues to be safe and which consumers can have confidence is fully traceable from farm to finished product.

- Support the pig meat supply chain in producing wholesome pork products with safety, provenance and integrity, from farm to fork
- Promote the use of isotope tracing using the SIRA (Stable Isotope Reference Analysis) tool through the supply chain
- Work with RUNA and the PVS to reduce the need to use antimicrobials
- Set up a technical processor forum on food safety and traceability.

5. Help to sell more pork

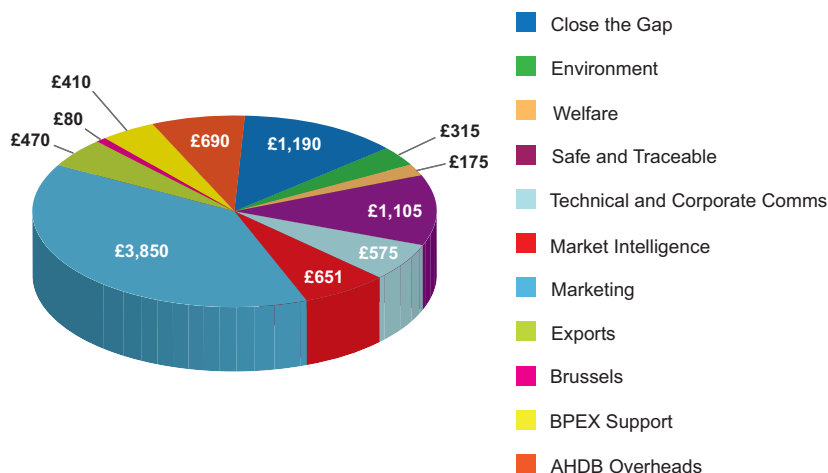
Objective: Stimulate the demand for pork through communication of the benefits of choosing pork and securing and developing export markets.

- Rejuvenate the image of pork
- Differentiate from the competition
- Communicate the health benefits of pork
- Communicate pork as an environmentally sustainable food.

Resources

BPEX resources are almost exclusively provided from the levy on producers and processors, which will remain at 85p a pig for producers and 20p a pig for processors, applied to pigs slaughtered in England.

Summary budget 2015-16

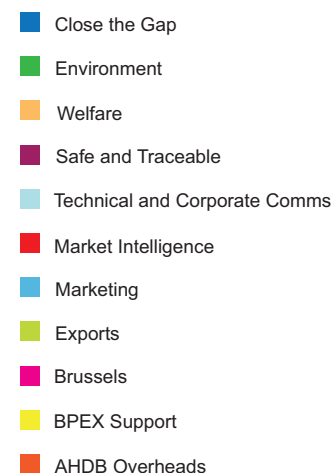


Monitoring the progress of the strategy

The BPEX board assess the progress in achieving the strategy on a regular basis, concentrating on a number of target areas, including:

- Improvements in Key Performance Indicators (KPIs)
- Reducing the industry's carbon footprint
- Monitoring the progress of Real Welfare
- Developing the use of SIRA to enhance the traceability of pork
- Increasing the consumption, particularly among light and medium users
- Tracking levy payer feedback, particularly with regard to delivering value for money
- Continuing to expand our export markets.

Budget allocation in 2015-2016 (£'000)



Pork promotion

During Sausage Week (3-9 November), BPEX joined forces with Rugby World Cup winner and former England international Phil Vickery, to drive extensive media and consumer awareness for premium and Red Tractor assured varieties. As a result, during the campaign week, sales of premium sausages increased by 6% compared to the weekly average.



The BPEX marketing team remains instrumental in promoting pork to consumers and informing key stakeholders – from supermarket buyers to levy payers – of the exciting activity and campaigns taking place across the industry.

One such high profile campaign, British Sausage Week, continues to prove hugely successful, generating widespread industry support, with promotional activity taking place in retailers and catering outlets nationwide. In addition, some 200 retailers and butchers entered the dedicated competition, with a further 230 varieties judged across five categories in the foodservice sector, demonstrating industry innovation and giving organisations a platform to boost their business.

The BPEX marketing team also produces an array of material to drive consumer awareness to promote the benefits of various pork cuts and products. The versatility of gammon was a focus in 2014, with a

'Glorious Gammon' recipe brochure, which included contributions from a host of high profile chefs. The simple recipe ideas showcased the versatility of gammon, with the aim of increasing sales beyond Christmas and to demonstrate how it can be enjoyed year round.

All activity is supported online via the Love Pork website, which contains hundreds of consumer-friendly recipes, as well as health-based facts and information about the Red Tractor scheme. Interaction is driven by a strong presence on social media sites, including Facebook and Twitter, supported by targeted foodie blogger activity.

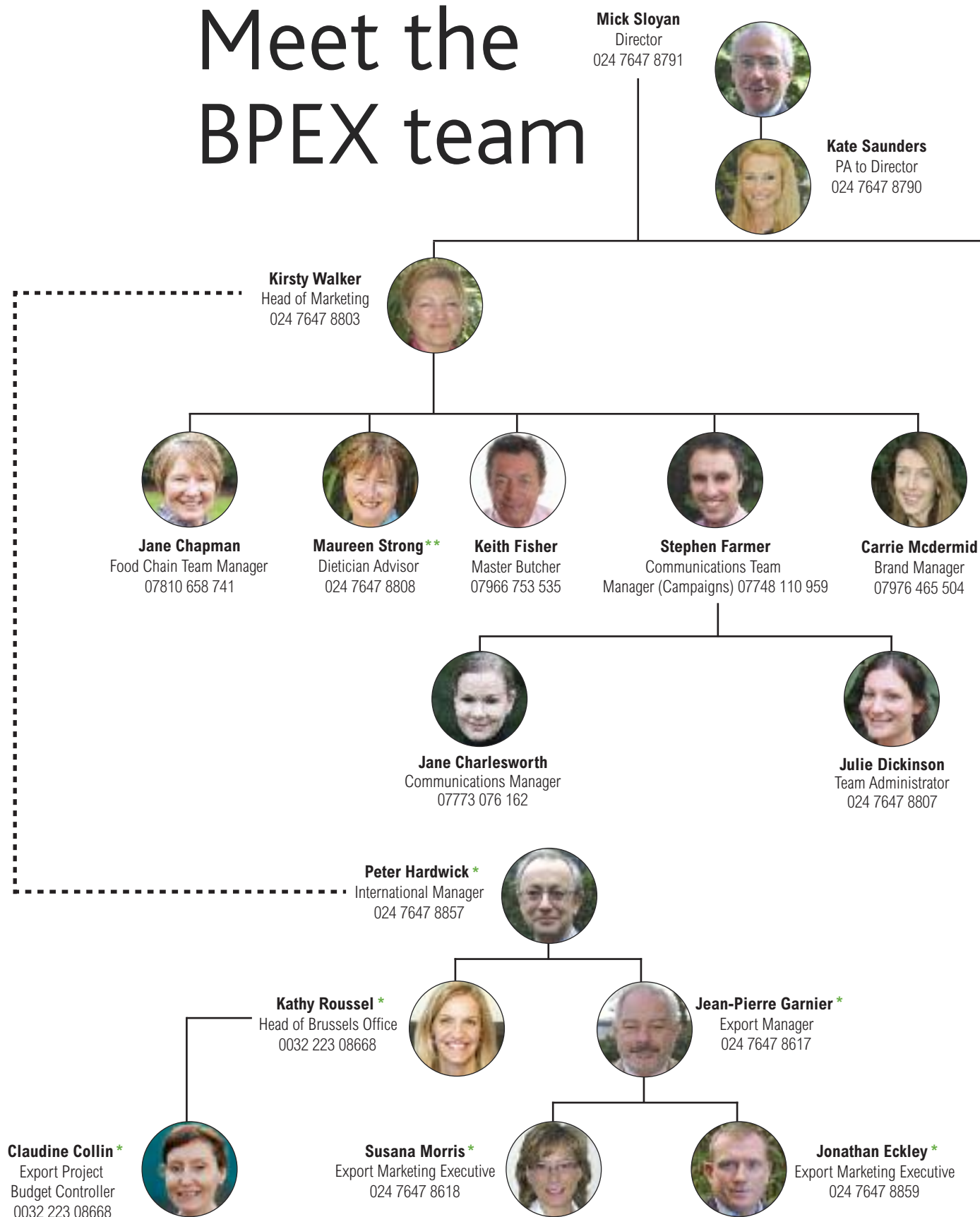
From May, TV advertising, supported by in-store and online activity, will kick-off the 'Pulled Pork' campaign, which is specifically targeting the 25-55 age group.

For the industry, as well as stimulating demand for pork shoulder and adding value to the carcase, it will give pork a fresh image upon which everyone can capitalise ●

Rejuvenating the image of pork is the major focus of the 2015 'Pulled Pork' campaign, which is focusing on younger consumers. Extensive research has pointed to the popularity of pulled pork with the young and also as a dish which can be easily replicated at home with tasty results.



Meet the BPEX team

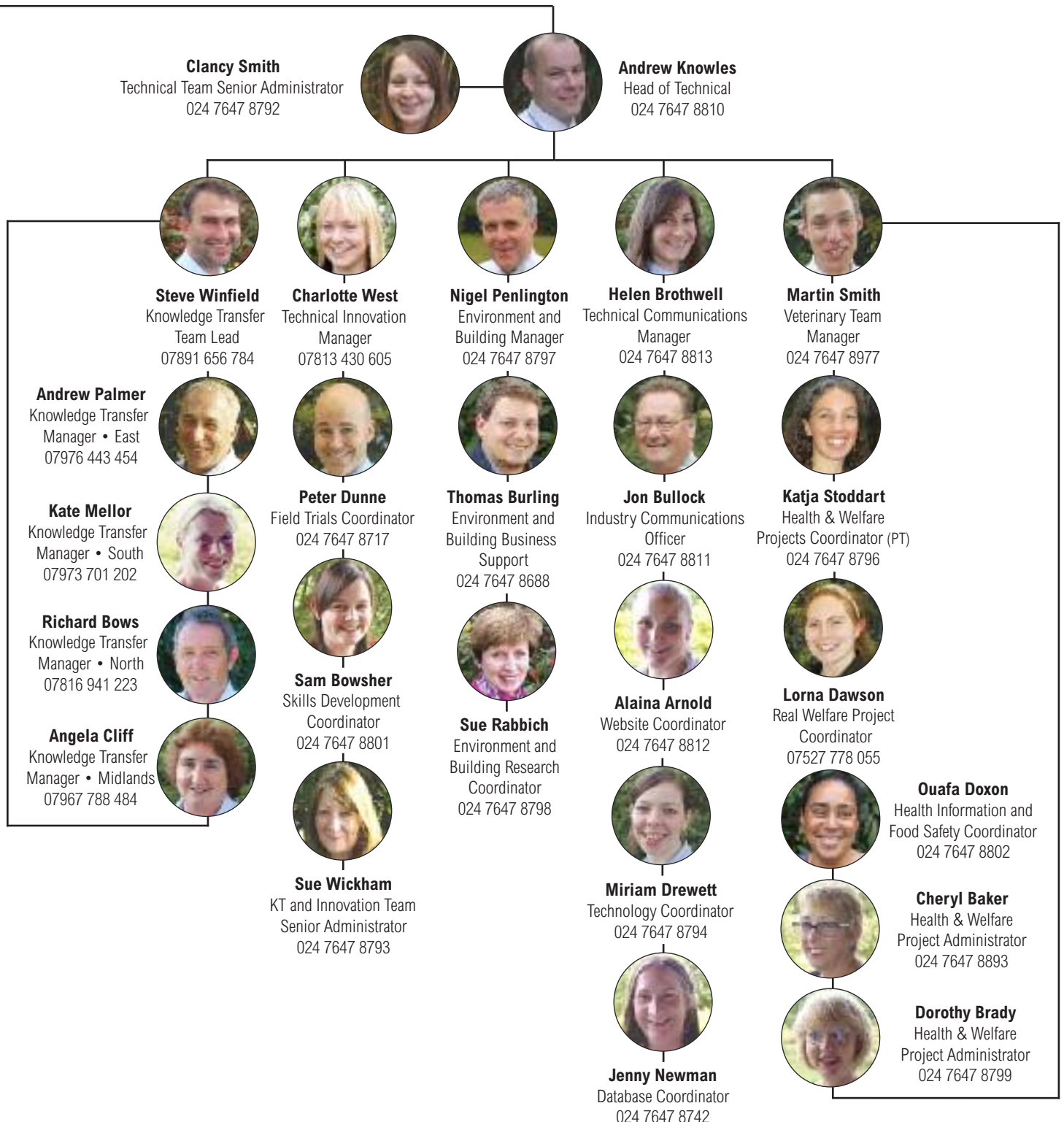


Correct as of April 2015

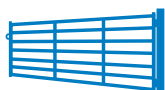
* Staff who work for EBLEX and BPEX

— lines of reporting

..... lines of communication



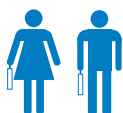
BPEX by numbers 2014-2015



193 farm visits conducted by
the KT team



2,154 publications and on-farm
tools requested



373 delegates attended
conferences



9% increase in volume of premium
sausages sold during British Sausage Week



3,212 training hours
delivered



Improvements in pigs weaned over
the last 12 months: 0.5



998 twitter followers



Improvement in FCR over the last
12 months: 0.11



5 PhD studentships sponsored
by BPEX



Change in DLWG over the last
12 months: -15g



6 scholarship placements
awarded



BPEX
Innovation Conference 2014

Established pig feed ingredients

- Wheat, barley, sorghum, "maize"
- Extruded maize, soyabean, rapeseed meal, sunflower meal
- Rapeseed
- Molasses (sugar cane, sugar beet), distillers' dregs
- Liquid feed additives

Industry statistics

The objective of AHDB Market Intelligence (MI) is to provide relevant, useful, accurate and timely market information to the English pig and allied industries. This should support them in understanding the market and making decisions that maximise their competitiveness and sustainability and also improve supply chain transparency.

Activities undertaken by the Market Intelligence function focus on both the supply and demand side of the industry and include the following:

- The collection and calculation of weekly pig, pig meat and other red meat price data and market information
- The production of accurate market forecasts of meat production and consumption
- The collection and provision of average pig production costs and performance measurement
- The publication of relevant market information and analysis from the UK, EU and beyond through regular free publications, the BPEX website and other media
- The collation and publication of international cost and physical performance comparisons, which are addressed through the InterPIG project
- Enabling BPEX marketing activity to be based on a sound knowledge of the market through consumer research.

The following sections of the report aim to

summarise some of the key market statistics and performance trends from the last year.

Costs of production

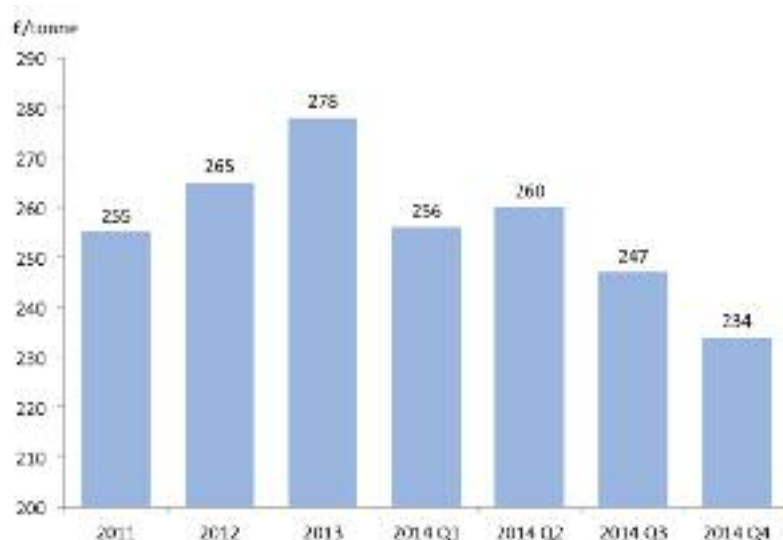
According to data from InterPIG, the cost of pig meat production in Great Britain increased by four per cent in 2013, to £1.59/kg. The average cost of production in the EU was £1.56/kg deadweight, a six per cent increase in sterling terms. However, GB production costs decreased during the course of 2013 and for most of 2014, to end the year at their lowest point in more than four years. Based on provisional estimates, average costs in 2014 were significantly lower than in 2013.

