AGRICULTURAL MARKETING IN ZIMBABWE; UNDERGRADUATE ESSAYS

11

January 1983 :

11

Kay Muir * (Editor)

Working Paper 1/83

Department of Land Management P.O. Box MP 167 Mount Pleasant Harare Zimbabwe

1. 8

• Kay Muir is a lecturer at the University of Zimbabwe

A Review of the Dairy Industry

in Zimbabwe

M. MELTZER

I	N	D	E	X

THEODICETON	Page
	1
CONSUMPTION	1
The Consumers of Wholemilk '	2
The Reasons for the Increase in Consumption and Shift in Consumption Patterns	. 3
Theoretical Aspects of Demand	3
- Factors Affecting Milk Consumption in Zimbabwe	. 5
The Milk Subsidy	6
Conclusions and Summary of Consumption	7
PRODUCTION	8 ^r
How to Increase Production	11
Conclúsions and Summary of Production	13
THE DAIRY MARKETING BOARD (D.M.B.) - THE CONTROLLING AUTHORITY.	. 14
D.M.B. Plans to Increase Production	15
Conclusions and Summary of the D.M.B.	18
SUMMARY OF THE REVIEW OF ZIMBABWE'S DAIRY INDUSTRY	19
FIGURES AND TABLES	
FIG. 1. Milk Intake and Estimated total Market Requirements	attached
FIG. 2. Production Trends in the Dairy Industry	attached
TABLES	Page
Table 1. Milk Sales in Zimbabwe	1
Table 2. Percentage Share of Milk Intake by D.M.B. Utilised as Wholemilk	1
Wahle 2 Other Durdiet Mills Utilizetting by D.M.D.	2

Table 3. Other Product Milk Utilisation by D.M.B. Table 4. Distribution of Milk Sales in Urban Areas 3 Table 5. Subsidies to the Dairy (Consumer Milk) Some Aspects of the Commercial, Herd Supplying Table 6. Milk to the D.M.B. Table 7. Financial Requirements for D.M.B. Projects

6

10100

17

INTRODUCTION

MILK - The Product

Milk is a very "natural" food and may be regarded as remarkable "...because it contains almost all the food constituents that the newly born need for vigorous and healthy growth" (Oliver). Although nature intended it primarily for the very young, the fact that it is an easily digested, well balanced source of nutrition makes it beneficial for humans of all ages to consume. Milk can be obtained in large quantities from suitably domesticated animals, some of which have been bred especially for milk production.

The problem with milk is that it quickly turns sour, especially in warmer climates like Zimbabwe's. Refrigeration will extend the life of milk, but it is somewhat unreasonable to expect milk to last beyond two weeks, even if refrigerated. If milk is produced for human consumption there must be a readily available market to absorb the entire production or there will be a waste of resources. Modern transport and refrigeration have expanded the radius of possible market sites from the production areas but as milk is very bulky, 88% water (Oliver), this can be expected to add considerably to (the cost.

If a local market cannot absorb all the milk produced then the remainder must be processed. Fortunately milk is a product that lends itself rather well to several processing methods that have increased storage life examples are: butter, cheese and powdered milk. These processed products can go further afield in the search of markets, thus enabling more people to benefit from the production of milk.

The Situation of the Dairy Industry in Zimbabwe

As virtually any urban dweller in Zimbabwe will comment, the local dairy industry appears to be having some major problems. The consumer has been facing a rationing of such products as cheese and butter for about two years and even wholemilk for the past six months. In the light of increased minimum wages there must be many urban dwellers who would like to increase their consumption of milk and other dairy products, but cannot do so to their entire satisfaction. However, this increase in demand, which has outstripped supply, cannot be blamed solely on such factors as increased income and the main agents in stimulating demand, because with the fixed retail price, which is the way the subsidy operates, the real price of milk has steadily declined relative to the price of other foodstuffs, making it ever cheaper and therefore more attractive to purchase.

On the production side, the output of milk has remained somewhat static for the past 4 - 5 years. The problem is how to increase production and the recent trend of declining numbers in the national dairy herd is disturbing. However, the commercial dairy herd, defined here as those cows kept for the purpose of selling milk to the Dairy Marketing Board (D.M.B.), has partially alleviated the problem of declining numbers by increased output per cow. However, the present trend of increased efficiency per cow cannot be expected to solve the entire problem of producing enough supplies to meet the ever increasing demand. All factors affecting the dairy herd, and therefore the supply of milk, must be examined in order to find ways of increasing output.

The D.M.B. is a Government parastatal body that is charged with organising the supply of dairy products. It was formed in the early nineteenfifties when Government was asked to intervene with the financially struggling private dairy co-operatives which had been supplying urban areas. As such, the D.M.B. has no legal monopoly, only the status of residual buyer, but due to several factors, including Government pricing policy, it has become an effective monopoly. This has not necessarily been a bad development and the D.M.B. has several somewhat ambitious (some may say overly ambitious) projects in various stages, designed to overcome the latest crisis, and provide a secure production basis for the future. However, these plans make virtually no recognition of private development in the dairy industry outside increasing the output from large-scale commercial farms. It seems something of a waste of potential to leave out private enterprise, especially when considering development in the communal areas.

This review inspects the Zimbabwean dairy industry from the aspects already outlined, namely that of consumption, production and the D.M.B. Despite the present problems, Zimbabwe has a well established dairy industry that, given the correct stimulus, should be considered fully capable of overcoming the present and any future challenge.

CONSUMPTION

On the consumer side of the dairy industry the most outstanding characteristic is the rapid increase in the sales of wholemilk. The production of wholemilk has become the "raison d'etre" for the dairy industry in Zimbabwe. Although always very important, the sales of wholemilk have now become such an overriding factor that some products have had to be seriously curtailed in production or totally suspended, as was the case of skimmed milk powder, the manufacture of which was suspended in December, 1980 (E. Cross).

Figure 1 shows the rising demand for milk and by-products and how that demand has outstripped intake. This fact is demonstrated by the need for rationing of such by-products as cheese and butter and periodic shortages of milk. Tables 1, 2 and 3 describe the dramatic rise of wholemilk sales.

Table 1 shows actual volumes sold and the fact that the really dramatic rise occurred in the 1980/81 and 1981/82 selling periods. The increases experienced in these years clearly explain the bulk of the 45% increase in the six years depicted and it is interesting to note that these rises occurred after the attainment of independence. Clearly the new Government's policy of higher minimum wages and the "upturn of economic activity" experienced immediately post independence played a major part in the increase in sales.

Tables 2 and 3 show how the increase in sales of wholemilk has affected the availability of milk for utilization in other dairy products. Note that the total in Table 3 has remained fairly static. Due to the production profile, to be discussed in the production section, the amount of milk available to the D.M.B. decreased, until 1979/80. The output of milk powder, cheese and, to a smaller extent, other liquid products, had to fall in order to accommodate the rise in the demand for wholemilk. Although lacto and sterilised milk did increase their shares, both absolutely and relatively, the increases were nowhere near that of wholemilk.

Table 1

Milk	Sales	in	Zimb	abwe

Year		Vol	'00	00 Litres			
76/77	 ·.	•	67	919			
78/79			71	751 +	5,6%		•
80/81			82	550 +	15,1%	+	45,2%
81/82			98	600 <u>L</u> +	19,4%		

Source: A.M.A. - Economic Review of the Agricultural Industry 1979, 1980.

