MARKETING CONSTRAINTS ON THE DEVELOPMENT OF THE DAIRY INDUSTRY IN JAMAICA

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Introduction

There is a widespread tendency in the countries in the Commonwealth Caribbean to underrate the role of marketing in the development of agriculture in the Area. This situation has arisen largely because of the narrow scope ascribed to agricultural marketing.

Marketing, in everyday language, refers to the physical handling of agricultural produce from the time it leaves the farm gate to the time it reaches the consumer. The scope of agricultural marketing is much wider than this. Agricultural marketing deals with three separate but closely related problems. First, it deals with consumer demand for the product and changes in this demand; second, with the price system that reflects consumer demand back to producers; third, with the physical methods and processes of handling the products in conveying them from the farm to the consumer when and where he wants them and in the form desired, at the lowest cost possible under existing technologies.

This paper attempts to identify and discuss, rather briefly, the more important marketing constraints on the development of the dairy industry in Jamaica. The paper is divided into two sections, the first deals with demand constraints; the second with other marketing constraints, namely, high marketing costs and defects in the milk price system.

Factors Which Affect the Demand for Milk in Jamaica

Milk consumption per head in Jamaica is low compared with consumption in some other countries (Table 1). Milk consumption in the Island has undeniably risen since 1964 but the level is still relatively low. In 1967, for instance, the total milk consumed per head of the population was about 128 pounds per year or approximately 6 ounces per day. About 44 per cent of the milk was consumed as condensed milk and about 30 per cent as fresh milk (Table 2). We may consider what factors are responsible for the low consumption of milk as a whole and for the greater preference for condensed milk in the Island.

Among the key factors which influence the demand for milk in Jamaica may be mentioned, first, the size of the total population and changes in both its size and composition; second, the income available for consumers to spend on food as a whole and, third, the dietary habits and tastes of consumers. These factors are largely exogenous to the milk marketing system although the third factor mentioned can often be influenced through the market system. Indeed, since the dairy expansion policy in the Island makes far reaching assumptions about dietary habits and tastes for milk it is appropriate to give some consideration to this factor later.

The demand for milk and the choice between fresh milk and condensed milk in Jamaica are also greatly influenced by prices and availability. Both these factors originate in the system of marketing milk. The price the consumer pays for milk is a key factor which affects consumption. Milk is just one of the several items of food purchased by the consumer and all these items compete along themselves for the income available for food as a whole. People, therefore, normally tend to consume

more milk when price falls and less when the price of milk increases relative to the prices of other foods. The price level of any given type of milk, as well as changes in the price level, will thus influence the consumption of the milk. Similarly, the relative prices of the different types of milk available in the Island largely determine which forms of milk are consumed and in what proportions.

It may be asked what role milk prices have actually played in the existing pattern of milk consumption in the Island. To answer this question it is necessary to examine the behaviour of milk prices in recent years.

Milk prices remained remarkably stable in the last decade. The prices of both condensed milk and fresh milk were controlled by the Government.[1] These prices were fixed for any given year, and, as Table 3 indicates, the prices often remained unchanged for several years. The prices of dry skim milk, dry whole milk and malted milk were uncontrolled but these too changed very little over the years.

The prices as presented above are not directly comparable. It would seem that the more relevant comparison of milk prices would use the prices per pound of the fresh milk equivalent of the different forms of milk consumed. These prices are shown in Table 4, while Table 5 shows the ratio of fresh milk price to each of these prices.

With the exception of malted milk, fresh milk has been, and is still, the most expensive milk in Jamaica. Dry skim milk has been the cheapest milk, the price of its fresh milk equivalent being generally about one-fifth of that of fresh milk. Next to dry skim milk at the lower end of the price scale is condensed milk with the consumer paying about 30 per cent less for condensed milk than for fresh milk. A significant feature of the milk prices was the stability of their ratios over the years.

Milk as a whole is an expensive food item in Jamaica; and its high price discourages milk consumption in the Island. Milk prices did not vary enough in the past years to make possible an empirical estimation of the relationship between the price of milk and consumption. In other words it is not known how elastic the demand for milk is with respect to price.[2]

High milk prices, undoubtedly, contributed to the low per capita consumption of some forms of milk, notably fresh milk, in recent years but the extent of the contributions can only be guessed. It is clear, however, that the variations in milk consumption per capita over the last decade were not price-induced since milk prices remained virtually unchanged for most of the period.

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1 Fresh milk in the present context refers to the pasteurised milk; the price was controlled in the metropolitan area only. The price of the raw milk was uncontrolled in all parts of the Island.

2 A knowledge of the responsiveness of consumption of a given type of milk to changes in its price (when prices of other foods, including other forms of milk remain unchanged) is essential for the intelligent operation of any price control programme. Since this knowledge is lacking in Jamaica the effect of a change in price on the consumption of milk cannot be predicted.