GB pig prices peaked in late 2013 at over 170p/kg. However, barring a brief seasonal rise in the spring, prices then fell throughout 2014. The GB All Pig Price (APP), which replaced the previous price series the DAPP during 2014, ended the year at just over 145p/kg, the lowest price since early 2012. Despite this, costs remained below prices throughout 2014, allowing producers to recover many of their losses from the preceding years. However, by the end of the

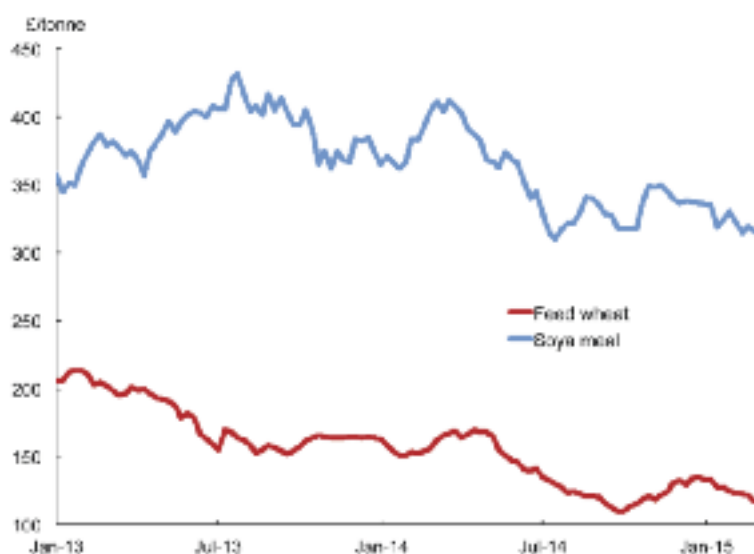
Figure 1 Total cost of pig production compared with pig prices



Source: AHDB Market Intelligence

Figure 2 Average compound feed prices, GB

Source: Defra

Figure 3 Prices for feed wheat and soya meal

Source: AHDB/HGCA

year, prices and costs were close together and further pig price falls in early 2015 will have taken many producers back into the red.

Average quarterly compound feed prices in Great Britain peaked in the first quarter of 2013 at around £291 per tonne. Prices have since fallen steadily and by the final quarter of 2014, the average stood at £234 per tonne. This was the lowest level recorded since the third quarter of 2010 and was 20 per cent below the peak.

The fall in compound feed prices matched developments for the main feed ingredients, as illustrated by UK prices for soyameal and

feed wheat. In early 2014, feed wheat prices gained some support from the political situation in Ukraine. However, as prospects for the 2014 harvest became clearer, prices began to fall and reached a low point below £110 per tonne in the autumn. Even after some recovery, prices ended the year at around £130 per tonne, over £30 below a year earlier. Soyameal prices also fell in the run up to the 2014 harvest and have been largely stable since the summer, fluctuating around £330 per tonne. This is around £60 lower than in the same period of 2013-14.



Key annual trends in physical performance for the British breeding, rearing and feeding herds from 2010 to 2014 are shown in Table 1. The average of InterPig EU countries is also displayed for the 2013 calendar year.



Performance trends in the British pig herd

Performance improved across many breeding herd indicators during 2014 but was typically still at or below the EU average from the previous year. As an example, the number of pigs born alive per litter rose by 0.25 but was still nearly a pig below the 2013 EU average. Unlike most InterPig members, GB has a significant proportion of outdoor kept sows, where average performance is lower. Nevertheless, most figures for GB indoor breeding herds are still below the EU average.

The feed conversion ratio for both the rearing and finishing herd improved in 2014, assisted by relatively benign weather conditions during the year. Daily liveweight gain increased in the rearing herd but fell slightly in the finishing herd, partly due to heavier finished weights. Overall, performance was better than the EU average in the feeding herd, although this is partly because GB producers finish pigs at lighter weights and males are not castrated.

Industry trends

Table 2 shows changes in pig carcasses between 2009 and 2014. The long-term upward trend in carcass weights continued in 2014, with the average topping 80kg for the first time, aided by lower feed costs and good weather conditions for pig growth. Probe measurements also increased marginally on the year but have not changed markedly as carcasses have grown. The net result was that the lean meat percentage was little changed, having remained at just over 61% of the carcass over the last decade.

In 2009, 12 per cent of clean pigs slaughtered had a dressed carcass weight of less than 70kg. By 2014 that proportion had fallen to nine per cent. Over half of pigs slaughtered in 2014 had carcass weights of 80kg for the first time, with 55 per cent in this category, up from 43 per cent in 2009. There was also a rise in the proportion of pigs weighing over 90kg, from eight per cent to 13 per cent.

UK clean pig slaughterings increased by two per cent in 2014, to 10.23 million head, their

Table 1 Performance trends in Great Britain

	2010	2011	2012	2013	2014	2013 EU average
Breeding herd						
Sow mortality (%)	3.6	3.2	3.6	4.5	4.6	5.8
Litters per sow per year	2.25	2.26	2.26	2.29	2.27	2.30
Pigs born alive per litter	11.20	11.39	11.54	11.87	12.12	13.03
Pre-weaning mortality (%)	12.7	12.4	12.7	13.0	12.6	12.9
Pigs weaned per litter	9.78	9.98	10.07	10.33	10.59	11.35
Pigs weaned per sow per year	22.0	22.6	22.8	23.6	24.1	26.1
Average weaning age (days)	28	27	27	26	26	27
Rearing herd						
Weight of pigs at start (kg)	7.2	7.6	7.3	7.2	7.1	7.4
Weight of pigs produced (kg)	34.6	36.8	35.9	35.6	37.1	29.9
Rearing mortality (%)	2.7	2.6	2.5	3.3	2.8	2.6
Feed conversion ratio	1.75	1.71	1.77	1.75	1.71	1.85
Daily live weight gain (g)	486	489	489	495	502	417
Feeding herd						
Weight of pigs produced (kg)	103.3	102.6	102.7	104.3	105.4	117.9
Finishing mortality (%)	3.0	2.9	2.5	2.8	3.2	2.5
Feed conversion ratio	2.95	2.82	2.72	2.78	2.67	2.85
Daily live weight gain (g)	766	784	822	816	801	787

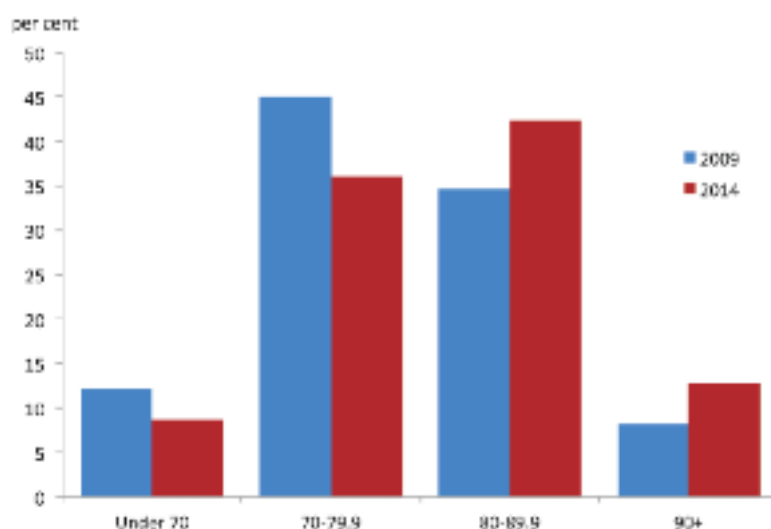
Source: Agrosoft Ltd, InterPig

Table 2 Average abattoir results

	2009	2013	2014
Back fat (P2, mm)	11.1	11.0	11.1
Lean meat (%) †	61.3	61.4	61.3
Carcase weight (kg)	78.8	79.6	80.6

†An average predicted lean meat percentage based on the following equation:

$$\text{Lean meat \%} = 66.5 - 0.95 \times \text{P2} + 0.068 \times \text{carcase weight}$$

Figure 4 Carcase weight distribution, 2009 and 2014

Source: AHDB Market Intelligence

highest level in 12 years. This is the fifth straight year of increasing throughputs and marked a return to trend growth after a much smaller rise in 2013. The increase in slaughterings was largely confined to England. Throughputs in Scotland and Northern Ireland were little changed compared with 2013, with the latter affected by lower imports of slaughter pigs from south of the border. With heavier carcase weights adding to the increased kill, overall UK pig meat production in 2014 was 863,000 tonnes, four per cent up on the previous year and the highest output since 2000.

Sow cullings for the whole year totalled 243,000 head, four per cent lower than the previous year. This was largely due to low prices paid for cull sows during the year, meaning that producers may have retained sows for a little longer, with a somewhat younger breeding herd and good producer profitability also contributing.

Throughout 2014, the UK imported more pork, bacon, processed pig meat and sausages than in 2013. However, in spite of the unprecedented gap between UK and EU prices, the rise was modest. Pork imports rose by two per cent on the year, with prices down seven per cent on 2013. Denmark increased its shipments but German and Dutch trade was down on the year. Volumes for other pig meat categories also rose but all by less than four per cent, however, prices were lower due to the subdued EU market.

Exports of pork in 2014 increased by five per cent although by value trade fell by around £4 million to £214 million. By volume there was an increase of less than one per cent to the EU and market growth was predominantly to Asian markets. China imported 13 per cent more and there was a rise of seven per cent for Hong Kong. Of the smaller markets, there were sharp rises to South Korea and the Philippines and an increase of five per cent

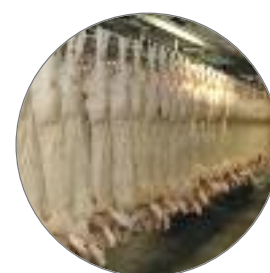




Table 3 Industry trends

	2010	2011	2012	2013	2014
UK breeding herd (000 head)					
June	427	432	425	421	406
December	422	409	400	398	390
UK sow productivity (a)					
Pigs per sow	20.2	21.6	22.5	23.0	23.7
Pig meat per sow (kg)	1,587	1,692	1,761	1,824	1,917
UK production and consumption					
(000 tonnes carcase weight equivalent except where stated)					
Clean pig slaughter (000 head)	9,233	9,813	10,035	10,050	10,227
Total pig meat production	758	806	825	833	863
Imports					
(Fresh/frozen)	941	960	942	928	948
(Bacon)	402	410	387	392	396
(Processed)	366	328	302	292	300
	173	223	254	244	252
Exports total					
	185	206	203	229	241
Total pig meat consumption	1,513	1,559	1,564	1,532	1,570
Per capita consumption (kg/head)	24.3	24.9	24.6	23.9	24.4
Self-sufficiency in pig meat (b)	50%	52%	53%	54%	55%

Source: AHDB Market Intelligence, Defra

- (a) Not survey results. Based on relationship between adjusted clean pig slaughter (slaughterings minus live imports plus live exports) and lagged breeding herd
- (b) Production as % of consumption

to the US where import demand has increased because of the PEDv outbreak. Offal exports were also led by Asian markets, with China and Hong Kong now accounting for 60 per cent of UK offal exports. Shipments to the smaller markets of Japan, South Korea and the Philippines were also up. On the other hand, a fall of 50 per cent in trade with the EU meant that total offal exports were still lower.

Retail pig meat purchases

Retail data from Kantar Worldpanel shows that in the 52 week period ended 4 January 2015, purchases of fresh and frozen pork were virtually the same as in the same period a year earlier. Increased sales of roasting joints, ribs and mince offset declines for belly and frying cuts.

The stability came despite lower prices during the year, which meant that consumer spending on pork was down by four per cent. There was also relative stability in purchases of cured and processed pig meat products. One per cent less bacon was purchased than in 2013 but ham and sausage purchases were slightly higher. Prices rose slightly across all of these categories, which meant that spending on sausages rose by two per cent, while it was also higher for ham and, marginally, for bacon. However, across all of the categories, a slightly lower proportion of households bought products during the year, with less than three quarters of households buying fresh and frozen pork.

Over the year as a whole, pork fared better than other meats in terms of volume sales. Overall, fresh and frozen meat sales were two

Table 4 Trends in retail pig meat purchases

	2010	2011	2012	2013	2014
000 tonnes					
Fresh and frozen pork	183.2	186.2	181.5	177.0	176.8
Pork belly	16.3	18.1	16.2	15.6	14.6
Pork frying/grilling chops	30.2	30.6	27.8	25.7	25.0
Pork frying/grilling steak	46.8	47.8	44.3	44.9	41.9
Pork leg roasting joint	28.0	27.1	22.8	22.0	22.9
Pork loin roasting joint	12.5	12.4	13.9	14.9	15.4
Pork shoulder roasting joint	31.2	30.4	28.1	25.4	27.4
Bacon	216.5	223.4	224.4	215.1	212.5
Pork sausages	170.1	175.1	172.4	165.9	166.7
Pork sliced cooked meats	148.6	154.5	157.7	161.4	162.1

Source: Kantar Worldpanel

per cent lower than in 2013 but higher prices for other meats meant consumers spent about the same. Beef sales were down just one per cent, despite prices being four per cent higher. Poultry meat sales dropped by two per cent, with prices little changed on average. Lamb, however, saw the biggest falls, with eight per cent less purchased, although spending was down just four per cent ●



International cost of pig production

This report examines the relative costs of production in selected countries. This is a joint project currently involving fifteen countries, which are known collectively as InterPIG.

Summary of the key findings

- The cost of pig meat production in Great Britain increased by four per cent in 2013, to £1.59/kg. The average cost of production in the EU was £1.56/kg deadweight, a six per cent increase in sterling terms compared to 2012
- All EU countries experienced an increase in the costs of production (in sterling terms) compared to 2012
- Average producer prices were higher in 2013 than in 2012, with five EU countries having production costs below the EU average reference price
- Average feed prices were higher in 2013 than in 2012, increasing by 6.8 per cent on average across the EU countries
- In 2013 as a whole, EU feed costs per kg increased by six per cent compared with a year earlier, in sterling terms. The cost increase in Great Britain was five per cent, amongst the lowest in the EU. In the EU, only Czech Rep experienced a reduction in feed costs compared to 2012, due to significant improvements in physical performance
- The overall average number of pigs weaned per sow per year in the European InterPIG countries showed a three per cent increase in 2013, up from 25.34 in 2012 to 26.06, with Denmark achieving 30.0 for the first time. There was a four per cent increase in pigs weaned per sow in Great Britain to 23.63, this was the lowest amongst the InterPIG members
- The main reason Great Britain has a below average number of pigs weaned per sow lies in the number of pigs born alive per litter. The 2013 average, at 11.87, was lower than all other European InterPIG members, although it was an increase compared to 11.54 in 2012. The EU average was 13.0, with six EU countries achieving more than 13 pigs born alive per litter
- The average number of pigs finished per sow in Great Britain increased in 2013. At 22.23 pigs per sow, average performance was 0.54 pigs higher than in 2012
- Great Britain produced 1.77 tonnes of carcass meat per sow in 2013, four per cent higher than in 2012 due to a combination of a small increase in the number of pigs finished per sow and an increase in finishing weight.

