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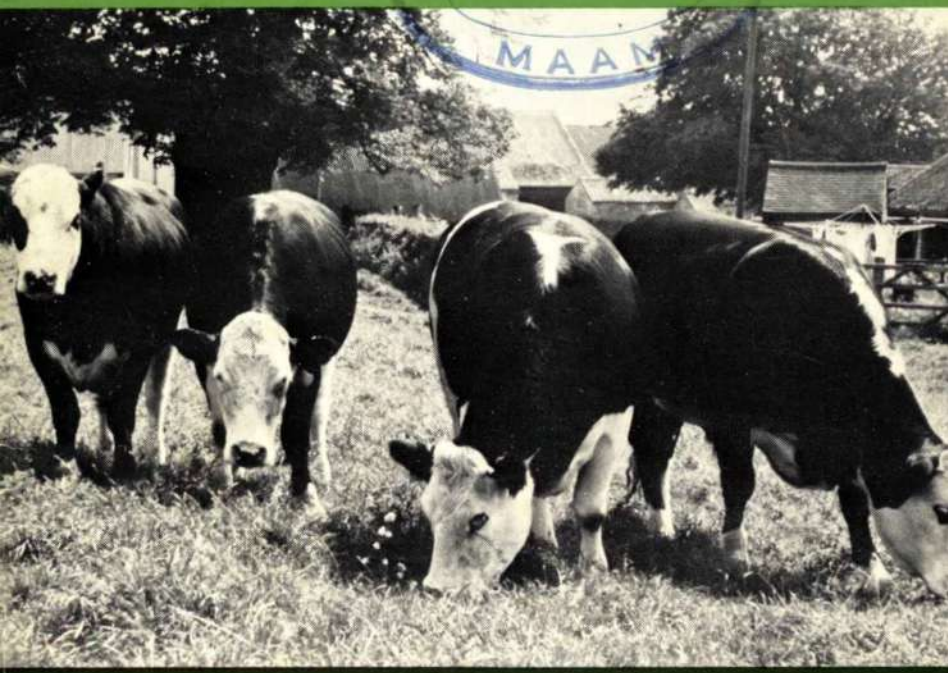

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FIFTH RICHARDS-ORPEN MEMORIAL LECTURE

DAIRY FARMING SYSTEMS 1974

by

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Introduction

Mr. Chairman, ladies and gentlemen, it is my pleasure to present the 5th Richards-Orpen Memorial Lecture and I would like to thank the trustees for their very kind invitation to do so. In this presentation dairy farming systems which are applicable to 1974 conditions will be discussed. These systems are combinations of the thinking and practice of progressive dairy farmers, together with the ideas and developments which have come from Moorepark and its field stations over the past 15 years. This 15 year period has been characterised by many desirable changes in the whole structure of the diary industry. Amongst the significant developments have been: (1) a more general acceptance of increased stock-carrying capacity on individual dairy farms which has resulted in a substantial increase in the national cow herd and (2) a much greater degree of rationalisation in the creamery structure. These developments must continue if we are to increase our competitiveness.

At farm level there is considerable potential for improvement in the organisation of the work load so that more cows can be carried with a reduced work load. Good organisation means good stock control, and a management system whereby key decisions can be made with minimal effort. To achieve this a calendar based system for the key management decisions is proposed.

Dairying on wet land.

The Mullinahone field station provided by Mullinahone Co-op. is being used to develop dairying systems for wet land conditions. One-third of the Mullinahone farm is classified as free-draining; one-third is imperfectly drained; and the remaining third is poorly-drained. This farm is considered to be representative of approximately 35% of the land used for dairying in the Republic. The farm was drained to Land Project specifications and a central farm roadway laid on the grass surface. The total area was fenced into four farmlets, each farmlet having a proportion of each soil type. On two of the farmlets, nitrogen usage was confined to the silage area while on the remaining two 200 lb nitrogen per acre per annum was used. The milk yields in the 71, 72 and 73 seasons are given in Table 1. All herds were spring calving; calving commenced in late January and in all years the shed was closed for 4-6 weeks from early December. During the winter period all herds were self-fed on silage cut from their respective farmlets. The annual meal supplementation averaged 200 lb per cow.

