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## United Kingdom systems of intensive pig production

by J. W. P. CURTIS

THE ECONOMIC CLIMATE at any given time dictates courses of action to the farmer to a large extent. The greater the changes in this climate the more drastically will the producer consider altering his methods. We are currently living in a somewhat difficult and ever-changing environment with problems such as alterations to the support system and our probable entry into Europe very much in our minds. These will affect our systems of management and will place the emphasis even more on efficiency and return on invested capital: this usually results in further intensification in our production systems.

Much of the work in intensive pig production seems to have taken place on the eastern side of the country where the main farm enterprise is grain growing. There is no doubt that this system of farming has been highly profitable but, after a while, it has become obvious that some break would be needed in the all-grain rotation. Of the different livestock enterprises pigs seem to offer the best return and seem to dovetail well into the established system. After all the grain is there, so is the straw, and the handling of these materials is already highly mechanised.

Pig herds began to appear on the large arable farms and these were farmed extensively on grass breaks as part of the rotation. Basically, this involved housing the sows and their progeny in half round wooden huts either in fenced one-tenth of an acre grass paddocks or, alternatively, grazing extensively on a field basis employing communal creeps and multiple suckling. This system gave a healthy, hardy weaner at eight weeks of age which grew very quickly when finished indoors on an intensive feeding regime. However, weaning weights were low, worm problems were acute, recording and improvements to stock were difficult and labour requirements were high. It was all plain sailing during the summer months, but who wanted the job of catching and castrating a batch of piglets on a wet and windy March morning in a 10-acre field? Pigs and huts had to be kept on the move to utilise fresh land, otherwise a quagmire resulted and it soon became obvious that the cost of supplying such services as water and adequate fencing was becoming prohibitive.

So the next step was to house the stock on a patch of concrete during the winter months and allow them grazing in the summer. This was probably the first real step in intensification. With this "concrete

farming" came health problems and a number of pioneers had poor results. However, the advances in veterinary science averted disasters and the system became quite widely adopted. It had other advantages inasmuch as infra-red lamps could be used in a properly constructed creep incorporating feeding facilities and gradually the weaner weights at 56 days went up from the 25 to 30 lb. in the old outdoor days to the 35 to 40 lb. mark.

Large units appeared and the specialist came into his own using well proven principles in simple housing design and husbandry techniques aimed at further intensification. Pigs were moving indoors and practice was altering accordingly. In place of natural grazing came scientifically balanced diets containing all the nutrients required by the indoor animal. Piglets were given additional iron by injection and sophisticated aids to farrowing and rearing were devised to prevent the problem of overlying. Numbers reared improved from the seven to eight per litter on the outdoor system, to eight to nine and even 10 on the newer systems. Pigs were kept in an environment which could, to some extent, be controlled by the stockman who was fast becoming a skilled technician working comfortably indoors.

There was a great interest in intensive housing and a number of firms sprang up offering package deals of various types of house and allied equipment. There were fashions which came and went due to hard economics, disease factors and management difficulties. A classic example was the "sweat box" which, I suppose, was the ultimate in intensification. Here, fattening pigs housed in block structures on bare concrete and allowed a total space of only 5 sq.ft. per pig. They were given no bedding and were floor fed dry meal or nuts. Ventilation was basically by stable door and the result was a mass of pig flesh living in a humid, very warm atmosphere. However, the economics were good, food conversion when compared with other systems was excellent and mortalities were few. But there were management problems, particularly with ventilation control, and the margin here between success and failure was very fine indeed, and it was most difficult to get men to work under these conditions. There was some opposition to the system on humanitarian grounds although this was never proved and gradually the system faded away.

The controlled environment house came in about 10 years ago and for a time virtually every new

unit being built employed this type of house. However, the title "controlled environment" turned out to be a mis-nomer, and this system does require high standards of management. Some producers thought it was just a matter of setting fans and baffles, introducing the stock and all would be well. After all there were thermostats in the houses to take care of the internal temperature. Ventilation problems were common, causing stress to the pigs which soon contracted pneumonia and other diseases; the result was either uneconomical food conversions or death.