More details

The full report is published each autumn and is free to English levy payers and can be obtained from BPEX or AHDB Market Intelligence. For non-levy payers the report has a cover price of £160 ●

Table 5 Average costs of pig production in 2008–2013 (Euros/kg deadweight)

Year	2008	2009	2010	2011	2012	2013	2013/12 % change
Austria	1.75	1.45	1.60	1.67	1.78	1.79	+1
Belgium	1.68	1.41	1.48	1.61	1.73	1.74	+0
Brazil (MT)	na	na	1.02	1.18	1.17	1.13	-3
Brazil (SC)	1.14	0.99	1.10	1.35	1.46	1.33	-9
Canada	1.10	1.03	1.11	1.29	1.45	1.41	-3
Czech. Rep	1.98	1.65	1.76	1.79	1.86	1.87	+0
Denmark	1.64	1.42	1.41	1.59	1.68	1.68	+0
France	1.61	1.37	1.37	1.60	1.66	1.71	+3
Germany	1.78	1.54	1.53	1.76	1.82	1.82	-0
Great Britain	1.69	1.46	1.64	1.74	1.91	1.89	-1
Ireland	1.74	1.48	1.52	1.72	1.80	1.93	+7
Italy	1.93	1.74	1.79	1.95	1.98	2.01	+2
Netherlands	1.67	1.46	1.43	1.62	1.68	1.77	+5
Spain	1.67	1.44	1.42	1.60	1.64	1.64	-0
Sweden	1.86	1.47	1.72	1.96	2.08	2.08	-0
USA	1.12	1.10	1.12	1.27	1.40	1.49	+6
EU	1.75	1.49	1.56	1.72	1.80	1.83	+1

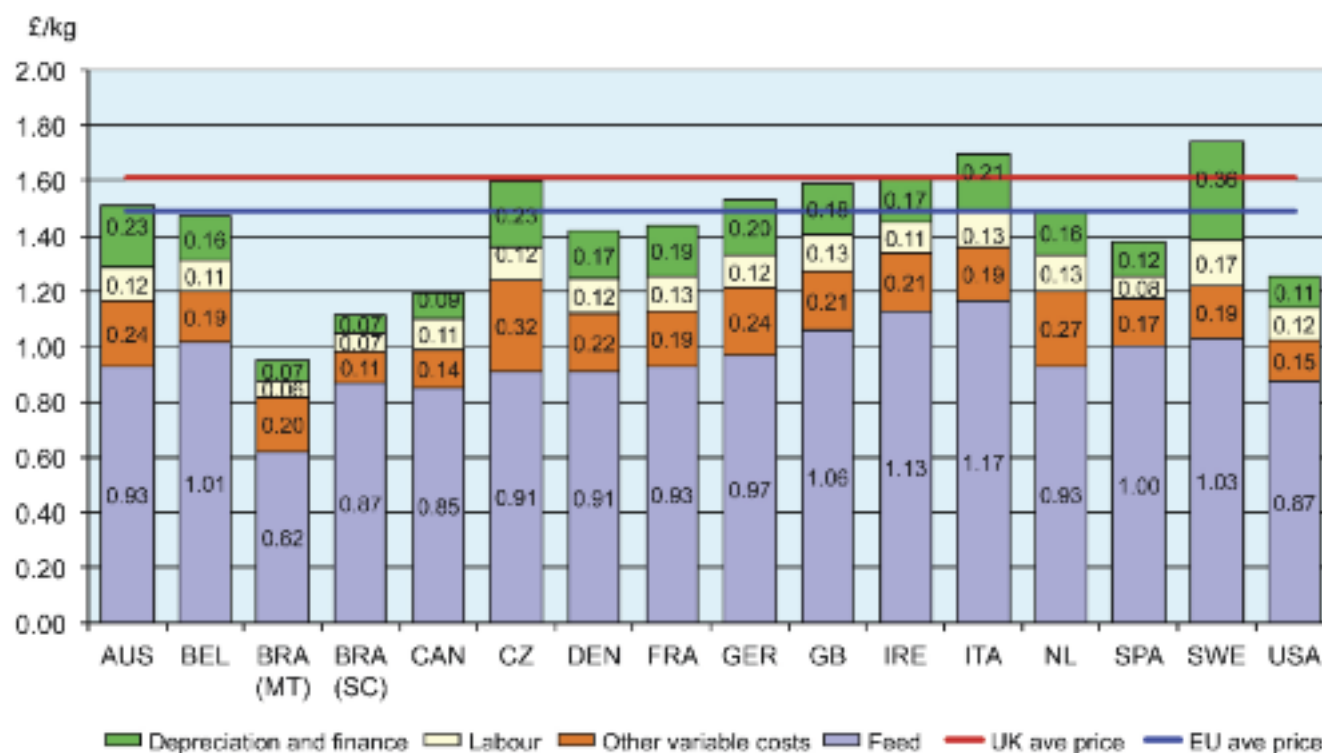
Source: InterPIG

Table 6 Summary of financial performance 2013 (£/kg deadweight)

	GB	EU
Feed	1.06	1.00
Other variable costs	0.21	0.22
Total variable costs	1.27	1.22
Labour	0.13	0.12
Building, finance and misc	0.18	0.20
Total fixed costs	0.32	0.32
Total costs	1.59	1.54

Source: InterPIG

Figure 5 Cost of production in selected countries, 2013



Source: InterPIG

Figure 6 Feed costs



Source: InterPIG

Figure 7 Number of pigs finished per sow



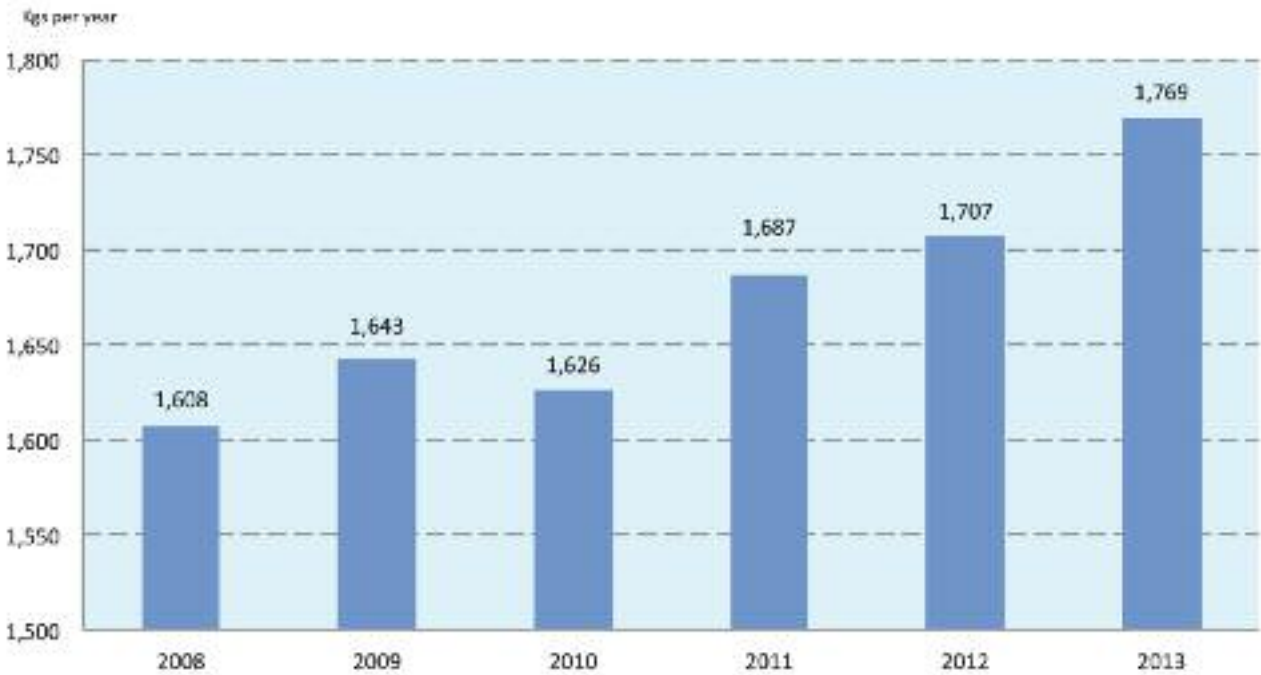
Source: InterPIG

Figure 8 Daily liveweight gain (finishing herds)



Source: InterPIG

Figure 9 GB carcass meat per sow per year



Source: InterPIG

Cost of production

The impact of changes in feed prices and key performance indicators

The physical performance figures are taken from Agrosoft data relating to the twelve months ending 31 December 2014. Costs of production are estimated using the model operated by AHDB Market Intelligence and take account of a range of financial cost estimations for 2014.

The Cost of Production estimations are expressed in pence per carcass kilogram and include variable and fixed costs. An explanation of the Cost of Production model can be found on the BPEX website under Prices and Stats: Costings and Herd Performance.

Change in Cost of Production (CoP) for change in feed price (£ per tonne)

The average cost of production was estimated at 149.4p per kg of carcass weight. The following table indicates how much an increase in each of these feed prices would change the cost of production estimate.

Table 7 Change in Cost of Production (CoP) for change in feed price (£ per tonne)

	Base CoP (p/kg)	Feed price +£5	Feed price +£10	Feed price +£15	Feed price +£20
Sow feed	149.4	149.8	150.2	150.6	151.0
Rearing feed	149.4	149.8	150.1	150.4	150.8
Finishing feed	149.4	150.6	151.7	152.9	154.0

Table 8 Change in Cost of Production (CoP) for change in pigs weaned per sow per year

	Bottom third	Mid-point marker	Agrosoft average	Model average	Mid-point marker	Top third	Mid-point marker
Pigs weaned per sow per year	20.92	22.43	23.93	24.09	25.67	27.41	29.15
CoP (p/kg)	156.3	152.8	149.7	149.4	146.6	143.9	141.5

Change in Cost of Production (CoP) for change in pigs weaned per sow per year

The number of pigs weaned per sow per year is a result of three different elements: pigs born alive per litter, litters per sow per year and pre-weaning mortality. The following table indicates the change in cost of production for different numbers of pigs weaned per sow per year. The Agrosoft average, bottom third and top third are based on all farms included in the Agrosoft database. The model average is based on weighting the average performance of indoor and outdoor sows, using a weighting of 60% indoor and 40% outdoor.

The following tables report the relationship between physical production performance, feed prices and total costs. All tables use figures for the period from 1 January 2014 to 31 December 2014 inclusive.

Feed Conversion Ratio (FCR) and Daily Liveweight Gain (DLWG)

The relationship between FCR and the CoP is direct and impacts on the quantity, and therefore cost, of feed consumed in producing each carcase kilogram of pig meat. FCR relates to feed efficiency but feeding less feed can result in lower DLWG and a longer feeding period. It is therefore important for farms to optimise their FCR and DLWG according to their farm situation and system. The following tables indicate various levels of

performance for FCR and DLWG, on the assumption that by varying one trait there is no change in the other. All farms are represented in the average, but the farms in the top third for FCR may not be the same farms in the top third for DLWG as these figures have been independently calculated for each trait.

Table 9 indicates the change in cost of production (p/kg) for a change in FCR for different feeding periods.

Table 10 indicates the change in cost of production (p/kg) for a change in DLWG for different feeding periods ●

Table 9 Change in Cost of Production (CoP) for change in Feed Conversion Ratio (FCR)

	Bottom third	Mid-point marker	Average	Mid-point marker	Top third	Mid-point marker
Rearing FCR	1.92	1.81	1.71	1.58	1.46	1.34
CoP (p/kg)	151.7	150.6	149.4	148.0	146.7	145.3
Finishing FCR	3.18	2.93	2.67	2.52	2.36	2.21
CoP (p/kg)	159.7	154.5	149.4	146.4	143.3	140.2
Combined FCR	2.74	2.60	2.45	2.34	2.22	2.11
CoP* (p/kg)	162.2	157.7	153.3	149.7	146.1	142.6

* Not all rearing and finishing units are used in the combined average performance data, resulting in a different base CoP

Table 10 Change in Cost of Production (CoP) for change in Daily Liveweight Gain (DLWG g/day)

	Bottom third	Mid-point marker	Average	Mid-point marker	Top third	Mid-point marker
Rearing DLWG (g/day)	361	432	502	543	584	625
CoP (p/kg)	150.8	150.0	149.4	149.2	148.9	148.7
Finishing DLWG (g/day)	659	730	801	884	967	1050
CoP (p/kg)	151.2	150.2	149.4	148.7	148.0	147.5
Combined FCR	530	590	650	697	744	791
CoP* (p/kg)	153.4	151.8	150.5	149.7	148.9	148.3

* Not all rearing and finishing units are used in the combined average performance data, resulting in a different base CoP

Technical performance data

The technical information in this chapter comes from a range of outdoor and indoor breeding systems; rearing, grower and finishing units. The physical performance data is collected through the Agrosoft pig recording system. The feed costs have been provided by AHDB since 2014.

Table 11 Distribution of herd size in Agrosoft recorded breeding herds, 2006-2014

No sows	% herds								
	2006	2007	2008	2009	2010	2011	2012	2013	2014
100-249	5	12	9	15	15	14	11	10	13
250-499	15	12	25	32	26	26	25	26	23
500-749	11	17	26	32	29	28	29	25	29
750-999	27	25	24	12	15	17	18	20	10
1000-1500	27	21	14	8	12	11	13	17	20
1500-3000	15	13	2	1	2	4	4	2	5
>3000	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100

Table 12 Trends in weaning age 2004-2014

Age at weaning (days)	% herds										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<19	0	0	0	0	0	0	0	0	0	0	0
20-25	23	49	37	28	31	30	29	27	29	49	37
26-32	68	45	62	70	65	66	67	69	68	48	60
33-39	9	6	1	0	2	3	1	1	1	1	3
>39	0	0	0	2	2	1	2	3	2	1	0
Total	100	100	100	100	100	100	100	100	100	100	100

Totals in Table 11 and 12 may not add up due to rounding

Table 13 Results for all breeding herds, year ended Dec 2014

	Average *	Top third *	Top 10%*
Herd structure			
Average number sows and gilts	714	653	527
Average number unserved gilts	59	102	35
Replacement rate (%)	52.10	55.18	55.93
Sow sales and deaths (%)	51.55	54.08	55.69
Sow mortality (%)	4.54	5.23	5.34
Sow performance			
Successful services (%)	83.42	86.09	88.08
Litters per sow per year **	2.27	2.35	2.40
Non-productive days per litter ###	18.96	12.69	10.49
Pigs born per litter			
alive	12.05	13.10	13.42
dead	0.58	0.66	0.66
mummified	0.20	0.23	0.24
total	12.83	13.99	14.32
Pigs born alive per sow per year	27.40	30.88	32.18
Pre-weaning mortality (%)	12.73	11.10	9.32
Pigs weaned per litter	10.52	11.64	12.15
Pigs weaned per sow per year **	23.93	27.41	29.13
Average weight of weaned pig (kg)	7.03	7.24	7.20
Average weaning age (days)	26.34	26.75	26.19
Feed usage #			
Sow feed per sow per year (t)	1.401	1.358	1.258
Feed per pig weaned (kg)	55.28	47.01	41.96

* Selected on the basis of pigs reared per sow per year

** Per sow data excludes unserved gilts

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6-day weaning-to-service interval

