THE ECONOMIC RELATIONSHIP OF DAIRYING TO GRASSLAND FARMING UNDER VARYING MARKETING CONDITIONS.

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1. THE TREND IN GRASSLAND FARMING:

The development of grassland dairying in New Zealand has resulted from the potential ability of large tracts .of country to carry pastures of a milk producing type throughout the whole year. The introduction of refrigeration gave an immediate export value to grass when converted into milk, products, Even under conditions of low prices prevailing in the early stages of export, grass sold in the form of butter and cheese gave a higher return per ton consumed than when used for any other purpose. Under such conditions, a living could be made from dairying at a lower capital cost than in any other branch of agriculture, which inevitably led to its rapid adoption by large numbers of settlers. It is reasonable to believe that in the early stages, the utilisation of grass in the production of milk was viewed as a transient stage leading' to rotational farming and the provision of special feed crops. The final recognition of. the fact that production from grassland itself was potentially higher than mixed grass and crops,. determined the policy of dairy farm management in respect to stock food supply. Consequent upon the development of grassland farming with its accompanying high standards of production, competition irrevocably led to high values being placed on all land of potentially high output, irrespective of the stage of development reached. The tendency has therefore been for land suited to dairying to realise higher prices than its actual production warranted.

The capitalisation of land at a level above its immediate production value was only possible under a mortgage system. The development of land where accepted modern methods could be applied to increase production at a diminishing unit cost was handicapped for many years through lack of working capital, aggravated by the drain to meet mortgage interest.. The 'position . became acute during the war years when rising prices were capitalised, and was again aggravated by the State undertaking settlement of discharged soldiers in 1918-1919. The rise in butterfat prices culminating in the "half-a-crown" season of 1920-1921, supplied the incentive for an increased effort in production. An unbroken high price level for a period of ten yearsending in 1929, implemented the application of research knowledge into improved pasture management practices, resulting in the production of butterfat at a lower unit cost than in any other dairying country if nntioncl and private obligations of the land itself be ignored.

The nim during these years of nctivo and conscious devel-opmont has been an ever increasing provision of milk producing pasture. This essentially means an increased provision of nutritiqus young pastures produced as such, or old pastures kept young in growth. The measures adopted to secure this result can be briefly summarised as follows;-

(1) Adequate usage of fertilisors of the right type and applied at the right time of the year.

(2) Utilisation cf the best strains of plants in the pasture association, and a balancing of the association itself.

(3) Manipulation of the mower and the harrow in the mechanical control of grass growth.

(4) Judicious subdivision and rotational grazing.

(5) Improved general management of suitable typos of stock.

The implementing of all the above expressed or implied management features into practice has undoubtedly been expedited and to a great extent directed by research into pasture response under varying conditions and treatment. A study of the decrease in cropping and the increase in hay and ensilage recorded statistically in dairying districts from 1920 onwards, indicates the extent to which the results of research have been applied in the development of a grassland sense in farm management.

(2) THE DEVELOPMENT OF DAIRYING UNDER GRASSLAND FARMING.

The science of grassland farming has been actively engendered under a period of high prices and the spur of the interest collector. The trend in development can best be studied on the basic period 1920-1933.

The ultimate movement in total production is determined by the total number of cows milked, and the average per cow performance of the total herd.

(a) Cow Numbers:

Owing, to the alterations in the method of enumeration, it is necessary in this discussion to include in the total herd all dairy cows whether in milk or dry.

In January, 1921 (1920-1921 season) the total herd numbered 1,004,666 cows. Prior to 1918, the average annual increase in the total herd was from 20,000 to 30,000. Active settlement and the tendency for sheep-farmers to supplement their income with butterfat produced in many instances from station cows, accellerated the annual increase up to 1922, subsequent to which the movement was not maintained. The milking herd actually appeared to be approaching stability in the period 1924-1927 but the upward movement then recommenced and gained momentum as the price depression became intensified from 1929 onwards. The influx of the sheep-farmer into dairying again made itself felt, and it is expected that the total herd as at January, 1933, will have reached an approximate figure of 1,820,000 cows. Thus we

find the herd as a faotor in development has increased by over 81% in the period taken.

(b) Average Production per Cow:

The level of average production fluctuates from season to Season according to climatic conditions and the standard of efficiency of animal units comprising the total herd. The trend has, however, been definitely upwards, consequent upon improved feeding and the adoption of sound breeding and culling principles.

The avcrago production for tho period 1912-1921 fluctuated between 151 and.163 lbs. of butterfat per cow, but subsequent to that dato a definite forward movement has taken place. Tho interim figuro *for* the present (1932-1933) season is 218 lbs., this level having been reached only once previously, namely in 19294930 whon average production was 218.05 lbs. per cow.

(c) Total Production:

Tho cumulative effect of a rapidly increasing total herd and a generally improved standard of production per cow is reflected in the phenomenal increase in the total amount of butterfat produced. For the 1920-1921 season this total approximated 155,000,000 lbs., whereas for the present season an interim estimate places the Dominion's production of butterfat at 396,500,000 lbs. or an increase of approximately 156% over 1920-1921.

