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A PLEA FOR WINTER DAIRYING.

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Traditional attitude to dairying.

The traditional view is that winter dairying, however desirable from many points of view, is not practical economics for the Irish farmer. Milk production in the winter time means intensive feeding of the cows, and the food, some of which must be imported, would cost more than the value of the milk would justify. Apart from the limited number of farmers—and others—producing for urban consumption, as whole milk, the main determining factor in the price of milk has hitherto been the export price of butter which is an international one. Up till recently there was a substantially higher price for winter produced butter than for the product of summer dairying, but the rapid increase in the exports of Southern Hemisphere countries to the British market, as well as the increasing practice of cold storage, have caused the winter price to approximate more and more closely to the summer price. And this tendency is one which we may expect to continue. Last year owing to abnormal conditions the price of Irish creamery butter on the London Market actually fell from 140/- per cwt. in June to 132/- in October. (Table quoted in *Irish Trade Journal*, Vol. VI., No. 1, P.5.)

The increasing volume of butter imports from New Zealand and other Southern Hemisphere countries helped to even out the monthly arrivals in the British market, and seemed to constitute a still further justification for our traditional summer dairying policy.

Policy implied in the Butter Tariff.

The unexpected fall in the price of butter last autumn *below* the level of the previous summer found many Irish creameries with butter bought and cold stored, while the milk had been already paid for at a price governed by the expectation that the winter price of butter would rise rather than fall. In consequence a serious crisis was threatened in the whole industry and the machinery of the Tariff Commission was invoked, that thus the home market might be summoned to redress the price balance of the export market. The import of foreign butter in 1929 amounted to 41,000 cwt. as against 53,000 in the previous year. This figure less 10,000 cwt. of Irish butter exported in January, February, and March, 1929 (the three

months in which home produced butter is less than the requirements of home consumption) may be taken to represent the deficiency on the home market which the imposition of a tariff might be expected to induce home producers to fill. In any case this deficiency has been a steadily diminishing one, and it would not require any great effort to increase our production of winter butter by 31,000 cwt. The new tariff of 4d. per lb. will probably have this effect in the near future, but if the effect stops there it will have made no substantial contribution to the solution of the main problems of the dairying industry. As soon as every month in the year begins to show a surplus of butter produced in that month, which must find a market abroad, the home price will fall to the level of the export price which, of course, is governed by international conditions. The policy behind the tariff is a policy of inducement to the dairy farmer to go in for winter milk production, not merely in order that he may supply the home market (already almost saturated), but in order that he may supply the export market more uniformly and more effectively throughout the year than he has ever done before, and be able for the first time to hold his own there with his Scandinavian competitors.

Countrymen are familiar with the practice of holding out a carrot to an obstinate type of quadruped in order to induce it to go where it would otherwise be unwilling to go. When it gets there it may possibly get some stronger nourishment than the carrot. The monopoly of the home market is held out to our dairy farmers as a means of inducing them to recapture the export market, and hold it firmly every month of the year. If this result is achieved it will mean nothing less than a revolution in the whole of our agricultural economy.

General object of this paper.

The object of this paper is to examine, in the light of all the available economic facts, whether this revolution is possible and desirable.

The altogether admirable statistical publications of our late ex-President, John Hooper, and his staff have made this task much easier. I am particularly indebted to "The Agricultural Output of Saorstát Eireann, 1926-1927" and "Agricultural Statistics, 1847-1926." Our sense of personal and public loss is intensified by every closer realisation of the great value of the work with which John Hooper's name is imperishably associated. I have also consulted the "Tariff Commission Report on Application for a Tariff on Butter" and found it a most sensible and well documented piece of work. The "Interim Report of the Tribunal to inquire into the Marketing of Butter" adds little to already available information, but contains the promise of greater things to come. The *Irish Trade Journal*, Volume VI., Nos. 1 and 2, contains useful and well informed articles on various aspects of the butter question. The *Journal of the Department of Lands and Agriculture* is a mine of valuable information. Last but not least I would like to acknowledge indebtedness to numerous practical farmers. If the general standard of agricultural practice could be levelled up to that of our best, most enterprising and most successful farmers, the national agricultural wealth would be at least doubled in a very few years.

