

THE NEED FOR AND PROBLEMS CONCERNED WITH WINTER
DAIRYING IN NEW ZEALAND.

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The object of this paper is not to present the results of original research work, but to introduce for discussion a subject of no mean immediate importance and one which is not unlikely to command earnest consideration in the early future. Although the Paper is concerned with winter dairying practices, it should be carefully remembered that the system is being considered only as a means of spreading our dairy production more uniformly throughout the year.

The Need for Winter Dairying: A few years ago any suggestion of winter dairying would not be considered by even the most prominent dairymen or leaders in the industry. To-day, it is being seriously considered by many and practised by a few. The probabilities and possibilities of the future, therefore, need careful analysis so that the necessary assistance to farmers will be available before, if ever, the movement becomes widespread.

At the moment, increased production is overshadowed by difficulties in the disposal of produce. The imposition by importing countries, first, of high tariffs, and, later, of quotas, has made the marketing of produce difficult for exporting countries; and production is correspondingly wavering in the balance. The repercussions of these same weapons make imperative the consideration of the wisdom of our seasonal dairying. The Dominion industry has been built up on it; and the whole present structure from production to marketing is based on it. Considerable departure from the present practice if effected rapidly would obviously set up severe strains which, must be guarded against. Britain is the only useful outlet for our dairy produce. Briefly, the position at the present time is that Britain uses fully 400,000 tons of imported butter annually (407,100 tons in 1932), of which New Zealand supplies 26% and Australia 22%. The British supply on the market is only about 27,000 tons annually. The greater part of the remaining need is provided by Denmark. New Zealand supply is essentially seasonal, as may be seen from the grading figures for the season ending 31st July, 1932.

August	3.5%	February	10%
September	7%	March	9.6%
October	12.2%	April	6.8%
November	14.2%	May	4.6%
December	16.1%	June	1.7%
January	13.2%	July	1.1%

The Australian supply also is seasonal, but to less extent than New Zealand's. Annually, New Zealand is increasing her output, and, consequently, needs to extend her market range. Meanwhile, the Dominion produce is mainly sold in the South of England: the trade in the Midlands and North is mainly held by Continental competitors. These competitors, especially Denmark, maintain fairly uniform production of produce throughout the year and supply a product with a flavour different from that characteristic of the New Zealand product, but which deteriorates on long storage. Obviously, if New Zealand wishes to extend her market, she must, in addition to advertising the superior quality of her produce, follow as far as practicable the accepted practice of her competitors. There is room also for the belief that heavy production at peak periods has a depressing influence on market values because of the uncertainty of the future in the minds of buyers far from the Dominion. The Cheese position is quite different. There is much less need for uniform production of it because New Zealand, Canada, and the United Kingdom provide the bulk of supply needed by the market. Canadian and United Kingdom production are nearly equal to the New Zealand output; and the periods of production are reciprocal.

As is well known, the Dairy Board very effectively overcomes the difficulty of uneven supply by regulating exports to suit market needs. This policy probably has been of very much greater advantage to the Dominion than is commonly realized during the recent years of rapid increase in production; but, by itself, it is very doubtful whether it can cope with the future position if increased production continues. At any rate, the figures show plainly that during the period of peak production there already is factory accommodation, plant and storage room at ports to increase production rather less than 100% if production throughout the season were made uniform. Since peak production involves in some instances temporary methods of utilizing plant, it probably would be safer to estimate that existing plant could deal with an additional increase of 80%. Interest charges on plant, therefore, would be reduced by a proportional amount.

Advantages of Balancing Production: The figures illustrate the relative interest charges and overhead expenses of the periods of high production against (Oct.-Jan.) the periods of low production (June-July); but other important factors are involved. Firstly, storage rates need to be paid on produce held over for shipment. Secondly, a severe strain is imposed on the keeping quality of the butter. Experience shows that it can stand up to this; but relief from the strain would raise quality to an even higher level; because it is well known that any fat very gradually changes on long storage. By refraining from storage either in New Zealand or Britain it would be easier to export butter with a mildly full flavour which would suit the Northern market. Thereby, New Zealand could compete with Continental countries, or, alternatively, satisfy the British demand as a whole for Empire produces. Thirdly, labour efficiency and unemployment are affected. While all factories have a nucleus permanent staff, there is a large floating population to cope with peak production. This lack of continuity of employment is inclined to inspire "work for wages and hours" rather than "all-round efficiency." The factor as a unit thus loses that interest in quality expected of the staff from the most junior to the most senior employee. The ranks of the unemployed also are swelled in periods of low production. It is especially the younger men and boys in industry, those who really should be learning every aspect of their work during impressionable years, that are most affected. Too frequently, short seasonal employment falls to their lot; and the future of the industry is correspondingly likely to suffer. Uniform production would increase labour efficiency and reduce unemployment. From a national viewpoint, there would be several advantages, especially in the direction of the employment of labour indirectly affected by seasonal farm production, the employment of labour during the harder months of the year and a more uniform spread throughout the year of the spending capacity of the farmer.

