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## Development of management systems on large pig units in Eastern Europe

by D. BELLIS

*BOCM Silcock Ltd.*

PIG production systems that developed in the UK during the Industrial Revolution of the 19th century remained more or less the same until the 1930's when organised pig marketing began. Up till then pig production was haphazard. It was based on very small units and the industry tended to stagnate. The setting up of the Pig Marketing Board in 1936 encouraged units to specialise and unit size started to grow. This did not last long before wartime conditions led to a decrease in the pig population and pigs again became a sideline of a mixed farm.

Conditions since 1950, however, have led to marked changes in management systems and during the last 10 years in particular, herd size has increased. The 500 sow herd is not uncommon today and a few 1,000 sow herds are in existence. It is obvious that this expansion is by no means over and could indeed accelerate.

In Eastern Europe, on the other hand, the development of new systems of pig production has been much more rapid. At the end of the war much of the pig production was in a relatively primitive state but now herds of 6,000 sows are common and several units of more than 10,000 sows are in being. I have been fortunate enough to be involved in these large units since 1965, when exports of protein, vitamins, minerals, concentrates from UK began. I have, therefore, seen the units operating over five years and seen new ones starting and in this paper I will describe the farms, the systems operating, results and also describe what changes in systems are being made in the new units that are being currently built.

### Organisation

Relatively large farms have been in existence in Yugoslavia since before the war, the biggest of these being 1,000/1,500 sows but these are now out of date. The farms that have been built comparatively recently are on modern principles and are up to 10,000 sows in size. These large pig units in Yugoslavia form part of an Agrocombinat—a farm which has other enterprises, e.g. cattle, poultry, wine production, etc., and which is, in effect, an enterprise owned and run by a farmers' co-operative. The Agrocombinat has its own feed production mill and slaughterhouse for the livestock. It often sells its own branded products both at

home and abroad. In Romania, on the other hand, large units were unknown until five or six years ago and pig production was based on herds of up to 200 sow size in very old and primitive conditions. Social and economic reasons led to a State Farm organisation developing very large units of 6,000-10,000 sows and there are now about 20 such units in Romania. The sow farm is a completely separate entity from other farming operations in the neighbourhood and all farms are controlled centrally from Bucharest.

In Hungary pig production has also been under relatively primitive conditions until the last two or three years, but now large units of 1,000 sows or more are being built. These farms fall into two classes, i.e. those organised by the State Organisation, as in Romania, and those belonging to co-operatives, not unlike the agrocombinats. There is, however, some degree of central control of the co-operative farms.

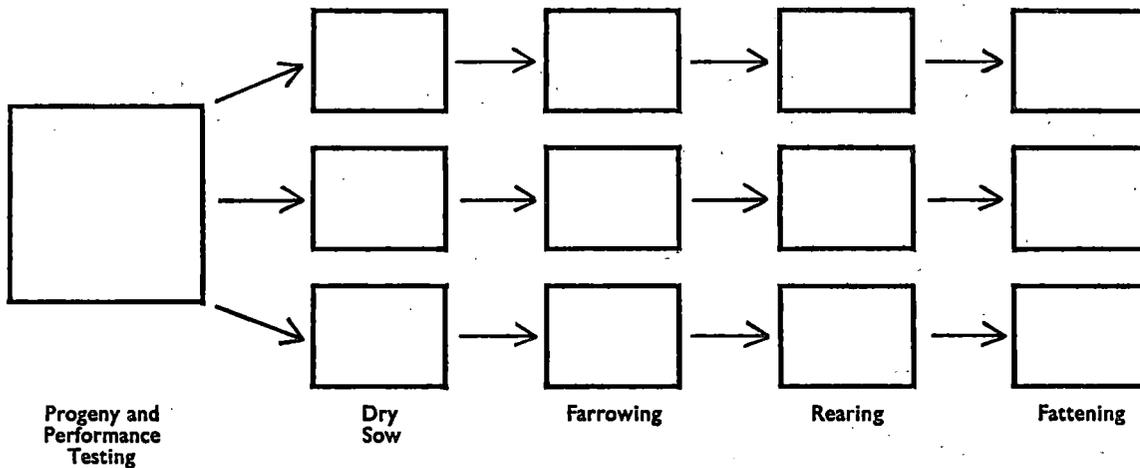
### Systems and housing

The main systems adopted in Yugoslavia and Romania are similar and are basically as shown on the following page.