We could conclude from a casual glance at some of the tables that relative milk prices played no significant role in the choice of milk in Jamaica, for, the consumption of the different forms of milk in the past did not often reflect the marked differences in their prices. For example, considerably less dry skim milk (on fresh milk equivalent basis) was consumed per capita in most years than either fresh milk or condensed milk, although consumers generally paid nearly six times more for fresh milk and about four times more for condensed milk. In 1967, for instance, only 18.4 per cent of the total milk was consumed as dry skim milk compared with 30.5 per cent and 44.4 per cent respectively for fresh milk and condensed milk. Any such conclusion is, however, premature and misleading. In fact the bulk of the milk purchased commercially was used in the manufacture of ice-creams and various milk-based drinks. The levels of per capita consumption of dry skim milk attained in the past years were possible only because a high proportion of the milk consumed was supplied virtually free of cost to many consumers under various Food Aid Schemes.

The apparent failure of milk consumption to reflect fully differences in milk prices was also due to the fact that not all the available forms of milk are close substitutes. The consumer, therefore, would not simultaneously compare the prices of all the different types of milk in his choice of milk. Fresh milk and condensed milk are generally considered as fairly close substitutes, while the powdered forms of milk, although not very close substitutes for one another, are regarded as closer substitutes among themselves than they are for either fresh milk or condensed milk. However, the distinction between the fluid forms of milk on the one hand, and the powdered forms on the other, reveals that consumption in fact reflected differences in milk prices.

As observed earlier, the ratio between the prices of fresh milk and condensed milk remained unaltered for most of the last decade. The consumption of condensed milk, however, continued to expand much faster than the consumption of fresh milk. It is therefore necessary to examine other factors, such as the availability of milk and the dietary habits and tastes of consumers, in order to explain the high preference of condensed milk in the Island.

Availability of Milk and Dietary Habits and Tastes of Consumers

Availability of Milk: The low consumption, and the slow expansion in consumption, of fresh milk as compared with the consumption of condensed milk were due, in part, to differences in the availability of the two forms of milk to consumers. People in some parts of Jamaica do not always have access to regular supplies of good quality fresh milk.

Unlike condensed milk, it is impossible to keep fresh milk without refrigeration. A prime factor contributing to the poor availability of fresh milk to some consumers in the past was thus the lack of storage facilities in the homes. The number of domestic refrigerators has increased in recent years but many homes still remain without refrigerating facilities and cannot keep fresh milk.

A possible solution to this problem would be for consumers to purchase their requirements of fresh milk each day. However, this was not always possible because of poor distribution of fresh milk in the Island. In fact, until quite recently many parts of Jamaica, including parts of the metropolitan area of Kingston and St. Andrew, were without regular supplies of fresh milk. When available, the milk was in most cases unpasteurised and consumers were often sceptical about its quality.

Furthermore, many distributors of fresh milk had no facilities for cooling the milk and it occasionally deteriorated in transit. It is therefore not surprising that many consumers found it more convenient and much safer to use condensed milk.

The volume of consumption of fresh milk in Jamaica is still less than that of condensed milk but many of the factors which contributed to the poor availability of fresh milk in the past have gradually disappeared or are in the process of disappearing. This is due largely to the increasing pasteurisation of milk in the Island. It may be pointed out, however, that the pasteurised milk available has by no means been fully accepted by all consumers of fresh milk. Some consumers still prefer the raw milk on the grounds that pasteurisation deprives the milk of its natural flavour. Other people are reluctant to consume pasteurised milk because of the suspicion that it is not always fresh milk but reconstituted milk.

The degree of cleanliness of the pasteurised milk, nevertheless, appears satisfactory to most consumers and this has eliminated a major source of prejudice against fresh milk.

Dietary Habits and Tastes of Consumers: The other important factors which affect the consumption of milk in Jamaica are the dietary habits and tastes of the people. Jamaicans are not milk consumers by tradition. There are many people in the Island who do not drink milk at all simply because they do not like it. Others consider milk as essential only for babies and infants and occasionally for invalids.

Some forms of milk are distinctly more preferred by Jamaicans. The most popular form is, undoubtedly, condensed milk and this popularity probably originates from the fact that condensed milk is free of the characteristic odour of fresh milk which some new consumers of fresh milk find unattractive. The taste for condensed milk is thus well established in the Island. In addition the supply of condensed milk has, generally, been ample and the milk has been available at reasonable prices. Furthermore, condensed milk can be stored easily without refrigeration. These factors explain why Jamaicans consume more condensed milk than any other form of milk.

As already observed, both the total consumption and the consumption per capita of milk have been rising. It is therefore rational to expect the consumption of milk as a whole to continue to expand in the future. However, the consumption of the individual forms of milk may largely depend on changes in tastes.