Dairying a key industry in our national agricultural economy.

The recent crisis in the dairying industry was not merely a crisis affecting a few thousand dairy farmers but a crisis affecting our whole agricultural economy. Otherwise the Tariff Commission and the State would scarcely have been justified in acting as they did.

Dairying is closely associated with live stock production. Output of cattle in 1926-1927 amounted to £14,000,000 while the value of milk and milk products also came to £14,000,000. Pig, poultry, and egg production are important complementary activities to dairying. The output of these by-products was £18,000,000. The estimated value of the total agricultural output in that year was £65,000,000, and as we have seen, £45,000,000 of this was directly or indirectly related to dairying. Perhaps poultry and egg production, amounting to £9,000,000 in value, is not yet so closely related to dairying as it should be, and will be if winter dairying becomes the rule.

While milk production to a greater or less extent is an adjunct of every farm in the country there are certain geographical regions in which milk production is carried to a high degree of specialisation, and it is in these regions that creameries are found. Elsewhere, and to some extent even in creamery counties, butter is made on the farm, and in commerce is known as farmers' butter. The butter of a number of different farmers, if blended before resale, is called factory butter.

The ten "creamery counties" (i.e., counties in which creameries receive the milk of not less than 38 per cent. of the cows) occur in two groups, a South-Western group consisting of Kilkenny and all Munster except Clare, and a North-Western group, Monaghan, Cavan, Leitrim and Sligo.

If we add County Clare to the South-Western region and add Counties Donegal and Mayo to the North-Western region we get six North-Western counties characterised by having 9 to 11 cows per 100 acres of crops and pasture, and seven South-Western counties having 9 to 18. That leaves thirteen Central Eastern counties in which the number of milch cows per 100 acres of crops and pasture lies between 3 and 7, except in the case of Dublin where the density is 10, on account of metropolitan fresh milk requirements.

The thirteen Central Eastern counties include both tillage areas like Louth, and grazing areas like Meath and Westmeath, but in any case the fattening of stock is their main agricultural activity, and as they do not rear enough for the purpose they buy the surplus calves raised in the dairying regions, to the great convenience of all concerned. Limerick is the creamery county *par excellence*. If we consult page xix of "Agricultural Statistics, 1847-1926" we find that Limerick has only 131 cattle other than milch cows for every 100 milch cows, while Louth has 393, Westmeath 628 and Meath 1,063.

Not every cow produces a calf every year, unfortunately, and in fact the ratio of calves under one year to milch cows for the whole country is 78 per cent. On that basis Louth, with a milch cow population of 10,700 in 1926, imports (from other counties) about 1,600 calves under one year and 2,200 cattle from 1-2 years old. In order to do without imported calves Louth would have to increase the cow population by about 50 per cent. Any serious collapse of dairying in the dairying regions, by cutting off the supply of extra calves from the fattening regions, would compel farmers in the

latter to revolutionise their agricultural methods. If in order to get the requisite number of calves County Louth had to increase substantially its cow population it would find itself with a considerable surplus of milk, and probably have to establish creameries in order to dispose of this inconveniently large by-product. In other words dairying is so closely interwoven with our general agricultural economy that if it failed in the regions where it has hitherto been a traditional speciality, it would have to be established in other regions where it formerly played a minor part.

Winter dairying means tillage. Existing tillage areas, like Louth, are in a position to develop winter dairying activities at any time, and in fact such areas will probably be the first to respond to the stimulus of the tariff. A real change of agricultural policy is called for in the case of a county like Limerick which is notoriously deficient in tillage.

Disposal of total milk production. One third of our milk supply already produced in the winter.

It is evident from Table 9 of "The Agricultural Output of Saorstát Eireann, 1926-1927," that already 188 million gallons of milk were being produced in the winter six months, and it would not be unreasonable to assume that the amount now approximates to 200 million gallons. Of the total annual production—589 million gallons—given in that table it would seem that approximately one-third was winter milk. The milk equivalent of butter exported was 145 million gallons and of cream 11 million gallons. Since the surplus available for export as butter or cream occurs almost entirely in the summer months it is clear that if we increased our winter milk production by 50 per cent., or 100 million gallons, we would go far to secure the desired ideal of a uniform monthly export in each of the twelve months.

