The Masstock system of beef production

by A. McGUCKIAN

THOUGH I would be inclined to question the authenticity of the 'pig in the parlour' image of the Ireland of the first half of this century, it is true that a tremendous change has taken place in our pig industry since that time. One can recall the time even more recently when the chicken was the ubiquitous creature which spent its aimless existence wandering around the farmyard, found its food on the midden and left its produce conveniently in the neighbour's hedge.

This is the story of the not too distant ancestry of the units of production whose food conversion ratio in the 1960's was measured in second decimals and whose production efficiency was assessed as accurately as the factors in any modern enterprise.

Today we are in the 1970's. Astonishingly, the extent of the control to which we subject our beef cattle goes no further than the restriction of movement by fenced enclosures and restriction of behaviour by castration.

Ireland was always a nation of cattlemen; even the famous wars of Gaelic mythology were fought over the possession of cattle herds, herds which were grazed and controlled in precisely the same manner in which they are handled today. This is how far we have advanced.

In the competitive world of today the successful farmer is the one who moves away from these traditions. His intention will be to produce as much as he possibly can from his land, his time and his labour and with as little capital as possible. These principles have been applied skilfully in other areas of farming, but I believe that until now the possibilities in beef farming were never examined closely enough for, had they been, a completely different form of beef farming than what at present exists would have emerged. The revolution that has taken place in pigs, eggs and broilers and to some extent in milk, could happen to beef, and the highly sophisticated methods which will make it possible are already with us.

(It is held by the politicians and farmers of this country that its greatest economic hope lies in joining the EEC and what is more that the greatest prospects for agriculture in the EEC lie within the beef industry. It must be clear to all concerned that this great opportunity will only be taken advantage of, if we place less emphasis on store production which is the raw material of a beef industry and more on the production of meat. This being so it is important to be aware that we will then be in direct competition with southern European farmers whose beef are fed on a high energy diet, indoors, all year round).

What I am propounding is the belief that the close confinement of beef cattle, like all other livestock, the control of all their feedstuffs and more rigorous management techniques in a more industrialised framework is the big step that must be taken to drive beef farming into the present times. Coupled with this I still believe that grass, green or conserved, is still likely to be the most economic basic forage in our cattles' diets but that in feeding grass the decision making process should be taken out of the animals' mouths. The decision will have to be made therefore to cut every blade of grass that grows and treat it as a mobile product. Before explaining how this should be done I will firstly explain the reasons why I think it should be done.

1. The story of the life of an average animal is a sad tale to tell. If it is fortunate enough to avoid being the one calf in 10 which doesn't survive rearing, the few weeks that it spends near its mother, or on the bucket, are the happiest days of its career. But the day will come when penitence will be expected for this period of indulgence in the luxuries of calf creeps. Long periods of fasting and abstinence, many days in the market with changes of ownership, and rough journeys on the road are essential parts in the ritual of an animal's upbringing. Under such circumstances what account is taken of weight for age, or what regard have we for the ruminant's stomach which must be carefuly nurtured from one diet to another. If we continue to treat our cattle in this fashion we will never establish a straight line graph of production from birth to slaughter. In some present improved systems of grazing the target is 9 cwt. of beef in 18 months. This doesn't look excessively ambitious when compared with German farmers producing 11cwt. in 15 months, albeit with high energy diets and different breeds. The most important factor that makes this possible is that their animals are maintained in a non-changing environment throughout their lives.

2. The fact that the grazing animal wastes some grass is indisputable. The debatable point is not in this contention, but in the proportions involved. Some theorists think that the figure could be as high as 40 per cent. But zero grazing has its effect not only on utilisation but also on production. As grass production per day is at a higher level after it is suitable for

in-situ grazing than before that time the average output per day should be increased by later defoliation.

Only when we mechanise the grazing process, can we guarantee to get the most from every acre available.

3. Another consequence which will automatically follow these developments will have tremendous ramifications in the whole field of marketing. One would expect a levelling off in the seasonality of production, and above all a consistency of size and finish, which would not be possible in the field. While I must admit that there is a certain amount of crystal ball gazing in the concept of a 12-month indoor feeding system, there is no doubt that the greatest need in the beef industry is to level off the seasonal supply pattern with more winter feeding. In the short term this is a sound practical, commercial step and autumn and spring zero-grazing in October-November and in April-May are important features in this type of set-up.