The dairy expansion policy of the Government implicitly assumes changes in tastes for the different forms of milk now consumed in the Island and specifically aims at a rapid expansion in milk production for the fresh milk market. The policy thus assumes that more fresh milk will be consumed in the future, relative to the other forms of milk currently consumed in the Island. Although it is possible to influence the pattern of milk consumption to some extent through education of consumers and prospective consumers, there are no strong reasons, *a priori*, to assume a change in the present pattern of milk consumption in the Island. In fact, the trend in many countries at present is for consumers increasingly to avoid the consumption of milk products which are rich in fat, in favour of products which are fat free.

This argument does not preclude the possibility of changes in tastes but it does suggest that it is difficult, if not impossible, to predict the direction of any such changes. In fact, it is quite conceivable that tastes may in future shift from natural milk as a whole to artificial milk based on vegetable protein and fats. Although artificial milk presents no threat to natural milk in Jamaica at present, the possibility exists. The artificial milk may most likely be produced more cheaply than

fluid milk and it has decidedly better preservation qualities than fresh milk. Furthermore, the artificial milk is free of the characteristic odour of fresh milk which, as pointed out earlier, many local consumers and potential consumers dislike.

Implications for the Future Expansion in Milk Production

It should be asked what the implications will be for the future expansion in the production of fluid milk as a whole in the Island should the present pattern of milk consumption persist. It will imply that the demand for fresh milk may fail to increase as fast as has generally been predicted but it will also imply that the production of condensed milk may have to increase considerably to meet the growing demand.

Since there is little difference in the prices milk producers receive on either market it could be argued that the increased demand at the Condensery for milk will provide the necessary impetus for expansion in the local dairy industry. This argument is highly debatable. In spite of the small difference in prices between the fresh milk market and the Condensery, production primarily or solely for the Condensery is not remunerating to farmers. In fact, most dairy farmers, notably the commercial ones, would prefer to produce only for the fresh milk market. Many producers, including those with access to the more lucrative fresh milk market, already consider the prices they receive too low, and as will be discussed more fully later, this is a major reason why a number of producers have gone out of production in recent years. It is thus difficult to visualise any rapid expansion in milk production in the Island based on the Condensery as the principal market for the milk. The Condensery is unlikely to offer producers prices which are high enough to encourage rapid expansion in output.

The other important point is that although the Condensery has excess capacity at present, and in theory can accommodate any foreseeable increase in fluid milk supplies, the quantity of milk the Condensery can actually absorb willingly is likely to be limited by cost considerations. Fluid milk is an expensive raw material, compared with dry skim milk, for manufacturing condensed milk in Jamaica. The demand for liquid milk by the Condensery will most likely be determined by the proportion of the milk which can be used with powdered milk to produce and sell condensed milk at prices which may be considered reasonable. The fact that the Condensery continues to use any fluid milk at all may be because it is obliged by law to accept all the milk offered by producers.

The production of consensed milk in Jamaica is economic at present primarily because the Condensery uses relatively large quantities of cheap dry skim milk and also because prices paid for fluid milk are subsidised to a small extent by the Government. It seems highly unlikely that the Condensery will be able to maintain its prices for liquid milk at their current levels, when supplies greatly increase, or offer producers new prices which they may consider remunerating enough to encourage expansion in the industry unless some specific actions are taken. Such actions may include increasing the price of condensed milk substantially, raising the subsidy to the Condensery, and importing increasing qualities of dry skim milk to maintain a desired ratio with the fluid milk supplies available.

Admittedly, some of these proposals may not be feasible for various reasons. For instance, any substantial increase in the price of condensed milk is likely to discourage the further development of milk consumption as a dietary habit. It will also adversely affect human nutrition since condensed milk is a much cheaper source of animal protein than fresh milk in the Island. Similarly, the increasing payment of subsidy to maintain prices to milk suppliers is not always a feasible proposition.

Such payments can become prohibitive as the supply of milk increases. Furthermore, the idea of heavily subsidising a particular enterprise can impair the efficient allocation of resources in agriculture as a whole.

Continuous importation of increasing quantities of dry skim milk offers the best solution to the problem, although it may appear to conflict with the general import substitution and import displacement policies of the Government.

The continuous importation of dry skim milk for the manufacture of condensed milk cannot, however, conflict with these policies, first, because it is uneconomic and perhaps unwise to produce this milk locally. Second, it may not be possible in the foreseeable future to replace dry skim milk by fluid milk in the manufacture of all the products which currently rely largely or wholly on dry skim milk simply because of limited supplies of fluid milk in the Island. Third, imports of dry skim milk have so far entailed little expenditure of foreign exchange when compared with the expenditure on imports as a whole and of dairy products in particular.

Thus, should the present milk consumption pattern persist, implying that the Condensery, remain a major, if not the major market for fluid milk in the Island, it would seem highly desirable to continue to import all the dry skim milk the Condensery can profitably use. This will not only ensure an adequate supply of reasonably cheap condensed milk but will also enable the Condensery to offer producers prices which are high enough to retain their interest in dairy production as a whole.