On the sides of manufacture and marketing, winter dairying with the object of making production throughout the year undoubtedly has many economic, social and national advantages.

Production Aspect: The problem must now be viewed from the aspect of production. Pasture in the form of any fresh grass, hay, and ensilage, form the greater part of the diet of the New Zealand dairy cow throughout the whole year; indeed, it would be safe to say that the modern tendency throughout the whole of the North Island is in the direction of complete reliance on pasture and its products. Unfortunately, pasture production is even more seasonal than dairy cow production. Still more important are the facts that, firstly, cow production can be controlled independent of climate, while pasture is pre-eminently dependent on weather, and, secondly, the cow, by reason of her body reserves and natural impulses, can be mismanaged for some time without doing excessive damage, which can be repaired by careful management, while under corresponding lack of care, pasture is slow in recovering. It is well-known that in the North Island dairying district most of the season's pasture grows between the end of August and the beginning of February. During the remainder of the year pasture is comparatively inert except for a short period of recovery in some districts.

lasting from early April to mid-May. Naturally, these periods are subject to district and yearly variations. The splendid published work of Rigg, Askew Hudson, Doak, and, McPherson, give quantitative measurements of seasonal growth and the effects of manurial treatments. The most outstanding feature of all this work is the influence of the weather, especially rainfall, and to a lesser, yet appreciable extent, of average atmospheric temperature and wind. The value of fertilizers cannot be denied; but their benefits are definitely limited by weather, over which the farmer has no control. The farming problem, therefore, is provision of feed for periods of scarcity in an average season, and the maintenance of reserves for abnormal times. By itself, this task is no simple one; but it is magnified many times over by four well-recognized, straightforward farm management considerations, namely:- (a) the utilization of pasture at the optimum period of production, bearing in mind the depressing effect of growth on food value and the corresponding decrease in bulk with short grazing; (b) labour distribution difficulties attendant upon "rushed" work; (c) the saving of pasture from pugging in wet weather and excessive defoliation, especially in winter and early spring, and (d) the absolute need for dividing stock into separate mobs to ensure proper care. The two last-named are extremely opposing practical factors.

Present Position: In an average season approximately 75% of the total feed grows between the beginning of September and the end of January. Not infrequently the percent. is even greater; and sometimes growth is delayed till late in September or cut off early in January. Under existing seasonal conditions, cows commence to come into profit, varying with district and circumstances, from early July till mid-August; and in most herds there is a fair proportion of September and October calvers. Experience shows that the July-early-August calver produces much more butter-fat than does the mid-September calver, estimated by Marsden's survey of Waikato records at 12½%. In spite of this increase, production frequently is reduced by careless wintering and insufficient feed after early calving till grass comes away. Experience in Manawatu shows that to permit of this early calving and provide for periods of scarcity it is advisable to provide for an average, Grade Jersey cow about 14 cwt. hay and fully 3 tons ensilage or its equivalent in roots if no pasture is to be sown for winter use.

Fundamental Needs to suit Uniform Production: If 2 n at t empt were made to make production uniform, the date of calving of the cow, her management and her feed must be carefully considered. It is immediately obvious that there is required a greater reserve of feed for the cow in full milk in winter. A s s u m i n g that the cow calves in April under the winter dairying scheme, and in August under the present system, there would be needed roughly twice as much feed for the months of May, June, and July. This excess need is partly offset by the lower needs in the low feed production period, February till early-April; but it could still be approximately estimated at, say, 50% additional for the three winter months referred to. The date of calving must be such that the cow will readily flush in production when grass recovers growth in spring. It is difficult to get the cow to do this if her production is allowed to fall unduly in early spring before growth recovers; indeed, from experience in winter dairying in the Manawatu it can be said that the hardest period on the average to provide for is early-July-early-September. In the first three months after calving, the natural stimulus of the good dairy cow to produce milk is strong enough to offset adverse conditions. The stimulus then starts to wane and by the fifth month a stimulant is needed to sustain production. Thus, assuming average growth to commence in early September, it is not advisable to bring winter milking cows into profit before April. For the first two months after calving little difficulty is experienced because the freshly-calved cows can be grazed on pasture shut up from early April onwards; and as