Table 2

Percentad	e Share	of Mi	lk Intake	by D	.M.B.
Faither all a subsection of the second					
U+	ilised	as Who	lemilk		

Year	% Share Intake Volume m/litres
76/77	44 65,4
78/79	52 78,0
80/81	57* + 13% 84,0 + 28,4%
Source:	A.M.A Situation and Outlook Report 1981/82.

-1-

Table; 3

Other Product Milk Utilisation by D.M.B.

-2-

	r	•		. *	· ·			Indust-	
		1. 1000	Sterilised	Other*/	Total*		Milk	rial	•
	Year	Lacto	Milk	Liquid	Liquid	Cheese	Powder	Milk	Total
	•	······································						×.	
	76/77	11,6	3,1	4,5	84,6	17,6	26,6	19,4	148,2
;		8	2	. 3	57	12	18	13	100
	78/79	16.1	4.1	4.0	97.2	19.3	11.1	13.0	140.7
	$\mathcal{F} \models \mathcal{F}$	11	3 1	3	67	14		9	100
		a chương	Service and the service of the servi					•	
	80/81	17,4	5,8	3,3	.110,5	12,0	4;8	19,0	146,6
		12	4	2	76 ,	8	3	13	100
			L part	1.1					
	•		Volume in m	11:1-				- (•	
				1111166					

Volume in m/litres % Share

*Other Liquid - includes flavoured milk, yoghurt, ice cream, liquid skim and cream *Total Liquid - includes wholemilk - see Table 2

Source: A.M.A. - Situation and Outlook Report 1981/82

The Consumers of Wholemilk

Milk must be either consumed or processed rapidly or it will spoil, especially in Zimbabwe's semi-tropical climate. This means that sales of milk tend to be centralized around the place of processing. As we travel further and further from the site, the logistics of transport and storage decree that we must change the nature of the dairy product which is predominently sold, from easily perishable (e.g. milk) to more durable (e.g. cheese, sterilised milk). In a way we may regard this as a consumer variation of von Thünen's idea of locational aspects of land use for production.

More modern technology in the form of refrigerated storage and transport has greatly increased the distance from the processing plants where it is possible to send and sell milk. The D.M.B. has, in the past few years, made major attempts to improve the distribution of dairy products in the rural areas of Zimbabwe.¹ Some D.M.B. dairies will now send their products daily up to 600 km from their point of production (Gordon-Farleigh). However, due to its low value and high bulk (milk is about 88% water), and the fact that even the best refrigeration will only increase shelf life by some 2 - 7 days, there are decided economic limits to the distance that the D.M.B. can truck milk under the present structural limitations.

. The bulk of the milk sold by the D.M.B. is thus sold in the major urban areas of Zimbabwe. The D.M.B. divide urban milk sales into two groups: that sold in the low density (L.D.) housing areas and that sold in high density (H.D.) housing areas. This division also indicates a division by income, with higher income groups living/the the L.D. areas and lower income groups residing in the H.D. areas. There is also another sales group and that is schools, in the form of small 200 ml sachets (about 1% of urban sales).

¹ See mimeo "The Future Development of the Dairy Industry" D.M.B.

Table 4

Distribution of Milk Sales in Urban Areas of Zimbabwe

-3-

	Year	1972/73		1974/75		1976/77	1977/78
L.D. Urban Area H.D. Urban Area		79,8%	·	74,6%		68,2%	61,7%
Schools (200 ml)		0,6%		0,6%	y	0,6%	1,0%

6 Year Change : L.D. -18,1% H.D. +17,7% Schools +0,4%

						%Breakdown
			Month Dec.1980	Vol '000 litres	Dec.1981	Dec. 1981
L.D.	Urban	Area	3 491	+14,4%	3 996	49,6%
H.D.	Urban	Area	3 034	+33,6%	4 054	50,4%

Source: A.M.A. Economic Review of the Agricultural Industry - 1975, 1980.

Table 4 shows clearly the growing demand for milk in the High Density suburbs which accounted for only 20% of urban milk sold in 1973, but by December 1981 they were buying over 50%. This upward trend was continued in 1982.

The Reasons for the Increase in Consumption and Shift in Consumption Patterns

"The two principle factors responsible for the marked growth in the consumption of liquid products are the maintenance of a static consumer price for wholemilk, which has necessitated a high level of Government subsidy, and the improvement in consumer incomes arising from the upturn in economic activity and the income distribution measures that have been adopted by Government since the attainment of independence in April, 1980". (A.M.A. Dairy Situation and Outlook Report - 1981/82)

In addition, part of the reason for the substantial increase in consumption of dairy products (especially liquid) by the low income groups, and even rural consumers, can be attributed to a determined sales campaign by the D.M.B., aimed specifically at the high density urban areas. This sales

Coefficient of price Elasticity of demand

Ep = - <u>Proportionate change in quantity demanded</u> Proportionate change in price

Often a negative sign is put before the ratio for ease of use.

When (Ep) is equal to 0 demand is said to be perfectly inelastic, which means that quantity demanded will remain unchanged regardless of price changes. When (Ep) is equal to demand is said to be perfectly inelastic, which means that up to a certain price all of the good in question that is made available for purchase will be bought. If the price is above the "cut off" price then demand will fall to near zero. Most products fall between these two extremes and the size of (Ep), their elasticity of demand, gives an indication of how society, a sector of society, or even an individual, views the good in question. High inelasticity indicates that the good is considered essential, with few replacements (substitutes) and probably is also a very small part of expenditure. Highly elastic means consumer will readily stop buying if price increases by even a small amount. Suth a good is not so essential, perhaps is regarded as having substitutes and could possibly take a proportionately large share of expenditure.

In Britain, milk is regarded as an essential, with an (Ep) figure of 0,09 for the period 1968-1973. Butter and cheese, other dairy products, had coefficients of 0,40 and 0,25 respectively. Bread (regarded as something of a staple here in Zimbabwe) had an (Ep) of 0,32, whilst eggs were 0,09. Beef and veal were a lot more elastic with a coefficient of 1,57 (Ritson).

Whilst I am unaware of the existence of actual figures for Zimbabwe, the A.M.A. report on the dairy industry (1976) remarked that the market amongst higher income groups is characterised by a fairly low elasticity of demand, and that rising demand in this sector linked to a rising higher income population. The lower income market exhibits a far greater sensitivity to price and price changes, i.e. their demand for milk and dairy products is far more price elastic.

Splitting the Zimbabwe consumer market into two sectors, high income and low income, we can view the effect of income on demand. Again this is measured in terms of an elasticity, similar to that of price elasticity, except there is no negative sign in "front" for convenience, and in place of price, substitute income. This gives the elasticity of demand with income (E_T) .

In Kenya, Hopcraft (1976) gives the figure of 1,2 as a "guesstimate" of overall (E_{I}) for milk. This means that there will be a greater proportionate increase in demand than in income. The populace regard increases in income as a "signal" to increase milk consumption and milk becomes one of the first "targets" for extra income.

In the high income group milk will be both price and income inelastic. The high income group has little need, or marginal utility, for extra milk, even if their income increases and price changes do not really affect the quantity bought. The low income group has a much larger marginal utility for milk and extra income is expressed by extra consumption, but because a price increase means much more, relatively, to this group's food budget, an increase in price means a significant decrease in quantity bought. Hence greater price and income elastiticy than in high income groups.

From Table 4 it would appear that there is a strong case to be made for a high income elasticity of demand for milk to be attached to the high density residents. Quite large increases in demand for milk were experienced with the advent of new, higher levels of minimum wages set in 1980 and 1981.