Table 1. MULLINAHONE

Nitrogen	S.R. Acres/cow	Milk yield/cow '71	'72	'73
Silage only	1.4	675	624	624
Silage only	1.1	614	512	622
200 lb/acre	1.1	760	738	750
200 lb/acre	0.88	612	603	656

At both nitrogen levels increasing the stocking rate reduced milk yield per cow in all years with one exception in 1973 on the low nitrogen level. Neither stocking rate nor nitrogen level affected the fat content. However, protein content on the high stocked low nitrogen herd was significantly depressed. The milk yield of the low S.R./high N group was significantly higher than that of low S.R./low N groups. This has been a consistent feature of the Mullinahone results. The mean results for 1971-1973 period are shown in Table 2. On average, increasing stocking rates on the low nitrogen farms decreased production per cow by 58 gallons or 9% but increased production per acre by 72 gallons. On the high N farms increasing the stocking rate from 1.1 to 0.88 acres per cow significantly decreased milk yield per cow but marginally increased milk yield per acre. These results suggest that on this type of land a stocking rate of 1.0/cow to 1.3 acres is possible with low nitrogen usage. Where 200 lb of N is used a stock carrying capacity of 1 cow per acre is possible.

Table 2. MULLINAHONE 1971-73 MEAN

Nitrogen	S.R. Acres/cow	Milk Yield Cow	Acre
Silage only	1.4	641	458
Silage only	1.1	583	530
200 lb/acre	1.1	749	681
200 lb/acre	0.88	624	709

Calendar Blueprint for wet land.

The calendar of operations necessary to achieve a stocking rate of 1 cow per acre (on a 100 acre farm) is outlined in Table 3. The following herd management recommendations are proposed:

(1) calving should begin towards the end of January;

(2) calved cows should be fed 8 lb meal (15% protein) per head per day in addition to ad lib silage;

(3) the milking cows should be on grass by April 1, the dry cows remaining on self-fed silage;

(4) the first paddocks grazed should be those from which it is intended to cut silage. The main limitation to grazing before April 1 is the risk of excessive poaching. Serious poaching has not occured after April 1 on the Mullinahone farm since operations began there in 1966. When grazing commences on April 1, the second round of grazing will usually begin around April 20. Paddocks are closed for silage after second grazing; it is necessary to close 45% of the total farm area to achieve the proposed target. At the overall stocking rate of 1 cow per acre the actual stocking rate on the grazed area during this first silage cut is 1.8 cows or livestock units per acre. It is possible to carry this stocking rate where nitrogen is used without any significant depression in milk yield per cow.

(5) The first silage cut is usually taken around June 10 and is followed by a second cut of silage from 30% of the farm area which is being cut for the second time. The stocking rate on the grazed area during the second silage period is 1.4 cows/acre. It is also possible to achieve this stocking rate without depression in milk yield per cow. When the second cut has been taken the total area is grazed at the overall stocking rate of 1 livestock unit per acre until late November. Silage yields of 9 tons and 6 tons per acre from cuts 1 and 2, respectively, provide 5.85 tons per cow which is more than adequate for the Mullinahone winter which is usually about 130 days.

Table 3. 80 COWS + REPLACEMENTS ON 100 ACRES (WET MULLINAHONE LAND)

	April 1st	April 20-30th	June 10th	Aug 1st
Milkers	Milkers on to grass	S.R. 1.8/ acre	S.R. 1.4/ acre	S.R. 1.00/ acre
Silage + 8 lb meal/day	100 acres grazed	55 ac. grazed	70 ac. grazed	100 ac. grazed
Dry cows: silage only	Dry cows: silage	45 ac. silage	30 ac. silage	

9 ton/acre + 6 ton/acre = 5.85 tons/cow

Dairying on free-draining land.