Totals in Table 13 may not add up due to rounding

Table 14 Trends in performance and feed costs in the breeding herd, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Herd structure											
Average number sows and gilts	474	571	662	631	583	545	605	682	580	591	714
Sow sales and deaths (%)	42.3	44.7	44.6	41.6	46.5	46.0	49.2	47.6	51.5	53.5	51.6
Sow mortality (%)	4.7	4.7	5.8	3.4	4.3	4.0	3.6	3.3	3.6	4.6	4.5
Sow performance											
Litters per sow per year *	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Pigs born alive per litter	10.7	10.9	11.7	11.1	11.2	11.2	11.2	11.4	11.5	11.8	12.1
Pre-weaning mortality (%)	10.4	10.9	13.3	12.6	12.6	12.5	12.7	12.6	12.7	13.1	12.7
Pigs weaned per litter	9.6	9.7	9.5	9.7	9.8	9.8	9.8	10.0	10.1	10.3	10.5
Pigs weaned per sow per year *	21.3	21.5	21.5	21.6	22.1	22.2	22.1	22.5	22.9	23.5	23.9
Average weaning age (days)	26	26	26	27	27	27	26.7	26.4	26.7	26.4	26.3
Sow feed											
Sow feed per sow per year (t) #	1.334	1.339	1.338	1.343	1.456	1.278	1.230	1.169	1.280	1.529	1.401
Sow feed cost per tonne (£) ##	110.36	105.22	102.40	131.08	155.14	178.49	162.87	207.63	207.72	238.02	199.60

* Per sow data excludes unserved gilts

Per sow data includes unserved gilts from 2013

Per tonne compound feed cost from AHDB since 2014

Table 15 Breeding herd results by herd size, year ended Dec 2014

	100-249	250-499	500-749	750-999	1K-1.5K	1.5K+
Herd structure						
Average number sows and gilts	176	365	617	853	1185	2080
Average number in-pig gilts	27	57	112	125	173	446
Average number unserved gilts	13	28	51	38	160	72
Replacement rate (%)	51.36	50.91	50.38	52.25	52.64	55.46
Sow sales and deaths (%)	51.45	51.82	53.99	48.35	50.14	52.87
Sow mortality (%)	4.92	4.63	4.30	5.62	3.89	5.40
Sow performance						
Successful services (%)	82.38	83.08	84.68	83.01	83.51	81.89
Non-productive days per litter ##	19.86	18.79	15.41	19.29	19.64	23.14
Litters per sow per year *	2.25	2.26	2.32	2.27	2.26	2.22
Pigs born per litter						
alive	12.29	12.31	12.39	12.09	11.73	11.90
dead	0.86	0.68	0.67	0.57	0.48	0.54
mummified	0.23	0.26	0.23	0.15	0.22	0.10
total	13.22	13.16	13.18	12.71	12.28	12.48
Pigs born alive per sow per year	27.54	27.92	28.80	27.46	26.51	26.49
Pre-weaning mortality (%)	13.81	11.23	11.81	13.36	13.74	12.54
Pigs weaned per litter	10.57	10.93	10.93	10.48	10.12	10.39
Pigs weaned per sow per year *	23.81	24.81	25.40	23.80	22.90	23.15
Average weight of weaned pig (kg)	7.29	7.17	7.25	6.82	6.98	6.68
Average weaning age (days)	27.78	27.18	26.28	26.38	26.11	25.94
Feed usage #						
Sow feed per sow per year (t)	1.418	1.288	1.361	1.527	1.440	n/a
Feed per pig weaned (kg)	42.47	49.29	52.50	58.61	62.35	n/a

* Per sow data excludes unserved gilts

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6 day weaning to service interval

Data includes indoor and outdoor herds

Totals in Table 15 may not add up due to rounding

Table 16 Breeding herd results by age of weaning, year ended Dec 2014

	Less than 26 days			26 days+		
	Top 10%	Top third	Average	Top 10%	Top third	Average
Herd structure						
Average number sows and gilts	632	718	829	435	621	646
Average number in-pig gilts	108	122	131	63	125	113
Average number unserved gilts	21	126	75	25	74	50
Replacement rate (%)	53.34	58.89	54.73	55.26	52.63	50.29
Sow sales and deaths (%)	52.04	57.62	53.45	52.16	52.12	49.87
Sow mortality (%)	2.42	4.85	4.68	4.17	4.73	4.39
Sow performance						
Successful services (%)	87.23	83.74	82.71	88.46	87.38	83.35
Non-productive days per litter ^{##}	10.42	13.90	20.34	10.97	12.31	18.03
Litters per sow per year *	2.42	2.37	2.27	2.37	2.34	2.27
Pigs born per litter						
alive	13.17	12.82	11.89	13.48	13.20	12.15
dead	0.59	0.64	0.53	0.69	0.67	0.63
mummified	0.28	0.24	0.21	0.23	0.22	0.19
total	13.94	13.61	12.52	14.31	13.99	12.86
Pigs born alive per sow per year	31.99	30.49	27.09	31.99	30.96	27.57
Pre-weaning mortality (%)	7.97	11.22	13.08	10.08	11.18	12.52
Pigs weaned per litter	12.12	11.38	10.34	12.11	11.71	10.63
Pigs weaned per sow per year *	29.37	26.99	23.55	28.70	27.46	24.15
Average weight of weaned pig (kg)	7.24	7.07	6.88	7.24	7.28	7.12
Average weaning age (days)	24.41	24.59	24.67	27.41	27.67	27.61
Feed usage [#]						
Sow feed per sow per year (t)	1.199	1.256	1.392	1.273	1.418	1.409
Feed per pig weaned (kg)	41.59	43.76	55.03	44.11	48.99	55.75

* Per sow data excludes unserved gilts

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6-day weaning-to-service interval

Data includes indoor and outdoor herds

Totals in Table 16 may not add up due to rounding

Table 17 Comparison of results for outdoor and indoor breeding herds, year ended Dec 2014

	Outdoor herds	Indoor herds
Herd structure		
Average number sows and gilts	928	598
Average number in-pig gilts	133	100
Average number unserved gilts	55	36
Replacement rate (%)	50.96	52.89
Sow sales and deaths (%)	48.51	53.98
Sow mortality (%)	3.84	5.15
Sow performance		
Successful services (%)	82.98	83.78
Non-productive days per litter ##	21.47	16.85
Litters per sow per year *	2.24	2.30
Pigs born per litter		
alive	11.36	12.63
dead	0.47	0.68
mummified	0.11	0.23
total	11.85	13.46
Pigs born alive per sow per year	25.4	29.08
Pre-weaning mortality (%)	14.18	11.53
Pigs weaned per litter	9.75	11.16
Pigs weaned per sow per year *	21.82	25.71
Average weight of weaned pig (kg)	7.02	7.13
Average weaning age (days)	26.08	26.56
Feed usage #		
Sow feed per sow per year (t)	1.547	1.345
Feed per pig weaned (kg)	72.46	47.27
Feed costs #		
Sow feed cost per tonne (£)	196.10	201.94

* Per sow data excludes unserved gilts

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6-day weaning-to-service interval

Totals in Table 17 may not add up due to rounding

Table 18 Comparative results for indoor breeding herds, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2013 Top third*	2014	2014 Top third*
Herd structure													
Average number sows and gilts	362	406	482	501	548	440	492	586	481	549	570	598	644
Average number unserved gilts	30	38	n/a	22	54	36	95	37	37	85	70	36	35
Sow replacements (%)	47.2	47.1	49.5	47.7	45.5	49.2	47.6	49.2	51.8	53.0	53.4	52.9	54.7
Sow sales and deaths (%)	44.7	43.8	49.2	46.7	47.2	47.5	41.5	47.9	52.9	55.4	55.7	54.0	54.2
Sow mortality (%)	5.9	4.9	6.1	3.9	3.9	3.9	1.4	2.9	3.2	5.2	4.4	5.2	5.6
Sow performance													
Non-productive days per litter ##	35.0	32.0	21.0	21.0	44.0	20.2	19.9	20.8	18.9	16.2	11.9	16.9	11.5
Litters per sow per year **	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.38
Pigs born per litter													
alive	10.9	11.1	11.2	11.4	11.5	11.5	11.6	11.9	12.1	12.4	13.0	12.6	13.3
dead ***	1.1	1.2	1.1	0.9	1.0	1.1	1.0	1.1	1.1	0.9	0.9	0.9	0.9
total	11.9	12.1	12.0	12.4	13.1	12.5	12.6	12.9	13.1	13.2	13.7	13.5	14.0
Pre-weaning mortality (%)	11.8	11.8	12.9	13.0	12.3	12.3	12.2	12.8	12.4	12.3	10.7	11.5	10.8
Pigs weaned per litter	9.6	9.8	9.7	10.0	10.1	10.1	10.2	10.4	10.6	10.8	11.6	11.2	11.8
Pigs weaned per sow per year **	21.4	22.1	22.0	22.4	22.9	22.8	23.0	23.4	24.1	24.9	27.5	25.7	28.1
Average weight of weaned pig (kg)	7.4	7.2	7.2	7.4	7.2	7.5	7.4	7.5	7.4	7.3	7.2	7.1	7.2
Average weaning age (days)	27.0	27.0	26.1	27.1	27.0	26.9	27.0	27.0	26.9	26.9	26.1	26.6	26.6
Feed usage #													
Sow feed per sow per year (t)	1.240	1.265	1.367	1.362	1.334	1.256	1.168	1.059	1.217	1.476	1.442	1.345	1.353
Feed per pig weaned (kg)	63.0	61.0	63.3	66.0	62.3	60.2	51.2	46.1	49.8	50.2	47.2	47.3	43.7
Feed costs ###													
Sow feed cost per tonne (£)	112.81	102.96	102.22	127.73	164.99	180.59	164.32	215.23	210.28	212.31	217.75	201.94	n/a

* Selected on basis of pigs weaned per sow per year

** Excludes unserved gilts

*** Includes mummified pigs born

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6-day weaning-to-service interval

Per tonne compound feed cost from AHDB since 2014

Totals in Table 18 may not add up due to rounding

Table 19 Comparative results for outdoor breeding herds, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2013 Top third*	2014	2014 Top third*
Herd structure													
Average number sows and gilts	676	820	806	783	777	645	735	771	676	932	791	928	774
Average number unserved gilts	60	66	n/a	21	80	57	45	84	70	66	88	55	63
Sow replacements (%)	23.1	45.9	57.6	45.8	46.4	46.0	39.2	52.4	51.3	52.9	54.9	51.0	52.5
Sow sales and deaths (%)	31.2	45.2	42.6	36.9	45.6	43.8	38.6	47.0	49.1	46.7	48.2	48.5	47.3
Sow mortality (%)	1.6	5.6	5.4	3.1	4.6	3.8	1.1	3.5	4.0	3.4	2.2	3.8	3.6
Sow performance													
Non-productive days per litter ##	48.0	41.0	19.0	25.0	45.6	20.4	19.2	21.0	19.9	19.4	14.3	21.5	15.8
Litters per sow per year **	2.1	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3
Pigs born per litter													
alive	10.6	10.7	10.8	10.9	10.9	10.9	10.7	10.8	11.0	11.1	11.7	11.4	12.0
dead ***	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.5
total	11.3	11.4	11.4	11.4	11.7	11.5	11.3	11.4	11.6	11.6	12.3	11.9	12.5
Pre-weaning mortality (%)	9.1	10.5	13.6	12.3	12.9	12.6	13.1	12.4	13.0	14.0	12.6	14.2	13.6
Pigs weaned per litter	9.6	9.6	9.3	9.5	9.5	9.6	9.3	9.5	9.6	9.6	10.1	9.8	10.3
Pigs weaned per sow per year **	20.1	21.2	21.1	20.9	21.3	21.6	21.0	21.3	21.7	21.7	23.8	21.8	24.0
Average weight of weaned pig (kg)	7.8	7.3	8.1	7.6	7.6	7.7	7.0	7.9	7.7	7.0	7.1	7.0	7.3
Average weaning age (days)	30.0	27.0	26.0	26.5	27.0	26.5	26.0	27.0	26.5	25.8	26.0	26.1	26.1
Feed usage #													
Sow feed per sow per year (t)	1.446	1.402	1.298	1.296	1.584	1.300	1.330	1.345	1.365	1.601	1.515	1.547	1.589
Feed per pig weaned (kg)	72.0	73.0	68.0	70.2	79.0	72.9	64.5	63.0	64.3	76.1	64.6	72.5	68.9
Feed costs ###													
Sow feed cost per tonne (£)	107.22	110.03	102.63	133.36	180.72	153.53	160.34	194.44	204.31	226.82	230.24	196.10	n/a

* Selected on basis of pigs weaned per sow per year

** Excludes unserved gilts

*** Includes mummified pigs born

Per sow data includes unserved gilts

Non-productive days excludes gestation, lactation and a 6-day weaning-to-service interval

Per tonne compound feed cost from AHDB since 2014

Totals in Table 19 may not add up due to rounding

Table 20 Overall rearing herd results, year ended Dec 2014

	Top 10%*	Top third *	Average
Herd structure			
Average number of pigs	1061	2017	2523
Pig performance			
Average weight of pigs at start (kg)	7.6	7.3	7.5
Average weight of pigs produced (kg)	21.3	32.4	37.1
Rearing mortality (%)	2.5	2.5	2.8
Feed conversion ratio	1.17	1.46	1.71
Daily gain (g)	394	481	502
Days in herd	34	51	58

* Selected on feed conversion ratio

Table 21 Trends in performance and feed costs in the rearing herd, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Herd structure											
Average number of pigs	1,449	1,782	1,377	1,192	1,994	2,083	3,345	1,984	2,237	2,607	2,523
Pig performance											
Average weight of pigs at start (kg)	7.4	7.3	7.2	7.4	7.7	7.3	7.4	7.4	7.4	7.2	7.5
Average weight of pigs produced (kg)	36.4	36.3	35.1	35.3	38.5	36.6	34.6	36.8	35.9	31.45	37.1
Rearing mortality (%)	5.0	3.4	2.5	2.7	2.4	2.5	2.7	2.6	2.5	4.0	2.8
Feed conversion ratio	1.84	1.70	1.71	1.82	1.73	1.80	1.75	1.71	1.77	1.84	1.71
Daily gain (g)	449	509	493	453	478	492	486	489	489	479	502
Feed usage and costs *											
Feed cost per tonne (£)	197.35	183.22	192.04	213.63	272.83	277.4	297.11	261.95	346.89	352.17	282.15

* Per tonne compound feed cost from AHDB since 2014

Table 22 Overall herd results ranked on Daily Liveweight Gain, year ended Dec 2014

	Rearing			Feeding			Combined Rearing/Feeding *		
	Top 10%	Top third	Average	Top 10%	Top third	Average	Top 10%	Top third	Average
Herd structure									
Average number of pigs	2,861	3,421	2,523	1,120	1,360	1,733	3,700	5,041	4,577
Pig performance									
Average weight of pigs at start (kg)	8.0	7.9	7.5	44.0	41.2	35.0	8.4	7.6	7.6
Average weight of pigs produced (kg)	44.3	44.2	37.1	115.8	110.5	106.1	109.1	111.3	104.6
Mortality (%)	2.2	2.2	2.8	3.3	2.8	3.2	3.4	4.7	4.7
Feed conversion ratio	1.75	1.77	1.71	2.71	2.56	2.67	2.35	2.32	2.45
Daily gain (g)	641	584	502	1,088	967	801	796	744	650
Days in herd	57	62	58	66	72	92	127	140	153

* Rearing, feeding and combined rearing/feeding do not necessarily directly correspond

Table 23 Overall finishing herd results, year ended Dec 2014

	Top 10%*	Top third *	Average
Herd structure			
Average number of pigs	1,932	2,298	1,733
Pig performance			
Average weight of pigs at start (kg)	24.6	31.4	35.0
Average weight of pigs produced (kg)	97.2	106.1	106.1
Finishing mortality (%)	3.0	3.2	3.2
Feed conversion ratio	2.00	2.36	2.67
Daily gain (g)	749	819	801
Days in herd	83	90	92