The whole farm is enclosed and away from other livestock. All pigs, except selected gilts and boars from the breeding unit are kept on concrete all their lives and often there is no bedding whatsoever. A 6,000 sow unit would have nine dry sow houses each holding 600 sows in pens of 30. A pen has an outside concrete run and feeding is usually by wet pipeline. At farrowing time two pens (two days farrowings) are moved into a single room in the farrowing house. The farrowing house is similar in design to many in this country and is fitted with crates and a source of supplementary heating for the winter. Each sow has a small exercise pen adjacent to her crate and is fed twice daily out of a trough. The litters are creep fed and weaning age varies by farm but is always between 3-5 weeks.

At weaning all 60 litters are moved to the rearing quarters, mixed, graded according to size, and housed in pens of 50 or sometimes 100. They stay in these slatted pens and are fed dry and ad lib until 12-14 weeks, when they are transferred to the fattening section. The group of 50-100 is split into groups of 25 and a room holding 2,000 pigs (one week's output) and pipeline fed to slaughter at 200-240lb. liveweight.

### SYSTEMS AND HOUSING



#### Feeding and performance

The main raw materials available are maize and sunflower, which is fibrous and a useful but not a good source of protein, and small quantities of meat meal,

soya, barley and bran. The problem of devising rations is therefore one of balancing maize and using barley to the best advantage. The following rations are typical:—

#### COMPOSITION OF SOW AND FATTENING PIG DIETS (%)

Prot./Vit./Min	Sows		Growing Pigs	
	Pregnant	Suckling	20-50 Kg	40 Kg—Slaughter
Concentrate	5	8	8	3
Maize	70	75	60	85
Barley	5	—	10	—
Bran	10	5	10	—
Meat	—	2	—	1
Soya	—	—	7	1
Sunflower	10	10	5	10

#### COMPOSITION OF BABY PIG DIETS (%)

Prot./Vit./Min. Concentrate	Up to 6 Weeks	6 Weeks—20 Kg
	Maize	55
Barley	—	15
Bran	—	10
Wheat	10	10
Sugar	10	5
Dried Skim	10	—

These feeds differ from their UK counterparts mainly because they are higher in energy than feeds based on barley. Pigs will therefore tend to be overfat unless care is taken in dietary restrictions.

Performance of pigs under the system described above naturally varies from farm to farm, as in this country. In general pig performance from birth to 12 weeks of age is poorer than is normal in this country and mortality is higher but from 12 weeks to slaughter performance is satisfactory. Sow performance in terms of litter size, birth weights, etc., is very similar to that in this country.

#### General observations

The management system adopted is based on a flow of pigs from one end of the farm to the other. Fattening pigs, for example, are housed some 800 yards from sows and litters and there is no movement backwards of pigs except for newly weaned sows back to the dry sow yards. Such a system ensures that only pigs of the same age are together, which I consider to be essential in any large unit. Other major precautions are taken, i.e. completely closed herds, isolation of the farm as a whole from other pig units, complete clothing changes and disinfection for all staff and

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visitors in and out of the farm. The success of such precautions has meant that diseases such as foot and mouth, swine fever and TGE are unknown, although they have been prevalent in the countries themselves or in neighbouring countries.

Within the farm itself each sub unit is completely independent of the others for labour—farrowing house staff, for example, are never allowed to go near the fattening houses. This is, of course, possible only on a large unit and there is no doubt that such a seemingly small factor is important in a very large pig unit.

I believe that, basically, health problems under these conditions are little different from those experienced on many farms in UK. However, management skill varies and the systems are not constant from farm to farm. This again is the case in this country and, as you know, leads to differences in health and performance. On these large farms, however, deficiencies in the system adopted or in the feed itself can lead to more severe and obvious effects on health. After all 10 deaths in a 100 sow herd is less obvious than 1,000 deaths in a 10,000 sow herd! Therefore, on these large farms it is relatively easy to spot what is right and what is wrong, and this is probably the most important advantage of experience of these units over a few years. As a result, I am quite convinced that most of the so-called diseases we see in this country are the result of incorrect management or feeding. Some of the most striking are described below.