soon as the Autumn rains set in. The spring-calving cows kept in a separate lot can then be denied some of the best pasture as they are approaching the end of lactation, and can be kept, going on spare pasture with the addition of some ensilage or equivalent green feed. The saved feed will last, according to season, till the middle of June and sometimes early July, depending on circumstances. It needs to be rationed however by grazing for only one to two hours per day. Difficulty starts in July and becomes progressively more intense till fresh growth commences. If the cow is allowed markedly to drop in her production she may even dry-off before grass comes away; at the best her production recovers only slightly. If however, the condition of the cow and her milk supply are sustained, she flushes rapidly and her daily production compares favourably with the freshly-calved cow until at least December although she does not dry-off finally till February. To obtain these conditions we find at the Massey Agricultural College that calving dates arranged from the last week of April, onwards, are suitable. By that time there is generally available the flush of autumn growth which can be conserved as described. As previously stated, however, the feed problem is an important one from mid-June onwards. Compared with the dry animal the cows in full milk need ^{as much} twice and sometimes more nourishment. This must be contained in very little more than the same weight of bulk. Several sources of supply present themselves for consideration - (a) Conservation of permanent pasture in March, April and May, rationing of this by off-and-on grazing and supplementing with hay and ensilage; (b) The growth of winter-growing crops, rationing of and supplementing them in the same way; (c) Reliance on ensilage, made from short pasture and good hay; (d) the feeding of concentrates in addition to hay and ensilage or roots. The lavish use of concentrates is out of the question on the score of cost: in moderation, up to 4 lb. per day, it has much to commend it. It can be rationed in the bail according to production: contrasted with the use of special manures to stimulate grass growth which is controlled by weather, its use can be started and stopped at will; it has definite residual manurial value. Much more important, however, is the adequate provision of green feed. Ideally high quality ensilage and hay, without green feed, is not likely to be effective; and because of low bulk per acre is unlikely to be economic. 1. Reliance on saved permanent pasture may suit some districts, but in our experience is not of itself satisfactory - it provides for May and June but it is very slow in recovering in Spring with the consequence that difficulties are experienced when the Spring-calving cows swell the numbers of the winter-calvers in early August. This is a very important point to consider; We have had very good results from a combination of a small area of saved permanent grass for early winter use followed by special winter crops such as barley and Italian ryegrass, the use of good ensilage and hay and the careful rationing of concentrates from early July till grass growth starts, to cows yielding over 1 1/4 lbs. butterfat per day. During the past winters the practice has been adopted of sacrificing two paddocks in July and early August, one as a day-holding paddock, the other as a night one. The milking cows were fed hay, and ensilage or roots immediately after milking, then they were turned into the good grass when it was dry; after mid-day they received more hay and ensilage, and before milking were turned again into the good feed. In the night paddock they received hay and ensilage and roots. In this way, cows have produced up to 83 lbs. fat in the 30-day period in July; and several have steadily sustained production of over 50 lbs. butterfat per 30-day period from early May. In the meanwhile, dry cows, heifers, calves and cows grazed separately on the lighter land paddocks.

Problems to be considered:

The subject of husbandry to suit winter dairying is bristling with many interesting important problems. It brings sharply under review the present tendency to rely solely on permanent pasture and top dressing; temporary pastures, forage crops, and even root crops need renewed consideration as sources of winter growing nourishment and rapid early spring growth to provide for the whole milking herd on the farm after some paddocks have been in use during winter to sustain production; suitable rotation of temporary crops is worthy of consideration to suit various districts and soils.

In my opinion, knowledge of factors affecting grass growth is too far ahead of the study of farm and stock management to utilize the growth. Much is to be gained by studying farms as a whole, correlating stock needs with "plant desirabilities" and paddock utilization with farm stock distribution.

Soil Management:

One of the greatest difficulties experienced in winter dairying is soil management. On light soils no material harm is done, but on heavy and even loamy soils pugging is extremely difficult to control by reason of heavy supplementary feeding and the grazing of the same paddocks over some time by the off- and-on-plan. Repugnant and expensive as it may at first sight seem, housing has much to commend careful consideration. No elaborate housing is needed so long as plenty of fresh air is provided and adequate provision is made for keeping the cows clean. The animals do not need the house so much as the soil and pasture. Housing solves the problem of excessive defoliation, the pugging of 'good land, time taken up in carting feed to mobs of stock in paddocks which are used only as leg space at a period of the year when days are short and weather is often far from pleasant. It permits of the true rationing of animals according to production: it would be interesting to know how much is lost through random grazing by low-production animals. Animal manure is available in bulk for those parts of the farm or those crops most needing it.

Obviously, the economic benefits of housing are primarily dependent on the costs of the house and slight additional labour, compared with the increased revenue arising from increased production per cow, rational feeding, extra feed from carefully saved paddocks, and the heavier crops resulting from the differential use of farm-yard manure.

The advent of winter dairying would assist in avoiding stock ailments and breeding difficulties. It would make possible the bringing into profit of heifers at 2½ years' old, thereby strengthening the vigour of herds sometimes spoiled by bringing heifers into profit too small or too young; it would solve the problem of the late calver and stripper; it would spread the mating period over a greater part of the year and thereby assist with sterility trouble. Finally, it would make more easily possible the all-year-round supply of fat pigs with corresponding disposal and marketing advantage.

S U M M A R Y.

Summarized, winter dairying as a means of evening-up' dairy production has many distinct marketing, economic, and social advantages. It is needing careful consideration if New Zealand dairying is to be increased and Britain remains the principal market. The practice, however, demands careful consideration in the light of methods of husbandry. The gross cost would be higher than seasonal costs, but it remains to be seen whether additional returns and reduced overhead costs would more than recover the extra expense.