(3) THE FUTURE OF THE DAIRYING INDUSTRY:

The future of the industry is a question of unparalled importance from a natfonal viewpoint. The economic, and ultimat-cly to a large extent the social destiny of the Dominion depends on the decision roached. in respect to *our* trado relationship with Great Britain, To grassland research workers the decision is equally vital. The object of this discussion is to measure with some degree of accuracy, the movement which may ha expected under varying conditions, and to indicate the problems which will thon confront grassland farmers and those interested commercially and professionally in the future of the dairying industry.

It is first of all necessary to survey in some detail, the probable' movement during the next five seasons, assuming that production will proceed normally as measured by movement actually realisod in the past, Tho resultant figure mcy be taken as a basis of argument and assumes groat significance in our discussion on restricted marketing.

(a) Normal Movement:

In the final analysis of production wo are mainly concerned with the surplus available for export. It is true that total local consumption advances each year in sympathy with increased population, greater per capita consumption of. milk products, and the requirements of an ever increasing herd of replacement calves. The fact remains, however, that internal consumption cannot keep pace with increased production, and is showing a regressive movement in percentage absorption of total *output,* with a consequent increasing percentage available for export.

Total butterfat production for tho period 1922-1933 shows a definite trend. If tho data is subjected to mathematical treatment this trend can be established, and corrected for plus and minus seasonal fluctuations. Once this trend has been determined, it can be projected into the future. This has been done (graph 1), taking tho above period as a base, with the resultant forecast that total Dominion production in 193749313 should approximate 572,000,000 lbs. of butterfat under normal conditions. It may well be asked, is it reasonable tosuppose that cumulative increases cm be sustained under our existing organisation? The answer is dependent upon a number of factors. As previously observed, total production is determined by tho number of cows milked and the average level of production per cow. The movements in cow numbers and in average production during the past decade hove been mathematically treated and projected, the results (graph 1) appearing not at all unreasonable or impossible of attainment.

It is apparent from past experience that the requisite additional stock can be supplied in addition to normal replacements, the annual increase for a number of years having been in the vioinity of 100,000. The area of land devoted to the present estimated dairy herd' of 1,820,000 cows is in the vicinity of 5,000,000 acres or approximately one cow to $2\frac{3}{4}$ acres, without considering the unexploited land embraced in a large percentage of dairying farms. If we presume that 5,000,000 acres only are available for dairying and increase the herd to 2,322,000 cows, as necessitated by estimated total production, it presupposes an improved carrying capacity of one cow to 2.2 acres. This in itself may appear difficult of attainment, But we must take into consideration the scope *for* improvement on existing dairying farms plus the possibilities of expansion on undeveloped land, and land at present devoted to other purposes.' This scope in area to ho exploited is. backed by the accumulated knowledge of pastures and pasture management, which in itself has gained a momentum promising the roalisation of these estimates within the next five years, under normal conditions,

The projected estimate of por cow production to 8 level of 242 lbs, in 1937-1938 may be subjected to criticism. What are the facts of the past which must be weighed in evidence? Under conditions of improved feeding both in quantity and quality combined with intensifying propaganda on breeding principles emanating from breed societies, herd testing organisotions, farming periodicals and the press generally, and 'all bodies, public or private, associated with the industry, steady progress has been made in the general level of unit production (graph 1). Perhaps the most illuminating evidence is that supplied by a comparison of tho general trend with herd testing records, tho latter being availablo since 1924-1925 for a sufficient percentage of the total hord to give a reliable trend basis. It will be seen (graph 2) that . averages for tested cows and for the total hord exhibit a marked

convergence. In 1924-1925 the general average was 42 lbs. per cow below tested cows, whereas in 3.932-1933 the difference is 33 lbs. only. With the tested average now standing at 251.5 lbs. per cow on a trend basis, the convergence of the two lines should reasonably ensure a general average of 242 lbs. by the season 1937-1938. The question naturally arises as to whether a straight line trend can be maintained. There must come a time when cumulative increases taper off, but it is to be expected that this point will be reached earlier in tested cows than in" tho general herd, the level of which is being affected by tested cows themselves, and their progeny going into replacement. The difference of 33 lbs. between the present levels of tested and total cow production should be sufficient to ensure the continuance of a straight line in average production *for* the next five seasons, even though the trend for tested cows may not be maintained.

"B" MOVEMENT UNDER A QUOTA.

If the foregoing arguments in support of the expected movement of production factors and consequent output under conditions approaching normality arc accepted, the effect of a quota *on* produotion *can* be gauged with a rcasonablo degree of accuracy. The projected production for the next five seasons (graph 1) is basod on the parabolic function exhibited in the curve of production for the past eleven seasons, but it is not desirable to estimate further. The future depends upon conditions for the period 1933-1938 conforming to the average of the eleven years' base .