* Selected on feed conversion ratio

Table 24 Trends in performance and feed costs in the finishing herd, 2004-2014

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Herd structure											
Average number of pigs	1,725	1,841	1,992	2,016	1,811	1,881	1,788	2,066	1,764	1,660	1,733
Pig performance											
Average weight of pigs at start (kg)	27.7	25.9	27.2	26.6	35.9	38.8	38.0	39.8	38.4	38.9	35.0
Average weight of pigs produced (kg)	97.9	96.9	98.2	98.8	101.6	103.3	103.9	103.0	102.7	99.4	106.1
Finishing mortality (%)	6.7	6.5	5.6	4.8	3.3	2.8	3.0	2.9	2.5	3.1	3.2
Feed conversion ratio	2.77	2.74	2.75	2.73	2.87	2.77	2.95	2.82	2.72	2.80	2.67
Daily gain (g)	630	639	655	673	757	819	766	784	822	786	801
Feed usage and costs *											
Feed cost per tonne (£)	129.29	119.69	119.87	132.75	184.12	183.99	177.46	261.83	241.52	248.06	231.70

* Per tonne compound feed cost from AHDB since 2014

Table 25 Analysis of pigs born, weaned and weaning to first service interval by parity and Indoor/Outdoor sows, year ended Dec 2014

Parity	% of total			Born alive per litter			Born dead per litter			Total born per litter incl mummified			Weaned per litter			Weaning to first service interval (days)		
	All	Indoor	Outdoor	All	Indoor	Outdoor	All	Indoor	Outdoor	All	Indoor	Outdoor	All	Indoor	Outdoor	All	Indoor	Outdoor
Gilt	23.8	24.7	22.6	11.4	12.0	10.7	0.5	0.6	0.4	12.0	12.7	11.1	10.5	11.3	9.5			
2	19.5	19.5	19.6	11.9	12.4	11.3	0.5	0.5	0.4	12.4	13.0	11.7	10.8	11.4	10.0	6.6	6.9	6.2
3	16.6	16.6	16.5	12.5	13.1	11.8	0.6	0.6	0.5	13.2	13.9	12.3	10.7	11.3	9.9	5.6	5.5	5.7
4	14.1	14.3	13.9	12.6	13.3	11.8	0.7	0.8	0.5	13.4	14.2	12.4	10.5	11.1	9.8	5.4	5.3	5.6
5	11.0	11.3	10.8	12.4	13.1	11.6	0.7	0.8	0.6	13.3	14.1	12.2	10.3	10.9	9.6	5.4	5.2	5.6
6	7.7	7.6	7.9	12.0	12.6	11.3	0.8	1.0	0.6	12.9	13.8	11.9	10.1	10.8	9.3	5.4	5.2	5.5
7	4.3	3.7	5.0	11.5	12.1	11.0	0.8	1.1	0.5	12.4	13.4	11.5	9.7	10.5	9.1	5.5	5.3	5.6
8	1.9	1.5	2.4	11.1	11.6	10.7	0.8	1.0	0.6	11.9	12.8	11.2	9.5	10.1	8.9	5.5	5.5	5.4
9	0.7	0.5	0.9	10.8	11.3	10.4	0.8	1.1	0.5	11.6	12.5	11.0	9.2	9.9	8.7	5.5	5.5	5.4
10	0.2	0.2	0.3	10.5	11.1	10.0	0.8	1.0	0.7	11.4	12.3	10.7	8.7	8.9	8.6	5.5	6.1	5.1
11< 15	0.1	0.1	0.1	10.2	9.8	10.5	1.0	1.1	0.9	11.2	11.0	13.3	9.3	9.4	9.1	5.8	6.2	5.6

Table 26 Analysis of total services and returns by parity, year ended Dec 2014

Parity	% of total	Farrowing rate			% returns		
		All	Indoor	Outdoor	All	Indoor	Outdoor
Gilt	23.8	77.2	78.5	75.6	9.3	8.5	10.4
2	19.5	76.5	77.2	76.0	10	10.1	10.2
3	16.6	77.8	78.8	76.8	8.8	8.5	9.2
4	14.1	79.0	80.5	77.2	8	7.8	8.2
5	11.0	79.6	80.6	78.3	7.6	7.5	7.7
6	7.7	78.5	79.8	77.1	7.2	7.2	7.1
7	4.3	79.6	80.2	79.0	7.2	7.1	7.3
8	1.9	76.6	78.8	74.9	7.1	7.3	7.0
9	0.7	75.3	76.9	74.2	6.6	5.9	7.1
10	0.2	71.3	67.0	74.6	7.4	10.0	5.3
11 < 15	0.1	64.8	57.6	72.9	12.6	15.6	9.5

Technical

The BPEX 5-Point Plan has been developed to help deliver a more competitive and profitable pig production and processing industry. This includes working to narrow the technical performance gap between English pig producers and competitors through a number of work streams.



Work stream include:

- Establishing a field trials programme
- Identifying innovation from around the world and disseminating it to pig producers
- Developing skills under the banner 'Recruit, Retain, Reward' recognising professional development of staff and demonstrating a skilled and attractive career path

- Setting up regional technical forums.

This chapter outlines some of the key activity which the BPEX technical department has been involved with over the past year and touches on some of the plans for the forthcoming coming months ●

Skills and training

Skills development and training continue to play a key role in BPEX's overall strategy. The activity is helping ensure all pig staff are equipped with husbandry, data interpretation and decision-making skills, which contribute to improved herd productivity, while also providing people management training and support for managers and business owners.



Sam Bowsheer
Skills Development
Coordinator

The facts

- Skilled, enthusiastic people are the most important part of a successful pig business
- A survey of pig businesses achieving '2TS' highlighted a common factor – they all had structured training in place for staff
- A pig business is a great place to pursue a rewarding career in farming.

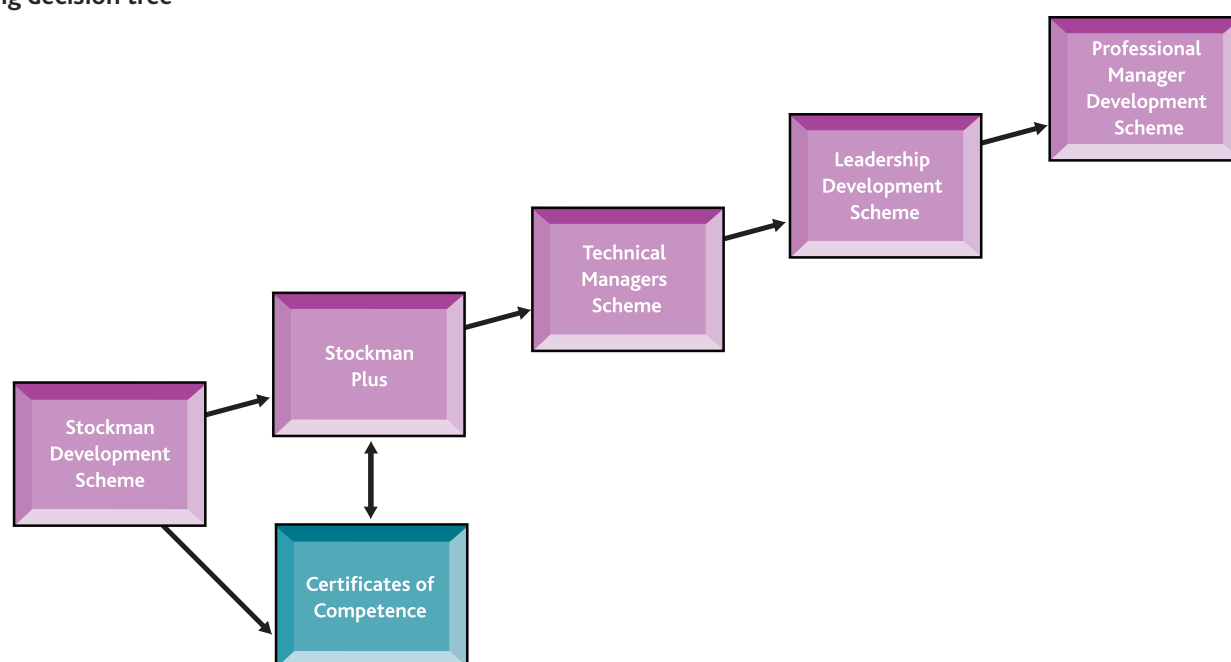
The pig industry skills strategy Recruit, Retain, Reward outlines steps needed to ensure the industry remains sustainable and profitable.

The aims of the strategy are:

- **Recruit:** Provide and promote an attractive environment for a progressive career within allied industries
- **Retain:** Promote skills development as vital to business improvement
- **Reward:** Promote recognition of achievement to motivate staff •

Current BPEX training offer

Training decision tree



Skills and training

Key Figures

Training hours: **3,212** training hours


Health and Welfare RDPE Spec allocation:
1,000 training hours

Scholarship companies: **10**

Scholarship applications:
47 across **10** companies

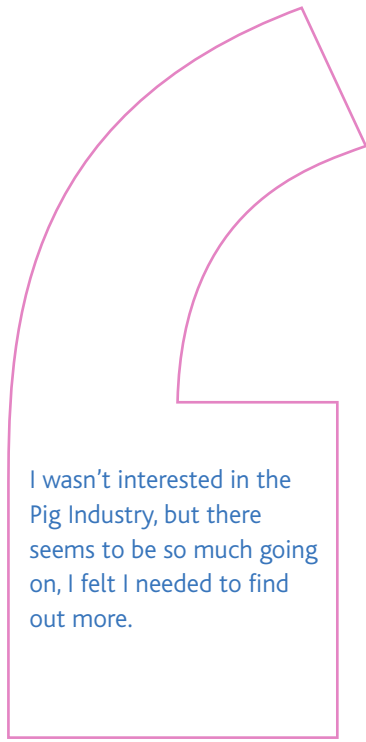

Scholarships secured: **6**

What people have said





I attended a great Vet Med session run by BPEX, covering responsible use, food safety and health and welfare, demonstrating the professional approach of our industry to the use of medicines on farm.

Sophie Hope,
Alexander & Angell
Farms Ltd



I wasn't interested in the Pig Industry, but there seems to be so much going on, I felt I needed to find out more.

Harper Adams
student, Scholarship
Fair 2014



Why is staff training so important to our business? It increases staff retention, increases their self-worth, their knowledge and understanding of production is improved and I believe this leads to increased herd performance and profitability.

Tony Wright,
Shedden Farms,
BPEX Skills Sector
Champion



Technical Managers Scheme

New to the BPEX training offer this year, the Technical Managers Scheme was developed after a gap in the training offer was identified for supervisors and managers. The previous offer covered practical production and problem solving skills for stockman, as well as people management and business training. The Technical Managers Scheme covers the issues facing those who are responsible for a unit on a daily basis. It can also contribute towards the Level 3 Certificate of Competence in the supervision and operation of a pig unit. The scheme consists of six full day sessions covering welfare, interpreting records, management of farm waste and pollution, organising pig sales and purchases, feed milling and mixing and staff supervision. In its first year the scheme has been run in York, Bury St Edmunds and Kidderminster ●



Scholarship scholars

- Assessment questions now include asking candidates to demonstrate their usual everyday tasks
- The online written test has been removed to ensure the assessment is practical throughout
- The learner manuals are set out with training information as well as progress check questions to test the learner's knowledge
- There is a practical skills checklist to ensure the individual is ready for assessment
- Further reading references have been included, directing the reader to additional information
- The learner manuals are now available in one folder, which contains all the necessary manuals to complete the full certificate, although each unit is still able to be taken as an individual award ●

Pig Industry Scholarship

After the success in its inaugural year, the scheme has continued to grow, with 10 companies offering scholarships in its second year. The scholarship has also allowed us to demonstrate to students the diverse nature of the industry and the wide range of opportunities being offered. The companies involved in the first and second years have included production businesses, feed and breeding companies, technology and engineering firms and a pig veterinary partnership. The interest from students has also grown, with the number of applications across the scheme rising from 35 in its first year to 47 in its second year ●

For full details on the BPEX skills and training offer, including the training calendar, visit: <http://www.bpex.org.uk/2TS/Training/>

Certificates of Competence

The Certificate of Competence in Pig Husbandry Skills was updated during the course of the year, with a more practically focused assessment criteria and a revamp of the learner manuals, including additional information on outdoor production systems. The revised learner manuals were launched in autumn 2014. Other changes include:

- The assessment criteria have been altered to allow those taking the qualification to demonstrate their knowledge and skills through their own unit's practices



Study tours

BPEX organises and runs several study tours for producers each year. The tours are aimed at looking at new technologies and/or production systems, both here and overseas. They are usually 50% funded by BPEX, with the remaining 50% coming from a commercial company. During 2014-2015 BPEX ran five study tours to various countries and events, summarised below.

Flanders, Belgium

Activity: Two farm visits looking at slurry flushing systems and bio-scrubbers

Who: A small group comprised of producers, BPEX and AIG

Sponsored by: ABN

Ireland

Activity: Two farm visits looking at ventilation systems (automatically controlled ACNV)

Who: Nine producers along with BPEX and AIG

Sponsored by: Boehringer Ingelheim

France

Activity: SPACE Pig Show

Who: Six producers along with BPEX and AIG

Sponsored by: Zoetis

Denmark

Activity: Agromek and a visit to a brand new state-of-the-art multiplier unit for SPF/Danbred to see the latest technology in action

Who: Eight producers along with BPEX and AIG

Sponsored by: Suffolk Pig Club

The Netherlands

Activity: To see how producers in the Netherlands achieve an average of 30 pigs weaned/sow/year while routinely keeping sows to eight parities and to look at feeding and managing sows for longevity and reduced replacement rate

Who: A small group comprised of producers, BPEX and AIG

Sponsored by: Zarkos-Smith Associates Ltd and SwiNco

For more information on study tours, including how to get involved, visit:
<http://www.bpex.org.uk/research-innovation/study-tours/>



Ireland study tour



Netherlands study tour

Innovation Fund

The BPEX Innovation Fund awards grants of 50-100% to pig producers or businesses who have a good idea but not enough money or support to try it out or develop it. The grant is there to help evaluate new systems and technologies. It is about encouraging investment, improving technical competence and boosting cost competitiveness in the English pig industry.

Current and recently completed projects include:

- The use of a laser torch to see how it impacts on bird prevalence
- The use of false flooring to impact on farrowing mortality and reduce straw usage
- The use of plastic matting around feeders to reduce soil erosion
- The benefits of creep feeding outdoors
- Feeder review: A range of feeders from different manufacturers were installed on a single pig unit to compare performance
- Outdoor CCTV trial to measure predation levels
- The effects on performance of effective feed delivery in dry sows
- LED lighting in dry sow arcs.



Charlotte West
Technical Innovation
Manager

Field trials

The BPEX field trials programme is a series of on-farm experiments aimed at solving herd performance problems. They are protocol-based, scientifically robust and are driven by adaptation of global knowledge.

Field trials are run on several farms for each problem area identified and are funded 100% by BPEX. Topics for field trials are largely proposed by the regional forums, whose role it is to inform BPEX of current and future production issues on farm.