Other Marketing Constraints

It has been pointed out that poor distribution of fresh milk discourages rapid expansion in output. Similarly high cost of fresh milk to consumers have been identified as a major factor limiting demand for the milk and is therefore a limitation to increased production.

The price paid by the consumer for the milk is determined partly by the price received by the dairy farmer and partly by the marketing margin, namely, processing and distribution costs and profits made by the marketing intermediaries. Reduction in this margin may thus encourage a more rapid increase in production through its effects on consumption.

The size of the marketing margin for milk is of interest also because of its influence on prices received by producers. The total production of fluid milk in Jamaica has increased little in recent years, although a number of medium and large dairy farms has been established. The fact is that many existing producers have gone out of production because they did not consider dairy farming sufficiently rewarding. Many of these people attribute the low returns in dairying mainly or wholly to low milk prices.

There are indications that the price of milk received by the producer is an insignificant factor in the profitability of production in the Island; in fact, many dairy farmers who produce profitably do not often receive any higher prices than those who produce at a loss. It is a fact, however, that for a given output of milk net returns to the producer increase as the price of milk rises. Thus, if a reduction in the marketing margin would improve prices to the producer this could encourage expansion in the industry.

The important question therefore is whether and how the marketing margin can be reduced. It is necessary to examine the marketing margin in order to answer this question satisfactorily. As Table 6 shows, in 1968 the consumer paid 10.0 cents per pound for the milk. The dairy farmer received 4.7 cents per pound, or 47 per cent of

the retail price and the marketing margin accounted for the rest. Processing and wholesale distribution costs amounted to 3.9 cents per pound and accounted for 39 per cent of the retail price of the milk; the processor/wholesale distributor made a profit of approximately 0.2 cents per pound and thus received about 2 per cent of the price paid by the consumer. The cost of retailing the milk and the retailer's profit together amounted to 1.2 cents per pound of the milk and claimed 12 per cent of the retail price. It is clear therefore that most of the marketing margin represented costs. Any serious efforts to reduce the margin should thus be directed primarily at reducing costs.

Two possibilities for reducing marketing costs of milk stand out. The first is to reduce the cost of collecting the raw milk from the farms and this may be achieved through zoning of production and through the rationalisation of the system of collecting milk from the farms. There are perhaps as many milk routes in the Island as there are distributors and the unnecessary duplication of routes raises marketing costs. The other possibility is to lower milk processing costs per unit of milk by increasing the volume of milk handled.

The latter point raises an important question. It may be asked whether the number of milk processor/distributors in the Island is not too large relative to the size of the market for fresh milk to permit economies of scale being realised. We could suggest that one or at the most two processing plants can adequately handle all the fresh milk in the Island. Such a move, which concentrates the marketing of fresh milk in the hands of one or two companies only, will undeniably, lead to monopoly, with its attendant ills. However, such a market situation can be effectively controlled; for instance, prices may be controlled through the appropriate legislation. It is necessary to remember that marketing efficiency is really a compromise between economic efficiency on the one hand and technical efficiency on the other.

A further question which seems inevitable at this juncture is whether a reduction in marketing costs is likely to benefit producers and consumers of the milk. In the short-run any reduction in marketing costs of milk is likely to increase profits to the marketing intermediaries largely because the retail price is fixed. It is conceivable, however, that the milk processors, in an attempt to secure more supplies, may offer producers higher prices and in this way pass some of the savings in cost back to producers even in the short run. This situation is, nevertheless, unlikely at present since the processors have access to all the milk they are prepared to handle. In the long run these benefits are destined to be passed over to producers and consumers and thus encourage expansion in the industry.

Defects in the Milk Price System

Marketing constraints on the development of the local dairy industry are also to be found within the milk price system. As pointed out earlier, a major function of the milk price system is to reflect consumer demand for milk, and any changes in demand, back to producers and thus aid rational production. Defects in the local milk price system impair the proper functioning of the system.

Prices received by producers on the fresh milk market are determined largely by market forces; milk sold to the Condensery on the other hand is subject to administered prices. This section will concentrate on the pricing policy for milk supplied to the Condensery, for, in spite of the bias in the dairy expansion policy towards the production for the fresh milk market, the Condensery is likely to remain a major market for milk produced in the Island.

Milk price policy in Jamaica has three main objectives. First, the policy

endeavours to give producers 'fair' and stable prices which would cover production costs and encourage investment in milk production. The second objective is to encourage an increased milk output on the farms especially in the 'winter' months. The price policy also aims at encouraging the production of milk which is clean, low in acidity, and rich in butterfat.

The system of determining milk prices provides the means to the policy objectives. The pricing of milk involves a form of guaranteed minimum price paid by the Condensery, and a Government subsidy to producers. It also involves a number of premium payments, as well as penalty deductions, and also combine seasonal and quantity incentive payments, which apply in reverse to the deductions. The possible monthly prices per imperial quart which producers may expect at the Condensery are shown in Table 7. The total possible price is lowest in June and July, namely 11.33 cents, and increases to a maximum of 13.25 cents in March.