./ -5-

The rise in consumption amongst higher income groups can be attributed to changes in income distribution. With high income groups it is a fairly safe assumption to assume that this sector are consuming all they need or. want of milk, i.e. their marginal utility for extra milk is very low. Thus extra consumption in the high income groups is due to the number of people in this group increasing, so that as the inequality of incomes decreases, the demand for milk will rise. This is income distribution against demand and as income is more evenly distributed, so demand rises for a product like milk. Some products can be expected to experience a reverse of this. A possible example is with maize-meal in this country, which is used to make "sadza", a traditional staple dish. As incomes rise and income distribution increases in equality, so demand can be expected to drop as consumers move from this starch staple to a protein replacement like beef. For very low income groups consumption may increase before it eventually decreases as their marginal utility for maize-meal may be large initially, but as this decreases and as, their income rises, maize-meal becomes something of an inferior product and their consumption pattern begins to mimic those in the higher income brackets.

Factors Affecting Milk Consumption in Zimbabwe

In looking at actual figures for milk consumption in Zimbabwe, I tried to establish the relative importance of what appeared to be such major factors as price, population, income, income distribution and sales of other liquid dairy products.

Other factors which may affect sales are obviously other food products, e.g. the sale of mineral cool-drink. Since the price of a 350 ml mineral drink has equalled that of 600 ml of milk, the sales of milk for µse at lunch and snack times has increased (Gordon-Farleigh). The price and volume of sales of other competing products may have a marked effect but due to lack of readily available data I was unable to establish a numerical relationship.

The only workable figures for milk readily available were sales, population and price. Average income and income distribution are not easily found and one is tempted to question accuracy when they are discovered. Even something like the consumer price of wholemilk is fraught with some difficulties in a year-by-year analysis of sales, because price changes rarely occur "neatly" (at the end of the year. In the end, I used price figures from Jansen (1982) who averaged consumer price for each year. Even population figures for urban areas are based on estimates from the 1969 census, and the current census has indicated that these may be inaccurate. However, I still believe that sufficient evidence is available to indicate trends.

The first statistical analyses run were multiple regressions of the sales of the main liquid products sold (wholemilk, lacto and sterilized milk), as the dependent variables, against urban population size, for 14 major towns and cities, and consumer price of milk (as the independent variables). Only the size of urban population was considered as it is felt that the bulk of milk sales is still confined to the towns (see earlier). The approach used was that the independent variables were non-causal to each other, i.e. did not affect each other to a marked degree.

The sales of sterilized milk and lacto were insignificant when compared to the influence of population size and price on the sales of milk. The regressions showed that whilst absolute population and consumer price has a significent effect upon milk sales, the joint effect is more important, accounting for nearly 87% of the variance that can be attributed to price and population. This joint effect could probably be broken down into further categories if more information were available. / Such areas would be total urban income, average real income, rate of inflation and, therefore, real price of milk, real price of other foodstuffs and beverages, price elasticity of demand and income elasticity of demand spring to mind as possible "inhabitants" of the joint effect.

The Milk Subsidy

The most important influence on the demand for milk in recent years has been the Government subsidy (The Herald, August 17, 1982 and E. Cross).

The subsidy on consumer milk was first introduced in 1975/76 as a method of maintaining low food prices and thus low wages. Even though the subsidy was introduced by a previous Government the present one has yet to lift or ' reduce it. Thus, whilst the actual price is about 27c/per litre, the breakeven price is calculated at being around 48c per litre - 21c more (Herald, August 17, 1982). The result is that the subsidy distorts demand and is "ridiculous in terms of the magnitude of demand" (E. Cross). The result has lead to a situation, illustrated in Fig. 1 and tabulated in Tables 1 - 3, where demand has outstripped supply, making rationing of wholemilk, cheese and butter necessary. As the subsidy becomes larger and larger, so the distortion becomes more pronounced.

Table 5

Subsidies to the Dairy (Consumer Milk).

Year	Dairy '000\$	Total Food Subsidy	Dairy % of Total
1975/76	1 875	4 339	. 43
1978/79	3 700	42 193	8,8
1979/80	2 108	20 302	10,4
1980/81	4 500	50 568	8,9
1981/82 `	10 334	121 650	8,5

Increase in subsidy 1975 to 1981 - 451%.

Source: Jansen - 1982

The milk subsidy has operated by freezing the retail price of milk which since July, 1979 has been 16c per 600 ml or 41% of the border price. Note that this is a subsidy of about 17,68c per litre which puts Jansen's calculation on the conservative side when compare to the D.M.B's of 21c per litre subsidy estimate.

Perhaps even more disturbing than the size of the subsidy is, who actually benefits from it? "About 60% of milk went to people who did not need subsidised supplies, 'the urban elite'" (E. Cross). Jansen, using 1976 and 1977 expenditure survey data, shows that the higher income household spent about \$9,93 per month on milk against a lower income expenditure of just \$2,68 per month. With the rise in wages, this data is probably a bit out of date but it does show that milk consumes only about 1,5% of upper income expenditure against about 3,2% of lower income expenditure.

We can expect the lower income group to react more to any real price and income changes because we are dealing with a larger segment of their expenditure. Although the selling price of 27c per litre has been in operation since July, 1979, inflation in the price of other foodstuffs has made the retail milk price cheaper in real terms. The price elasticity of the lower

-6-

income group ensures that the reaction to a drop in price is an increase in consumption. The drop in real price also means a relative decrease in the income spent on milk, which represents an overall increase in income available. The income elasticity again ensures a positive reaction and sees the consumers buyng more. The rise in wages can be viewed as increasing consumption from both the income distribution and the income elasticity point of view.

The effect of the subsidy has been to maintain a fixed price for consumer milk, but due to inflation the real price of milk has dropped quite considerably. The low income and high income groups' real price for 600 ml of milk has dropped since July, 1979 and sales have climbed upward. The real price of milk was calculated by using the increases in the consumer price index for foodstuffs (not the All Items index) as a deflationary index. The Central Statistical Office (C.S.O.) produce a consumer price index for high and low income urban families. The low income price index is calculated on a quarterly basis and the high income on a monthly basis. As real price drops' so sales climb and the most dramatic climb has occurred since 1981. The real price for higher income groups is lower than for low income groups, which backs up the statement quoted earlier saying that the main group to benefit from the subsidy are those who do not really need it.

Conclusions and Summary of Consumption

Studying the consumption pattern the trend facing the consumer side of the dairy industry is completely reversed from that of the mid 1960's, when a report commented "The ultimate collapse of the Dairy Industry is inevitable if present trends continue (i.e. reduced wholemilk sales) accompanied by increasing production of industrial milk" (Report of the Commission of Inquiry into the Dairy Industry - 1966). The report went on to explain that the milk sales had fallen due to a decline in the number of people in the high income group (probably due to the breakup of the Federation and the declaration of U.D.I.) and the resultant slack was not taken up by the low income groups.

The overriding feature of present dairy product consumption patterns is that milk has become the dominant product, where demand for milk has meant reduced production of other dairy products. This has meant, for the consumer, a shortage and a rationing scheme of such items as cheese, butter and even for a short time, milk itself.

The reasons for the tremendous up-swing in demand were discussed and in I cluded the size of urban population, income and income distribution. The effect of the subsidy was examined and it was shown that directly and indirectly the subsidy has had a marked effect on the price and thus consumption

In the light of these facts, I feel that a definite Government policy on consumption of dairy products should be formulated and that it should be recognised that the present policy in the form of the subsidy causes the dairy industry to be wholemilk, urban-centre orientated. A policy should take into account such facts as who consumes what.