The effect of different metabolic status indicators of sows during gestation and lactation on subsequent performance of sows and piglets

Duration: May 2015-2016

Aims and objectives: To address variable weights and body condition at farrowing and to improve sow longevity and lifetime performance

Expected benefits: A 10% increase in sow efficiency •

Investigation of the effect of allocating 50% and 100% more feeder space on the performance of growing-finishing pigs

Duration: April 2015-2016

Aims and objectives: To investigate the effect of doubling feeding space for growth

Expected benefits: An increase of 40g/day from 30-110kg liveweight •

Optimising the potential of the small pig through the implementation of best practice in the farrowing house

Duration: May 2015-2016

Aims and objectives: To address variable weaning weights and post-weaning performance

Expected benefits: Four days fewer to slaughter and 2% reduced pre-weaning mortality •

Investigation of the effects of varying space allowance (stocking density) on the performance of growing-finishing pigs

Duration: April 2015-September 2015

Aims and objectives: To investigate the effect of increased space allowance for growth

Expected benefits: An increase of 20g/day growth from 30-110kg liveweight •

Supplementation with omega-3 polyunsaturated fatty acids and effects on reproductive performance of sows

Duration: April 2015-March 2016

Aims and objectives: To address seasonal infertility and increase piglet viability

Expected benefits: An extra pig born per litter and 2% increase in piglet survival •

Establishing soil water movement and nitrate leaching in soils used by outdoor pigs

Duration: Two years

Aims and objectives: To develop a better understanding of the interaction between urine and faeces with the soil and consequential leaching losses

Expected benefits: A better understanding of potential leaching will help inform policy makers and allow farmers to comply with legislation with more confidence •

Evaluation of ultra-high frequency (uhf) electronic ear tags to optimise marketing strategies on farm

Duration: January 2015-February 2016

Aims and objectives: To undertake a feasibility analysis to test the practicalities of using ultra-high frequency technology on farm, integrating this data into existing management systems (on farm and at the abattoir) and using this data to inform better management decisions

Expected benefits: An improvement in FCR of 0.1 (wean-finish) and an increase in average daily gain of 50g •

Establishing ammonia emission factors for straw-based finishing pig buildings and evaluating improved ventilation systems

Duration: 14 months

Aims and objectives: To collect and evaluate data for ammonia emission levels within pig sheds

Expected benefits: Evidence of the impact of ammonia on the local environment will help to develop better emission factors •

Evaluation of a carcase cooling container

Duration: March 2015-March 2016

Aims and objectives: To evaluate the operation and performance of cooling containers for the on-farm storage of dead pigs (fallen stock) in England

Expected benefits: Potentially improved biosecurity and carcase quality for enhanced marketable yield of products derived from rendered material following storage •



Research

The aim of research is to generate new knowledge about pig production and demonstrate this new knowledge in commercial environments to remove some financial risks when investing on-farm. Work is aimed at optimising pig production efficiency, enhancing pig health and welfare, protecting the environment and maintaining safe and traceable pork that is ultimately appetising to the end consumer.

Health

High standards of pig health and welfare throughout production help to protect food safety and public health at the abattoir. Maintaining these standards, along with traceability, help to build trust in pig meat products with the consumer.

Public health and food safety within the pig sector is of high importance. The current approach to maintaining public health is mainly through a risk management approach. Risk reduction strategies for the control of zoonoses (animal diseases that can be transmitted to humans) are applied throughout the pig meat production chain.

The Pig Health and Welfare Council Surveillance Subgroup Exotic and Emerging Diseases Roundtable in April 2014 developed a series of recommendations to strengthen the UK pig industry's defences against the introduction of new and notifiable diseases and to improve preparedness to identify quickly, contain and eliminate new disease agents.

Part of the BPEX 5-Point Plan includes minimising the risks from endemic and exotic disease by establishing effective biosecurity tools and technologies •

Pig Health and Welfare Council

2014 saw changes to the structure of the established Pig Health and Welfare Council (PHWC) from the 20:20 strategy with eight objectives to a more streamlined four key strategic priorities. The reduction has allowed the council to focus on four key areas which are of significant importance to the industry, while capable of adapting to any unforeseen changes that may appear on the horizon.

The PHWC subgroups now cover the following areas:

- Welfare Subgroup – Enhancing pig welfare
 - Pig Meat Food Safety Subgroup – Enhancing pig meat food safety
 - Disease Surveillance Subgroup – Improving preparedness for exotic and emerging diseases
 - Antimicrobials Subgroup – Reducing antimicrobial use in pig production
- The proposed reorientation of the PHWC strategy into these four themes did not infer that other strategic themes, such as minimising the impact on the environment, were no longer of key importance to the industry and wider stakeholders. It is acknowledged that the PHWC may not be the most appropriate forum to affect change in these areas and that a more precisely defined set of strategic themes could culminate in more tangible delivery and success.
- The new subgroups, as well as the PHWC, have established key milestones for each group for 2015. Further detail can be found on the BPEX website:
- <http://www.bpex.org.uk/health-welfare/pig-health-welfare-council>



Martin Smith
Veterinary Team
Manager

PED contingency planning

The Disease Surveillance Subgroup of the PHWC has been actively involved in the development of an industry-wide contingency plan against the highly pathogenic strains of Porcine Epidemic Diarrhoea virus (PEDv). The contingency plan has been a collaborative effort between the pig sector, Defra, APHA, PVS, NPA, BPA, BMPA and other allied industry groups.

The contingency plan outlines what will happen in the event of an outbreak in England, which would include intensive cleaning and disinfection of the first five sites on which the disease is detected. Following the first five cases, any subsequent cases would be monitored and supported as laid out in the plans. A considerable amount of work has been carried out to fulfil the requirements of the plan, which includes:

- Developing Standard Operating Procedures (SOPs) for controlling the disease
- Implementing testing on ALL porcine diarrhoea samples through APHA for suspect PED

Health

- Creation of PED sample packs to go out to farms in advance of an outbreak
- Creating a PEDv disease questionnaire and database for epidemiological purposes in the event of an outbreak
- Delivery of a 'Significant Diseases Charter' to the industry to provide data sharing and rapid alerts of outbreaks to subscribers in the event of the disease
- Maintaining open global communication channels to promote exchange of knowledge and to ensure the latest understanding of the disease situation.

Work continues on further development and refinement of the contingency plan in the absence of the disease, with the aim of testing the measures already set in place autumn of 2015. The contingency plan remains a living document and will continue to develop as more information becomes available ●

Antimicrobial strategy

The topic of 'One Health' and the prudent use of antimicrobials across the veterinary and human medical fields have been of increased public interest over the past few years. The

European Union is now introducing measures which will require each member state to be able to quantify antimicrobial usage within each sector. This process is a considerable task, to which the PHWC Antimicrobials Subgroup are taking a lead. BPEX is actively involved in three main areas of delivering this strategy:

- Creating a data platform: To facilitate collection and reporting levels of antimicrobial usage
- Running study tours: To develop a better understanding of existing approaches in reducing antimicrobial usage
- Research and field trials: Bringing the latest technology and concepts in medication and pen-side diagnostics to the producer to help to reduce reliance upon antimicrobials.

BPEX aims to deliver tools and resources to the producer and wider industry which assist in the wider aim of reducing antimicrobials in the pig sector. These resources need to be practical and not burdensome to the producer and BPEX will continue to work with key producer groups and consult wider industry throughout the process ●



Research projects • Health

The use of oral fluid from pig populations for the diagnosis and monitoring of infectious disease

Research partner: Newcastle University

Sponsor: BPEX-funded studentship (Lorna Dawson)

Duration: 2011-2014

Aims and objectives:

- To develop diagnostic testing for the detection of European strains of PRRSv and Salmonella infection in UK pig herds, using oral fluid (OF)
- To find out how to get good quality oral fluid samples that truly represent the total population for large group sizes of pigs.

Findings to date:

- Provision of multiple cotton ropes may improve representation of pen-based OF samples in weaned but not finishing, pigs in straw-based systems
- A single cotton rope can result in a pen sample representative of 40% of the total population, approximately four times more than current blood testing recommendations
- FTA cards* may provide a simple and safe means of storing/shipping porcine OF for PRRSv testing without the need for chilling
- Porcine OF shows good but not total, agreement with blood serum for anti-PRRS antibody testing
- The next stage of the project is serial OF collection following weaned pens through growth for anti-PRRSv antibody detection and real time PCR testing of dry stored field OF to validate FTA card* method for PRRSv monitoring.

* *Flinders Technology Associates (FTA) cards: bind and store nucleic acids at ambient temperatures*

Further information

Research into Action factsheet 13: Measurement of Acute Phase proteins •

Mycotoxin contamination: Assessment of risk in livestock systems

Research partners: Food and Environment Research Agency (Fera), The Queen's University of Belfast, Harper Adams University, Raft Solutions Ltd.

Sponsor: AHDB

Duration: 2014

Aims and objectives:

- To determine the severity of the mycotoxin problem in the UK
- Highlight research gaps
- Formulate mitigation advice for farmers
- Collate evidence for regulatory processes •

Validation of automated screening for pathologies at abattoir

Research partner: Tulip Ltd

Sponsor: BPEX

Duration: 2014-2017

Aims and objectives:

To validate and develop effective knowledge exchange for the outputs from a parallel project which will:

- Develop and deploy multi-camera recording infrastructure that enables capture of images of carcasses
- Acquire image data sets and have experts annotate pathologies in these images
- Develop and refine algorithms/software that can automatically recognise pathologies
- Validate these algorithms on large scale datasets and disseminate results to relevant users •

Research projects • Health



Antimicrobial use in the pig industry

Research partner: Octagon Services Ltd

Sponsor: BPEX

Duration: 2012-2014

Aims and objectives:

- To identify areas of difficulty around collecting antimicrobial usage data for the English pig herd and trial different methods of collection
- To determine what volume of antimicrobials are used in the English pig herd, providing a benchmark to inform the industry of our current standing in comparison to other EU countries
- To inform the current debate on antimicrobial usage.

Findings to date:

- Data was collected from vet practices, integrated production companies and feed mills, to gain a full view of how antimicrobials are prescribed, dispensed and recorded
- A benchmarking tool has been created to help producers and their vets measure antimicrobial usage specific to that farm and therefore be able to set targets for reduction where appropriate
- The industry can now start to address data gaps and improve data provision throughout the supply chain •

Enhancing the impact of regional health improvement programmes

Research partner: Warwick University

Sponsor: BPEX-funded studentship (Daniel Franklin)

Duration: 2010-2014

Aims and objectives:

- To help the pig industry understand how porcine reproductive and respiratory syndrome (PRRS) and swine dysentery (SD) persist in the national herd
- To develop mathematical simulation models to help understand the role of the metaherd in the spread of PRRS
- To use these models to test control and intervention strategies across the metaherd.

Findings to date:

- The use of vaccinations in the metaherd was simulated
- The metaherd level gives an indication of what extent PRRSV reduces productivity from a regional perspective
- Results suggest that fadeout within the metaherd does not occur once infection has spread to herds >150 sows
- Results suggest that a loose threshold herd size exists, between 100-150 sows, below which infection does not persist in a herd •



New approaches to diagnostics of *Haemophilus parasuis* related disease

Research partner: University of Cambridge

Sponsor: BPEX-funded studentship (Kate Howell)

Duration: 2011-2014

Aims and objectives:

- To bring the UK to the forefront of *H. parasuis* (HPS) diagnosis
- To develop sensitive and specific tools for the detection of the organism in field material
- To assess the value of vaccine in the control of disease outbreaks.

Findings to date:

- Statistically significant markers for serotype and for different disease categories for *H. parasuis* have been found
- The next stage is to determine which combination of markers gives the best probability of disease causation and to design the molecular diagnostics
- Markers could be able to predict:
 - Disease
 - Serotype
 - Antibiotic Resistance •

Towards an eradication strategy for *Mycoplasma hyopneumoniae* from the UK pig herd

Research partner: The Royal Veterinary College, Veterinary Laboratories Agency, BBSRC

Sponsor: BPEX-funded studentship (Veronica Brewster)

Duration: 2009-2014

Aims and objectives:

- To develop and validate immunohistochemistry (IHC) as a diagnostic tool for *Mycoplasma hyopneumoniae*
- To determine the impact of enzootic pneumonia-like (EP-like) lesions on post trimming carcase weight
- To undertake a feasibility assessment on the eradication of *M. hyopneumoniae*.

Findings to date:

- A significant association was identified between increasing severity of EP-like lesions and a decrease in post-trimming slaughter weight
- On an individual level, each 5-point increase in EP-like lesions equates to around -53p/pig
- On a batch level, each increase of 1-point score equates to -50p/pig
- An increase in EP-like lesion severity was significantly associated with an increase in slaughter age •

Research projects • Health

Reduction of pathogen load in the environment of pigs (*Mycoplasma hyopneumoniae*)

Research partner: Royal Veterinary College

Sponsor: BPEX-funded studentship (Christopher Browne)

Duration: 2012-2015

Aims and objectives:

- To identify novel and alternative methods to reduce pathogen load in the environment of pigs and reduce the use of antibiotics
- To determine the efficiency of
 - i) UVA activated photo-catalytic paints
 - ii) Silver ion solutions
 - iii) UV-based air purification system against *Mycoplasma hyopneumoniae* (M. hyo) in the environment of pigs.

Findings to date:

- The minimum effective dose of silver ions to successfully inhibit the growth of *M. hyopneumoniae* was determined; studies were carried out to assess the duration of the inhibitory effects
- Four photocatalytic paints were tested under a range of UVA intensities, the results of the inhibitory effects of the paints, alongside the integrity, were considered when selecting the paint to use in vivo
- The in vitro analysis has shown that both UVC and photocatalytic paints are effective at inhibiting growth of *M. hyopneumoniae*
- Further analysis is needed from the in vivo work to establish whether these methods may be of benefit to the pig industry •

M. hyopneumoniae exposed to silver ions after 20 minutes

Welfare

One point in the BPEX 5-Point Plan is dedicated to enhancing pig welfare. The aim is to help pig producers comply with existing and emerging legislation and achieve recognition for progress made in reducing environmental impact. This workstream aims to:

- Support the development of Real Welfare as part of farm assurance
- Develop the communication of welfare measures to producers and vets
- Develop support packages to help producers and vets enhance pig welfare
- Monitor, interpret and seek to inform developments in welfare regulations in conjunction with industry representative organisations.

We aim to provide up-to-date training and advice on welfare issues to help pig producers comply with existing and emerging legislation. Current important themes include:

- Provision of environmental enrichment
- Freedom around farrowing
- Solutions to tail biting
- Tail-docking and teeth-clipping
- Euthanasia of sick/injured pigs.

The welfare activities of BPEX in 2014-2015 mainly centred around the continued support of the Real Welfare assessment scheme. Required under the Red Tractor Pig Scheme for all units that finish pigs, BPEX owns the assessment protocol and hosts and maintains the IT infrastructure for data collection and submission.

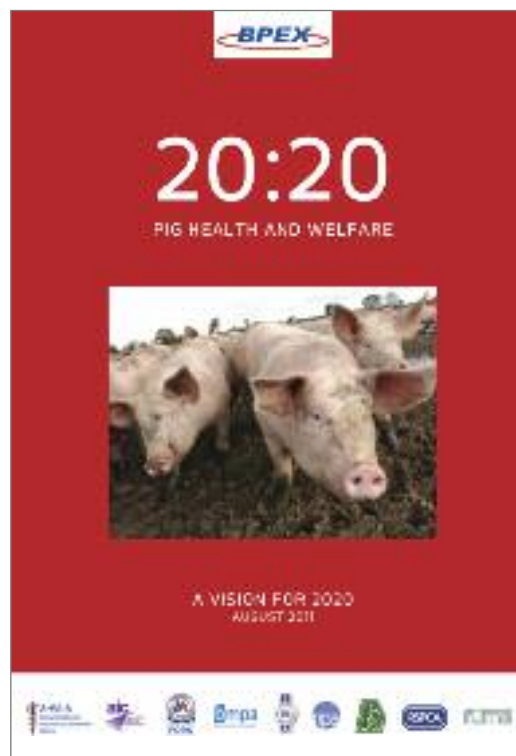
All vets were and continue to be, trained in the welfare outcome measures by BPEX and a refresher course is being developed. The Real Welfare Scheme had a rocky introduction in 2013. Following changes to the protocol, the past year seems to have brought some stability and increased acceptance of the Scheme. The protocol remains under continual review by the Steering Group who meet twice a year.