The maximum possible prices for milk supplied to the Condensery and the average prices obtained by a sample of suppliers in 1969 are shown in Table 8. The mean maximum possible price for the year was 11.98 cents per quart while the prices actually realised by the sample of suppliers as a group, averaged 9.16 cents. As the table shows, the average prices received rose as the quantity of milk supplied increased.

The factors responsible for the variations in the average prices received are not difficult to ascertain. The differences in price arose partly from the differences in the premiums received and the penalties incurred. On the whole, the amount of premiums received increased and the deductions decreased as the quality of milk delivered to the Condensery rose. The differences in the prices received by the various groups of suppliers also derive partly from the effect of the combined seasonal and quantity incentive payments on the premiums earned and the penalties paid. These payments increase the amount of both the premiums received and the penalties paid for defective milk and thus accentuate any differences between the two.

One of the main objectives of the milk price policy, as stated above, is to give producers prices which are sufficiently high to cover production costs and encourage investment in milk production. It may be asked whether the level of prices at the Condensery is high enough to achieve this policy aim. A recent study of production costs in the industry suggests that average costs on the farms far exceed the maximum possible prices being offered by the Condensery.[1]

The fact that milk prices are lower than production costs, however, has little significance since milk sales are not the only sources of income from the operations. Milk is the most important product on these farms with milk sales accounting for the bulk of the income. However, milk consumed on the farms, or given away to friends, and the value of net changes in stock also constitute income from the farm operations. Indeed, as much as 40 per cent of the gross returns on many of the small farms originate from these sources. It may be argued therefore that the price milk producers receive need not equal production costs since these costs refer to the total farm product.

The policy of offering producers prices to cover production costs appeals to both

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1 Atsu, S.Y., An Economic Study of the Dairy Industry in Jamaica, Dept. of Agric. Econ. and Farm Management, U.W.I., St. Augustine, Trinidad, August 1970

producers and policy makers but the idea is largely an illusion and has serious drawbacks. Production costs vary very widely even on farms which may appear similar in many respects. It may thus be asked whose costs should serve as the criterion in the determination of prices. The use of an average production cost on the farms is inappropriate and undesirable; in any case such an average cost may be so high as to be impracticable as a mean basis for setting prices. Unless the cost of production of the most efficient producer is used, the resulting price will encourage inefficiency in production, raise the price paid by the consumer and discourage the consumption of milk in the Island. Indeed, such a price will result in income transfer from consumers of condensed milk to producers. Since it is mainly the low income consumers who buy condensed milk in Jamaica, this type of income redistribution may not be a desirable feature.

Price Stability

Seasonal variations in prices are inherent in the procedures adopted for pricing milk supplied to the Condensery. As already noted, the idea is to offer producers higher prices for milk in the 'winter' months, when milk output and supplies to the Condensery are lowest, as inducement to increase production.

Prices received by suppliers generally fluctuate more than the maximum possible prices at the Condensery. What is more significant, however, is the fact that prices received by suppliers reach their peak in December instead of in March as envisaged in the pricing policy. This is not surprising in view of the fact that the penalty deductions are also highest in March.

The fact that producers received their peak prices in December rather than in March, can seriously limit the effectiveness of the seasonal incentive payments to producers. The idea behind the seasonal incentive payments has already been noted. Higher milk prices in March, it is argued, would assist producers to purchase concentrates to augment the little grass which may be available for stock feeding. The failure of prices to reach their peak in March can therefore make it impossible to achieve this aspect of the milk price policy objective.

The whole idea of offering producers the highest prices in March is highly debatable and can only be defended on the rather dubious assumption that the purchase and feeding of concentrates is the main or the only means available to meet the problem of feeding dairy cattle in the dry season in the Island. Studies elsewhere indicate that the problem of feeding dairy animals in the dry months could be tackled by carrying fodder in the field. For example, the quantity and the quality of such carry-over grass could be greatly improved by the application of adequate quantities of fertilizer to the grass about 60 days before the onset of the dry season. To encourage milk producers to adopt this solution to the perennial problem of feeding stock in 'winter' (dry season) it may be argued that the seasonal incentive payments should be highest in earlier months, probably in November or December.

Apart from month to month variations milk prices also fluctuate in the short-run within the month. Milk supplies to the Condensery are paid for on a fortnightly basis and prices in the first and the second halves of the month often differ substantially.

These short-run fluctuations in prices also originate in the system of pricing the milk. The fluctuations arise as a result of variations in the premiums received and the penalties paid. Specifically, it is the changes in the quality of the milk, including the butterfat content, and the corresponding variations in the premiums and

the deductions which give rise to the instability in prices.