Any discussion on a quota must take into account our pros-- ent level of export, approximating 125,000 tons on butter and 100,000 tons of cheese for the season 1932-1933. The best that could be hoped for should restriction be necessary is that this season's output be accepted as the basis of our-quota. We would then be in a comparatively favourable position, as the estimated season's production is 396,500,000 lbs. of butterfat, or

or 11,500,000 lbs. above the point established on the trend of conditions and exhibited in the parabolic curve. Our present season's output will therefore ho taken as a basis of discussion, -in order to give a conservative estimate of the operation' of such a quota. After deducting the butterfat required for internal consumption, the estimated surplus available for export as butter and cheese during the noxt five soasons'is as follows:-

1933-34	333,774,000	lbs.)
1934-35	366,097,000	")
1935-36	401,139,000	" I In round figures.
1936-37	438,868,000	")
1937-38	479,305,000	")

During the past four seasons, the increase in butterfat available for export has been divided between butter and cheese in the ratio of 3 - 1. If this ratio is maintained for the next five seasons, the export of butter and cheese respectively would be:-

Season:	Butter (tons).	Cheese (tons).
1933-34	130,835	108,033
1934-35	143,930	117,572
1935-36	158,138	127,385
1936-37	173,433	~~118,454~~ 138,454
1937-38	189,836	149,701

It is perhaps difficult to visualise the significance of these figures when expressed in terms of butter and cheese. Let us therefore assume that the cheese position remains stationary at 100,000 tons for the period under discussion, the whole of the increase in butterfat available for export going into butter. On this assumption, butter available for export in 1933-34 and succeeding seasons expressed in tons would be:-

Season:	Export Butter. Tons.	Excess over assumed quota of 125,000 tons.
1933-34	134,662	9,662
1934-35	152,301	27,301
1935-36	171,235	46,235
1936-37	191,824	66,824
1937-38	213,700	88,700

If we assume a quota of 125,000 tons of butter,, the difference between this figure and the amount available for export as established on the estimates put forward, indicates the degree to which cur normal trend in pasture and stock management efficiency would need to be relaxed in order to exactly fill our quota. 'The butterfat equivalent of the present season's export of butter and cheese is approximately 314,500,000 lbs. The comparable figure estimated for 193.7-1938 is 479,305,000 or 165 million pounds more than would be required for an export of 125,000 tons of butter and 100,000 tons of choose. This surplus is equal to 41.6% of the total production estimated for 1932-1933. Our surplus butter would increase from 9,662 tons in 1933-1934 to approximately 88,700 tons in 1937-1938, provided management factors are allowed to function normally during that period. The arbitrary assessmont of restriction necessary for the season 1937-1938 represents a 29% restriction on potential efficiency established on normal trend.

(c) Movement under Free Marketing Conditions in Great Britain:

It is impossiblo to give an estimate of production under conditions of free competition between the producers of the Empire for the markets of Great Britain. It is necessary, however, to give some consideration to the factors which might be expected to operate so far as New Zealand is concorned.

(1) Price Movement;

It has been shown that the Dominion is potentially capable of materially increased output. Under competition, the motive power in production is the general level of price realised for the product concerned. It is generally accepted that additional supplies of butter and cheese on British markets will further depress the price realised, and this is substantiated by dairy produce price movements when studied in conjunction with total supply. in store or in sight. This is particularly true with regard to commodities in the same price class. Our serious

competitors in butter are therefore Australia and Argentine, the trade of these countries being similar in price class, seasonal distribution of production, and localised marketing in England. It is true that any general upward movement in the price of Northorn Hemisphere products is reflected in our own, but this is only a reflection of healthy market conditions.

In addition to being on a competitive basis with Southern Hemisphere butter,we are unfortunately bordering on the margarine price class also; and the significance of this substitute as it may affect the markets of thc'futurc must be recognised.

Price level depends on the absorptive capacity of Great Britain and the ability of competing countries to supply at the price the consumer is prepared to pay. In this connection, it would appear that the potential absorptive power of other countries can bo ignored as a possible outlet for our surplus if recent trends toward nationalism are reliable indicators. Internal consumption of producing countries may however, be increased in certain *ins* tances. The degree of saturation reached *in* Great Britain is therefore of paramount importance. In 1927, the per capita consumption stood at16 lbs. of butter and 13.3 lbs. of margarine. For the present year the estimated supply of butter will amount to 24 lbs. per oapita or 5.3 lbs. below the combined consumption of of butter and margarine in 1927. It is diffidult to obtain definite information as to the degree of replacement which has taken place, particularly as 83% of the margarine consumed in 1927-1929 was manufactured in Great Britain. It is quite clear from a study of consumptive figures and market reports that it is becoming increasingly difficult to stimulate consumption in respect of both butter and cheese. It can only be done by a lowering in price or an increase in purchasing power, and the latter appears a receding possibility.

Can New Zealand maintainan increasing surplus for export under suah condition? I say New Zealand rather than the farmers

of New Zealand, as it has become apparent of recent years that the maintenance of production is a national consideration where the general public subsidises the farmer through direct and indirect taxation to enable him to carry on.

These subsidies, plus mutual or arbitrary arranagements regarding mortgage interest, have ensured a cumulative increase in production and 'in our percentage supply of Great Britain's imports during recent seasons, despite the trend in factory payout on butterfat 'from 16.25d per lb. in 1929-1930 to 11.58d, 11.03d and approximately 9.0d for the sucoecding three seasons. Further pay-out of butterfat depends entirely on input in the form of goods or services to maintain produotion. It is significant that the failure in recovery of the price trend of butter in November, 1932, was followed by a marked falling off in the use of fertilisers, the drop approximating 38% since the first of January compared with the same period in 1932. This is the farmers' reply to a continued reduction in, his unit payout, but again the mattor is one for' national consideration. It must eventually' be decided whether the- trading power of the State benefits from a reduced volume of export, or whether an increased export offsets any price reduction+ Under this competitive system, the country which can supply an increasing proportion of Great, Britain's requirement in any price class is in a relatively stnong position.

