

MAIZE SILAGE FOR BEEF PRODUCTION — BORTHWICKS, FEILDING OPERATION

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In early 1973, after a year of investigation, a company was formed to buy 220 hectares of land in the Feilding area for the purpose of running an intensive beef farm.

The shareholders were two local farmers, and Messrs Thos Borthwick and Sons. Subsequently, a further farm of 240 hectares was leased with right of purchase, adjoining the first farm.

INTENDED USE

The main object was to supply specialised markets in Japan and the Pacific region with beef from animals 'finished' for 60 to 90 days in a feedlot, without access to grass. The requirements were for a carcass of 280-300 kg, having more marbling than normal from our grass fed beef, and not having the grass taste which is generally indistinguishable to New Zealanders, but unfortunately is often detectable by our customers. We had several years experience in supplying this market on a small scale from my own farm at Marton.

In late 1973 the property was ploughed and sown with lucerne and maize in preparation for the start of operations. Four pits were built for storage of the forage, and the feedlot was set up, using fence materials recovered from surplus fences on the farms, and troughs from macrocarpa milled on my farm.

Although the property was grazed until spring of 1973, all stock were sold, and in fact we did not stock up again until May-June of 1974, largely because of understandable nervousness over the state of the beef market.

PRESENT USE

Radical changes were forced on us by the total closure of the Japanese market, and drastic falls in the price of beef. Our operation last winter was to supply prime heifers for local trade, together with one or two side lines, and once again all stock were sold, with few remaining after September.

The present system involves; (i) wintering from May until October of butcher heifers and some slaughter bulls; (ii) making maximum year round use of the grassland which remains on the rolling areas not suited to cropping; (iii) running about 1400 hoggets among the maize from January till May, and then on the Hunter River lucerne until August; (iv) holding 700 cull beef cows on maize stubble from May until July. This move benefits the works by taking these cows from the market at a time when the works cannot handle them and holding them until the stock supply for killing and boning is short; (v) special operations which last year included four months trials for Alta Lipids, and production of milk fed veal by feedlotting cull dairy cows.

However, our major source of income this year has been the selling of 1100 tonnes of maize which was not needed for maize silage. Our stocking at present consists of 500 fat heifers, 200 slaughter bulls, 200 cows which will be calved down on grass, and 1400 fat wether hoggets

We are below maximum cattle capacity of 1300 head because we elected to sell a higher proportion of grain rather than keep it for silage.

EVOLUTION OF A NEW ZEALAND FEEDLOT

The main reason for the establishment of the venture and for Borthwicks involvement in it was not really connected with many of the foregoing operations. We set out to develop a 'New Zealand style' feedlot. A high degree of flexibility was our first requirement; self-reliance, particularly for the supply of feed was the second. All feed is grown on the property, and the two farming partners can specialise in the supply of cattle suitable for any of the markets envisaged. So far cattle supply has not been a problem — we are in the centre of a very good supply area, close to the Feilding saleyards, and of course close to Borthwicks Aorangi works.

There are potential advantages to the country, and to the freezing industry, from operations such as our own and that of Hellaby's. These relate mainly to the evening out of the exaggerated peaks and troughs of supply which we have in New Zealand. No other major primary producing country had this supply imbalance problem to the extent that we have in New Zealand. The large Borthwicks Melbourne works has a seasonal variation of only 20%, and since this was achieved, a marked improvement in labour relations has occurred, with the staff now thinking of themselves more as regular employees and less as outsiders with no commitment to the firm or the job.

The other advantage of this type of operation will be seen when the container trade gets under way. But for the world dislocation in the meat trade, this would already have begun. All markets currently pay more for fresh or chilled meat than for frozen meat. Chilled meat has a limited storage life (45 to 60 days) compared to frozen. Therefore, containers must be regularly shipped in order to keep a market supplied. In addition, costs are kept lower if ships and containers can be utilised on a continuous basis so out-of-season container shipments will require a supply of suitable animals on a regular basis. This will be in addition to the present national requirement for out-of-season domestic supply.

Of course I do not suggest that New Zealand should not continue to place its faith in seasonal grassland farming. High costs of machinery and fertilizers, particularly nitrogen, can only reinforce this view. Nonetheless, there are compensating advantages in our system of semi-feedlot farming, and these should not be overlooked.

The disadvantages are clearly those of costs, which have moved further against us. Machinery repair and replacement, fertilizer costs and of course fuel costs are substantial disincentives.

To offset these cost disadvantages we have three objectives.

Firstly, to grow more per hectare than is possible

under a grassland system. We can certainly achieve this by growing maize and lucerne. In two dry seasons maize has produced 20 tonnes DM/ha, and lucerne harvested about 12 tonnes DM/ha, as well as providing a winter grazing. I know the Waikato area can do better. Maize for silage was produced on 70 hectares and lucerne on 100 hectares, making a combined yield of 2,600 tonnes DM.