Research results from Moorepark and from the Kilmeaden field station owned by Waterford Co-op. are used to develop dairying systems for free-draining land. The results obtained in the Kilmeaden field station for 1971-1972 (Tables 4 and 5) are typical results for free-draining land situations. On both nitrogen levels increasing stocking rate significantly reduced milk yield per cow. There were no significant differences between nitrogen levels at the low or at the high stocking rates. On both nitrogen levels increasing stocking rate increased production per acre. From these and other data we conclude that where low levels of nitrogen are used a target of 1 cow to 1.1 acre is possible; where 200 lb of nitrogen per acre is used a target of 1.25 cows per acre is possible.

Table 4. KILMEADEN 1971, 1972 RESULTS

Nitrogen Level	Stocking Rate		Milk Yield Gal/Cow	
	Acre/cow	Cows/acre	'71	'72
Silage only	1.32	0.76	686	661
Silage only	0.92	1.09	615	605
200 N/acre	1.02	.98	696	707
200 N/acre	0.74	1.35	585	645

Table 5. KILMEADEN 1971-72 MEAN

Nitrogen Level	S.R. Cows/acre	Milk Yield Cow	Acre
Silage only	0.76	674	512
Silage only	1.09	610	665
200 N/acre	.98	701	687
200 N/acre	1.35	615	830

Calendar Blueprint for dry land (low N).

A calendar of operations for a free draining farm receiving a low level of nitrogen is outlined in Table 6. The stocking rate proposed is 75 cows and replacements (25%) on 100 acres i.e. 1.06 acres per cow. The principal recommendations to achieve this target are:

(1) calving begins in mid-January

(2) calved cows fed 8 lb meal as per P. Gleesons recommendation

(3) grazing begins in early March

(4) the key decision influencing the quantity of silage is made in mid-April. Adequate silage can be obtained if 45% of the total farm area is closed for the first and only silage cut. This means that the stocking rate on the grazed portion of the farm is 1.69 L.U./acre. A yield of 9 tons/acre from this cut will provide 4.35 tons per cow. A second silage option is possible. This proposes 35% of the total farm area for the first cut and a resultant stocking rate of 1.43 L.U./acre followed by a second cut/from 15 percent of the total farm area. Yields of 9 and 6 tons from the first and second cuts respectively, also provides 4.35 tons per cow. Farmers who are farming at this stocking rate should aim to get all their silage from the first cut. In the event of the resulting stocking rate proving too high in certain seasons a portion of the area reserved for silage (15 acres) could be released for grazing and used for a second cut.

Table 6. 75 COWS + REPLACEMENTS ON 100 ACRES (FREE DRAINING) LOW N.

Jan. 15th	March 1-15th	April 10-24	June 1st	Dec. 1st
Milkers	Milkers on to grass		S.R. 1.69/acre	S.R. 0.93/acre
Silage + 8 lb meal/day	100 ac. grazed		55 ac. grazed	100 ac. grazed
Dry cows silage only	Dry cows silage only		45 ac. silage	

9 ton/acre = 4.35 ton/cow

FARMING 1 COW + REPLACEMENTS ON 1 ACRE OF FREE-DRAINING LAND (HIGH N):

The important management decisions to carry 1 cow + replacements (25%) on one acre of land are incorporated on a calendar basis in Table 7. The overall stocking rate is 1 cow to 0.8 acres (1.25 cows per acre). It is suggested for the creamery herd that calving begins in mid-

January. The calved cows are fed silage + 8 lb meal per day as per P. Gleeson's recommendation; the dry cows are fed silage only. Gleesons work at Moorepark has shown quite clearly that dry cows can be adequately maintained on reasonable quality self-fed silage.

Table 7. 100 COWS + REPLACEMENTS ON 100 ACRES (FREE DRAINING LAND).