Persistent fluctuations in the butterfat content of milk can, and often do, indicate adulteration of the milk. It is this practice that the deductions for low butterfat are intended to discourage. Similarly, it may be argued that the deductions for both contaminated and highly acid milk are necessary to enhance the production of clean milk. The fact still remains, however, that these deductions given rise to serious instablilty in prices in the short-run. Price fluctuations increase uncertainty on the farms and make planning difficult.

Perhaps the chief merit of the milk pricing policy in the Island derives from the fact that the monthly maximum prices established at the Condensery serve as forward prices. This in principle should greatly reduce price uncertainty and improve price expectation on the farms. The fact that milk prices received by producers fluctuate markedly during the month and also deviate substantially from the monthly maximum prices, reduces the effectiveness of these forward prices in aiding a more efficient production.

Implications of the High Premium on Butterfat: The effects of the deductions for low butterfat on price stability have already been examined. It is also necessary to examine that implications of the relatively large premium payments for high butterfat milk.

The premium on butterfat ranges from 0.21 cents per quart of milk with 4.05 to 4.10 per cent butterfat, to 1.88 cents per quart of milk which has more than 5.00 per cent butterfat. When the combined seasonal and quantity premium is applied, these payments increase substantially. Hence the maximum payment for butterfat varies from 1.92 cents per quart in June and July to 2.25 cents in March.

The reasons behind the high premium placed on butterfat at the Condensery are obscure. The Condensery does not manufacture cream or butter and therefore does not need the milk fat for such purposes. It may be argued that a high fat milk serves as insurance against adulteration of the milk on the farms. This argument is plausible but it may equally be argued that the penalty deductions for low butterfat should provide an adequate safeguard against the adulteration of milk. We could conclude that the high premium placed on butterfat is unwarranted.

Not only is the premium on high fat milk unwarranted but it is also undesirable under existing circumstances, for it can have adverse effects on the rapid expansion of the milk industry in the Island. The production of milk which is rich in butterfat is not in the interest of the consumer, for he pays for milk fat which in most cases he does not want. Since vegetable fats are normally cheaper, milk should in effect be regarded primarily as a source of cheap protein and not fat.

The energy and the protein needed by the cow for the production of milk are normally assessed on the basis of the fat content of the milk produced, and these requirements increase with the fat content of the milk. The production of high butterfat milk is therefore not in the interest of the producer, for, it could raise production costs.

The pursuit of milk with high butterfat content can also adversely affect the quantity of milk produced on many farms. This is most likely to occur in the dry season (winter) when grass is normally scarce. It is often necessary to feed relatively large quantities of concentrates at such times but this is liable to lower the butterfat content of the milk. It is conceivable that some producers may, as a result, deliberately restrict the feeding of concentrates and thus produce less milk.

The large premium payment for fat-rich milk can have a more profound effect on increased milk output in the Island. The current policy discriminates, rather unnecessarily, against some dairy breeds, notably the Holsteins. Although these are good milkers the milk is low in butterfat. Most of the Holsteins imported in the Island in recent years have been sponsored by the Government under the Dairy Industry Development Scheme. Many private farmers are reluctant to introduce Holstein into their herds for a number of reasons the foremost of which is perhaps the low butterfat milk produced by these animals.

The locally developed dairy breed, the Jamaica Hope, is a good dairy breed, and produces high butterfat milk; there is a school of thought which would prefer to have the local dairy industry based wholly or largely on this breed. The introduction of large numbers of cattle of other dairy breeds into the Island, is therefore not always without some opposition. It is apparent, however, that a rapid expansion in the size of the national dairy herd cannot rely on the Jamaica Hope alone. It is necessary, as the Government and many people have fully realised, to introduce good dairy cows of other breeds, notably the Holsteins. The existing milk price policy with its bias towards the production of high butterfat milk thus indirectly discourages a rapid increase in the size of the national dairy herd and in total milk output.

It may be asked if payment for milk on the basis of total milk solids instead of on the butterfat content would not be more desirable. Such a change would be more meaningful and certainly less descriminating against some breeds.

The foregoing analysis of the milk price policy has revealed some serious limitation of the policy. The impact of the price policy on the development of the dairy industry as a whole is further reduced by the narrow scope of the policy. The milk price policy, as already noted, does not extend to the milk supplied to the fresh milk market. It is true that in terms of numbers, the suppliers of milk to the Condensery form the bulk of milk producers in the Island. The milk supplied to the Condensery on the other hand most probably does not exceed 25 per cent of the total national output. Any policy which ignores milk supplies to the fresh milk market can thus only have a limited influence on the industry.

The restricted scope of the milk price policy in Jamaica can, in fact, have serious repercussions on the long term development of milk production. In most dairy countries milk which is sold as fresh milk fetches a considerably higher price than milk used for manufacturing purposes. Prices received on the two markets are invariably controlled, generally by a milk marketing board or a milk industry control board. In Jamaica, where no such body exists, prices differ little on the two markets. Of more significance, however, is the fact that any increase in the condensery prices (which is not infrequent) is inevitably followed by a demand for higher prices for milk supplied to the fresh milk market. Such increases in fresh milk prices discourage consumption of the milk and this in turn can adversely affect expansion in production. However, price differences between the fresh milk market and the Condensery seem essential to encourage the production of high quality milk demanded on the fresh milk market. The need for a more comprehensive milk price policy in the Island cannot therefore by overemphasised.