The failure of the export surplus in the winter months under present conditions is accounted for partly by the prevalence of "summer dairying" in the dairying regions. But in the country as a whole the extent to which winter milk production is already practised—one-third of the whole—is surprisingly large. If we look at the calving statistics for the separate counties we find that in 1917 the percentage of annual calving that took place in the period September to December was 17·3 for Carlow, 18·9 for Kildare, 18·4 for Louth, 19·9 for Meath, 17·0 for Westmeath and only 2·7 for Tipperary and 0·7 for Limerick. The export trade in butter is mainly in the hands of the creameries. Two-thirds of our creamery butter is exported. The output of farmers' butter, 904,000 cwt., as against 587,000 cwt. of creamery butter (1926-27), is for the most part consumed at home. Only 16·7 per cent. of it is exported, and that almost altogether in the form of factory butter. The total per capita consumption of butter in the Saorstát is surprisingly large, 43 lb. per annum by agriculturists, 31 lb. by non-agriculturists, and 38 lb. on the average by the total population. In Great Britain it was only 16 lb. in 1924-25, in Denmark 12 lb. in 1925 and in France 8 lb. in 1923.

If our people were to reduce their consumption of butter in the winter time to the Danish level a surplus of well over 300,000 cwt. would immediately become available for export.

The monthly consumption of butter in the home market is 27,000 cwt. creamery, and 54,800 cwt. farmers', and there is no reason to consider that there is a wide variation between the summer and winter rates of consumption. A reduction in the home consumption of butter of both kinds in equal proportion would liberate two lb. of farmers' butter for every lb. of creamery butter, but the farmers' butter thus liberated would find no welcome on the English market, and consequently such a solution of the "seasonal export" problem is economically impossible, even if it were not undesirable on hygienic grounds. But it is interesting to observe that the problem exists partly because, unlike the Danes, we are voracious consumers of our own butter.

Our consumption of milk—30 gallons per head—is high in comparison with Great Britain (23) and Denmark (19). Nevertheless it is not desirable to restrict our per capita consumption of this most useful food. On the contrary it should be expanded, especially in the case of our urban populations, whose average consumption is estimated at only 17 gallons per person per annum. The consumption among our agricultural population is 38 gallons. On grounds of public health, no less than on economic grounds, public policy should aim at encouraging the consumption of a much larger volume of pure milk by our non-agriculturists. There is no reason why it should not be doubled, and in that case the home market would absorb an additional 20 million gallons of milk in the form of whole milk.

One of the features of the commerce in milk as a whole is what might be called the non-liquidity of the liquid milk market. There is a lack of sympathy between the price levels of milk for liquid consumption and milk for butter manufacture. It appears from the "Report of the Prices Tribunal," p. 88-91, that the average creamery price for milk (skim milk being returned to the farmer) was 6½d. per gallon in 1926, whereas the average annual price to farmers supplying milk for liquid consumption in Dublin was 11d. at the farm or the farmer's railway station. Even if we allow 2d. per gallon as the value of skim milk returned the width of the margin that remains is evidence of a serious lack of organisation in the commerce in milk as a whole.

The development of winter dairying in our tillage and grazing districts would bring the creamery system much nearer Dublin, and it is probable that a trade in whole milk (preferably pasteurised) would arise between such creameries and Dublin, and become a useful adjunct to the butter-making industry. It would also open up the export market for butter as creamery butter to farmers whose butter, as farmers' butter is now practically confined to the home market.

The present tendency is for the total output of butter to increase though the output of farmers' butter is diminishing. In 1929 creamery butter to the amount of 707,000 cwt. was produced as against 587,000 cwt. in 1926-27 while the output of farmers' butter diminished from 904,000 cwt. to 835,000. The total output thus increased from 1,491,000 cwt. to 1,542,000 cwt. It is interesting to observe that the home consumption of Saorstát butter increased from 963,000 to 982,000 cwt., an increase of 71,000 cwt. in the home consumption of creamery butter being partly set off against a decrease of 52,000 cwt. in the home consumption of farmers' butter. The net increase in butter production (51,000 cwt.) would correspond to

an increase of 14 million gallons in the production of milk. Apparently then the total volume of milk production has increased from the 589 million gallons shown in the "Agricultural Output Report" of 1926-27 to 603 million gallons in 1929.