An example of a consumer policy step would be to remove or reduce the urban-centre orientated wholemilk subsidy and apply it to a more ruralorientated produce like sterilized milk. Such a step would take cognisance of the fact that the rural people are less likely to have benefited as much as the urban dwellers from equity orientated acts such as minimum wage increases. A subsidy on sterilized milk could be viewed as an attempt to increase the welfare of the rural people. However, subsidies applied, for whatever reason, are fraught with problems and as such may not be the best answer. The point is that a coherent consumer policy should allow the Government to pursue a course of action that will benefit all consumers without having to resort to somewhat piecemeal and disjointed actions that benefit only some and present great problems and costs such as the current subsidy.

Another consumer policy step could be the decentralisation of processing plants. This could be fitted into the policy of increasing/starting/production in the communal lands (to be discussed later).

Whatever the actual policy is, it should take into account the various factors which influence milk consumption. Changes in any of these factors will probably cause a change in demand. Perhaps one of the factors of demand that can be most easily changed is the actual selling price. This would be expected to have quite a dramatic effect as a large segment of milk consumers are from the low income group, which has a relatively high price elasticity of demand for milk and would thus be quite sensitive to any change in price. It would require strong commitment on the part of the Government to follow a policy of controlled consumption by price. If milk was left to find its own free market price the problem would be solved, but this is unlikely to happen here, when considering the Government's commitment to more centralised control, and so we have to find a solution for a controlled market.

Another alternative form of control is by reducing sales outlets or the number of deliveries i.e. a form of rationing. Again this, also, cannot be expected to be popular as people will be deprived of a product that they are consuming in greater quantities.

Any policy must avoid a setting up of diametrically opposite points, such as encouraging consumption via a subsidy but restricting consumption via rationing. I feel simplicity, and therefore implying lucidity of aims, in a consumer policy is essential in bringing about a controlled growth of milk consumption that will not strain the resources of the D.M.B. Unrestrained growth of fresh milk sales makes the D.M.B. very urban-orientated, leavingfew products for the rural areas. Perhaps a target figure of a certain percentage of utilization of milk intake be made for fresh milk production, and that consumer price be set in order to reach that given level. A period of trial and error, plus mathematically orientated predictions, can'help establish corect prices for given levels of milk consumption and utilization. The major problem with increasing prices by lifting the subsidy is political, but at the same time, the subsidy does help to encourage people to drink milk rather than minerals and other less nutritional drinks.

PRODUCTION

The D.M.B. classifies the production side of the dairy industry into four major segments. These are:

1) The peasant sector. This has an estimated 1 million cows giving about 125 - 175 million litres per annum (yields based on Kenyan research data). All of this milk is consumed in the area produced.

2) Large farm production for sale to the D.M.B. (D.M.B. (ix))

3) Large farm production for home consumption or sale to the D.M.B. as butterfat.

4) Large farm production for retailing direct to consumers. Due to the now wide disparity between retail price and price paid by D.M.B., there are only some 27 of these producers left.

Dealing first with those that are actually supplying the D.M.B. with milk. The first thing of important notice is that the D.M.B. has steadily become The major receiver of the commercial dairy herd's output. In 1953/54 it, received only 55% of output, but by 1973/74 it received 88%. By the late 1970's and early 1980's the D.M.B. was receiving 95%t of all commercial dairy herd output (A.M.A. (ii) and (vi)). Note that we have a situation where dairy cows are kept for two reasons, either to sell milk and butterfat or to provide for home consumption. Since virtually all milk now sold is sold to the D.M.B.; I shall now define the phrase "commercial dairy herd" as the dairy herd supplying milk to the D.M.B. The national herd is made up of this commercial herd plus any dairy cows kept for supplying home needs.

-9-

With more and more milk production going to the L.M.B., it is natural to expect that the commercial dairy herd should take a bigger and bigger percentage of the national dairy herd. The trend of the converging of the commercial dairy herd and national dairy herd means that soon virtually all dairy cattle will be kept for the commercial enterprise of selling milk to the L.M.B. This, of course, excludes all cattle held by peasant farmers for whatever purpose.

Although the commercial herd is expanding in size, and at 90 200 head comprises some 87% of the total herd, the decrease in size of the national herd from 129 000 in 1973 to the present 10 300 head, means that the commercial herd has almost reached its maximum size under present conditions and trends.

Fortunately, production does not rest entirely on herd size. The dairy milk intake, up to 1972/73, grew at a faster rate than did the size of the commercial herd. This was because at the same time as the commercial herd increased in size, so did the average herd size increase. This means that more and more commercial cows are coming under specialised dairy farm management. This has resulted in milk output, both on a per cow and total herd basis, rising at a rather dramatic rate: in 1976 the A.M.A. report on the Dairy Industry stated that the past 21 years had seen a 46% increase in the number of commercial cows, a 7% per annum increase in herd size and a 5% decline in number of dairy farms. All this resulted in an approximate 380% increase in output. Some aspects of this 'condensation' of the commercial herd into fewer but larger sized units are given in Table 6 (see page 10).

As can be seen there has been an increase in efficiency, in terms of output per cow, even over a one year period. This increase in efficiency has ensured an increase in milk supplies despite a decline in total herd size, but the increase falls very short of the increased demand for milk and milk products and hence the problems faced by the D.M.B. Note also, that whilst Table 6 on the following page may show a small increase in output comparing the months of October, Fig. 2 shows that overall, since 1972/73, the rate of increase of output is a lot slower than pre 1972/73. This would tend to suggest that under present circumstances, we might be looking at a reduced rate of increase in output. Note that even the sharp increases in producer prices from 1977/78 onwards did not bring about substantial increases in output. Even the most recent 6c per kg rise, putting producer price at an average of 29,02c per kg, which represents about 26% increase in price, has only brought about a 9% - 10% increase in deliveries to the D.M.B. (Financial Gazette ii)).

Mr. Kirby (Chairman, National Association of Dairy Farmers) feels that the above figures show that there is a definite limit to the usefulness of producer prices as an incentive to increasing milk output. As such, due to the fact that dairy production requires quite a considerable capital outlay, price increases may be considered to affect only the already established dairy farmer. It is true, that in order to ensure that these established dairy farmers remain in business, the producer price should always allow the farmer to obtain a financial return with which he is satisfied. Such a situation should also help to attract more farmers into dairying. However, in view of the fact that the C.F.U. Dairy Model gave a 268 head farm an income over expenditure profit of \$11 928,00 before the 26% rise in milk producer prices, one must ask if the recent increases were not excessive and that the only people who really benefit are those already established.

Table 6

Some Asp	ects of th	e Commerci	al Herd Su	pplying Milk	to the D.M	1.B.
Trainel and the H	Re Salaria		ulographs a		apintos pintos de la composición de la Composición de la composición de la comp	rangel Tugtun
National Hero	Size ('00	0 Head)	and the		albeying world	409125
1970	1973	1976	1979	1981.	17 secoldat	ANTION
123,0	129,1	125,7	108,7	103,2	tore and the left	11-2-2 () () () () () () () () () (
		- 14%				no hir hibset
Commercial Da	iry Herd S	ize ('000	Head)	- 1 		
1970	1973	1976	1979	1981	NEVES SHE AS	of will
65,3	77,7	87,1	84,6	90,2		
		+ 38%			1	onte of common R
Average Herd	Size					1
1970	1973	1976	1979	1981		2 - ART - P
154	183	200	209	• 219	• • • • • • • • • • • • • • • • • • •	
		+ 42% inc.	rease			
Number of Far	ns					<u></u>
1970	1973	1976	1979	1981		
419 +19	6 424 +3%	435 -59	% 415 -1	%411		
	_	- 2% decrea	ase			
October 1980		October 1	1981			
2 833 kg	+ 2%	> 2 877 1 > 928 1	kg Avera	ge monthly d	elivery per	supplier
829 kg	+ 1%	835	kg Avera	ge monthly y	ield per co	w
10,6 kg	+ 2%	10,8 1	kg Avera	ge daily yie	ld per cow	

Source: A.M.A. Dairy Situation and Outlook Report 1981/82 and A.M.A. Economic Review of the Agricultural Industry, 1975.