Summary

This paper has shown that a number of marketing problems constrain the development of the dairy industry in Jamaica. The demand for fresh milk is limited and this

has discouraged rapid expansion in production. Similarly, the cost of marketing milk is high in the Island and this not only raises the price paid by the consumer for the milk but also lowers the price received by the producer. The high cost of marketing milk therefore retards the development of the industry. Defects in the milk price system, likewise inhibit rapid expansion in milk production. The paper has also examined possible ways of reducing these constraints.

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Table 1 Jamaica: Milk Consumption per Capita in Selected Countries, 1964

Countries	Fresh Milk	Condensed Milk (f.m.e.)[a]	Other Major Forms of Milk (f.m.e.)	Approximate Aggregate Consumption (f.m.e.)
	(..... pounds per annum .....)			
Jamaica	37.3	48.1	42.3	127.7
Peru	158.7	-[b]	-	158.7
Israel	167.5	-	18.6	186.7
U.S.A.	273.5	25.4	35.5	334.4
Canada	278.6	37.4	127.5	443.5
U.K.	327.1	16.3	38.8	380.2
Ireland	473.7	-	-	473.7
Netherlands	356.0	20.0	84.0	460.0
Australia	290.0	-	20.0	310.0
New Zealand	325.1	-	-	325.1

Sources: 1. The Federation of U.K. Milk Marketing Boards, Dairy Facts and Figures, 1966.

2. International Dairy Federation, Dairy Throughout the World, Monographs on Dairying in a Number of Countries throughout the World published on the Occasion of the XVIIth International Dairy Congress in Münich, Federal Germany, 1966.

Note: [a] f.m.e. = fresh milk equivalent
The fresh milk equivalent of any milk may be defined as the quantity of fresh (fluid) milk required to make one pound of the particular form of milk. The fresh milk equivalents of the milk types being discussed are as follows:-

(i)	Fresh milk	= 1.0 pounds
(ii)	Condensed milk	= 2.3 "
(iii)	Dry skim milk	= 10.6 "
(iv)	Dry whole milk	= 7.8 "
(v)	Malted milk	= 2.3 "

[b] Consumption is negligible or nil.

Table 2 Jamaica: Relative Importance of the Major Forms of Milk Consumed, 1960/1967

Year	Proportion of the Total Milk (f.m.e.) Contributed					Total
	Condensed Milk	Fresh Milk	Dry Skim Milk	Dry Whole Milk	Malted Milk	
	(..... per cent .....)					
1960	36.98	29.25	32.29	1.14	0.34	100
1961	38.45	34.93	25.29	0.91	0.42	100
1962	35.14	28.36	34.32	1.77	0.41	100
1963	36.26	29.56	32.11	1.65	0.42	100
1964	37.68	29.21	30.81	1.83	0.47	100
1965	39.45	31.08	22.15	6.87	0.45	100
1966	44.52	32.20	18.20	4.36	0.72	100
1967	44.42	30.46	18.44	6.15	0.53	100
Average	39.11	30.63	26.71	3.08	0.47	100

Table 3 Jamaica: Retail Prices per pound of the Principal Forms of Milk Consumed, 1958-1968

Year	Fresh Milk[a]	Condensed Milk[b]	Dry Skim Milk[c]	Dry Whole Milk[d]	Malted Milk[e]
	(..... cents per pound .....)				
1958 ...	6.33	14.50	10.00	60.00	37·50
1959 ...	9.17	14.50	10.00	60.00	37·50
1960 ...	9.17	14·50	15.00	60.00	37·50
1961 ...	9.17	14·50	16.25	60.00	37·50
1962 ...	9.17	14·50	16.25	60.00	37·50
1963 ...	9.17	14·50	16.25	60.00	37·50
1964 ...	9.17	14·50	16.25	60.00	55·60
1965 ...	9.17	14·50	16.25	60.00	55·60
1966 ...	9.17	14·50	16.25	60.00	57·50
1967 ...	9.58	14·50	20.00	62.50	57·50
1968 ...	10.00	15·17	17.50	69.17	65·75

Source: Retail prices collected mainly by the staff of the Ministry of Trade on request by the writer.