Seasonal character of Butter Export Trade and consequent effect on price.

The facts outlined above help to explain the seasonal character of the Saorstát Butter Export Trade. The statistical record of these facts is sufficiently striking. It appears from a table published on page 39 of the "Report on Application for a Tariff on Butter" that 15·6 per cent. of the annual production of creamery butter is produced in June, 15·2 per cent. in July and only 1·2 per cent. in January and 1·1 per cent. in February. As home consumption of creamery butter absorbs 27,000 cwt. monthly, and the output exceeds this figure only from April to November, the disparity in the volumes of monthly export surpluses is even more striking. In 1929 the maximum export surplus of creamery butter occurred in July and amounted to 73,000 cwt. The minimum for the eight months period was in April (11,000 cwt.). The export in the winter months was quite trifling, especially in February and March. The export of creamery butter in the first three months of 1929 amounted only to 2,812 cwt. It is significant to note that the export of factory butter in those same three months was 6,741 cwt. though the annual export of creamery butter is normally about 3 times the annual export of factory. Apparently our much abused factory butter is better able to hold the export market in the winter time than creamery butter. The explanation is that the creamery system is too much confined to areas where summer dairying is practised, and, as already noted, a certain amount of winter dairying is endemic in areas which have unfortunately not yet been touched by the creamery movement.

In any case unless the so-called dairying regions will add winter to summer dairying they cannot expect to hold the markets at all in the future. However profitable summer dairying may be in Limerick as an abstract proposition, we must face the fact that the average consumer does not want to eat 7 lb. of butter in July and August and none at all in November and December. In 1929 the *least* monthly import into the United Kingdom from Denmark was in February (11,400 tons), the greatest in August (15,200 tons). The import of Danish butter is practically the same from month to month and this, taken in conjunction with the recognised high quality of their butter, has enabled the Danes to reach and maintain their present commanding position. That there is a definite connection between price and regularity of supply (or ability to maintain an adequate supply in the winter) is the considered opinion of the Tariff Commission.

From a table published as Appendix 8 of the "Report on Application for a Tariff on Butter" it appears that the Swedes send most of their butter to the British market in the winter season. The average margin, over the last seven years, by which the average annual price of Swedish butter falls below that of Danish is only 7/- as against 27/- in the case of the Irish Free State. No doubt there are other factors in the case but regularity of supply is one of them.

The Dairy Produce Act of 1924, while it did nothing to promote winter dairying, did much to secure a uniformly high standard in the production of creamery butter and in the blending of factory butter. For some years it seemed as if, in consequence of this Act, we could improve our position in the British market during the eight months of the year in which we condescended to play a part in it. At any rate the margin separating the average price of all Irish butter and Danish butter diminished more or less continuously from 31/- in 1924 to 17/- in 1929. This result is better than it seems, for the price of all Irish butter is depressed by the existence of a substantial element of factory butter (23·4 per cent. in 1929) in the export surplus. The margin between Irish creamery and Danish butter, which is all creamery, was in 1929 probably not more than about 10/-. It seems fairly obvious that in normal conditions of price the attainment of regularity of supply, in addition to the other results which the Dairy Produce Act has helped to bring about, would enable us to obtain as good a price as the Danes all the year round, if not a better one. This would mean, at least, an additional value of £280,000 for a total export of 560,000 cwt. (the 1929 figure) and this total could be substantially increased.

Price collapse of the autumn of 1930.

The price situation in 1930 was far from normal. In addition to the general business depression, which, however, affected butter prices only to the same extent as general wholesale prices ("Exports and Imports of Butter," article in *Irish Trade Journal*, Vol. VI., No. 1), there took place in 1930 the culmination of a long process of growth in the total International Trade in Butter. Between 1924 and 1929 the total import of butter into all countries grew from 7,430,000 cwt. to 10,310,000 cwt. The proportion of that butter which went to the United Kingdom fell from 68·6 to 60·9 per cent. That proportion though diminishing is still a dominant one. Incidentally we may note that the German share of import has increased from 14·2 per cent. to 25·7 per cent. in the same interval. If the export figures for all countries are next considered it appears that while Saorstát exports have increased by 30 per cent. their relative importance in the total export trade in butter from all countries has shrunk from 5·8 to 5·5 per cent. Denmark maintains practically the same *relative* position as in 1924 (30·6 per cent.). Sweden, Finland, Poland, Latvia, and Esthonia have substantially improved their relative positions. Unlike other exporting countries the Saorstát sends practically the whole of her butter to one market (the British market). In 1925 Saorstát butter accounted for 7 per cent. of British imports. The proportion had risen to 9 per cent. in 1929, but fell to 7·7 per cent in 1930. These interesting facts are contained in an article on the "World Butter Trade" in Vol. VI., No. 2, of the *Irish Trade Journal*.