Jan. 15th	March 1-15th	April 1-24th	June 1st	July 25th	Dec. 1st
Milkers	Milkers on to grass	S.R. 2.25/ acre		S.R. 1.75/ acre	S.R. 1.25/ acre
Silage + 8 lb meal/day	100 ac. grazed	55 ac. grazed		70 ac. grazed	100 ac. grazed
Dry cows: silage only	Dry cows silage	45 ac. silage		30 ac. silage	

9 ton/acre + 6 ton/acre = 4.6 ton/ cow

Date of First Grazing.

Too much mental effort is used in making this decision and in general people tend to be far too conservative in their attitude to putting cows on to grass early. The advantages of putting the calved cows out to grass early in March are:

(1) Milk yield per cow increases when the cows go on to grass even when there is little grass available, or perhaps I should say when there **appears** to be little grass available.

(2) Concentrate feeding can be stopped so the combination of reduced concentrate feeding and increased milk yields result in increased income to the farmer.

(3) Having cows on grass eases the work load. Cows are cleaner and consequently easier to milk.

(4) Lastly, but most importantly, putting the cows out early in March has no ill-effects on total grass growth. McFeely has shown this for the past 3 years (Tables 8 and 9). Three dates of first grazing were compared, March 7th, March 28th, April 19th; and they were compared with no nitrogen applied (Table 8) with 40 lb N per acre per grazing (Table 9). In both cases even though they were significant differences in the amount of dry matter harvested in each of the three first grazings, there was no effect in total dry matter produced up to the end of June under both systems. These data strongly support the recommendation

for an early start to grazing on the dairy farm. To ease the total management burden we would suggest that the milking cows are put on to grass early in March irrespective of apparent amount of grass available for them.

Table 8. FIRST GRAZING DATE EFFECT

Date of 1st grazing	1st cut* DM lb/ac.	Grass DM lb/ac * total to June 30th
7 March	550	4400
28 March	775	4200
19 April	1725	4600

*No nitrogen used.

Table 9. FIRST GRAZING DATE EFFECT

Date of 1st grazing	1st cut* DM lb/ac.	Grass DM lb/ac total to June 30th
7 March	775	7,000
28 March	1400	7,250
19 April	3050	7,225

*40lb. N/Acre/Grazing

First Silage Cut

On free-draining farms where grazing starts early the paddocks from which silage will be cut are the last paddocks to be grazed in the first rotation. When these paddocks are grazed for the second time they are closed and fertilised for silage. This should happen between the 10th and 24th of April. This is a crucial decision and it is best made on a calendar basis. If one waits for surplus feed conditions one will invariably find that it is too late and that the first cut of silage cannot be taken until mid-June. This disrupts the whole system and results in poorer silage quality. The key to farming 1 cow to 0.8 acres is to close a sufficient area for silage in mid-April. If the resultant stocking rate is depressing milk yield then a portion can be released for grazing. It is not possible to do the reverse successfully. To over-winter this stocking rate of 1.25 cows per acre on self-fed silage requires that 45% of the total farm area is closed for the first cut. Where 45% is closed the resulting stocking rate on the grazed area is 2.27 cows per acre. This stocking rate is possible during the very active period of grass growth in late April and May. However this is a crucial decision and it is important that the farmer should be conscious of the implications of changing this percentage. If at the stocking rate of 1.25 L.U. per acre the farmer decided to conserve 50% of the area rather than 45%, the net effect on stocking press-

ure on the grazed area is to increase it from 2.27 to 2.50. This is equivalent to an increase of 23 cows per 100 acres. In some situations this increased stocking rate may be too high and may result in an excessive reduction in yield per cow. Similarly, if grazing pressure is too high on a 20 paddock farm the release of one of the silage paddocks to the grazing area means that the stocking rate is reduced from 2.27 to 2.08 i.e. a reduction of 19 cows per 100 acres which in most circumstances will be sufficient to overcome a temporary slow period of grass growth.