(4) THE IMPLICATION OF RESTRICTED QUTPUT;

It has been observed that a restriction on output of butterfat may be imposed by a deliberate quota on exports to Groat Britain, or by a progressive- failure on the part of farmers to maintainthe input of production goods and services necessary to ensure the efficient operation of factors contributing to normal expansion. The final results measured in volume of production may be the same, but the intermediate stages are likely to be very dissimilar. The terms of a quota provide an immediate 'basis on which total butterfat required to meet internal needs and known

overseas markets may be computed. The degree to which production is to be controlled must then be determined. This would be influenced by the possibility of storage and its limitations as it affects or retards prices,. *and* the scope for exploitation of new markets . If there are no avenues of disposal other than to "quota" **markets,** the quota must be passed back from the controlling body through factories to the farm itself .

The method of operating a restriction is, a matter for serious consideration, There are two possibilities, either of which may be adopted with suitable reservations.

(a) Direct control on the farm, the factory being given its quota, and it in turn would put the onus on its suppliers., each farmer being given a quota based on previous year's production. It would then be a matter for each farmer to arrange his stocking programme accordingly, but it would need. to be remembered that seasonal fluctuations in production would necessitate planning for an excess over the quota in case of a bad season being experienced.

(b) Control of export by a central body having absolute power of disposal **over** all produce . In this instance it would need to be 'determined whether it paid the producer and the State to aim at a normal output and thus allow of discrimination in export of the highest quality only, the surplus being disposed of outside the quota market *or* used for other purposes. In the final analysis it may even pay to destroy the surplus . Such a system would necessitate strict regulations governing quality of farm supply, and the pooling of a levy to cover surplus stocks.,

It is contended by quota advocates that its application, through a conscious regulation of supply, must result in orderly marketing and an advance in the price level, This may be the case provided the supply is sufficiently restricted or consumers'

purchasing power is increased. If the price is advanced solely by creation of an artificial scarcity, it must be recognised that the margarine interests are in a position to fill demand at low prices. In fact, margarine will always act as a governor to maintain an equilibrium between price and demand, and very careful analysis would be necessary to establish the quantitative point at which it paid producers to hold supplies. If this point could not be accurately determined, accumulations must again result with a Consequent drop in price to clear stocks.

Restriction through the operation of economic forces leaves the individual producer complete freedom of action. Adjustment would be slow, and competition between producing countries extended to competition between the individual farmers, of each country. A value is automatically placed on efficiency in organisation and management, whilst marginal land inefficiently farmed must go out of production entirely, until the stage is reached when reduced output results in a rising price level commensurate with that aimed at under the quota system.

What then are the direct reactions in either case, as they affect the farmer and the grassland research worker?

(A) THE FARMER:

(1) The Quota:

Every acre of land now carrying dairy cows is capable of maintaining or increasing its present production under reasonable conditions of management. The impetus to production occasioned by working capital already spent and represented in improved pastures and stock ensures an increased trend in output from all dairy farms for some time to come, even though normal management factors be neglected. At the same time, seasonal fluctuations in production due to climatic conditions may result in a movement of 5% plus or minus the normal level.

If farmers are directly limited in their supply to the factory, two courses are open to them, They may either (a) relax in their management and continue to milk the same number of cows

producing less efficiently, or (b) cull heavily on production and milk less cows. 'In the first case the total farm area will be required, whereas in (b) a suffioient area may be kept at a high state of fertility and the remainder be neglected or used for other purposes. In either case a condition of "status quo" is reached with either a lowering of production efficiency or a discard of land, whilst the unit cost of production cannot be reduced with a fixed overhead represented by land and stock. Even though the return per pound of butterfat advanced materially, there would be no incentive to maintain pastures at a high state of efficiency, unless they were capable of exploitation by other stock, the proceeds from which would meet the cost of production. The profits to bo expected from such a course would again depend on access to overseas markets. If control were exercised through a central body responsible for the disposal of a surplus, the reaction of farmers would depend upon the measure of financial success experienced in the first two seasons. Should it prove possible to realise on the surplus even at a low price, the incentive to maintain production efficiency would be safeguarded, and the industry retained in a healthy condition in anticipation of an extended quota. It is feared, however, that suitable out-lets for surplus butterfat would be difficult to locate under accepted market conditions. Should such a market not materialise, the farmers themselves would exorcise restriction in production by methods previously discussed.

(2) Economic Bostrictions:

If cumulative increases in dairy produce are thrown on British markets,' it is feared that the average payout to farmers must be reduced. Should this fear be realised the limiting fector in dairy management then becomes cost of production, It is well known at the present time, that unit production costs vary from 6d to probably 2/- on individual farms, the occupiers of uncnonomic areas being allowed to remain in production-only at the discretion

of mortgagees. Whilst this position persists, a lowering of price may not throw land at present used for dairying out of production, but occupiers will become still less able to meet their capital indebtedness. This might go on indefinitely, or be regulated by wholesale adjustments of capital; With a free interplay of economic forces, however, dairying must ultimately be restricted to land which enables butterfat to be produced at a price which meets the market and the obligations of the land itself. Under such conditions it is conceivable that land at present considered low in production may retain its position, whilst some high production land may revert, This is particularly likely with regard to land brought to its present state by high developmentcosts, and which demands high annual expenditure in maintenance. The movement previously noted in respect of fertiliser usage is but the commencement of restriction in expenditure on production goods. The continuance of such a trend which must also apply to other goods and services not easily ascertainable, will inevitably result in a lowering of production on those farms where such measures are being effected.