Perhaps more attention should have been placed on the capital outlay required to start farming. To give an idea of costs involved, Henderson Research Station was recently donated a 4 unit, 8 cow herring-bone milking parlour equipment, valued at around Z\$37 000,00. Dairy cattle can fetch up to \$800 per head for Jersey and around \$1 300 per head for Friesland (personal communication and various editions of The Farmer). Although a high producer price will help a farmer pay back the cost of such equipment, it does not always help him obtain a loan with which to originally purchase the necessary items. Thus it may have been a better idea to have had a smaller increase and to divert the funds thus saved to such institutions as the Agricultural Finance Corporation where they could be used to improve credit facilities for would-be dairy farmers.

One must never ignore the price incentive because it is undoubtedly very important, but it must not be forgotten that other factors contribute to milk output, including the economic and political environment which particularly affect new investment.

How to Increase Production

The increase of 9 - 10% in milk deliveries experienced at the onset of winter were due partly to the increased price and partly to the increased feeding of stock as pastures failed and farmers switched to feedlot type dairy farming. Although there are many farmers who do not use pastures at all for dairy production, there are some who rely quite extensively on them. Oliver gives an extensive general account of grasslands, their feed value and how to improve on them. They are a good source of fairly cheap food which does not compete directly with human food sources.

Increased production that comes from feeding foods that humans could consume can only be regarded as a short term, stop-gap procedure. The near exclusive use of maize, soya beans and other feeds which increase milk production cannot be considered satisfactory in a country which may face a shortage of these foods for human consumption in the future. Thus alternative production methods must be fully investigated. These can include unused grasslands, savanna, crop residues and irrigated pastures in rotation. To ignore these food sources is to ignore potentially valuable sources of food.

As a further example, many areas must surely be considered to have adequate area for running dairy herds but due to lower rainfall the grass is unable to support a stocking rate conducive to profitable dairying. If such places could be irrigated and planted with improved grasses and/legumes, then milk could profitably be obtained. Obviously such a plan requires development of water resources as the first step.

Sometimes there are areas where water resources are adequate and even adapted. This is especially true for wheat growing areas. Listance then becomes the problem as these farms can often be quite far away from an intake point. The D.M.B. has recognised this and is attempting to solve the problem by installing bulk tankers. Already the dairy association has received queries from farmers in the Lomagundi and Karoi areas who wish to start dairying if bulk tankers are made available (Mr. Kirby - personal interview). Such an opening up of a previously non-dairying area (except for local use) can only be regarded as a positive step and one of the aims of the bulk tanker scheme (see page 16).

As far as established large scale commercial dairying is concerned, Mr. 1 Kirby feels that efficiency can only increase in a significant manner if farms start using computerized automation and management. There is one dairy farm in Zimbabwe, Kintyre Estates, that has accomputer controlled automatic feeding system that correlates feed and feed intake against milk yields. It is felt that systems like these are needed to help improve dairy farms to higher planes of production. The C.F.U. supports the idea of a central bureau to start off a computerization system.

However desirable such equipment may seem, it would appear that there are still other areas available for improvement on the present status quo of the industry. Dealing with basic animal husbandry and production, Higgins,

in a survey on dairy heifer wastage in this country, reported that dairy calf. mortality can be between 0 - 55%, with 34% of this total occurring in the first week and up to 67% by the end of the second month. This survey was done on recorded herds in this country, which tends to imply that the more progressive and more efficient type farmers were surveyed. The situation in the non-surveyed herds is unknown but mortality rates are likely to be higher. The survey showed that some farms can obtain a 0% mortality rate of calves. Henderson Research Station claim that their system of rearing dairy calves in crates can lead to a zero death rate, and they had had only ond death by accident in eleven years (personal interview). There is the technology and the animal husbandry knowledge needed to achieve something as simple but vitally important as lowering calf mortality. However, it would appear that there are many farmers who feel it unnecessary to avail themselves of this knowledge. One must then feel compelled to ask the question that if something as basic and fundamental as calf mortality cannot be controlled, what good : would expensive computers, imported with vital foreign currency, really do? This may seem harsh and there are probably farmers who could use computer control to great advantage, but there are probably also many who could quite easily improve production with what exists right now.

What must not be forgotten, is the peasant and communal land sector. As indicated in the beginning of the production section, the D.M.B. estimates that some 1 million cows produce 125 - 175 million litres per year. In the perspective of sheer volume, such an amount of milk, if collected, could probat solve any internal supply problem and leave some for export. However, the problem is that it comes from 1 million cows at 125 litres per head. That means supply will be widely spread and consist of small amounts.

Small herds need not necessarily present a problem. In 1977/78 the herd supplying the D.M.B. consisted of 1 132 herds of sizes varying from 1 - 49 , head, but these are not Zebu (Bos Indicus) type cattle with their inferior yields. The type of cattle which make up even the smallest of commercial herds is the superior yielding Bos Taurus type. The Bos Indicus cow can produce about 800 kg of milk per lactation and a Bos Taurus, in the form of Friesland breed, about 4 000 kg, i.e. five times that of indigenous cows (Oliver, 1971).

Oliver (1971), maintains that local indigenous cattle breeds are so little suited to commercial dairy farming that he comments: "To attempt dairy farming with local cattle, ..., ...means that African (peasant) farmers will have little or no hope of lifting themselves out of a subsistence farming economy"

Is there, then, a definite breed to recommend? The European origin breeds (Bos Taurus) need supplementary feed and high management standards to produce adequately. Thus these breeds would seem inappropriate with which to start any dairy scheme in the communal lands. The L.M.B. is going to promote dairy co-ops in the rural communal lands (to be discussed more fully under D.M.B.) but seem uncertain or non-commital on breed types to be used. I feel that the use of the 'deligate' breeds in any communal land project, designed to increase milk production, may lead to an expensive failure.

Oliver (1971) claims that such Indian breeds as Sahúval and Red Sindhiare more adapted to lower rainfall areas, where crops are less abundant, which makes them a distinct possibility for certain communal lands. Another answer is to cross breed, using artificial insemination, the local cattle with types of a higher milk yielding nature. This would produce Zebu crosses and perhaps even grade cattle with the hardiness of Zebu still instilled. After all, one does not want to lose the toughness inherent in indigenous cattle which enables them to withstand quite harsh conditions. In Kenya, a programme of this type appears to have been in operation for some time and Zebu crosses, with improved yields, made up about 13,4% of the grade cow population in 1974 (Hopcraft et al 1976). However, the Kenyan experience points to many problems that must be avoided here. First and foremost is raw data. Hopcraft (1976) gives a few examples of a diversity of estimates for many aspects of the dairy industry in Kenya and states that little reliance should be placed on them. This obviously makes planning difficult. A dairy statistical information centre is a must. The Department of Research and Specialist Services does run a centre which provides information and such services as milk testing and veterinary advice. However, shortage of specialist staff is another problem that must be overcome.