Another problem was also created—that of slurry disposal. Most of the controlled environment houses employed slatted floor dung channels with a sunken pit to collect the slurry. No bedding was used and the farmer found himself faced with disposing of one gallon per pig of liquid manure each day. Disposal systems were costly and not without their problems. Organic irrigation can cause a public nuisance when operated close to areas of population, and the pollution of water courses is all too easy. On the larger units, the tractor and spreader could not keep pace and large storage pits had to be provided at additional cost.

Maybe as a result of these difficulties there has now been a swing towards the Suffolk type house which utilises strawed dunging areas and kennelled sleeping accommodation. Certainly solid manure handling is straightforward and can await the right outside conditions whereas slurry has to be moved almost daily. This system of housing needs plenty of cheap straw and adequate land for muck, hence more pig feeding is taking place on the eastern side of the country. Before, without intensive methods, it was impossible to keep large numbers of pigs on a very small acreage virtually in any location.

There has, at the same time, been an increasing demand for quality lean meat by the consumer and this has resulted in husbandry changes. Valuable help has been offered by NAAS and PIDA (now the Meat & Livestock Commission) in proving new techniques and giving practical advice. PIDA introduced national testing of breeding stock and great improvements in the breeding herds resulted. We are now producing a much more uniform product and British bacon is attracting such outlets as Fine Fare, British Home Stores, and Marks and Spencer. There has grown up a healthy demand for breeding stock of the highest quality as an essential raw material for production units. Specialist hybrid pig breeding companies have been set up to supply this stock which is produced under scientifically controlled conditions employing rigorous testing and rapid generation turnover, with selection based on sophisticated performance standards.

So intensification brought on in the main by declining margins has gone a long way to reducing production costs, and has altered the face of our industry. We have, in the last 15 years, seen a swing

from outdoor systems to scientific housing, balanced nutrition, disease prevention programmes, and advanced methods of producing top quality commercial breeding stock.

At this point it would be interesting to spend a little time outlining the various systems used in producing firstly the weaner and secondly the finished pig.

Dry sows seem to have attracted the least attention of any class of pig when it comes to housing and systems of management. Once served, the sows were usually turned out onto some old pasture, or stubble, and possibly fed once a day with a few pounds of meal or nuts. Housing, if provided at all, was some form of communal hut or shelter. Sometimes a boar ran with the sows to check for returns to service. Sows which had been pulled down in body condition during the suckling period (which lasted usually for eight weeks) never had a chance to recover, went to the boar in poor condition and either didn't conceive or produced small litters of underweight piglets. Recording of service dates to plan farrowing programmes was virtually impossible and management problems resulted.

As time progressed sows were put onto deep straw in old buildings and this was certainly a step in the right direction. Less food would be utilised in maintaining body temperature and more would be available for repairing body tissue and producing the unborn litter. Stockmen were able to observe their sows under better conditions and conception rates and numbers born alive increased as a result of this change in systems.

Currently, the larger intensive units utilise specialist dry sow houses. These have been designed to get the maximum performance from sows during this stage in their breeding cycle. Usually they are introduced into individual stalls when their litters are weaned, and here there has been a swing recently towards weaning at 5 to 5½ weeks rather than the traditional eight. Consequently the sow loses less body weight and goes to the boar in a rising condition. The onset of heat is more easily detected, and the stockman can use either AI or natural service.