"B" THE GRASSLAND RESEARCH WORKER:

(1) Quotas:

It must be accepted that the imposition of a quota, no matter how it is operated', would load immediately or. in a short space of time to a less intensive type of grassland management over all land devoted exclusively to dairy cows. Improved marketing condition may occasion an extension of our export limits, but it is not at all likely that such an extension would be commensurate with progress under normal conditions. Any action necessitating or causing an easing in the present standard of exploitation of pastures and stock, automatically restricts the need of research on pastures and their improvement.

(2) Economic Restrictions:

If previous observations with regard to the farmers'

reactions to lower prices are correct, the grassland worker'has a very definite objective under conditions of economic restriction, The object then is to keep as much land in production as possible by a general reduction in unit cost. The slogan should therefore be "Research can assist in lowering the costs of production", and any programme of work suggested must be designed to that end. Although certain types of apparently impractical research may still be warranted under conditions of economic stress, the time has arrived when research generally must justify its continuance, and the final analysis of its economic significance is the practicability of the adoption of its- findings in the war to lower costs per unit of production,

Actually, the conditions of marketing pertaining at the present and for some time past, are such that measures leading to economic restrictions would hnvc been put into operation had legislative action not been taken to counteract such forces. It is to be expected that the action of economic stress will be retarded for-'some considerable time, and that readjustments will be slow.. It is therefore an Opportune time for research workers' interested in pastures and their bchaviour, to take stock of their position and to decide how they can assist in the process of readjustment.

I therefore 'put it forward as a considered suggestion that the outstanding need of the present moment is a critical examination Of the functions and behavior of pastures as they exist and are managed on the farm laboratories of New Zealand. Under conditions of keen competition, the quality of the product becomes of paramount importance. Although quality of butter and cheese is determined mainly by officiency in manufacture, the possibility Of a corellation between pasture association and the chemical and physical properties of the raw material entering into products should not be ignored in such an investigation.

The data obtained from an examination of this nature should be analysed and studied in such a way that research workers and teachers would have a clear understanding of the problems confronting the practical worker, namely the farmer., Research projects should then be framed in intimate relationship with the definite problems arising from the enquiry, even though it may be found that measures necessary to overcome the difficulty could not be put into operation immediately owing tofinancial stringency.

If the New Zealand Grassland Association is to function and take the place in our internal farming economy as suggested by its constitution, this donferoncc should not break up without the formation of a small committee being formed for the express purpose of reporting in detail to the Association Executive onresearch projects, and suggesting ways and means of carrying out such an investigation as suggested above. I feel that the research worker can only enter fully into the problem of reducing costs, after he is thoroughly conversant with the economic, social and psychological outlook of the men who must implement research into practice.

(5) CONCLUSION:

Restricted output of dairy products whether effected through quotas or economic forces, completely upsets our expansionist psychology built up step by step as the Dominion has developed. In this respect, a country such as Denmark would not be so adversely affected by a quota. Her volume of production is semi-static and diversified, and the interest of the State particularly in small holdings, allows of greater flexibility in capital adjustment. The implications of restriction in output of primary products could well be discussed as they might conceivably effect the internal organisation of capital and labour, but such a discussion is outside our 'present agenda. It is pertinent to suggest, however, that unless a restriction results in a definite upward trend in the general price level with an accompanying increase in sponding power of consumers, adjustment of a drastic nature must eventually take place between capital and the holders of title deeds to land used in production, even if it does not become necessary to indulge in some form of nationalisation of land and production.

APPENDIX 1.

Season:	Total Cows in Milk & Dry,	Production per cow. Lbs.	Total Butterfat Produced. Lbso
1920-21	1,004,666	154.25	154,972,143
1921-22	1,137,055	174.97	198,945,959
1922-23	1,248,643	180.62	225,526,337
1923-24	1,312,589	174.10	228,516,803
1924-25	1,323,432	182.89	240,985,575
192-5-26	1,303,856	179.40	233,913,057
1926-27	1,303,225	198.50	258,693,050
1927-28	1,352,398	195.38	264,236,638
1928-29	1,371,063	210.84	289,070,517
1929-30	1,441,410	218.05	314,068,158
1930-31	1,601,633	201.05	322,006,147
1931-32	1,702,070	199.65	339,817,181
1932-33	x 1,820,000	x 218.00 x	396,500,000

x Interim estimate.