**(i) Sows**

A large sow unit using a flow system depends on regular farrowings. The 6,000 sow unit needs 60 sows farrowing every two days to maintain the flow. Forty sows farrowing is useless because of the strain on accommodation when 80 sows farrow in three weeks time. This problem, of course, can be overcome with spare accommodation, but is not desirable when capital involved is high and expensive. In a 6,000 sow unit, 80 sows are served every two days to ensure

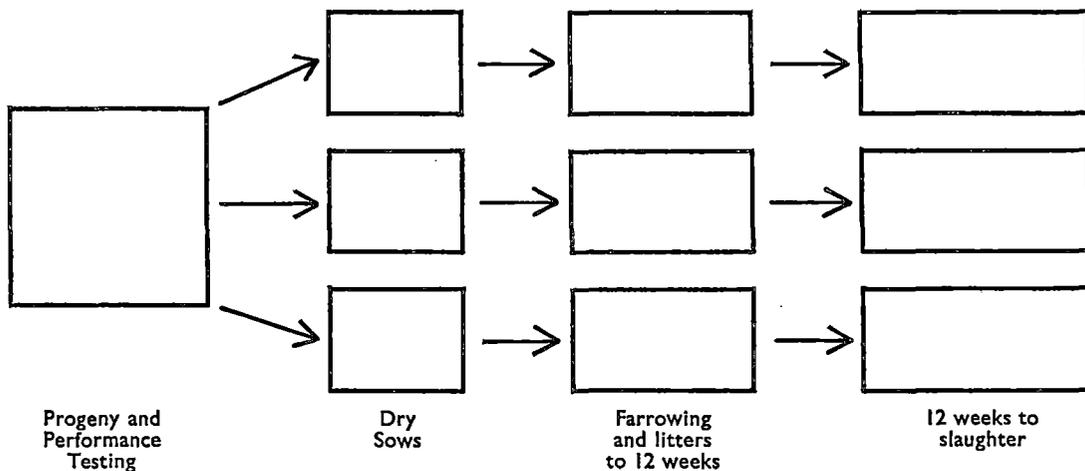
that 60 hold. Experience shows, however, that this 75 per cent conception rate varies from about 85 per cent for winter services to 60 per cent for summer services. This lower conception rate in hot weather is often experienced in this country, and it is one of the problems which must be solved for a really big unit.

In the housing conditions I have described sow lameness is a problem, particularly if the concrete floors are wet with pipeline feeding dry sows. Tests are going on in which bitumen and rubber are mixed in the concrete and the latter is promising. The problem is worse on farms where dry sows are large and heavy through overfeeding, which also seems to be connected to agaluctia problems and associated syndromes.

**(ii) Young Pigs**

Mortality and stunted growth are very serious on these large units in which the system imposes most stress on pigs and scouring in baby pigs is common. Some of the farms have farrowing houses in which the crates are in small compartments of 3-6 litters instead of 50-100. Simple partitions to divide the air space seem to lead to a significant reduction in the 0-3 week diseases.

The most important malpractice on many farms is the practice of weaning, mixing and re-housing three to five week old litters in one operation. This leads to very poor performance during the period up to 10 weeks, particularly in terms of high mortality and low growth. The improvement on farms that have adopted multisuckling so that litters are mixed before weaning is very noticeable and adjusting the system to allow the litters to stay a few days in the farrowing accommodation after weaning is also important. Indeed, the effect of leaving newly weaned litters in the pens in which they were born has been so obvious that the large units which are being erected in Hungary at this moment have modified the system, i.e.



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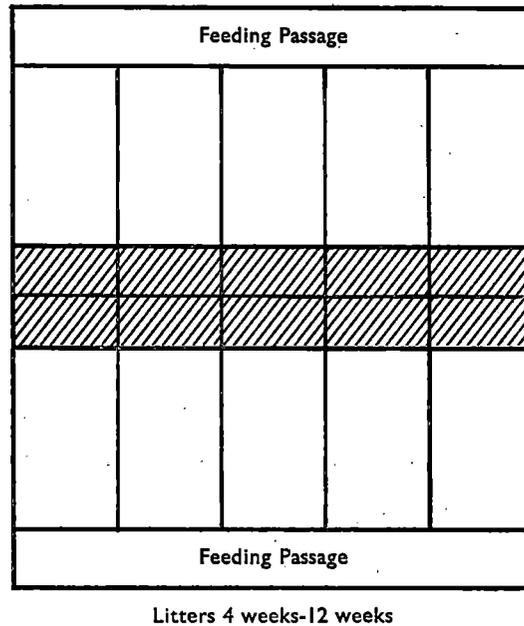
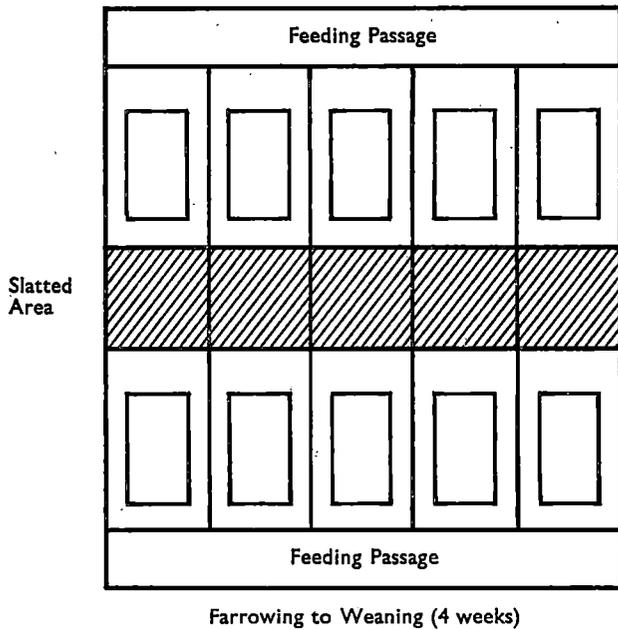
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It is seen that one movement of pigs is eliminated because in effect there is a combined farrowing-rearing house instead of separate entities. The most impressive results are obtained where the farrowing house is split into rooms holding 10 sows. The sows are farrowed in crates in two rows of five. Litters are weaned at four weeks of age and the sides and fronts