Notes: [a] Price paid for pasteurised milk in Kingston

[b] Price paid for locally manufactured condensed milk

[c] Refers to powdered skim milk normally retailed in 1 pound bags

[d] Mean price of two of the leading brands of powdered milk

[e] Mean price of two of the leading brands of malted milk

Table 4 Jamaica: Retail Prices (f.m.e.) of the Major Forms of Milk Consumed, 1958/68

Year	Fresh Milk	Condensed Milk (f.m.e.)	Dry Skim Milk (f.m.e.)	Dry Whole Milk (f.m.e.)	Malted Milk (f.m.e.)
	(..... cents per pound .....)				
1958	6.33	6.45	1.03	7.69	15.47
1959	9.17	6.45	1.03	7.69	16.30
1960	9.17	6.45	1.41	7.69	16.30
1961	9.17	6.45	1.52	7.69	16.30
1962	9.17	6.45	1.52	7.69	16.30
1963	9.17	6.45	1.52	7.69	16.30
1964	9.17	6.45	1.52	7.69	23.91
1965	9.17	6.45	1.52	7.69	23.91
1966	9.17	6.45	1.52	7.69	25.00
1967	9.58	6.45	1.88	8.01	25.00
1968	10.00	6.86	1.63	8.87	28.33

Table 5

Jamaica: Retail Prices (f.m.e.) of the Major Forms of Milk Consumed, 1958-68

Year	Fresh Milk	Condensed Milk (f.m.e.)	Dry Skim Milk (f.m.e.)	Dry Whole Milk (f.m.e.)	Malted Milk (f.m.e.)
	(..... cents per pound .....)				
1951	1.0	1.15			
1952	1.0	1.15			
1954	1.0	0.91			
1958	1.0	1.01	0.14	1.21	2.57
1959	1.0	0.70	0.10	0.84	1.77
1960	1.0	0.70	0.15	0.84	1.77
1961	1.0	0.70	0.17	0.84	1.77
1962	1.0	0.70	0.17	0.84	1.77
1963	1.0	0.70	0.17	0.84	1.77
1964	1.0	0.70	0.17	0.84	2.60
1965	1.0	0.70	0.17	0.84	2.72
1966	1.0	0.70	0.17	0.84	2.60
1967	1.0	0.67	0.20	0.84	2.60

Table 6 Jamaica: Distribution of the Consumer's Expenditure on One Pound of Fresh Pasteurised Milk, 1968

	Amount Received	Proportion of Total
	(..... per cent .....)	
Producer's share	4.7	47
Cost of processing and wholesale distribution ..	3.9	39
Processor-wholesale distributor's profit ...	0·2	2
Cost of retail distribution and retailer's profit ..	1·2	12
Total (retail price)	10·0	100

Table 7

Jamaica: Ex-Farm Price of Milk Supplied to the Condensery

	Monthly Prices											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	(..... cents per imperial quart .....)											
Initial price	8.53	8.62	9.00	8.82	8.16	7.69	7.69	7.78	7.88	8.07	8.25	8.53
Government subside to producers	0.95	0.96	1.00	0.98	0.91	0.86	0.86	0.87	0.87	0.90	0.92	0.95
Standard price for milk of 3.90 - 4.00 per cent butterfat ..	9.48	9.58	10.00	9.80	9.07	8.55	8.55	8.65	8.75	8.97	9.17	9.48
Approved farm premium	0.23	0.24	0.25	0.24	0.23	0.22	0.22	0.22	0.22	0.22	0.23	0.23
Chilled milk premium .	0.71	0.72	0.75	0.73	0.68	0.64	0.64	0.65	0.66	0.67	0.69	0.71
Butterfat premium (maximum)	2.14	2.16	2.25	2.20	2.04	1.92	1.92	1.94	1.96	2.02	2.07	2.14
Total Possible Monthly Price	12.56	12.70	13.25	12.97	12.02	11.33	11.33	11.46	11.59	11.88	12.16	12.56

Table 8 Jamaica: Maximum Possible Prices and the Average Prices Received by Groups of Milk Suppliers to the Condensery, January - December, 1969

Month	Maximum Possible Price	Average Prices Actually Received				
		All Suppliers	GROUP 1 Supplying 500 qts. per month	GROUP II Supplying 550 to 1000 qts. per month	GROUP III Supplying 1000 to 5000 qts. per month	GROUP IV Supplying 5000 qts. and more per month
	(..... cents per quart .....)					
January	12.56	9.62	8.46	9.39	10.32	10.30
February ...	12.70	9.52	8.66	9.00	10.13	10.30
March	13.25	9.28	7.87	8.77	10.27	10.21
April	12.97	9.26	7.96	8.58	10.26	10.25
May	12.02	8.33	7.07	7.55	9.06	9.66
June	11.33	7.93	6.82	6.96	8.88	9.07
July	11.33	7.93	7.37	7.37	8.85	9.35
August	11.46	8.87	7.86	8.16	9.46	10.00
September ..	11.59	9.16	8.21	8.37	9.66	10.40
October	11.88	9.56	8.74	8.91	10.05	10.56
November ...	12.16	10.03	9.06	9.60	10.33	11.12
December ...	12.56	10.48	10.26	9.81	10.52	11.34
Average Price for Year	11.98	9.16	8.19	8.54	9.81	10.21