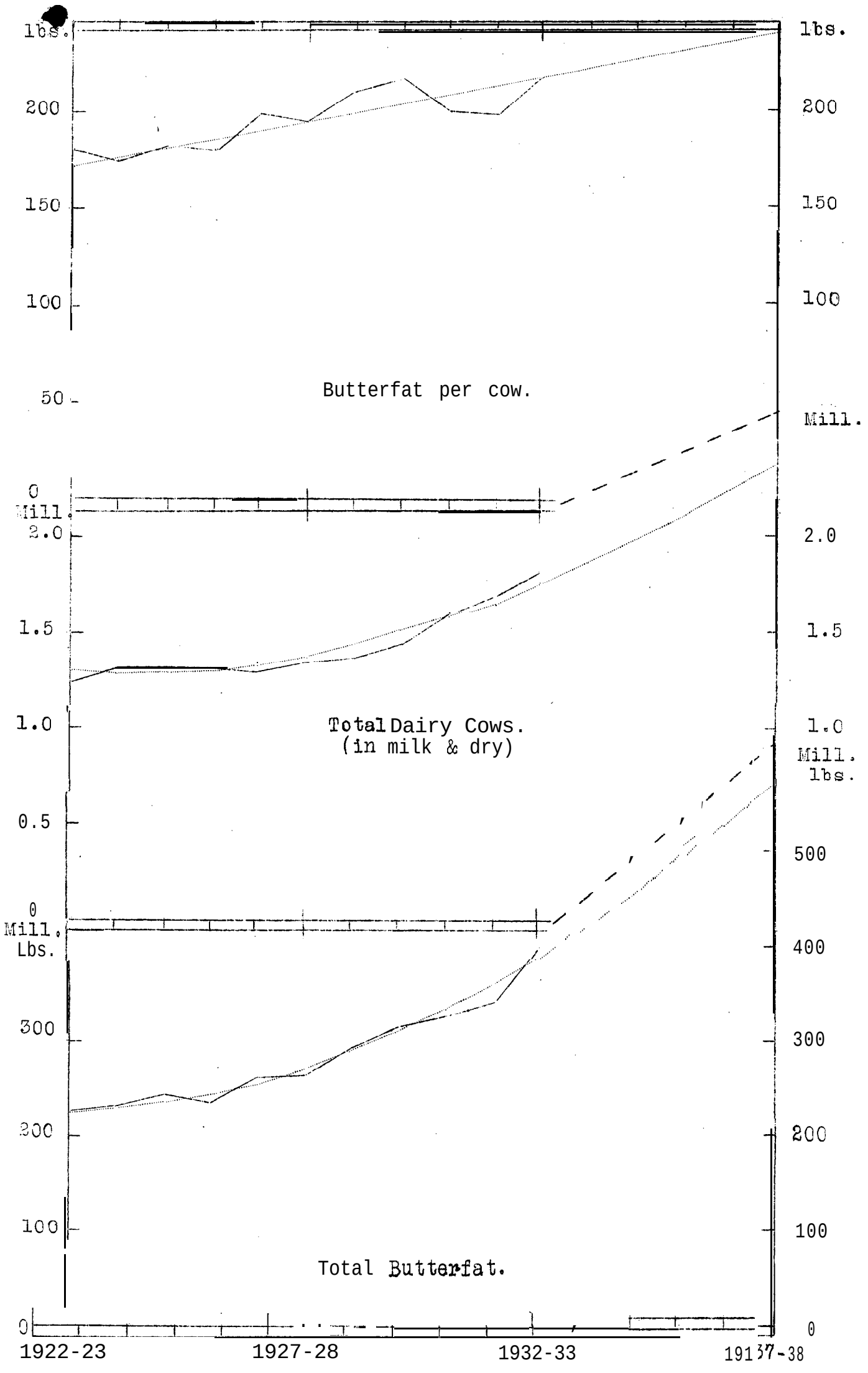
Season:	Estimated total Butterfat Production Smoothed by second order parabola:
1922-23	224,000,000
1923-24	227,320,000
1924-25	233,480,000
X925-26	242,480,000
1926-27	254,320,000
1927-28	269,000,000
1928-29	286,520,000
1929-30	306,880,000
1930-31	330,080,000
1931-52	356,120,000
1932-33	385,000,000
1933-34	416,720,000
1934-35	451,280,000
1935-36	488,680,000
1936-37	528,920,000
1937-38	572,000,000

	Butterfat devoted to:-		
	Butter.	Cheese.	Other.,
1933-34	294,037,500	98,012,500	24,670,000
1934-35	319,342,500	106,447,500	25,490,000
1935-36	346,740,000	115,580,000	26,360,000
1936-37	376,215,000	215,405,000	27,300,000
1937-38	407,775,000	135,925,000	28,300,000