Secondly, having grown this extra feed we aim to make maximum use of it by keeping wastage to a minimum and by matching maximum feed utilisation to the animals' highest genetic capacity for growth. This is really what efficient livestock farming is all about, regardless of the method used to achieve it. Around the countryside I see many examples of maximum feed utilisation, but it does not help to make use of every blade of grass if the animals' capacity for growth and production is restricted or stopped. A visit to any saleyard will demonstrate that there are too many maximum feed utilisers, but not many who use the animals' capacity for growth, and very few farmers who can use both to greatest advantage. Because of the controlled nature of our feeding method, we do have the opportunity, having accepted some field and storage losses (but none from treading or pugging) to join this select farming group. I will return to this topic when I discuss our feeding operation in detail.

The third aim we have is to buy and sell intelligently so that we get the most profit from our animals. In a case where there may be a \$50 profit in holding and feeding an animal for a year, it is probable that at least \$30 will be earned in the four month period from May until September. Therefore, in the current market situation we concentrate on feeding stock during this winter period. In 1975, having sold our fat heifers for local trade, we will have cows and slaughter bulls available to use the spring growth on our grassland, and take advantage of the guaranteed prices offered.

It will be obvious that we are at least partly dependent on our grain cash crop. As we are only wintering cattle, the work pattern fits in well with this cropping procedure. We also get better usage of our tractors and planter. It would not have been easy to establish this feedlot venture without this diversification, since we ran straight into a period of falling beef prices and rising costs. However, we have traded satisfactorily through an extremely difficult period at the beginning of our operation — the time when any new business is most vulnerable. We feel we should be well placed to take advantage of an upturn when it does occur.

Unless there is a considerable improvement in prices, it will be difficult to justify the establishment of intensive farming systems, and unless a premium is available from the market it does not seem logical to feedlot cattle during the period from September to May when grass is available. There is no prospect of such a premium at the present time.

OPERATIONS OF THE FEEDLOT

As I have said, our aim was to set up a flexible, New Zealand style feedlot of a type that is described in the U.S.A. as a 'Forage feedlot'; — i.e., it uses roughage in the form of lucerne haylage and high dry matter maize silage but no concentrates.

This concept is simply an extension of the better wintering systems used on many farms. The use of fine chop lucerne haylage at a DM content of more than 50%, and fine chop maize silage at 45% DM gives a balance of

nutrients. In my experience, maize on its own is inadequate, resulting in lower consumption and much reduced rate of gain.

Our stock receive nothing except a mixture of approximately 50% of each forage on a DM basis, plus rock salt. None of the expensive concentrate mixtures so often sold to farmers are used.

I am certain that the high dry matter of both these forages is of vital importance. However, at the dry matter levels quoted, very fine chopping is essential for both maize and lucerne. A 6 mm chop is used for lucerne; the same with the addition of a recutter screen is used for maize. In a 3 m deep pit silo, silage density is 20% greater with this fine chop compared with longer chop (25-30 mm) material. This gives a clear indication of the much better consolidation and air exclusion obtained after fine chopping and of course fewer expensive pits are required.

I have corresponded with an American animal nutritionist, Dr Paul Guyer, on this subject. He says "... silage already has some acids, with the drier silage having less. We feel this is one reason that the drier silage produces better for us than wetter silages. The organic acid content is considerably less and it looks to us like organic acids, particularly lactic, may depress appetite", and "if you use higher levels of maize silage I would suggest that you make a rather dry silage in the neighbourhood of 60% moisture. We usually get a higher dry matter consumption with the drier silage than with silage containing about 70% or more moisture".

I have found this good advice, and as said, have gone for an even drier silage in conjunction with very fine chop.

Layout of the Feilding feedlot is shown as Figure 1.

We feed cattle twice daily, and at peak occupancy of 1300 head, over 30 tonnes is fed out, taking two men two hours night and morning. We use a Gehl 'mixer-feeder' wagon, holding 9 m³ per load, and having electronic sensor scales enabling us to feed accurately and consistently and thus get maximum growth and maximum feed use.

Current consumption by heifers in the feedlot is 21 kg wet feed per day; their average live weight 280 kg in June, and rate of gain 1 kg liveweight/day. Forage consumption works out at 2.8% of their live weight on a dry matter basis with a conversion efficiency of 1:10. Last year steers killed out at 300 kg and ate 34 kg wet feed/day. Male animals should convert better than females, but we have had success with heifers. They take to feed more readily, and do not exhibit an initial period of low gain or even weight loss. However, this winter we are feeding some slaughter bulls on a trial basis, but it is too soon to comment on their performance.