A big leap forward in bringing the Scheme closer to producers is the upload of the Smartphone data collection apps onto the Google and Apple app stores. The apps allow electronic data collection and submission but most importantly, they immediately display the graphs on the outcome of the assessment and allow comparison with the overall averages. This helps pinpoint areas for increased focus if needed. The apps also work in areas where there is no network connection. Although the apps are aimed at vets who can then discuss results immediately with their clients, from next year, producers will also be able to access their results themselves directly and automatically via Pig Hub •



Katja Stoddart
Health and Welfare
Projects Manager

BPEX continues to work closely with the pig industry, government, universities and allied industry organisations to further enhance the welfare of pigs throughout their production life on farm, during transport and at slaughter.



Smartphone data collection app



Nigel Penlington
Environment and
Building Manager

Environment



The environment and the effect pig production can have on it is becoming increasingly important. It forms part of the BPEX 5-Point Plan under the banner of protecting the environment, with BPEX aiming to help pig producers and processors comply with existing and emerging legislation and achieve recognition for progress made.

Activity includes:

- Setting up a business support service to advise on reducing environmental impact, compliance with planning rules and environmental regulations
- Monitoring, interpreting and helping to inform environmental policy and regulations in both the UK and EU
- Capturing the progress made by the English pig industry and helping to ensure this is communicated effectively.

AHDB Environmental and Agricultural Resource Efficiency Tool (EAgRET)

Aims and objectives

- To develop a calculator to build awareness and understanding of how physical performance and farm management decisions on the use of resources (including land) determine environmental impacts and associated economic impacts
- To show how a user-friendly, computer-based calculator can be used in AHDB's interactions with UK farming and supply chain businesses to investigate the outcomes from possible changes that might be made to farming systems

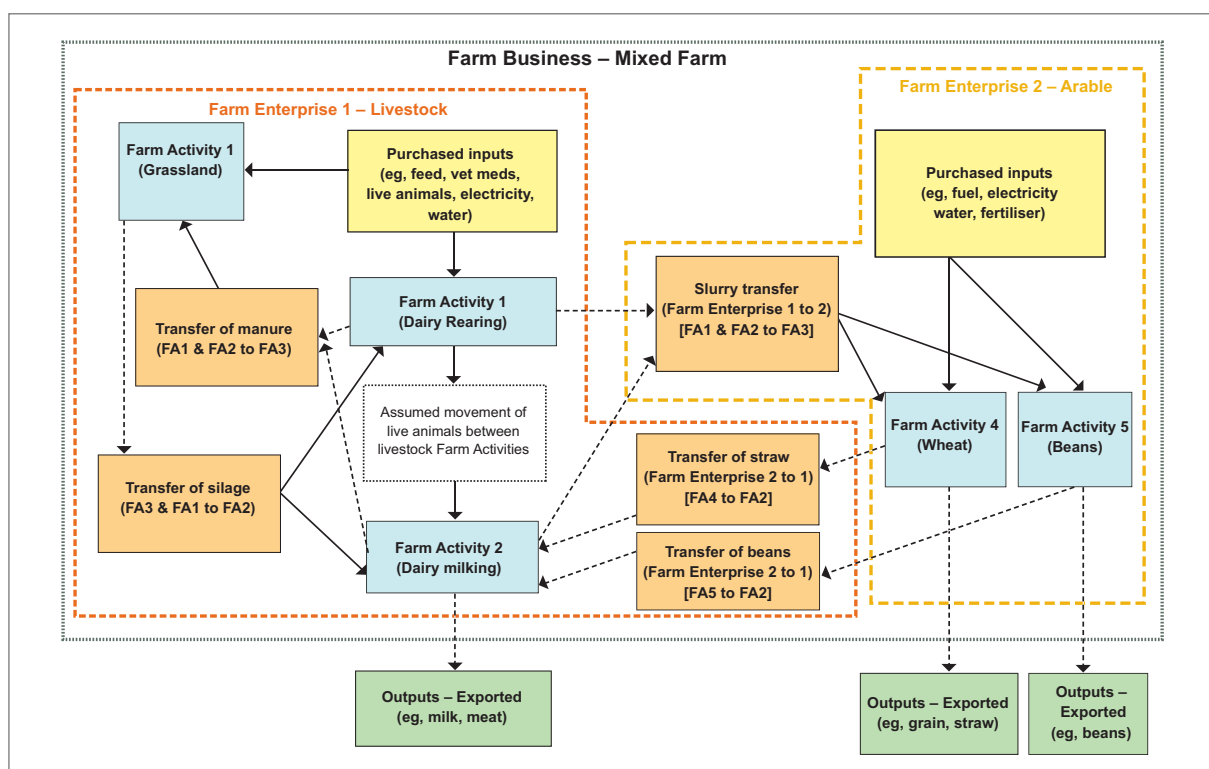
- To commission the development of the tool to better understand and thereby inform discussions with government departments and other important stakeholders.

The tool

- Based on a library of default data and user-modifications, it will allow users to explore the effect on resource use efficiency of changes in farming practice that might arise from government strategy or technical innovation
- Will enable comparisons of scenarios by a trained user
- Will provide outputs in a form that can be easily used to explain the effects of the scenarios to non-technical audiences
- It is not expected that the tool will enable individual farm businesses to make management decisions but does provide an indication
- Is in the process of being tested across the AHDB sectors.

Expected users of the tool

- Specifically trained AHDB staff



EAgRET

Expected audiences for the outputs of the tool

- Government policy makers
- Strategic decision makers in businesses throughout the agri-food chain
- Farmers, through interpretation by a knowledge transfer agent (eg AHDB regional teams).

Environmental Permitting (EPR/IPPC)

The Environmental Permitting Regulations (EPR) [formally the Integrated Pollution Prevention and Control (IPPC) Directive] aim to reduce pollution from industrial activity by controlling emissions. Permitted sites are required to adopt minimum standards of management practice and Best Available Techniques (BAT) for their production processes.

Aims and objectives

- To update all the BPEX model templates and associated documents to match the new application forms from the Environment Agency (EA).

Achievements to date

- Guidance for completing a full application with model templates, including all the necessary supporting documentation, have been completed and are on the BPEX website
- The Environment and Building Team is providing training and telephone support in their use
- The team is helping producers understand the EA's ammonia screening tool outputs and how application of Best Available Techniques (BAT) and/or altering how air is exhausted from buildings can alter the results, which can help sometimes, to change a fail to a pass
- BPEX has been heavily involved in representing the UK in reviewing the EU's Best Available Techniques Reference Document (BREF) draft document. This has included determining which aspects or products will be deemed as BAT and the emission levels ascribed to them. Emission levels are of particular importance because there will become limits below which farms will have to operate.

For further information and copies of the templates, visit the Environment and Buildings area of the BPEX website: <http://www.bpex.org.uk/environment-buildings/permitted-agriculture-eprppc/>

Thermal management for efficient production

The Environment and Building team is now using thermal imaging to help assess the condition of pig housing as part of its 'closing the gap' strategy. This includes pinpointing where heat is leaking out of buildings, areas with poor/no insulation, cold/damp areas and structural issues such as cold bridging. The main aim of the work is to improve pig production efficiencies and the health and welfare of the livestock on a unit. The team is combining the use of the camera with air movement indicator tools to assess ventilation in buildings. It is also possible to pinpoint areas of high ammonia concentration within pens.

Defra's fertiliser manual: RB209

RB209 is used by agricultural consultants, farmers and individuals and organisations concerned with developing and maintaining a sustainable agricultural industry. AHDB has taken responsibility for updating and modernising this document, which will also include the values of slurries and manures. The updated manual is due to be published in 2017.

Sector specific soil management information for outdoor pigs

Aims and Objectives

- To provide information and guidance on soil management for outdoor pigs.

Achievements

- A best practice guide on good soil management for outdoor pigs has been produced
- Four new video clips on soil management for outdoor pig units have been added to the BPEX Practical Pig App and website.

Further information

Practical pig app: <http://practicalpig.bpex.org.uk/>

Good Soil Management Practice A Guide For Outdoor Pig Keeping:
<http://www.bpex.org.uk/media/72701/good-soil-management-practice-report.pdf>

Research



Research projects • Environment



Carcaase coolers

Feasibility study on the desirability of the UK pig industry adopting carcass cooling as an on-farm method for the storage of fallen pigs prior to disposal

Research partners: FABRA, Harper Adams University

Project duration: April to August 2014

Aims and objectives:

- To conduct a detailed evaluation on-farm carcass cooling systems in Denmark and the Netherlands
- To assess the feasibility of implementation of on-farm carcass cooling for the UK pig industry.

Potential benefits

On-farm cooling of fallen stock prior to collection and rendering may provide significant economic, environmental and biosecurity benefits to the UK pig industry. Potential benefits include:

Economic

- An increase in the storage time and collection interval and potentially reduced costs associated with carcass disposal
- Maintaining the quality of carcass material sent to renderers may increase the yield and quality of the rendered products and their economic value
- The introduction of some carcass cooling systems may be cost effective with relatively short payback periods

- Pillar 2 common agricultural policy funding may be available to encourage the development and uptake of on-farm carcass cooling.

Environmental

- Secure on-farm storage and containment of fallen stock
- A reduction in odour emissions produced during storage, transportation and rendering and a reduction in the costs associated with odour control
- Increased compliance to legislation regarding the treatment and disposal of fallen stock (both on-farm and by processing plants)
- Enhanced public perception of the animal by-product industry.

Biosecurity

- Secure on-farm storage and containment may prevent access by wildlife, rodents and flies
- Appropriate siting of on-farm storage facilities could reduce the possibility of disease transmission and improve biosecurity
- A reduction in the frequency of collection visits and vehicle movements between farms may reduce the possibility of disease transmission and improve biosecurity
- Increased farmer awareness of biosecurity and disease prevention, including retention of resulting juices.

Further information: <http://www.bpex.org.uk/research-innovation/research/environment/>

Research projects • Environment



Ammonia sensors

Development of an ammonia and carbon dioxide sensor for pig buildings

Research partner: Harper Adams University

Sponsor: BPEX

Duration: 2013-2014

Aims and objectives:

- To develop an affordable sensor for use on pig farms to assess the performance and environmental impact of new buildings and/or feeding regimes
- To compare the performance of the sensor with commercially available (photoacoustic) equivalents.

Findings to date:

- The sensor (LGD F200 sensor) has been tested in the laboratory and on the Harper Adams University farm, it was shown to be suitable for use in the pig buildings monitored
- A high degree of sensitivity can be obtained
- Overall it was cost effective when compared to the commercially-available system
- Recommendations include regular calibration of CO₂ and installation of water traps outside the unit for operation in cold temperatures
- The sensor has been run in a commercial building and it has been proven that it will run reliably
- The next stage is for the sensor to undergo independent evaluation against a gold standard analyser •

Pig carcase bio-reduction using Anaerobic Digestion (AD) Stage 2

Research partner: Harper Adams University

Sponsor: BPEX and Defra

Duration: 2013-2015

Aims and objectives:

- To develop anaerobic digestion (AD) to optimise biogas production, bio-reduction and pathogen destruction
- To produce a report for the European Food Standards Authority (EFSA) to find out whether AD can be accepted as a safe means of disposal of fallen pigs under EU legislation
- To determine the optimum conditions for AD of porcine carcase material (PCM).

Findings to date:

- Significant levels of biogas can be produced from AD of PCM
- AD of PCM was more efficient and stable at 35°C than 55°C
- Pathogen destruction was greater at 55°C than 35°C and reduction of spore-forming bacteria such as C.perfringens was minimal at 35°C
- Small scale on-farm systems may be a cost-effective alternative to incineration or collection •

Reducing the excretion of phosphorus (P) from growing and finishing pigs – development of a decision support tool

Research partner: Newcastle University

Sponsor: BPEX funded studentship (Vasilis Seymou)

Duration: 2010-2014

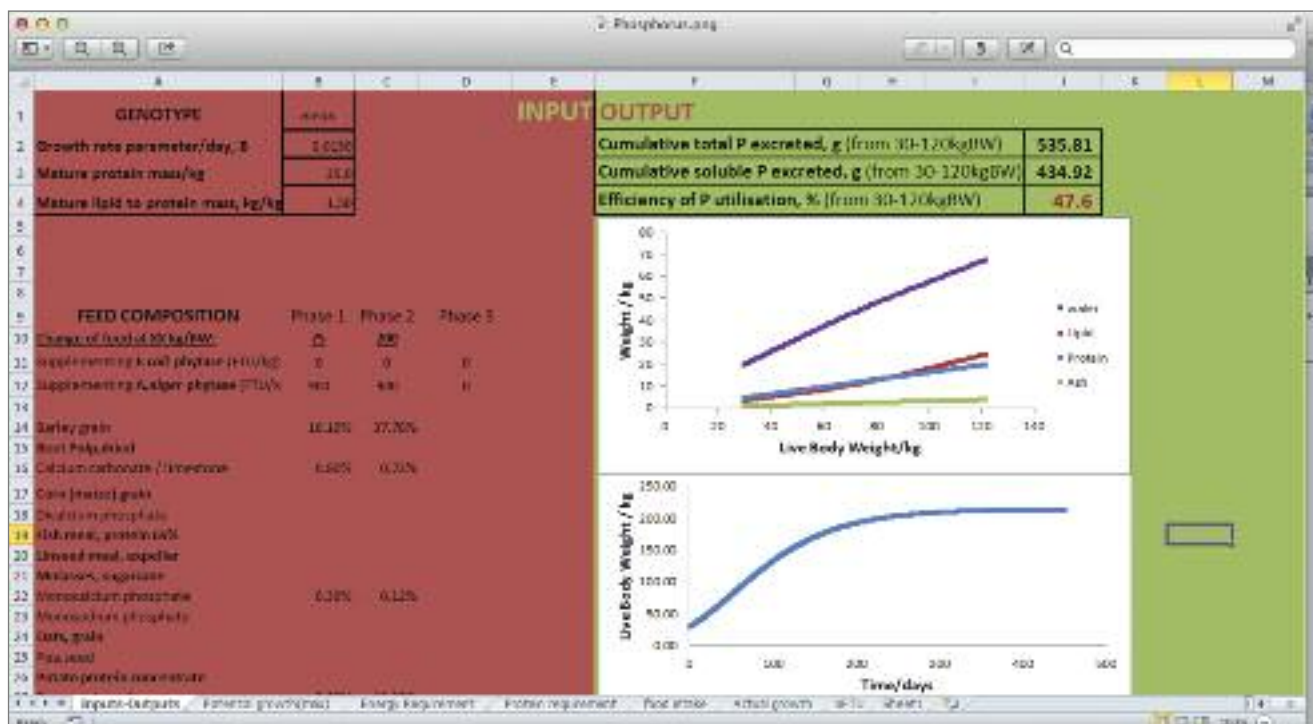
Aims and objectives:

- To extend an existing pig growth model in order to predict P excretion in the environment under different feeding scenarios for different pig genotypes
- To enable the formulation of pig diets that maximise P utilisation while minimising P excretion to the environment.