Second Silage Cut

When the first silage area (45% of the farm) is closed in mid-April it can be cut on June 1 and followed immediately with a second cut on 30% of the total farm area. This 30% should be taken from that part of the farm from which the first cut was taken. The stocking rate during the second cut is 1.75 cows per acre which it is possible to take without reducing yields per cow. When the second cut of silage is taken in late July the total farm area is grazed until late November. A yield of 9 and 6 tons per acre from the first and second cuts respectively ensures 4.6 tons per cow for the winter period. This is sufficient for the Moorepark winter of 110 days.

Kilmeaden Calendar and Results.

This calendar method of operation was fairly rigidly observed in the 1973 experiment (at Kilmeaden) which compared two levels of nitrogen (Table 10). The experiment examined a range of stocking rates from 0.96 to 1.58 cows per acre. The only deviation from the suggested calendar was that the cutting date for the first silage cut was one week late and consequently the cutting date of the second silage was a week late also. The yields obtained where 200 lb N was used are outlined in Table 11 where stocking rates of 0.96, 1.19 and 1.33 cows per acre were compared. The stocking rates during the first silage cut ranged from 1.9 to 2.41 cows per acre and during the second silage cut from 1.43 to 1.82 cows per acre. There was no effect on yield per cow which averaged 693 gallons.

Table 10. CALENDAR OF OPERATION KILMEADEN 1973

Winter	March 7th	April 10-19	June 8th	Aug. 1st
Dry cows silage only	Milkers on to grass	45% closed for silage	1st silage cut	2nd silage cut
Milkers silage + 10 lb meal/day	Dry cows on silage	closed for 2nd cut	27% closed for 2nd cut	

Table 11. KILMEADEN 1973

Nitrogen Level	S.R.	Cows/Acre 1st cut	Cows/Acre 2nd cut	Milk Yield /cow	Milk Yield /acre
N every 2nd grazing	1.05	1.90	1.43	683	656
	1.19	2.16	1.63	695	827
	1.33	2.41	1.82	701	935

Nitrogen Usage

Using 200 lb N per acre permits an increase in stock carrying capacity of 30%. The use of higher nitrogen applications to further increase stocking rates is being researched. In Moorepark it was previously shown that increasing the nitrogen level above the 200 lb per acre level did not permit a further increase in stock carrying capacity when bullocks were used. An experiment designed to examine the response for dairying commenced at the Kilmeaden field station in 1973 (Table 12). Two nitrogen levels were compared at three stocking rates. On all treatments nitrogen was applied in January for the first grazing and thereafter three of the farmlets received 1 cwt of 26% N after every second grazing. The total nitrogen usage in this case was 230 lb/acre. On the remaining three farmlets 1 cwt of 26% N was used after every grazing which is a total of 380 lb/acre. The advantages of the higher nitrogen level at the comparable stocking rates of .84 and .75 were non-significant. However on the 380 lb N level the high stocking rate of .63 or 158 cows per 100 acre did result in a depression per cow and in a depression in silage yield. This information suggests that on perennial ryegrass type swards the use of higher levels of nitrogen for stocking rates of up to 135 cows per 100 acres must be seriously questioned and the data available to date would not justify a higher usage than 200 lb.

Table 12. KILMEADEN 1973

Nitrogen Level	Stocking Rate Acres/ Cow	Stocking Rate Cows/ Acre	Milk Yield Cow	Milk Yield Acre
N every 2nd grazing	1.05	96	683	656
	.84	119	695	827
Total 230	.75	133	701	935
1 cwt. 26% N every grazing	.83	120	715	861
	.74	135	750	1014
Total 380	.63	158	639	1014

The intensively stocked dairy farmer can only keep his nitrogen application rate at 200 lb by omitting the application of nitrogen after certain grazings. The available information suggests 1 cwt of 26% N or equivalent for the first grazing (applied in January) and the same level of nitrogen for the second and third grazings. Afterwards 1 cwt N should be used after every second grazing. Obviously if there were periods of severe shortage this N level may be increased but this situation at stocking rates up to 130 cows per 100 acres should be a rare occurrence.