4. It is generally accepted now that keeping bulls entire can bring about an increase in production of the order of 15 per cent. and to increase the proportion of lean meat in the carcase by a similar amount. As modern consumer demand is increasingly for improved leanness there is no agreement in favour of castration. But, we just can't have scores of bulls roaming around our fields.

The only way to make it possible to set about this modern form of beef production is to keep the animals indoors.

5. While extolling the achievement in efficiency of other livestock industries, it is worthwhile considering to which features one would ascribe this success. To me the most important of these is the high degree of control one can have over inputs, particularly feedstuffs, and the measurements of the response to these inputs which is possible. Until we know in beef production the quantity of material that is fed per day and the cost and return we get from it, our standard of management will always be crude and our decisions will never be based on facts but on surmise.

The beef system which my brother and I have developed is called the Masstock System. It is built around a grass and silage based diet which is fed to purchased cattle from October to June. During the growing season a strict account is kept of the amount of grass and silage that is produced and of the cost of producing this including labour, machinery, depreciation, etc. In the winter time the daily consumption of grass silage and meal is recorded and the cost per day is thus arrived at—10 per cent. of all animals are weight recorded so that the cost per lb. l.w.g. can be easily deducted. These facts are illustrated on a graph which is superimposed on a budgeted graph, which indicates both the cost at any given time and the realisable price at any given time. These figures act as guides as to when to sell, what margin is available, and what is the least cost diet per lb. weight gain.

For the thinking critic the main arguments held against moving into this type of approach to beef production in the past have been that the additional capital requirements are too high and that there is more work involved.

The first case, I would answer in two ways. Firstly, because the production cycle of every beef animal exceeds 12 months it is impossible to avoid at least one winter. So a certain amount of capital must be spent in providing facilities for the housing and feeding of every animal over the winter period. It is good business sense to increase the value of this expenditure by lengthening its effective year.

Secondly we have shown with the Masstock method of providing for cattle that a fully comprehensive system can be constructed for a fraction of the cost of traditional layouts. As far as labour is concerned our system is designed to reduce work to an absolute minimum.

The development of cubicles, topless or roofed, appears on the surface to have been an ingenious way of keeping cattle clean and housed at low cost, but it is when one tries to provide a complete layout with laying area, silage feeding, meal feeding, walk around and slurry disposal and proper grouping of cattle that its drawbacks begin to appear. Therefore, in planning and laying out our beef unit at Massareene Park, Antrim, my brother and I finished up with an entirely different approach to providing the proper amenities.

Our beef farm totals 540 acres of grass, and during the past three years all of it has been harvested mechanically for beef feeding. The output per acre is around about 25 tons of which we usually conserve 75 per cent., approximately 9,000 tons. We are satisfied conclusively that in our climatic conditions, five animals per acre can be fattened over the winter period. The potential output of beef from grass in national terms is astronomical. So our beef unit was designed to take 2,000 cattle during the eight months, October — June. We have never been impressed by the practicality of tower silage nor of the associated methods of handling from towers and consider the high level of capital involved to be too high.

Our silage is therefore made on a large concrete apron 120ft. x 250ft., which has a capacity ultimately of 15,000 tons. Clamp silage has therefore become the central pivot of every Masstock beef unit. We do not think that the cost of roof to cover silage has ever been justified in any saving of wastage..

When it comes to handling the silage to the stock themselves it is important to remember two points.

Cattle must be fed every day and silage is a very bulky material. Therefore the approach to feeding must be dependable and strong. We believe that the cheapest and most reliable way is to do this directly with a fore-loader. In our case we use a County 4 with Bamford shovel which is working with grass or

silage virtually every day of the year. It fills in up to 400 tons/day of grass during summer time and feeds out 50 tons silage/day in winter.

The grass is cut directly by a self-propelled forage harvester, transported by two trailers and filled into the clamp by the loader, so that the silage making team consists of four men.

When it comes to feeding again in the winter time the entire operation of laying on the feeding stuffs can be handled by one man. The loader goes directly into adjacent feeding passage. No forage boxes or automated handling methods are involved and the meal is switched on into a pipe-line feeding system mixed with water. Thus one man could easily feed 4,000-5,000 cattle.