Findings to date:

- One recommendation is that the feed industry should provide a clear indication of the phytase activity in terms of phytase units (FTU)
- There could be enormous value in this work and other if nutrition and breeding companies could share information and collaborate to provide relevant information regarding standard growth rates and feed intake

- The model showed that leaner genotypes excrete less P but gross efficiency of P utilisation is lower when both lean and fatter genotypes are given access to the same food. This is because they need to eat less food to put on a kilogram of weight
- Some ingredients have a more positive consequence in terms of P excretion than others and the model allows this to be assessed
- Phase feeding follows the law of diminishing returns, ie less benefits are expected in terms of P excretion if one moves from 3 to 4 phases
- Sorting by weight as a feeding strategy does not produce returns from an environmental perspective compared to other feeding strategies, but can produce returns from a pig growth point of view
- The model suggests that variability in feed composition will have substantial effects on P excreted from groups of pigs
- The model will consider different growth characteristics based on genotype



Example output from the decision support tool

Research projects • Environment



Environmental and nutritional benefits of bioethanol co-products (ENBBIO)

The ENBBIO LINK project was a collaboration involving 25 industry and academic partners, sponsored by Defra through the Sustainable Livestock Production LINK programme.

Project duration: 2010-2014

Aims and objectives:

- To quantify the chemical composition of UK wheat Dried Distillers Grains with Solubles (W-DDGS) and other co-products
- To identify the limitations associated with feeding W-DDGS
- To identify routes to improving nutritional value of W-DDGS
- To test the modified and improved W-DDGS products using ruminant and non-ruminant species
- To quantify the overall benefits of W-DDGS production on reducing diffuse pollutants and enhancing home-grown protein production.

Findings to date:

- The project has established the ideal digestibility of W-DDGS
- W-DDGS from a modern bioethanol plant is very consistent in quality and the protein content of it is less variable than the original wheat used at intake
- W-DDGS has been used to successfully replace a significant proportion of the soya protein in poultry and dairy diets; analysis to understand animal responses and commercial value is ongoing
- Small scale farm feeding trials have been completed, monitoring growth through to carcase composition and quality
- Results will be published in summer 2015 •

Production efficiency

The English pig industry has a large variety of production systems including indoor units, outdoor units, straw based and slatted accommodation. This mixture makes the industry very different from our global counterparts and BPEX aims to narrow the technical performance gap between English pig producers and our competitors.



Steve Winfield
KT Lead and Corporate
Account Manager

Research projects • Production efficiency



The contribution of oocytes and follicular fluid to pig fertility

Research partners: The Roslin Institute, University of Edinburgh

Sponsors: BPEX-funded studentship (Selene Jarrett)

Duration: 2014-2018

Aims and objectives:

- To identify differences in the molecular composition of follicular fluid as a result of a high fibre diet
- To identify nutrition dependent molecular mechanisms involved in blastocyst development
- To optimise oocyte maturation environment *in vivo* and *in vitro* •



Sorting pigs at weaning in order to reduce variability and improve the efficiency of pig production systems

Research partners: Newcastle University

Sponsors: BPEX-funded studentship (Anne Huting)

Duration: 2014-2018

Aims and objectives:

- To reduce variability within pig groups through management and by doing so improve the efficiency of production systems
- To investigate the consequences of different management strategies on lifetime performance of light, normal and heavy pigs
- To develop cost-effective feeding regimes •

Strategies for the optimisation of finishing places

Research partners: Harper Adams University

Sponsors: BPEX

Duration: 2014-2015

Aims and objectives:

- To improve the efficiency of pig production in the final finisher phase, by having clear strategies for pen emptying
- To determine daily live weight gain, food conversion ratio and daily feed intake for groups of finisher pigs from 70-100kg live weight
- To investigate the effects of drawing pigs for slaughter from a pen on the performance of the remaining pigs
- To devise a spreadsheet for an optimal management system •



Improving udder quality traits in sows to aid survival, health and lifetime performance of piglets

Research partners: Newcastle University

Sponsors: BPEX-funded studentship (Agnese Balzani)

Duration: 2012-2015

Aims and objectives:

- Develop a methodology to describe a sow udder (eg conformation, ease of colostrum extraction)
- Determine the causes of udder conformation variation and define how measures change over the reproductive cycle and lifetime of the sow
- Investigate the relationship between udder conformation and piglet suckling behaviour and litter performance

- Evaluate an on-farm method to estimate colostrum quality and study the relationship between udder morphology and colostrum quality
- Estimate the heritability of key udder traits and colostrum quality and their genetic correlations with other important maternal selection criteria.

Findings to date:

An ideal udder:

- At least 12 functional teats
- Teats situated equal distance from one another
- Small teat length and diameter
- Close to the abdominal mid-line •



Emma Bailey-Beech
Health Information
and Food Safety
Coordinator



Ouafa Doxon
Health Information
and Food Safety
Coordinator

Food hygiene is vitally important and there are many regulations covering abattoirs. These regulations govern general food hygiene but there are further rules and regulations for meat. Food business operators of pig abattoirs must also comply with regulations that govern animal welfare and animal health.

Pork safety and product quality



The fourth point of the BPEX 5-Point Plan addresses the area of safe and traceable pork. BPEX aims to help producers and processors produce pork that continues to be safe and which consumers can have confidence is fully traceable from farm to finished product.

BPEX aims to:

- Support the pig meat supply chain in producing wholesome pork products with safety, provenance and integrity from farm to fork
- Promote the use of isotope tracing using SIRA (Stable Isotope Reference Analysis) tool through the supply chain
- Work with RUMA and PVS to reduce the need to use antimicrobials
- Set up a technical processor forum on food safety and traceability •

Research projects • Pork safety and product quality

The infection biology of pig-associated *Salmonella*

Research partners: Liverpool University

Sponsors: BPEX-funded studentship (Georgina Crayford)

Duration: 2010-2014

Aims and objectives:

To infect pig intestinal epithelial cells with different strains of serovars and to characterise:

- The behaviour of *Salmonella*
- The immunological response of the epithelial cells upon invasion of the bacteria
- Any differences that might exist between the strains.

The overall objective was to add to the current limited knowledge of the pathogenicity of monophasic *S. Typhimurium* DT193 isolates and determine the reasons behind their rapid and worldwide spread in recent years.

This work is in line with the UK Food Standards Agency (FSA) strategic plan to reduce the numbers of pigs testing positive for *Salmonella* at slaughter.

Findings:

- It is necessary to maintain awareness of the presence of epidemic strains and improve surveillance
- This study has gone some way towards contributing to understanding the host-pathogen interaction
- It has shown that monophasic isolates of *Salmonella* present in British pig herds possess a range of virulence characteristics
- Attempts to limit their spread and prevent their entry into products destined for human consumption should be made, particularly since they carry antimicrobial resistance •

Development of novel technology for boar taint detection to assist with the production of taint-free pork

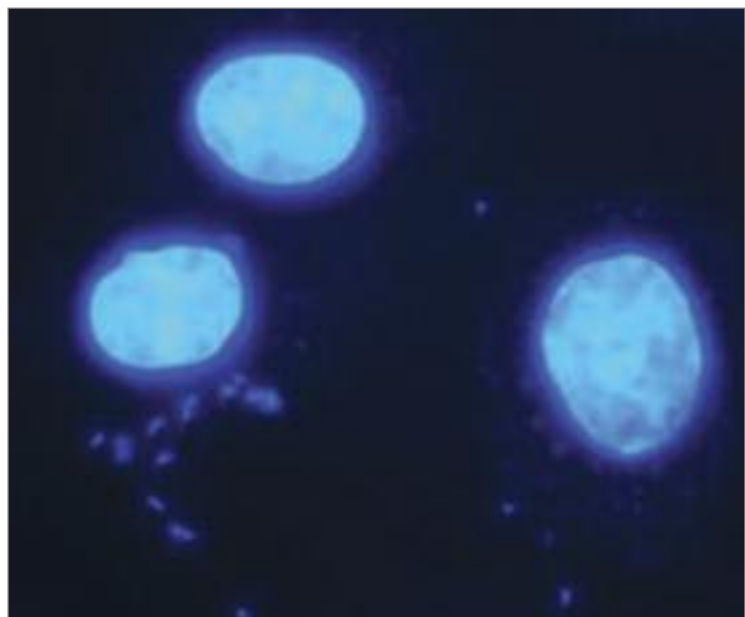
Research partners: University of the West of England

Sponsors: BPEX-funded studentship (Kelly Westmacott), JSR Genetics

Duration: 2014-2018

Aims and objectives:

- To fully characterise a UWE patented measurement system for abattoir use, which will be able to simultaneously determine the taint compounds
- To provide rapid results to prevent tainted meat reaching the consumer
- To assist research into taint prevention methods:
 - Genetic selection
 - Vaccination
 - Dietary manipulation
 - Other potential strategies
- To ultimately improve customer satisfaction and increase competitiveness of the UK pig industry •



Salmonella attaching to and invading porcine intestinal epithelial cells

Events

During the year the BPEX Technical team held a one-day technical conference at Stoneleigh Park, showcasing the latest innovation in feeding and a series of half-day events around the country looking at how to optimise kilograms sold per square metre. These were in addition to the pig clubs and workshops run by the regional KT managers. These national events attracted over 370 delegates in total, both producers and allied industry.



Innovation Conference

Aimed at forward thinking owners and farm managers, vets and allied industry.

Topics covered included:

- Future pig feeding
- Feed blending
- Gestal wireless lactating sow
- Outdoor ESF
- Precision feeding
- What might we be feeding pigs in 2020?
- What answers might plant breeding provide to pig nutrition?
- Innovations in recording and management systems

Presentations, podcasts and videos can be accessed online at:
<http://www.bpex.org.uk/events/conferences/2014/>

- How I use data to drive my business
- How data can be used in the pig sector (PIVIT)
- How we might use data to make better
- Precision pig farming in 2020.

Regional producer events

Aimed at farm managers and stock people.

Topics covered:

- Optimising weaned pig quality
- Managing the small pig at weaning
- The growth challenge
- Winning the Numbers Game.

Tools

Tools

As well as a wide range of publications BPEX also provides an array of online and on-farm tools for the benefit of producers and allied industry. Some of these tools are listed below and all can be accessed or requested via the BPEX website:

<http://www.bpex.org.uk/publications-tools/>

Online

Calculators

Ranging from cost of production, PMWS severity estimation and PMWS economics to antimicrobial benchmarking.

Practical pig app

Short video clips that demonstrate practical management techniques on farm.

HR Toolkit

Includes resources such as a new staff induction template, skills matrix and appraisal form template.

Quizzes

Interactive quizzes to test your knowledge and learn as you go along.

Recording toolkit

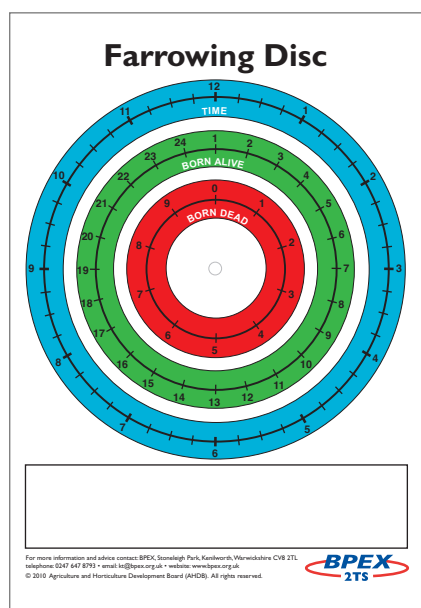
A toolkit of resources to help businesses understand trends and patterns in herd performance data as well as establishing what information is most useful to observe on a weekly, monthly and quarterly basis.

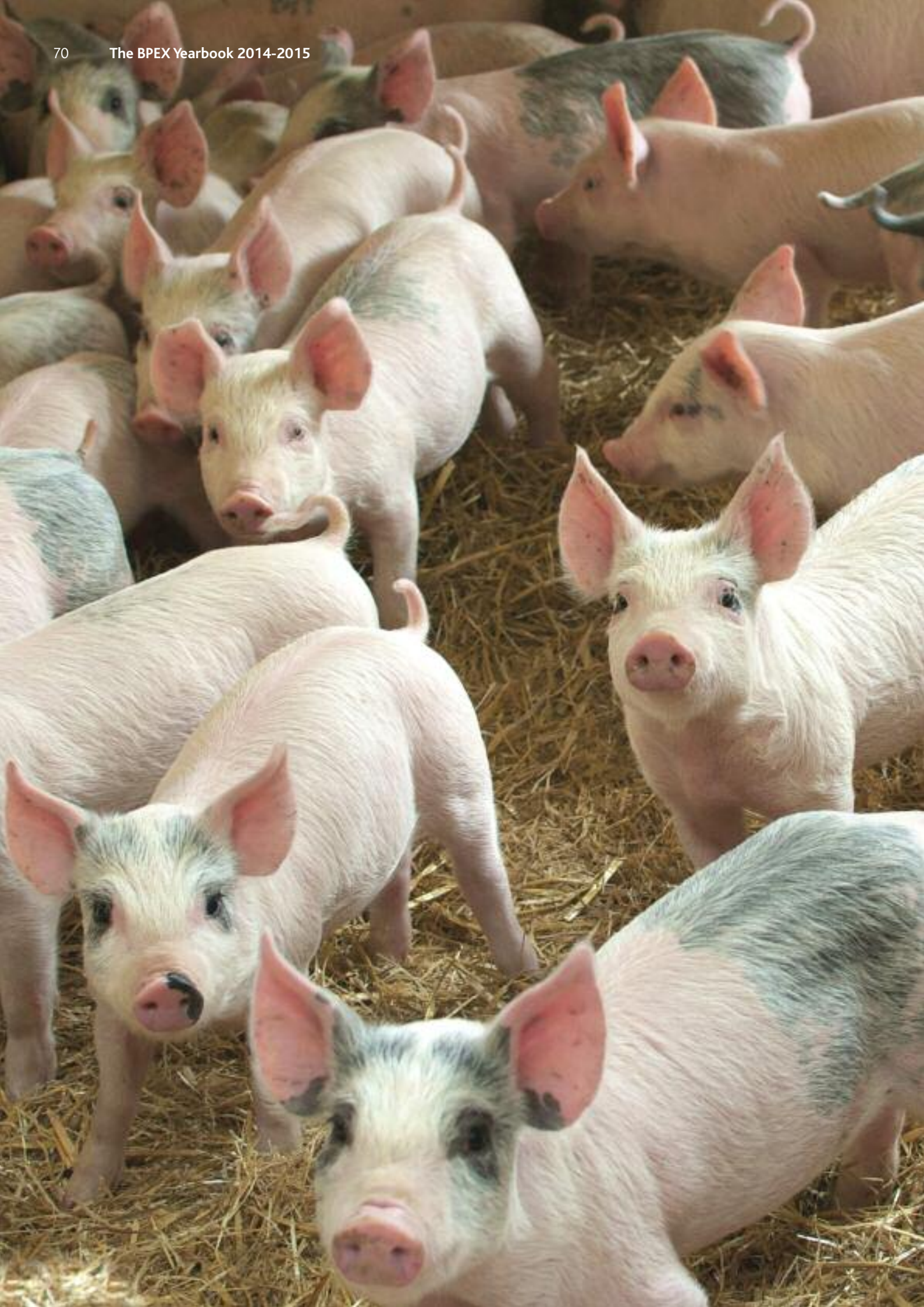
Antimicrobials tool

A tool to help producers comply with Red Tractor Assurance Pig Scheme requirements, effective from 1 October 2014.

On-farm

- Farrowing discs
- Biosecurity fence/gate signs
- Clipboards
- Magnets (medicated feed notice for feed bins and vet med information for fridges)
- Hand sanitisers.





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AHDB Pork
Agriculture and Horticulture Development Board
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

tel: 024 7647 8793

fax: 024 7647 8903

www.pork.ahdb.org.uk

AHDB Pork is a division of the Agriculture and Horticulture Development Board