Marketing problem insoluble apart from winter dairying.

The marketing problem presented by the Irish butter trade is insoluble by any other method than the wholehearted adoption of winter dairying. The percentage of Irish butter appearing on the British market is so small that it can be done without. British buyers do not wish to be troubled with a butter which has the

migratory instincts of the swallow. Even when it does come in, it comes in such irregular quantities from month to month that no market could accommodate it without discomfort. And this discomfort is bound to be reflected in a poorer price than the quality of the butter would otherwise merit. In addition there has been a considerable growth in the scale on which importing merchants have organised their business. Large combines do not want the trouble of dealing with numerous small scale producers when they can obtain their supplies from other sources organised on a similar scale of business. The formation of the selling organisation known as "Irish Associated Creameries" might possibly have remedied this particular difficulty, but it failed to command the support of a sufficient majority of producers. The reasons for the attitude maintained by the recalcitrant minority are not known to the public. If any creamery exists anywhere in the Free State which is in a position to guarantee uniformity of output, or at least a substantial supply in the winter months, such a creamery, even without a national selling organisation, could count on a regular connection in the British market, and a favourable price. The imposition of the Tariff, by attracting away the export surplus of such creameries to the home market in recent months, may possibly have done permanent harm by breaking a valuable connection at a critical time. An export bonus for freshly made winter butter would be needed to counteract this serious effect.

The proposal to "cold store" portion of the summer fresh supply in order to provide for the requirements of a protected home market in the winter time had nothing to recommend it, and was suitably dealt with by the Tariff Commission in their Report. Such a policy would do nothing to promote winter dairying. Cold storage of the summer surplus with a view to the supply of the export market with a uniform amount in every month of the year would involve the cold storage of 190,000 cwt. for an average period of about six months. Such a policy would be expensive and is probably regarded as impracticable. Cold stored butter is said to be just as good as freshly made butter, if it has been properly manufactured, but the consumer probably does not share that opinion. New Zealand butter is well made, and must come to market, of course, in cold storage. It has the advantage of coming in greatest quantity in the early months of the year when butter prices are highest, and yet the margin below the *annual* average price for Danish has never been less than 6/- per cwt. and is generally well over 10/-.

There is no alternative to the general adoption of winter dairying, unless we are prepared to abandon the British butter market, summer and winter, and allow the dairying industry to collapse with consequent disorganisation of our whole agricultural economy. With the general adoption of winter dairying the marketing problem will solve itself, or rather cease to exist. Without it no amount of ingenuity in the formation of national butter marketing organisations, or co-operative loyalty in their working, can save the industry from the fate it will have brought on itself.

Minimum development of winter dairying that is needed.

The access of Southern Hemisphere butter has not enabled the Irish product to dovetail comfortably into the British market. The former arrives mainly in the early months of the year. The months

September to December are still deficiency months in the arrival of supplies on the British market, partly because the Scandinavian export surplus is attracted to the German market to a relatively greater extent during those months. Consequently we should aim, in the first instance, at maintaining the full volume of our summer milk production at least till the end of December. During the first half of the winter period it is much easier and cheaper to produce milk than in the second half.

So far as the present distribution of calving throughout the year is concerned this policy could very easily and rapidly be adopted. The percentage of annual calvings in the period May to November is 39.6 for the six North-Western counties, and 26.8 for the seven South-Western. It is merely a matter of prolonging the grazing season by suitable top-dressing of pastures and feeding the cows adequately in the house after November.

Inadequacy of existing home-grown food supplies.