This task of heat detection is made easier in many cases by the fact that some dry sow buildings have facilities to house the boars. They are taken along the rows of sows each day and are able to identify those in season. Likewise, returns three weeks later can be covered. This is one of the most important sections of the production cycle and not enough attention is paid to it in many existing systems. Most progressive herds now operate the double service technique involving a repeat service 12 to 24 hours after the first. This technique has reduced returns to service and has markedly increased the sizes of litters produced. We might see in the future the larger herds having their own AI service for their own and possibly neighbouring herds. However,

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there are no clear indications that AI is the better substitute for natural service. Certainly to date the results are not as good and the system has its management problems. However, it is a useful way of introducing new blood lines into enzootic pneumonia-free and MD herds without the disease risks of natural service.

Specialist controlled environment maternity units which house the sow and litter for up to two to three weeks are becoming increasingly popular. The cost per sow tends to be on the high side but the improved performance can more than offset this. Follow-on housing is becoming more simple in design and incorporates multiple suckling on deep straw with fresh-air ventilation, kennelled sleeping quarters and communal creeps. This system seems to have the right balance of intensification with sound husbandry principles.

On the fattening side we have seen many changes in the last 20 years. Initially it was thought that pigs could be fattened in any old corner of some old building, using by-products from other farm activities. Old loose-boxes and shippens were converted, often badly, into fattening accommodation. Throughout all the changes, however, the Scandinavian-type house has stood the test of time and is still popular. This system, coupled with wet feeding, still yields excellent results and grows pigs efficiently in a warm, healthy, draught-free environment.

The choice of any house depends on two fundamentals other than cost: what system of manure disposal best suits the farm circumstances, and what feeding system is to be employed? Organic irrigation involves slatted floor dunging passages and means the fully enclosed building possibly incorporating a pipeline feeding system. On the other hand, deep straw rules out floor feeding and requires a layout with adequate space for mechanised cleaning out, so often the Suffolk-type house is employed. Again, much will depend on available capital as fattening pigs can be intensively housed from as little as £8 to as much as £20 using differing housing and management systems.

There have been advances made in the technology of timing and rates of feeding. Dry sows which were once fed virtually ad lib fattening meals when housed are now restricted to 4 lb. or 5 lb. per day of a breeding meal. Piglets which relied on mother's milk and spillage from her trough are now offered ad lib palatable creep pellets in a warm and attractive environment. Much work is being done on frequency of feeding. Some systems have self-feed hoppers offering ad lib dry meal, some have overhead calibrated bins which dispense measured amounts of meal onto the floor at regular intervals while other variations include a continuous circuit of wet meal mix available in the trough for a short period three times daily. There is still much work to be done, but what is important is the reduction of stress to

the growing pig to the absolute minimum. This involves housing, disease prevention, good sound stockmanship, a balanced diet fed under minimised stress conditions and a carefully devised system of overall management.

The units I am involved in at Beeford have two main objectives:—

1. To make a fair return on invested capital.
2. To specialise in the production of quality breeding stock with the highest possible genetic potential.

The end product of our endeavours is a hybrid pig bred to the specifications of the quality market. There are a number of ingredients which go into manufacturing this hybrid; all are vital in their own right and if anyone goes out of line, the quality of the end product could well suffer. It is the task of management to ensure that each facet is right and that the correct blend of materials is used.

Our first ingredient is health, and the maintenance of the highest standards can itself present special difficulties and hazards. We run two herds, one Large White, and the other Landrace and both are members of the Pig Health Control Association, meaning that we are free from enzootic pneumonia. We are also members of the health scheme run by the Ministry of Agriculture, Fisheries and Food. How pig farmers can attempt to select breeding stock when performance figures are masked by this disease I just don't know! Being enzootic pneumonia-free means that we have to be very careful when introducing new bloodlines. Indeed, it would severely limit our choice if it wasn't for AI and virtually all our new blood comes in this way. Last year we introduced some Hampshire blood by using the hysterectomy technique, but this is a costly and hazardous business with no guarantee of success. One of the most regular visitors to our units is the veterinary surgeon, but his visits, I am pleased to say, are of an advisory nature, and not a frantic last-ditch effort to cure a dying pig with a magic wand and bottle of antibiotics. We have a carefully planned disease prevention programme which is constantly under review, and as a result our customers know that they do not run the risk of introducing disease onto their farms when they buy our stock.