With this system of feeding one becomes conscious of profit per unit of feed; and although this is equally important with grass farming it is not so apparent. If there is a \$40 margin in feeding a heifer eating 21 kg/day, then a big steer eating 35 kg/day must yield a profit margin of around \$60 in the same time to equal the profit made on the heifer.

One also becomes very conscious of the necessity to feed cattle to the proper degree of finish and no longer. A line of experimental cattle which we fed on contract in 1974 were being slaughtered progressively, but Christmas intervened and the last cattle were fed for perhaps three weeks too long. Their rate of gain dropped to one quarter that of the first cattle slaughtered despite a steady feed intake. Once again, this fall in growth rate is often not realised in grassland farming, but it happens with both cattle and sheep.

CONCLUSION.

The future of intensive mechanised farming must be clouded because of the sharp rise in the cost of machinery and nitrogenous fertilizers, relative to the current prices for primary produce. The two most valuable functions that can be performed by intensive systems are the provision of regular meat supplies for container shipment, and the better utilisation of men and capital in the freezing industry. However, meat companies must be prepared to pay extra, perhaps by contract, for these out-of-season supplies.

In somewhat analogous fashion cull ewes which usually cause a glut in the works after Christmas, could be fed cheaply with haylage allowing a steady supply to freezing works during the winter, and perhaps making possible the sale of boneless mutton. This would provide added value, and maintain regular employment for boning room hands.

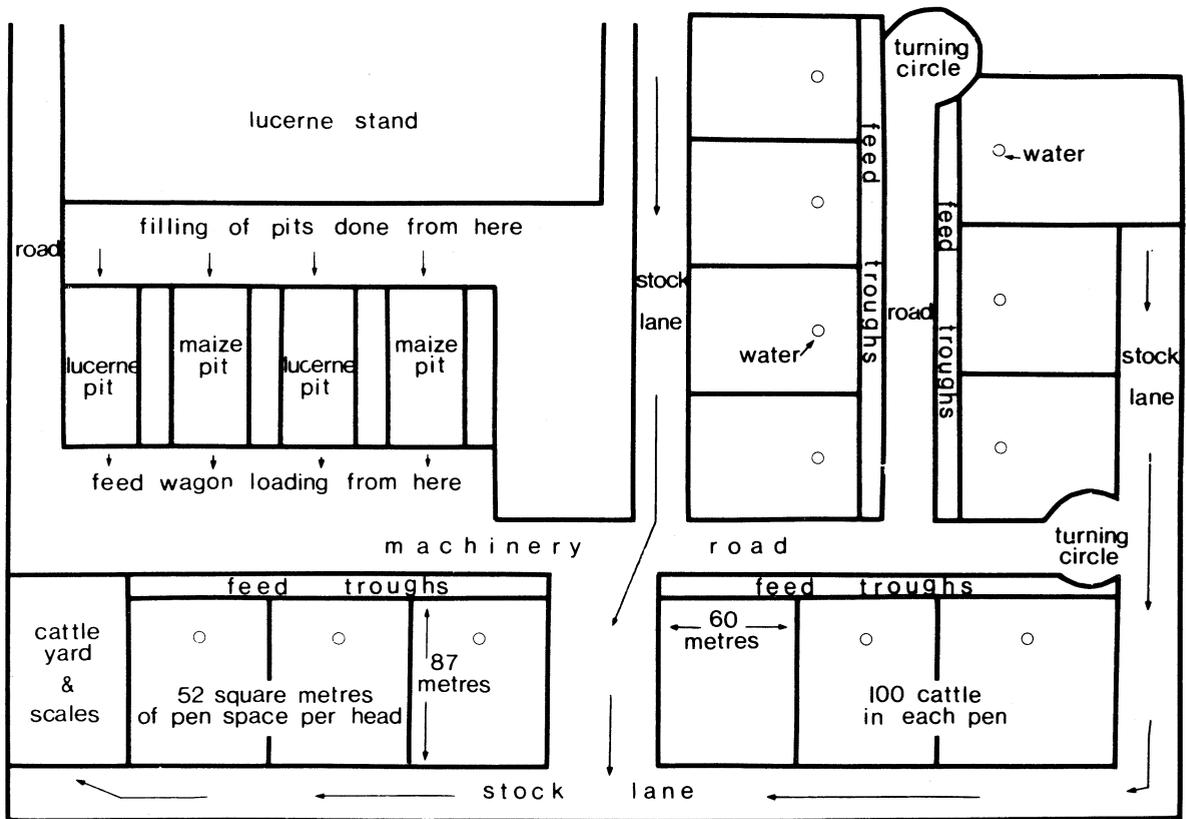


FIGURE 1. Layout of Borthwicks feedlot at Feilding.