Three degrees of intensity may be distinguished in the feeding of all stock in the winter time, when there is no nourishment to be derived from the grass. They may get a subsistence or semi-starvation ration, a maintenance ration, or a high production ration, the amount of which in the case of milch cows varies directly with the quantity of milk they can be induced to give. Not to feed at least a maintenance ration is bad business and bad farming, but it is to be feared that many animals do not get even that. Whether hay or straw is used as fodder the adequate maintenance of cows in the winter months requires that they should get about 2½ stones of roots in the day or 3 tons in the winter season of 200 days. Calves of more than 1 year old require each about two tons of roots in the year for adequate maintenance. On this basis the milch cows of Saorstát Éireann, numbering 1,180,000 in 1926, and the dry stock exceeding 1 year of age (1,810,000) would together require 7,160,000 tons of roots. The combined acreage of turnips and mangels in 1926 at 18 tons to the acre would have yielded about 4,760,000 tons—not enough for the cattle. In addition there were 1,800,000 sheep in 1926 to compete for this inadequate supply of a necessary winter food.

Turnips are a home grown food and one which under ordinary circumstances cannot economically be transported more than a few miles. Consequently the quantity grown in each province or county, in relation to the stock of province or county, is a good indication of the extent to which the latter are house fed in the winter. In 1926 Munster (the premier dairying province) produced 2,000,000 tons of roots, about enough for the 610,000 milch cows of that province, leaving the 580,000 calves over one year of age and the 410,000 sheep to go without.

Limerick produced 107,000 tons and had 106,000 milch cows. There were also 76,000 cattle over one year, and 14,000 sheep, to share this inadequate supply. Louth, on the other hand, with a production of 135,000 tons, 11,000 cows and 30,000 dry cattle, had something over for the 31,000 sheep of the county, as well as a surplus to wear out the Dublin road on its way to the cowsheds of the metropolis.

Whether we go in for winter dairying or not the welfare of the stock raising industry requires that the cultivation of roots should be

doubled unless some equally succulent and perhaps more nourishing food can be made available in sufficient quantity.

Various stages of winter dairying possible.

If we do decide to go in for winter dairying the maximum development of that policy to ensure an equal supply in every month of the year would require that calving should take place mainly between September and Christmas, and this would take time to arrange. The minimum that would afford any relief would make little difference to the present distribution of calving, but would prolong the grazing season in the autumn, and intensify milk production up till the end of the year in the manner outlined above. An intermediate stage of development would require the calving of about 250,000 cows in the autumn, in addition to the number now calving in that season, in the dairying regions. If we look at the table given on page 39 of the Tariff Commission Report we find that the output of creamery butter in May, 1929, was 88,000 cwt. and in September 87,000. It would be reasonable to take a uniform monthly output of 80,000 cwt. as "bogey" for the winter months (November to April). To achieve this result would require the production of 344,000 cwt. of creamery butter, in addition to the present production, 141,000 cwt. That would require 100 million gallons more milk, and for this purpose 250,000 additional cows calving in the autumn and properly fed would be quite sufficient. This implies a yield of 400 gallons in the winter season or 2 gallons daily from each cow, and would correspond to an average annual yield of about 600 gallons. Already the average for the whole country is 487 gallons and it is a well-known fact that cows calving in the autumn give, if properly fed, about 100 gallons more than spring calving cows. In County Louth 18.4 per cent. of the cows calve from September to December, and the average milk yield from the cows in that county, 542 gallons, is higher than in Cork (522 gallons), and indeed higher than that of any of the dairying counties except Limerick (616), Tipperary (576) and Kilkenny (546).

Additional cost of producing 100 million gallons additional winter milk.

It remains to examine what would be the *additional* cost of producing 100 million gallons more milk from November to April on the assumption that no additional labour and overhead charges are incurred in tending and providing for the winter-milking cows. Indeed it might be argued that if one man can milk 15 cows then summer-dairying methods require one milker for every 15 cows, all in milk together, whereas under an all the year round system one milker could tend 20 cows since one quarter of them would be dry at any given time. Additional labour costs will be taken into account in the cost of the additional food, mainly home grown, which will be necessary for winter milk production on the suggested scale.