Finally, the Kenyan example comes back to the price issue. Hopcraft (1976) found that the Kenyan Co-operative Creamery (K.C.C.) was running at a substantial financial loss due to a uniform price structure that did not take into account seasonality of production, i.e. wet or flush and dry season, nor did it express the divergency in transport and input costs experienced in different production areas. The producer prices offered to the producers have been termed 'politicized' and "....ignore the economic and technical characteristics of commodity production and consumption...."(Hopcraft, 1978).

Here in Zimbabwe, a seasonal price is in operation with more paid in the dry months than the wet, in order to secure supplies. But are these prices suitable for a production system that will extend to remote rural areas? The K.C.C. found itself burdened with over-supply during wet seasons due to an incorrect pricing system. In Zimbabwe, even established commercial dairy farmers question the wisdom of the present pricing policy, with regard to supply stimulation and input costs (Kirby - personal interview).

Transport costs aside, and even with bulk tankers, is it really economic to haul milk many kilometres from the rural areas, moving food from poor areas to rich?

Perhaps part of the transport problem can be alleviated by decentralizing processing plants. This could help increase consumption and production. However, such plants are not cheap and site situation must be considered critical, governed more by proven demand and need rather than projected or hoped for demand. The dairy industry is in no position to waste money siting a plant in an area where dairy pr duction will flourish only for a short while and then wither. However, note that more processing plants, or even more intake points (which are a lot less expensive than an actual processing plant) can help implement a different area/different producer price policy. Such a price policy can have a floor price, applicable regardless of situation, with additions or deductions for its seasonal, technical and economic consideration of the area.

Conclusion and Summary of Production

In contrast to the consumer pattern, production has been quite stable for some five years. It would appear that, despite increased efficiency per cow, some sort of maximum production limit has been reached, given the present herd size in the commercial area.

Factors that have affected milk output from 1970 - 1981 have included average and commercial herd size as amongst the most important. These, in turn, are most affected by the events of a year or two ago, especially producer price.

In discussing methods of increasing production, it was noted that methods which entirely utilize food suitable for human consumption must be considered short-term. To develop pastures, irrigation and pasture improvement must be considered of great importance. Also the problem of distance and product must be met with schemes like the bulk tanker.

The area of on-farm efficiency may be tackled and such areas as animal husbandry could probably be improved upon in the existing situation without the enormous opportunity costs incurred by a computerised system.

The question of production in the communal areas was discussed and the problem of what type of breed to use in a scheme designed to increase production was commented on. The Kenyan experience in cross breeding was shown as a possible answer to this problem.

Kenya was also cited as an example of the problem of price and questions of the suitability of the current Zimbabwean price structure for an expanded production set-up was mentioned.

It would appear that some outward looking steps need to be made in order to significantly expand production. However, the steps must be made after much forethought. Self-sufficiency, and even export capacity, may be a desirable goal for the dairy industry, and indeed, such a goal is supported by the Government and the National Association of Dairy Farmers. However, at all times the economics of production must be borne in mind and be used as a basis on which to build all plans.

THE DAIRY MARKETING BOARD (D.M.B.) - THE CONTROLLING AUTHORITY

The D.M.B. was established on October 1st, 1952, and was set up via the Dairy Marketing Scheme (L'M.S.) formed under Proc. 38 of September 26, 1952. Until the advent of the D.M.S./D.M.B. "...the greater part of processing and marketing of wholemilk was in the hands of Producer Co-operative Companies, most of which had inadequate resources to develop their business to meet the growing needs of the Colony, particularly as the cost of dairy plant is probably higher in relation to the returns on capital than in almost any other industry. With the price of milk to the producer controlled (by the then Southern Rhodesia Dairy Industry Control Board) there was, therefore, little opportunity for the co-operative companies to operate at a profit or to secure the capital required to modernise the industry. A position had indeed arisen in which the processing facilities available at a number of centres were wholly inadequate, both for efficient operation and to meet reasonable public health requirements. This met neither the needs of the producer nor the consumer." (D.M.B.- (ii)).

The first step in consolidating the industry under the L.M.B. was the purchase of the Salisbury Cooperative and then followed in rapid succession several other dairies - often saving them from closure as was the case of the Rhodesia Co-operative Creameries' dairies at Que Que and Gwelo. This take-over and improvement of existing capacity continued until 1975 with the acquisition of the Gazaland Co-op Cheese Factory in Chipinga. The D.M.B. is now Avirtually solely responsible for distribution and sale of milk and dairy produce in Zimbabwe. Since December, 1967, the D.M.B. has operated under the responsibility of the Agricultural Marketing Authority (A.M.A.) in accordance with the A.M.A. Act, Chapter 102. The dairies now in operation are situated in Harare, Bulawayo, Gweru, Mutare and a cheese factory erected in 1978 at Kadoma. (D.M.B. - Annual Report, 1980 and 1981).

As commented on, in the first annual report of the D.M.B. already quoted, the D.M.B. stepped 'in and averted the collapse of the dairy industry, primarily due to the fact that it could call on Government directly for capital or guarantee capital, and it could more efficiently use that capital due to size. However, despite its rather examplary "track record" to date, one mustask if the D.M.B. is actually in the best position to undertake the challenge of meeting the supply and demand requirements for both the present and the future. One is tempted to ask by how much the current problems are indeed due to the fact that the D.M.B., being a Government body, must always confer with Government first before making a major decision, thus making it rather slow and perhaps unwieldy. Admittedly there are justifiable excuses on the grounds of the war and changes of Government, leading to changes in objectives, but it still leaves much room to question motives and modus operandi. Witness the recent producer price increase which even the National Association of Dairy Farmers has questioned.

-15-

One must remember that it would not be a reversal of L.M.B. policy to allow private, or other, enterprise to move into the communal lands or expand existing dairy plant capacity, as, by A.M.A. statute law, it is only a residual buyer of milk. The D.M.B.'s present position of near monopoly is mainly because of the consumer subsidy. Pricing and other policies have forced the D.M.B. to become an effective monopoly.

The danger of letting such a body as the D.M.B. expand and control the industry as a monopoly is well illustrated by the British Milk Marketing Board, which does have a legal monopoly over milk processing and distribution in England. The overall situation, at least in the late sixties and early seventies, was that the producer price was considered to be above the competitive price, compared to imports, and this encouraged production at uneconomic levels, i.e. inefficient producers were maintained. (Whetstone -1970). Also, Hallet in Whetstone (1970) remarked "...it is difficult to find cases in which British Marketing Boards have improved efficiency of distribution". Even in the quality of milk, Whetstone (1970) maintains that a committee on milk quality found that the compositional quality of milk has declined since 1933, and this may be partly due to the Bcard's policy.

It is true that the L.M.B. has improved public health standards by making pasturization automatic at its plants and it has set rather stringent quality control standards. On the other end is the increase in producer price which may put some producers, who are inefficient, back into a profitable profile.

The type of mass merchandising practised by the D.M.B. very often benefits those who can afford it. The hidden costs of transport, finance,, pilferage and spoilage may by far exceed any benefit gained from lower prices (and price control that a marginal consumer, like a rural peasant, is supposed (to receive. Indeed, an organisation like the D.M.B. may 'crowd out' any alternative source of supply for that marginal consumer. The drop in the number of independent producer retailers (see producer section) is an example of this. (After Nuggent and Yotopoulous, 1979).

D.M.B.'s Plans +o Increase Production

After pointing out the many pitfalls that such an organisation as the D.M.B. may fall into, it must be recognised that the future of the dairy industry in this country is intimately linked to the D.M.B. It is only natural to expect the Government to use the D.M.B. as a springboard when considering the development of the dairy industry in this country.