0.8 Management Technique

As the 1973 Kilmeaden results show, (Table 12) stocking rates in excess of .8 (or 1.25 cows per acre) can be successfully achieved in certain situations. The management implications of stocking at .7 or 1.43 cows per acre are examined in Table 13. If stocking rates of 2.25 for the first and 1.75 for the second silage cut cannot be exceeded then the amount of silage available will be 3 tons per cow. This is unlikely to be sufficient in most circumstances. However, if stocking rates of 2.6 i.e. 45% of the farm area closed, can be achieved in the first cut and 2.04 cows (30% of the farm area) in the second, then the silage available per cow is increased to 4.09 tons per cow. There are obviously some situations in the south where this target can and has been achieved by some of our more progressive farmers.

Table 13. MANAGEMENT TECHNIQUE

		1st Silage Cut		2nd Cut		Silage
Acre/Cow	(Cow/Acre)	S.R.	%	S.R.	%	Ton/Cow
0.8	(1.25)	2.25	45	1.75	30	4.68
0.7	(1.43)	2.25	36	1.75	18	3.06
0.7	(1.43)	2.60	45	2.04	30	4.09

Replacement Rate Effect

The stocking rate targets suggested have included a percentage replacement rate of 25%. This replacement rate is higher than normal so consequently the targets suggested are conservative. A reduction in the percentage replacement rate from 20 to 15% means that an extra 5 cows can be carried. A 10% replacement figure which is achievable with excellent management means that an additional 13 cows per 100 acres can be carried. Using this data the effect of culling low yielders on the overall increase in herd performance can be assessed. If on a self-contained farm, only 15% of the herd needs to be replaced for disease and infertility the option of culling low yielders by increasing the culling percentage to 20% can be considered. An increase in the culling percentage from 15 to 20 means that 5 fewer cows are milked.

Assuming that the low yielders culled milked 300 gallons the replacement heifers entering the herd must milk an average of 570 gallons to make the increased culling rate financially attractive. Conversely if a farmer can maintain a 15% replacement rate he would be better off to keep his 300 gallon cows if the heifers coming in milked less than 570 gallons.

Facilities Required and Labour Productivity

The stock carrying capacities under discussion are not possible on the majority of Irish dairy farms without major re-organisation of roadways, paddocks and buildings. Progress in this respect has been slower than one would wish. Any attempt to achieve these stocking rates even on small farms without proper facilities can only lead to further hardship and diminishes the concept of dairying as an attractive way of life. The recommendation to improve facilities on a dairy farm is only relevant if the additional cost can be met from the increased sales without reducing living standards. Although the sum involved is high (Table 14), it can be financed on a long term basis from intensive dairy farming systems. The annual cost of providing these facilities is now less than the cost of fertiliser. It must be looked at in this light as an essential input. Without good facilities, nationally we would probably never accept the concept of one man handling more than 40 cows whereas with these facilities the concept of one man plus relief looking after 100 cows is a real possibility. The latter viewpoint is of course not very widely held. The essential facilities required on well-run dairy farms are firstly a good milking shed. The Moorepark open-sided shed with its absence of steps, doors, feeders and glass jars will satisfy the requirement on most dairy farms provided the shed is built big enough the minimum number of units per man being six with the possibility of one man being able to handle up to 10 when the occasion demands. A central gravel or metal roadway is absolutely essential and paddocks are essential to make management easier. P. McFeely is currently looking at the advantages of 30 paddock system versus a 10 paddock system and to date the milk yield advantage in favour of the 30 paddock one day system is quite small. The high stocking rates achieved have been achieved at the Agricultural Institute stations with 10-12 paddocks. Certainly 20 paddocks will permit a sufficient degree of management sophistication for most situations. Calving boxes are essential as cow numbers grow.

On a 100 acre farm the annual repayment of the total sum required of £13,300 for a 15 year period with a 20% grant for a commercial farm is £17.14 per acre; on a development farm with a 30% grant the annual repayment is £1500 or £15 per acre. These facilities are essential to attain these higher stocking rates. The relevant question for farmers contemplating development is whether the amount required for facilities can be met together with the finance required for stock.