of the farrowing pens and crates adapted to make 10 rearing pens large enough to hold one litter up to 12 weeks of age when the pigs are transferred to the fattening house. I was particularly impressed with this farrowing/rearing pen and the arrangement was as follows:—



I am certain that this kind of system is essential for all large units, preferably using multisuckling.

#### Application to UK conditions

My experience of these very large farms leads me to believe that problems are solved and that large farms can be run profitably in this country with the obvious advantages of scale, i.e. saving in transport, saving in labour, marketing advantages, etc. What is the minimum size of a large unit? i.e. the size beyond which there is no further advantage in terms of return on capital in increasing scale. I believe that under UK conditions that a unit of 1,500 sows, together with all the pigs up to bacon weight, is optimum by giving maximum return on capital. Below that size capital return is less, beyond it capital return would remain constant.

One of the main advantages of a 1,500 sow unit would be that the unit is large enough to have several self-contained sub units i.e. the dry sow unit would employ three men, the farrowing/rearing unit nine and the fattening unit three. Thus, each sub unit is completely self-contained for labour and the farm, in effect, consists of three specialised units together with the progeny and testing unit which may be on the site or otherwise. The figure of one man for 100 sows and followers appears to be optimum from my experience in Eastern Europe. When units are larger the proportion of sows/men remains constant. Below 1,500 the ratio is lower. Indeed, the only limitations in UK are dung disposal and capital. The former is always a problem; as far as the latter, there are signs that capital is available for what would appear to be a profitable business for many years to come.

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## DEVELOPMENT OF MANAGEMENT SYSTEMS —PIG UNITS

### DISCUSSION SUMMARY

The discussion centred over the following four main points:

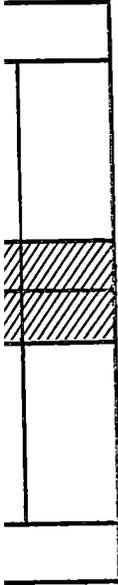
1. **Economic results:** It was impossible to give economic results because the costing systems developed on these Eastern European farms were not comparable with those adopted in this country. However, performance data were available. Numbers of pigs born were in line with data from this country, but numbers were lower, due to a higher level of post-weaning losses. From data seen, 8.2 pigs reared per litter was a reasonable average. Farrowing frequency with 3-5 week weaning was about 2.0 litters per sow per year, which again was in line with this country. Eight week weights of pigs was less, being about 35lb., but food conversions of about 3.7 from 8 weeks to slaughter at 230lb. was an average figure and **similar to that on good farms** in the UK. Such results were little different from what would be expected of a cross section of farms in this country, having, say 6,000 sows between them.

2. **Health:** The most important point that came out was the experience with antibiotics. These addi-

tives were widely used on units until about two years ago. There was no doubt that antibiotic-and-resistant disease organisms were present and health was not good. It was found that withdrawal of the routine use of antibiotics led to an immediate improvement in health, and much better results are now obtained when antibiotics are used in times of disease or stress only.

3. **Slurry: Handling:** The most common system adopted was a permanent pipe-line system so that slurry was pumped out over arable land growing maize, wheat or sunflower. All the large farms seen by the speaker were in the middle of cereal growing areas.

4. **Application to UK conditions:** This hinged around the possibility of very large pig units of a similar nature being developed in the UK. It was generally agreed that slurry disposal was the biggest problem; therefore, it was unlikely that a very large unit would be established away from arable land. Apart from slurry there seemed to be no technical problems why each unit should not run successfully. A large unit, however, did demand new thinking, particularly in the direction of organisation.



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