Our 250,000 cows would require 750,000 tons roots at £1 a ton, 375,000 tons hay at £2 10s. a ton, 700,000 barrels of oats at 10/- a barrel, and 50,000,000 lb. of cake at 1½d. per lb. This ration is based on an article appearing in the Journal of the Department of Agriculture, Volume XXIV, No. 4, from which it appears that the

ration of hay and roots here suggested will provide maintenance and one gallon of milk per cow per day, while the addition of the "concentrates" to the amount indicated will produce the second gallon. The total cost in food of producing the additional 100 million gallons of milk would thus add up to £2,322,500, and of this home labour costs would account for nearly £2,000,000. The value of the whole milk at 6d. per gallon would be £2,500,000. Allowing 2d. per gallon as the feeding value of skim milk returned, it is hardly likely that the price of butter will remain so low in the winter time as not to return 4d. per gallon to the farmers for milk (skim milk being returned to him as well).

If we take the value of the 344,000 cwt. of butter produced at 125/- a cwt. and of skim milk at 2d. per gallon (allowing one-eighth off for loss of cream) we get £2,879,000 as the value by this method of calculation. Deducting 20/- per cwt. as the cost of manufacturing 344,000 cwt. of butter we get £2,535,000, approximately the same as before. But there are other considerations which should appear in the balance sheet to the credit of the winter dairying account.

The saving in the cost of manufacturing butter that would result from equalising the creamery load throughout the year has been estimated at 3/- per cwt. This in relation to the manufacture of 707,000 cwt. of creamery butter, as at present, and 334,000 cwt., in addition, would amount to £156,000. A reduction by 5/- in the margin separating the price of Irish creamery butter from Danish would be worth another £250,000.

Supplementary advantages of winter dairying.

The most important consideration still remains. A calf arriving in the autumn is ready for the grass as soon as the grass is ready for it, and can be matured in six or twelve months less than the lean and hungry store that the dairying districts, in many cases, now inflict on the fattening districts. They are just what is wanted for "baby beef," which is very much in demand nowadays. The fattening districts cannot get enough of such animals at present. They aim at their production for themselves so far as possible, and it is noticeable in the calving statistics that they have a much higher proportion of cows calving in the autumn than the dairying districts. If the latter will not rise to the occasion the others will have to take up dairying themselves, in order to get the kind of calves they want. Such calves require only one or two periods of serious winter feeding, as against two or three in the other case, and are said to be worth £3 a head more to the fatterer than the spring-born calf.

Even with the present methods of winter feeding for milk production it would seem that such production can be undertaken without any serious probability of financial loss, though doubtless summer milk production is much cheaper.

Advantages of silage feeding for winter milk production.

Recent experiments have proved that the cheapest of all winter foods for cattle, both milk cows and dry stock, is grass silage. Grass contains its maximum of nutriment in the summer months, when the cattle cannot possibly eat it all. Much of it is tramped

down and wasted and in due course becomes more or less indigestible. The silo method is to cut the surplus grass from the pasture fields from time to time during the summer. This is stored in silos either of the tower or the pit type. The silo tower is becoming a feature of the landscape in County Louth and grass silage is now coming rapidly into fashion. I am informed that with a mixed ration of hay and silage it is easy to get up to 2 gallons a day, that oats is only given to very heavy milkers, and that there is no occasion to buy cake at all unless you want a fancy yield. It appears that the yield of grass silage is about 10 tons to the acre, that its feeding value, weight for weight, is more than twice that of turnips (which can be dispensed with altogether), and that a production cost of 10/- per ton would be a liberal estimate in most seasons.

The money obtained from the Butter Tariff should be used to subsidise the building of silos in the dairying districts, if we desire to push on by every available means a policy of winter dairying.

I am indebted to Dr. Kennedy's valuable article in *Studies*, on the "Winter Dairying Problem," for much valuable information about silage and winter milk production, but I could name half a dozen and more dairy farmers in County Louth who have nothing to learn either from Dr. Kennedy or the present writer in the economics of grass silage feeding.

The round towers of ancient Ireland gave our ancestors refuge from the Danish invader. Let us take refuge from the withering blasts of Danish competition by erecting towers of similar shape, to preserve for winter use the finest and most characteristic crop of the Emerald Isle.