As such, the D.M.B. believes that future milk production can be increased by:

- 1) introducing a bulk milk collection service;
- 2) establishing co-operative dairy farms as part of Government's rural development
- 3) introducing a collection system in the peasant sectors (D.M.B.-(ix))

In the bulk tanker scheme proposed by the D.M.B., the commercial producer has some advantages. There is less risk of rejection due to bacteriological deterioration, the present rather old and unwieldy system of cans and cooling is replaced and the milk is sold to the D.M.B. at the farm (Hoyle). the D.M.B. further believes that the system of leasing and depreciation over fifteen years to be used will represent a definite economic benefit to each farmer, and the fact that transport should be more efficient will mean a benefit to both the farmer's and the nation's vehicle fleet (D.M.B. - (x)).

The farmer's reaction has been positive. Grimley reports that 75% of 474 dairy farmers who replied to a questionnaire, replied positively - 5% were reluctant and the remaining 20% were undecided. Although there has been some delay in starting up the pilot scheme in Harare, originally scheduled for April, 1982, by July, 1982, the scheme appeared to be committed to fact and should go fairly smoothly into full scale operation in November, 1982.

What seems a little slower in becoming operative is the implementation of producer co-operatives. Three are envisaged, each with 100 members, in the vicinity of Bulawayo, Kadoma and Chipinga. Some 5 250 cows will be required to give each member 10 cows in milk at all times. In addition, each member will be allotted 4,8 hectares of land split into irrigated pastures, irrigated maize-wheat rotation and a vegetable and house stand. These co-operatives are meant to give an approximate 10 per cent increase in national production and a net income of some Z\$3 000,00. per member, plus food, water and shelter' (D.M.B. - (ix)).

In order to reach these figures, some 14 million litres of milk will have to be delivered in the first year, perhaps rising to 18 million in subsequent years. This works out at over 2 500 litres per cow per year and the problem of cow breed raises its head. This was discussed at some length in the production section. The question of who is actually to be picked as a member is avoided in the paper. With irrigated crops and high quality cattle, these co-operatives will need experienced and well-trained farmers. Personal experience in kibbutzim and Moshavim have led me to believe that not many skilled farmers are interested in a collective farming system and thus the required number of suitable recruits may be hard to find.

Less demanding in resources is the idea of milk collection schemes. A centre will be established in a suitable central location to receive, grade and store milk delivered to it by the surrounding farmers in the communal areas. Payment will be in cash and facilities (such as advice and A.I. equipment) will be made available for the cattle owners. The centres can also supply stockfeed and become a nucleus for growth in the area.

Even a downgraded scheme has been suggested where only butterfat is collected by a local extension officer. This would require a comparatively small expenditure and the milk, with its nutritional value, would remain in the rural areas. The money received by the sale of butterfat may stimulate production and lead to larger enterprises. If the scheme should fail, the lesson learnt will be inexpensive compared to that of the co-operatives and if it should succeed, the step-by-step upgrading of production should avoid many pitfalls of the 'all-in-one-go' schemes (D.M.B. - (ix)).

The last step of envisaged D.M.B. development is the building of longlife milk plants at Kadoma and Chipinga. With this implemented in more rural areas, it is hoped to make better use of local supplies and improve distribution so that within three years, 80% of Zimbabwe's population will have ready access to milk supplies. At the moment the Chipinga plant is scheduled for start-up about the middle of 1983 (D.M.B. - (vii) and Herald (v)). Table 7 below reproduces some of the envisaged costing for the projects and shows that the projects are not cheap for a country of Zimbabwe's size yet the total figure is only 3,5 times that of the subsidy paid out in 1980/81. Clearly, the expense is relative.

Table 7

Financial Requirements for D.M.B. Projects

<u>Z\$</u>	LOCAL milliona	FOREIGN Z\$ millions	TOTAL Z\$ million	ns
Bulk Milk Collection	2,5	4,5	7,0	· (`
Long-life Milk: Kadoma	0,6	1,9	2,5	. 6
Long-life Milk: Chipinga	1,0	2,1	3,1	
Co-operative Milk Production Schemes				. 4
Antelope Sanyati Chipinga	1,8 2,3 3,0	0,2 0,2 0,6	2,0 2,5 3,6	ť
Peasant Sector Feasibility				
Study and trail scheme Full Scale Development	0,1 3,0	0,1 12,0 ·	0,2 15,0	
TOTALS	14,3	21,6	35,9	

Source: D.M.B. - Future of the Dairy Industry, 1981,

One of the most original donations comes from the E.E.C. in the form of skimmed milk powder and butter oil worth some Z\$12,5 million. This will be reconstituted here in Zimbabwe and sold to the public. The money so gained wil go towards the projects detailed earlier. This idea has been carried out before with some considerable success in India under the name of 'Operation (Flood'. The plan calls for Zimbabwe to receive 4 000 tonnes a year of skim milk powder for the next five years, with 1 000 tonnes of butter oil for the first year, 750 tonnes the second year and 500 tonnes a year thereafter (Herald - (ii)).

At the Zimbabwe National Farmers' Union congress, Mr. Cross, General Manager of the D.M.B., commented on the fact that some of the plans, especially those in the communal lands, have made little progress in implementation due to the "... uncertainty over agency responsibility and the need to resolve a correct approach to the many technical and other issues which make dairy farming a complex area to develop" (Herald - (v)).

One hopes that the complexity and administrative problems are overcome, otherwise the E.E.C. food aid, intended for five years, may have to become a permanent feature. Again the idea of self-sufficiency crops up and it is the intended aim of the D.M.B. that "... by 1990," or long before, Zimbabwe would have resumed the export of dairy products to neighbouring countries" (Herald - (ii)). One assumes that exports equate with self-sufficiency plus surplus.

Certainly there is reason to assume an export market for Zimbabwe's product as, prior to the recent shortage, up to 14%, or 20 million litres, of production, was exported to Botswana, Zaire and a little to Malawi and Mozambique. There appears to be a demand for dairy products in Third World countries which outstrips local production. In a report on possible world trends in certain dairy products done for the A.M.A., demand for butter was shown to be very sensitive to price in developing countries. Thus, whilst Zimbabwe is a member of the SADCC and has a 'ready made' market for exports, the question of price is important, along with the ability of the importing countries to pay. So before one eagerly anticipates surplus for export, it must be ensured that the surplus will be generated economically and that exports do not merely become a way of reducing some, but not all, the costs of uneconomically produced milk.

Conclusions and Summary of the D.M.B.

The history of the formation of the D.M.B. showed that it was established to prevent the collapse of the dairy industry. It was noted that the D.M.B. has no monopoly powers but only acts as a residual buyer and that any effective monopoly it does enjoy is due much to pricing policy.

It was pointed out that an organisation like the D.M.B. does have disadvantages inherent in its structure and the British Milk Marketing Board was cited as an example of such a structure beset with problems.

The D.M.B's plans for increasing production were discussed, but only after querying by how much the D.M.B. is responsible for the current shortages due to pricing policies.

These plans have some rather doubtful aspects and even Mr. Cross has commented on problems of implementation. In the short to medium run, consumer supplies will be eased very much by E.E.C. food aid deliveries, the sales of which here are meant to finance a good deal of the D.M.B's plans. It is hoped that these plans become a working reality, otherwise the food aid may have to become permanent, or consumers will suffer continual shortages.

An export market is assumed to exist both by historical fact and by analytical report, but aiming for exportable surplus may result in a far too expensive product that customers will be unwilling or unable to buy. In other words, the export market should not be regarded as a magic lodestone that will be indicative of the dairy industry's well being in this country.