Table 14. FACILITIES REQUIRED ON 100 AC.

	£		
H.B. shed + machine	6,000		
Winter housing	5,000		
Road + paddocks	800		
Calving box	1,000		
Water supply	500		
	13,300		
Grant		20%	30%
Annual repayment per acre (15 year)		£17.14	£15.00

Dairy Merit

One of the factors which obviously has a big effect on repayment capacity is total sales per cow, i.e. the combination of milk price, calf price, and most important the gallonage produced per cow. Walshe's experiment on dairy merit (Table 15) showed that high merit cows reacted in the same way as low merit cows to increased stocking pressure. High milk yields per cow must be sought as well as increased stocking rate to maximise returns. At present milk prices an increase of 100 gallons per cow which is available through genetic improvement would provide sufficient finance to fertilise the intensively stocked farm. The top third of the Kilmeaden herd in 1973 milked 850 gallons per cow which at the high stocking rates on which they were carried and an expected price of 22p per gallon represents gross sales per acre for milk of £250; certainly something to be aimed for.

Table 15. DAIRY MERIT

	Cows/Acre	Milk Yield (Gal) Cow	Acre
High Merit	1.1	800	889
High Merit	1.4	696	995
Low Merit	1.1	451	501
Low Merit	1.4	408	582

Increased Stocking Rates using some Purchased Winter Feedstuffs.

In the past year experimentation at the Curtins farm at Moorepark examined the possibility of carrying stocking rates of 1.5 and 1.75 cows per acre. The objective was to design a system of management which would maximise the amount of silage which could be cut from these two stocking rates without depressing per cow performance. The results in Table 16 show that stocking rates of 2.75 cows per acre for the first cut and 2.0 cows per acre for the second cut has a significant

depressing effect on per cow production. The silage yields were estimated as 2.9, 4.7, 1.0 and 2.4 tons per cow on treatments A, B, C and D respectively. The shortfall in winter feed is supplied by molasses, a protein supplement and straw diet designed by T. Butler.

Table 16. CURTINS 1973

	Cows/Acre			Milk Yield	
Treatment	Overall	1st Cut	2nd Cut	Cow	Acre
A	1.5	2.25	1.75	603	905
B	1.5	2.75	2.00	547	821
C	1.75	2.25	1.75	636	1,113
D	1.75	2.75	2.00	479	838

Economic Analysis

Gross profit figures were calculated for a range of farm sizes from 20 to 200 acres with a range of stock carrying capacities of 0.66 cows per acre to 2.0 cows per acre. These data were computed for a range in sales per cow of 130 - £250 per cow. The gross profit figures obtained for the stocking rates, 0.8, 1.0, 1.25 and 1.5 cows per acre for each of the following sales per cow; £150, £170, £190 and £230 are shown in Tables 17 and 18 for 50 and 100 acre farms respectively. From these gross profit figures the total labour charges and the capital and interest repayment must be deducted. This data has been computed for current prices including the recent 30-35% increase in fertiliser prices. Nitrogen level is increased as stocking rates are increased. The same nitrogen level of 200 lb/acre is used on the 1.50 and the 1.25 stocking rates. The data assumes that the farms are self-sufficient for winter fed up to 1.25 cows per acre for a 120-day winter. The 1.50 stocking rate was calculated at a 140-day winter. A depreciation figure of £25 per cow was used. The principal findings from Tables 17 and 18 are

(1) an increase in gross profit per acre as stocking rate is increased up to the 1.25 cows per acre level

(2) a decrease in gross profit per acre if stocking rate is further increased to 1.50 cows per acre

(3) a striking effect of sales per cow on the gross profit figure.