The second ingredient is our foundation stock. This must be right, otherwise everything else is a waste of time and money. We test our nucleus stock under the MLC national scheme as well as undertaking a large amount of on-the-farm testing ourselves, both on gilts and boars in our newly constructed specialist houses. All the gilts and a selected number of boars from our nucleus unit go on test from 70 to 200 lb. liveweight and accurate records of food conversion, daily liveweight gain and days on test are kept. All tested stock are ultrasonically measured for backfat thickness before a final selec-

tion is made and the stock hardened off in open strawed yards.

The third ingredient is environment and this includes management and stockmanship. We aim to provide the best environment economically possible. This involves specialist farrowing accommodation, dry sow housing, testing units and fully enclosed fattening houses. This ensures that at all stages our pigs can perform to their optimum genetic potential. One saying which is always uppermost in our minds is "the speed of the convoy is governed by the speed of the slowest vessel". Stockmen have pleasant working conditions and the whole layout ensures the minimum of physical work on such routine tasks as mucking out and feeding. This means they have adequate time for record-keeping and assessing their pigs' performance. Each member of staff is trained on the importance of good disease-prevention discipline; without it the whole operation would fall down.

Finally, the last main ingredient is the feed. This must be correctly balanced to give the pig all the nutrients required for optimum growth. As a company we are members of a farmer-controlled group known as Feedex. This organisation which started five years ago was basically set up to provide a central mill and mix unit large enough to utilise all its five members' home-grown barley which was to be fed in their large pig units. The group has developed considerably and sells top quality pig rations both to its membership and to outsiders.

The first mill and mix plant cost the group £65,000, and a second unit recently erected cost just over £40,000, and the meal output capacity is over the 3,800 ton-month mark. The products sell themselves and no salesmen are employed; to do this would add 25 per cent per ton to the finished ration. The organisation also markets 80,000 baconers per year and this could be over the 100,000 mark in two years' time. Recently they have invested in their own 500 sow unit and have plans for further expansion.

Turnover has been remarkable; in 1967 it was £686,209, and by the end of last year it had risen to £1,715,060 and profitability in 1969 was £57,991. In July of last year Feedex went public with authorised capital of £150,000 in what were then 25/- shares. The directors anticipate a 1970 year end profit in the order of £80,000 which would enable payment of an interim dividend of 7½ per cent and a final dividend, less tax, of 12½ per cent. The foods they produce admirably suit the requirements of our specialist units and being a member of Feedex is just one of the important parts of our production and marketing. I think our results speak for themselves.

#### Performance Figures—Multiplication Unit

	1969	1970
Number born per litter ..	10.62	10.7
Number reared per litter ..	9.82	9.7
Litters per sow per year ..	2.15	2.20
Pigs per sow per year ..	21.07	21.34
Feed costs per weaner ..	£2:13:6 (£2.68)	£2:10:4 (£2.52)
Costs per lb. of weaner produced .. ..	1/8 (8p)	1/9 (9p)

#### Boar Testing Units

Average days on test (70-200 lb.) .. ..	76	75
Daily liveweight gain ..	1.70	1.73
Food conversion rate ..	2.51	2.48
C + K .. ..	34	33

Now what of the future, and how it is likely to affect the different UK production systems? We have still to overcome the nagging problems of effluent disposal which at present have put the brake on a number of expansion programmes. Planners and some local authorities seem very anxious to tell us how to farm rather than co-operating to help solve the difficulties. This problem is bound to have an influence on some of our systems for some time to come.

The age of weaning has been steadily reducing over the last decade from eight to five weeks and in a few cases successfully down to three weeks. Recent work in Germany, Belgium and at the Rowett in Scotland indicates that weaning at four days or even at birth could become an economic possibility in the future. This could revolutionise our production systems and would greatly lead to greater intensification and further cries of "factory farming". This type of development can run up against public feeling, and the recommendations of the Brambell Report have done much to placate these feelings.