Finally, it must be recognised that the dairy industry is looking at positive attempts initiated by the D.M.B.tooimprove the situation. However, these attempts must not be regarded as the only possible means and other avenues should be explored. An example is encouraging private enterprise in, say, collecting milk from remote areas where the D.M.B. will pay a middleman a set rate for the task of collecting and transporting. If the idea of encouraging middlemen is against Government policy, perhaps the people to encourage are local cheese or butter makers who would utilize the butterfat and leave the milk for local consumption. In the end, the array of answers that could solve the problems of the dairy industry are limited by the willingness of the D.M.B. and, indirectly the Government, to explore the possibility of combinations of private, Government and Co-operative enterprises.

SUMMARY OF THE REVIEW OF ZIMBARWE'S DAIRY INDUSTRY

The shortage of dairy products and even milk available to the consumer is due to the large increase in consumption in recent years without a reciprocal rise in production. The main factors causing the consumer rise in demand include the rise in incomes and population, and in particular the subsidy. As far as equilibrium solutions go, the subsidy must be regarded as the easiest tool with which to alter the pattern of demand to a level compatible with supplies.

On the producer side it would appear that some sort of production plateau has been reached. Although efficiency still increases in terms of yield per cow, recently increases in output have not matched the increases in producer price. In an attempt to increase efficiency from existing producers, computer orientated mechanisation and management is a possibility, although very expensive in terms of foreign currency. Improvements in basic animal production and husbandry must be regarded as a necessity, of more importance than the application of any sophisticated technology.

The utilisation of milk from the communal lands is also a possibility although fraught with many problems that include the unsuitability of indigenous cattle for dairy causing low yields, wide scattering of this herd and the question of actually collecting the milk. The development of milk production and distribution within the rural areas must be given more prominence. At present most projects aim to transfer milk from the rural to the urban areas rather than increasing availability to the peasant farmers.

The D.M.B. has an effective monopoly on milk processing and distribution. As a controlling agency it has initiated several projects aimed at increased production and better distribution. The D.M.B. projects must be regarded as a positive step but not the only possible answers. For example, private enterprise could play a part in developing the communal dairy industry. The D.M.B. projects have to be carefully planned and managed and will need to be flexible if they are to overcome the potential problems.

·	
2 . ch +	REFERENCES
-	A.M.A. (Agricultural Marketing Authority) Harare, Zimbabwe
	 i) Dairy Situation and Outlook Report 1981/82 ii) Report on the Dairy Industry - Sept., 1976 iii) The Report of the Committee of Inquiry into the Dairy Industry, 1966 iv) Economic Review of the Agricultural Industry, 1972 v) Economic Review of the Agricultural Industry, 1976 vi) Economic Review of the Agricultural Industry, 1980 vii) Economic Review of the /gricultural Industry, 1981
,	Behrman & Buckle: "A Comparison of the Fresh Milk Quota System in Natal with the Milk Pools of the Transvaal" University of Natal, Pietermaritzburg, 1970
	Central Statistical Office - Harare, Zimbabwe
(i) "Consumer Price Index for Higher and Lower Income Urban Families" Their ref. CF/9/82/530 - 1982 (mimeo) ii) Monthly Digest of Statistics - December, 1981 iii) Monthly Digest of Statistics - December, 1975
	Commercial Farmers' Union - Harare, Zimbabwe
	 i) <u>The Farmer</u> - Vol. 52 - No. 14, 1981 ii) <u>The Farmer</u> - Vol. 52 - No. 27, 1982 iii) <u>The Farmer</u> - Vol. 52 - No. 33, 1982 iv) "Dairy Model" - their ref. Econ/81/680 - mimeo, 1981
	C.I.R.A S.A. "Final Report of a Study to Determine the Possible Future World Trends in Selected Dairy Product Markets as a Guide to Rhodesian Dairy Product Policy". Study done for A.M.A Harare - date 1978/79? - Folio
	Dairy Marketing Board - Harare, Zimbabwe
. (i) Annual Report & Accounts for 1953 (with A.M.A.) ii) Annual Report & Accounts for 1960 (with A.M.A.) iii) Annual Report & Accounts for 1967 (with A.M.A.) iv) Annual Report & Accounts for 1976 (with A.M.A.) v) Annual Report & Accounts for 1980 (with A.M.A.) vi) Annual Report & Accounts for 1981 (with A.M.A.) vi) Annual Report & Accounts for 1981 (with A.M.A.) vi) Annual Report & Accounts for 1981 (with A.M.A.) vi) Annual Report & Accounts for 1981 (with A.M.A.) vii) "The Production and Marketing of Butterfat in the Peasant Sector" - 30th July, 1981 - mimeo viii) "An Introduction to the Dairy Industry" - 15th April, 1981, mimeo ix) "The Future Development of the Dairy Industry" - 29th June, 1981, mimeo x) "Bulk Milk Collection Scheme" - D.M.B. Paper No. 33/82, 1982, mimeo
the state	sister of a star star star star star star star st
	F.A.O Means of Adjustment of Dairy Supply and Demand - F.A.O., 1963, Rome
1	Financial Gazette - Harare, Zimbabwe
	i) June 25, 1982 ii) July 9, 1982
	Grimley, article in The Farmer Vol. 52 No. 27

.

	1
Hopcraft & Ruigu - "Dairy Marketing and Pricing in Kenya. Are Milk Shortages -he Consequence of Drought or Pricing Policy?"	· · · · · ·
Discussion Paper No. 237, Institute for Development Studies, University of Nairobi, Kenya, 1976	
Hopcraft - "Milk Pricing in Kenya. The Case of a Bulky, Perishable Commodity with Seasonally Varying Production Costs"- Discussion Paper No. 266, Institute for Development Studies, University of Nairobi, Kenya, 1978	
Hayslett - <u>Statistics Made Simple</u> Allen, London, 1967	с
Higgins - "Survey of Dairy Heifer Wastage in Rhodesia" <u>Rhodesia Agricultural Journal</u> Vol. 75 (6) - 1978	
Hoyle - "Milk Cooling Equipment" in: Thall & Dodd Machine Milking	
N.I.R.O., Reading, England, 1976 Herald - Harare, Zimbabwe	•
 i) July 9, 1982 ii) July 29, 1982 iii) August 5, 1982 iv) August 17, 1982 v) September 28, 1982 	2
Jansen - "Agricultural Prices & Subsidies in Zimbabwe: Benefits, Costs and Trade-Off" , May, 1982, mimeo	-
Karpoff & Webster - "Who Benefits from Hauling Discounts?" in: <u>Hoards Dairymen</u> - Dec 14 & 25, 1981	
Nie, Hull, Jenkins, Steinbrenner & Bent - <u>Statistical Package for the</u> <u>Social Sciences</u> - McGraw-Hill, New York, 1975	
Nuggent & Yotopoulous - "What has Orthodox Development Economics Learnt from Recent Experiences?" in: <u>World Development</u> Vol. 7, No. 6, 1979	
Oliver - "An Introduction to Dairying in Rhodesia" Occ. Paper No. 3, University of Rhodesia, Dept. of Agriculture, Harare, 1971	
Ritson - Agricultural Economics Granada, London, 1977	
Whetstone - The Marketing of Milk Institute of Economic Affairs (Res.Mono. No. 21), London, 1970	
Personal Interviews and Communications	
 i) Mr. E. G. Cross - General Manager, D.M.B. ii) Mr. Gordon-Farleigh - Sale's Manager, D.M.B. iii) Mr. T. Kirby - Chairman, National Association of Dairy Farmers iv) Mr. P. Mpunzwana - Economist. A.M.A. 	