The Masstock System was developed with three objectives in view: 1, Low capital cost. 2, High labour efficiency, and 3, Good husbandry.

The beef houses in the system are based on the slatted floor concept. The perimeter of each of the slatted floor pens is used up entirely with silage feeding at A, meal feeding at B and C and access at D. The silage is fed as explained into the central feeding passage A across which both groups of animals can reach and the cereal supplement is fed by pipeline mixed in water into troughs B and C. It has been found in the course of the development of these houses that the dimensions of these pens and passages are critical. The relationship between cattle density and access to silage and meal must be so in line that no excessive trough space will be available otherwise either the costs per head will automatically increase or the thrive of the animals will come down.

Slurry disposal is of course through the slats and into channels which are so designed that the slurry moves directly to a lagoon, a storage tank on a pumping point. Our slurry moves in the case of some pens a distance of 320ft.

The vast improvement which we effected in cutting capital and labour costs was brought about by increasing stock density in our buildings. In such circumstances disease usually raises its ugly head. It is quite likely that the most serious problem should come from respiratory ailments. These buildings are therefore so designed that a healthy natural change of air constantly takes place and the result has been that we have no infected or unusual ailments to contend with. We also believe that our live weight gains, varying from 1.8 to 2.5 lb. per day, are very good for a silage and 4-6 lb meal diet.

With cattle groups as low as 15 inspection can be conveniently carried out, and selection and handling of stock is well provided for. Because of the tremendous interest which other producers have shown in this enterprise we have now a company in operation which offers this type of beef unit as a package deal. This unit is manufactured centrally in sections and distributed for any size of operation. It has official approval for grant-aid purposes. We advise on the potential of a farmer's unit, help him to choose a site, draw up a suitable plan and construct a complete Masstock unit at an attractive price. If, for example, he constructs the base for a unit of around 200 animals we will erect the super-structure, slats and all, completing it for less than £35 per head, depending on transport. After grant-aid this figure becomes £21. It is very piquant that at the present cost of straw in most areas the price of this entire unit could be written off in two years.

We farmers are involved in the most complex of all industries, the range of products is so diverse, the resources and raw materials are so many, the talents, the experiences and the qualifications required are so demanding that fragmentation and inefficiency seem impossible to overcome.

To my mind before they ever will be, the foremost discipline that must be imposed is specialisation in products. Where this principle has been applied in the past it has always led to success.

What I have been arguing basically is that it must now apply to beef. I believe that I have given some of the reasons why it should happen to beef. I think we in Masstock know some of the methods how it could happen to beef. What is left is the determination to do it. I know that I am talking to many who have just that.

MASSTOCK

DISCUSSION SUMMARY

1. The paper was illustrated by slides, diagrams and coloured photographs, showing the techniques used by the Masstock system for the feeding and slurry disposal of the fattening cattle and of economic tables.

2. Mr. McGuckian stated that he felt traditional methods of in-situ grazing by fattening beef animals to be an anachronism and forecast universal adoption of beef fattening methods similar to the Masstock system where a high degree of control over input and performance could be achieved.

3. The discussion opened with the comment that the success of the beef feeding system as practised by Mr McGuckian was due, firstly, to the high degree of expertise and saving in designs and technique achieved by the McGuckian brothers and, secondly, to the excellent grass growing and rainfall characteristics of the Northern Ireland climate, and that Mr McGuckian's statement as to this system was conditional upon climate and geographical position being similar to that in Northern Ireland.

4. Mr. McGuckian replied that his forecast was based on European rather than world factors.

5. On a question as to the economic viability of the system, a gross margin of £35 was quoted, and a return on **all** capital except land of 25 per cent. Mr McGuckian, in reply to a question as to possible alternative uses for the capital facilities, spoke optimistically of future prices for beef, and pointed out that there was only a limited time for certain profit in any enterprise, and that an opportunity had to be grasped and exploited when there was a reasonable assurance of profitability, even for a limited period of five years.

6. Further questions revealed that mortality rates had been low, and technical questions on the positioning of slats and feeding problems were dealt with.

7. Of the farmers who had made use of the Masstock organisation to set up their own systems, 75 per cent. had returned for the construction of further units.