Genetic improvements have really come on apace in the last five years and it is a sad reflection on our industry that marketing has not improved at the same rate. We farmers are capable of producing to a defined brand image and better communications between consumer, meat trade and producers are essential if we are to improve this matter.

Further intensification of production schemes often leads to increased health problems so it is vital that pig farmers utilise their veterinary practitioners more as advisers and partners in their work rather than drug peddlers called in when all else has failed. Veterinary technology has advanced considerably in the past 10 years but there still seems to be a shortage of specialist pig vets who have an aptitude for large intensive unit work.

Unit  
1970  
10.7  
9.7  
2.20  
21.34  
£2:10:4  
(£2.52)  
  
1/9 (9p)

Finally capital. Our pig industry is under-capitalised and this has stopped many excellent schemes from getting off the ground. In the future we are likely to see more large-scale individual producers working in associations and utilising capital from the City. Admittedly our record over past years in the City has been none too bright but techniques have advanced a lot since those days and it is im-

portant for us to generate fresh confidence to attract new capital.

We have got the stock, we have got the technical abilities and, with the advent of the EEC coming along, we have got new marketing opportunities. Given the right economic climate, I am confident we can "bring home the bacon"—British bacon.

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## INTENSIVE PIG PRODUCTION

### DISCUSSION SUMMARY

1. Dr. Kuipers (Netherlands) in opening the discussion, congratulated the speaker and commented that the same procedures had been developed on the speaker's farm as in Holland. Similar troubles and difficulties had arisen but had been dealt with in a very scientific manner. One thing was missing from the paper. In the last paragraph new marketing opportunities in the EEC were mentioned. There would be prospects for exporting to the EEC but selling would make use of the meat packing industry. What they could sell would dictate what sort of animal had to be bred in this country.

2. Agreeing that the breeder and the meat industry must work together, the speaker felt that there was probably not enough mutual crystal gazing on what type of pig would be needed in the future. Bacon production was geared to the Wiltshire type pig. This was also satisfactory at lower weights but it was not clear where the EEC would take us and whether the British pig would meet the requirements. Time might be needed to breed the type they wanted.

3. A number of people raised slurry problems. They wondered what large units could do now that very large lagoons were overflowing and if land was not available for spraying by pipeline. American experience was that slatted houses were essential to reduce labour. The speaker's use of straw was questioned on labour grounds since it was just as good for the land to leave the straw on the field and spray pig slurry over it, as to bring straw in and cart muck out. Radiant heat had the same average costs as bedding and used less labour. In Illinois a single

large building was favoured to minimise the cost of moving pigs. Oxidation ditches under the pig houses were proving very satisfactory. Two thousand pigs per man per year was the usual figure and to give the man an interest in the business he was made an associate manager at an annual salary of \$12,000 plus a share of profits.

4. In reply, Mr. Curtis repeated that his system of housing, straw bedding and muck handling had developed because the pig unit was associated with a large cropping farm which had straw available. In this country 200 sows with their progeny was a large unit and this required a staff of three men. This may have been high; an umbrella house then being developed may have taken less but it was unlikely to bring a reduction of more than one man.

5. He described the role of the veterinary surgeon, as "a consultant partner in production" who looked round the enterprise once a week and drew attention to any point likely to cause trouble.

6. Finally, interest turned to the Feedex Company and to how this was organised to keep control. Had the lead to form this company come from feed manufacturers who were farmers?—in breeding, rearing and fattening they had the best of all worlds. The speaker confirmed that the founders were farmers who were interested in pig production and compounding feeds. They have sufficient shares in the company to keep control; this could only pass to others if some wished to cash their shares. They had tried to start from within and move out rather than have the initiative come from outside the farming interests.