Table 17. GROSS PROFIT* 50 ACRES

Sales/Cow	Stocking Rate/Cow/Acre			
£	0.8	1.00	1.25	1.50
150	2,222	3,093	4,096	3,336
170	3,022	4,093	5,346	4,836
190	3,822	5,093	6,596	6,336
230	5,422	7,093	9,096	9,336

*Deduct labour + repayment

Table 18. GROSS PROFIT * 100 ACRE

Sales/Cow £	Stocking Rate Cow/Acre 0.8	1.0	1.25	1.50
150	4,658	6,401	8,406	6,886
170	6,258	8,401	10,906	9,886
190	7,858	10,401	13,406	12,886
230	11,058	14,401	18,406	18,886

*Deduct labour + repayment

The effect on gross profit of increasing the stocking rate from 0.66 to 0.8; from 0.8 to 1.0 and from 1.0 to 1.25 cows per acre is given in Table 19 for a 100 acre farm. An increase in the stocking rate from 0.66 to 1.25 cows per acre at £150 sales per cow increases gross profit by £4,542, rising to £9,206 when sales per cow reached £230. The annual repayment charges (assuming the farmer has to borrow) and any increased labour charges must be deducted from these gross profit figures. The figure for gross profit less repayments with cows valued at £200 repaid over a 5 year period, and with facilities repaid over a 15 year programme is shown in Table 20. The data assumes that the 100 acre farm is considered a "development" farm under Directive 159. Increasing stocking rate from 0.66 to 1.25 cows per acre increases gross profits by £1,255 at £150 sales per cow (labour not deducted). The figures for gross profit less repayments for a 100-acre farm is considered a "commercial" farm are presented in Table 21. The main difference is that there is no subsidy on livestock purchases for the "commercial" farm. The gross profit increases are reasonable but the high interest rates and the short term availability of finance for the "development" are making things unduly difficult for "commercial" farmers. The implications of increasing the term for livestock borrowing from 5 to 10 years at two values for cows is shown in Table 22. At the £200 level increasing the term from 5 years to 10 years reduces the annual repayment by £2,409 on the "commercial" farm.

Table 19. GROSS PROFIT* INCREASE 100 ACRE

Sales/Cow £	0.66-0.8	0.8-1.0	1.0-1.25	0.66-1.25
150	794	1743	2005	4542
170	1060	2143	2505	5708
190	1326	2543	3005	6874
230	1858	3343	4005	9206

Table 20. GROSS PROFIT LESS REPAYMENTS* 100 ACRE DEVELOPMENT

Sales/Cow £	0.66-0.8	0.8-1.0	1.0-1.25	0.66-1.25
150	41	618	596	1255
170	307	1018	1096	2421
190	573	1565	1596	3734
230	1105	2365	2596	6066

* Deduct labour; cows at £200

Table 21. GROSS PROFITS LESS REPAYMENT* 100 ACRE COMMERCIAL

S.R. Sales/Cow £	0.66-0.8	0.8-1.0	1.0-1.25	0.66-1.25
150	-53	472	413	832
170	213	872	913	1998
190	478	1272	1413	3163
230	1011	2072	2413	5496

*Deduct labour; cows at £200

Table 22. REPAYMENT SCHEDULE FOR 100 ACRE DAIRY FARM

Cow Price £	Commercial 5 Year	Commercial 10 Year	Development 5 Year	Development 10 Year
250	10,185	7,175	9,017	6,020
200	8,426	6,017	7,455	5,029

The repayment schedule which a farmer has to meet if he is changing from a different farming system to intensive dairying at 1.25 cows per acre on 100 acres is high (Table 22). In such a case it is imperative that the livestock money should be borrowed for a 10 year period.

Conclusions.

The attractiveness of dairying in 1974 can be improved for many Irish dairy farmers. The cost of good facilities borrowed long term can be financed from the profits of intensive dairying. The availability of long term finance is necessary to accelerate intensification. Calendar - based management plans permit the achievement of higher stocking rates with minimum difficulty. Higher yielding cows are essential to improve the financial returns and to provide sufficient income to pay relief staff thereby permitting reasonable time off. With these improvements dairying in 1974 and succeeding years can be an attractive and financially rewarding Farm Enterprise.

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