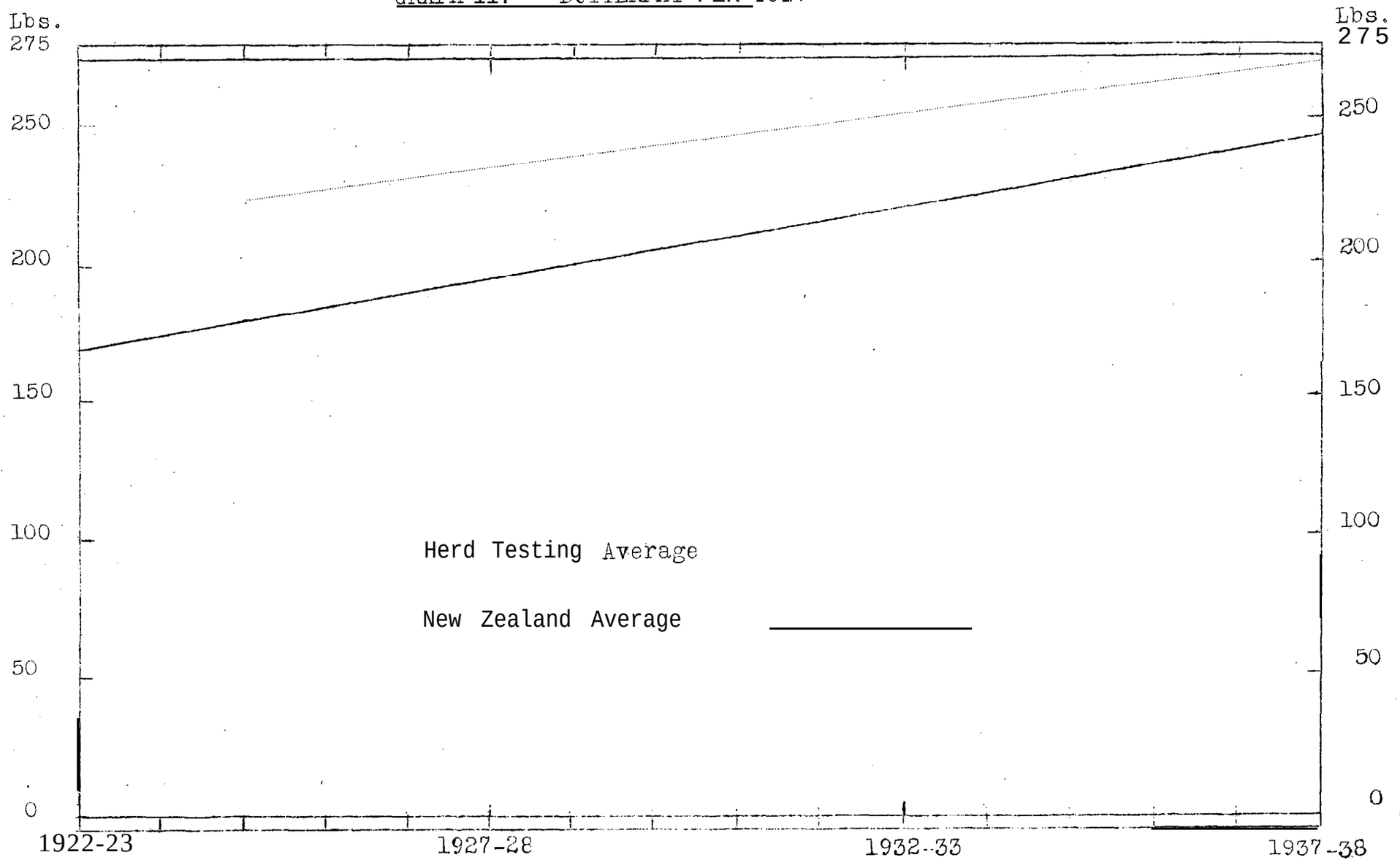
New Zealand's Percentage of
Total Butter and Cheese Imports into Great Britain.
Years ending 30th September.

Season:	Butter:	Cheese:
1923-24	20.5	51.8
1924-25	22.6	46.0
1925-26	18.7	48.6
1926-27	20.6	53.9
1927-28	20.6	51.6
1928-29	20.5	58.6
1929-30	22.2	60.8
1930-31	24.0	61.7
1931-32	25.1	58.4

GRAPH 1.

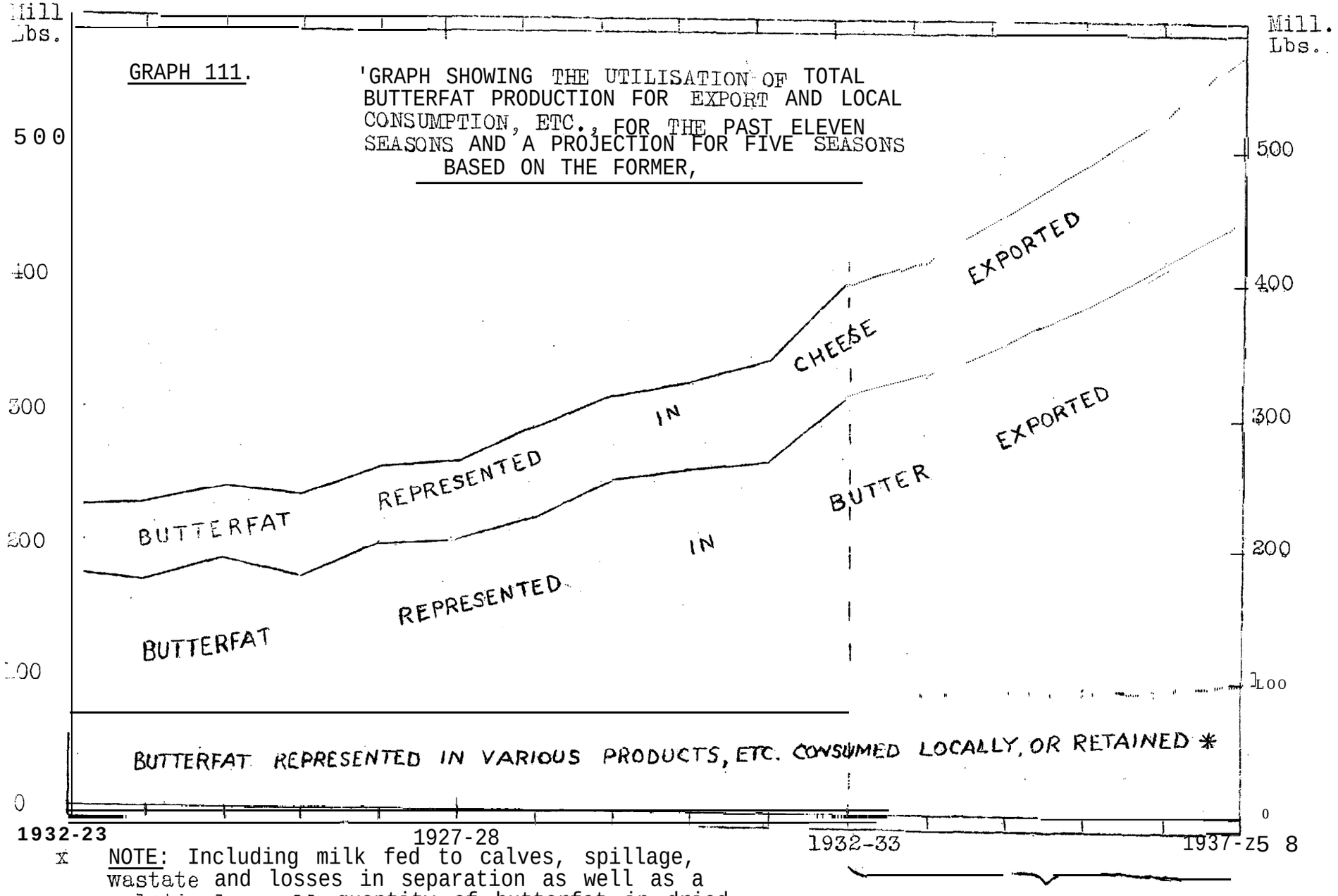

lbs.
200
150
100
Butterfat per cow.
50
lbs.
200
150
100
Mill.
0
Mill.
2.0
1.5
1.0
Total Dairy Cows.
(in milk & dry)
2.0
1.5
1.0
Mill.
lbs.
0.5
0
Mill.
Lbs.
500
400
300
200
100
Total Butterfat.
300
200
100
0
0
1922-23
1927-28
1932-33
1937-38

GRAPH 11. BUTTERFAT PER COW.



GRAPH 111.

'GRAPH SHOWING THE UTILISATION OF TOTAL BUTTERFAT PRODUCTION FOR EXPORT AND LOCAL CONSUMPTION, ETC., FOR THE PAST ELEVEN SEASONS AND A PROJECTION FOR FIVE SEASONS BASED ON THE FORMER,



x NOTE: Including milk fed to calves, spillage, wastage and losses in separation as well as a relatively small quantity of butterfat in dried and condensed milk exported.

PROPORTIONS OF BUTTERFAT UNDER VARIOUS HEADINGS RELATING

TO POSITION SHOWN IN GRAPH 111.

Season ending 31st July.	Total Butterfat Production. Quantity of Butterfat in lb.	Export %	Local x %	Total Butterfat in Butter & Cheese manufactured. Quantity of Butterfat in lb,	Export %	Local %	Total Butterfat Exported. Quantity of Butterfat in lb,	Butter %	Cheese %
1922-23	225,526,337	73.4	26.6	201,161,407	82.3	17.7	165,629,895	71.1	28.9
1923-24	228,516,803	73.6	26.4	204,843,254	82.1	17.9	168,089,790	64.8	35.2
19 24-25	240,985,575	73.8	2612	215,914,673	82.4	17.6	177,828,513	68.4	31.6
1925-26	233,913,057	71.8	28.2	209,147,292	80.3	19.7	167,870,329	64.7	35.3
1926-27	258,693,050	72.6	27.4	232,344,761	80.9	19.1	187,852,707	67.3	32.7
1927-28	264,236,638	72.8	27.2	237,370,158	81.0	19.0	192,238,993	68.7	31.3
192849	289,070,517	74.4	25.6	261,153,680	82.3	17.7	215,017,778	67.8	32.2
1929-30	314,068,158	75.7	24.3	284,533,605	83.6	16.4	237,903,143	72.4	27.6
1930-31	322,006,147	75.5	24.5	291,978,068	83.3	16.7	243,151,404	71.8	28.2
1931-32	339,817,181	76.6	23.4	309,310,027	84.2	15.8	260,385,681	72.1	27.9
1932-33	396,500,000	79.2	20.8	363,200,000	86.5	13.5	314,000,000	73.6	26.4
1933-34	416,720,000	79.7	20.4	382,330,000	86.8,	13.2	331,840,000	73.0	27.0
1934-35	451,280,000	80.7	19.3	415,240,000	87.7	12.3	364,000,000	73.2	26.8
1935-36	488,680,000	81.6	'18.4	450,860,000	88.5	11.5	398,860,000	73.4	26.6
1936-37	528,920,000	82.5	17.5	489,180,000	89.2	10.8	436,390,000	73.6	26.4
-937 --38	572,000,000	83.3	16.7	530,220,000	89.9	10.1	476,620,000	73.7	26.3

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x Including losses in separation.