

A MILK PRODUCTION STRATEGY FOR SOUTHERN AFRICA

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Approximately 7 per cent of the world's nutritional and 15 per cent of its protein requirements are supplied by dairy products (Nienhaus, 1978). It is estimated that 430 000 000 tons of milk are being produced annually in the world by approximately 200 million cows. South Africa's 2 200 000 tons produced by over a million cows, constitutes 0,5 per cent of the world production which is somewhat smaller than our 0,7 per cent share of world population, but still high in comparison with the typically very low milk production in African countries.

It has always been accepted that dairy products should constitute a basic part of the diet of any population because of the quality and cost of the protein, essential fatty acids, calcium, other minerals and vitamins. The fact that the milk cow converts 50 per cent of feed protein into high quality milk protein as against 12 per cent, 25 per cent and 35 per cent in the case of beef, pork and eggs, respectively, focusses attention on milk production more than ever before.

If policy makers speculate on a future production strategy and for that matter an agricultural policy, it is of utmost importance that there is clarity on priorities, i.e.:

- Do we want to be self-sufficient?
- Are we willing to rely on imports for certain food commodities, while exporting non-food products such as wool and wine?

To the author's mind this country should base its policy in order of priority, on

- the future nutrient requirements for a healthy population;
- the economy of production of such requirements and
- exportation of products.

It is maintained therefore that we must be self-sufficient in our basic foods of which milk is one of the most important.

If available arable land, water and energy are the main physical limiting factors these should be utilised for production of the most economic food products.

In the years to come it might even become necessary to question the production of wool on the highveld and of products such as tobacco, cotton and wine on valuable agricultural land.

Current situation

The producers

In February, 1978, there were 27 076 industrial milk producers in South Africa, which was roughly the same as in 1977. During the rest of 1978 the industry experienced a visible drop in producer numbers resulting in 9 per cent less producers in November, 1978, as against November, 1977.

The production per supplier sold to factories amounted to 26 254 kg per year or 72 kg per day in 1978 and is showing a decreasing tendency, mainly because of the movement of bigger producers into fresh milk production. The production per supplier including milk utilised on the farm is approximately 44 000 kg per year or 120 kg per day.

The number of fresh milk producers and fresh milk production statistics are less well known. There are approximately 2 100 producers delivery milk into metropolitan areas and bigger cities.

The number of producers supplying smaller towns are not officially known, but could be in the region of 500.

The total number of producers (excluding those in homelands) will be in the region of 2 600, selling 322 939 liter per year or 885 liter per day which is 12 times more than the industrial milk sold per supplier. (Total production amounts to approximately 350 000 kg per year or 960 liter per day).

The cows

The statistics on cow numbers do not seem to be very dependable. The official figures are as follows: (Department of Agricultural, Economics and Marketing)

	Cows above two years
1968	1 300 000
1974	1 090 000
1977	902 000

These figures apparently do not include "other" cows which are either dual purpose animals or of mixed blood. Such other cows constitute 32 per cent of the milking stock in the industrial milk sector (Jordaan, 1977).

If one assumes that the 27 076 herds contained on average 35 cows above two years the total number of industrial milk cows is 947 660 with 32 per cent or 303 251 being "other" cows (Jordaan, 1977; NCD surveys).

There are, furthermore, a number of cows in the homelands, providing the biggest part of the product consumed in homeland rural areas.

Based on known herd sizes in the Milk Board areas and in Natal the number of cows in the fresh milk industry is guesstimated as 340 000.

Total numbers could be approximately as follows:

Table 1

An estimate of the number of cows above two years of age

Fresh milk	340 000
Industrial milk:	
Milk race	644 000
Other	303 000
Cream production	100 000
TOTAL IN WHITE AREAS:	1 387 000
Homelands	250 000
	1 637 000

The production

The production per cow

On the basis of the figures in Table 1, consumption statistics for farms, cities and towns, and milk fed to calves, and assuming that there are 67 per cent cows in milk, the production per cow per lactation is approximately 3 200 kg for fresh milk and 1 400 kg for industrial milk.

According to the survey of the Central Dairy Co-operative (Jordaan, 1977) the production per industrial milk cow in September, 1976, was 7,2 kg per day which could mean 2 160 kg per lactation if such a production level is maintained for 300 days, which is normally not the case.

Total production

The statistics for total milk production are not very reliable. According to the Division of Agricultural Marketing Research (1976) milk usage in 1977/78 was as follows:

	Tons of milk
Fresh milk	1 054,4
Butter	396,7
Cheese	315,1
Condensed milk	409,0
TOTAL	2 185,2

If one takes the very excellent study of the Bureau of Marketing Research as a basis (Loubser & Steenkamp, 1977) plus the work of Jordaan (1977) plus the Statistics of the Dairy Board and the Milk Board, the following estimate can be made for 1977:

	Tons of milk
MILK UTILISED FOR	
1. Fresh milk and fresh milk products (i)	1 390 000
2. Industrial milk products	650 000
3. Other purposes (ii)	50 000
4. Cream production (iii)	15 000
5. Calves	120 000
TOTAL	2 210 000

(i) Includes milk and skim milk consumed on farms and in homelands.

(ii) A guess.

(iii) Total milk separated for cream production on farms is approximately 125 000 tons.

The skim milk utilised on the farm is included under (1) and (4) so that only *cream* sold can be added to the milk figure.

The consumption

Total consumption

Milk is consumed in the form of full cream and skimmed fluid milk, various fresh milk products, cheese, condensed milk, powder, various other products and butter.

The work of Loubser and Steenkamp (1977) provides, for the first time ever, a reasonably accurate picture of consumption patterns. The figures were calculated on the basis of their study and with the aid of Dairy Board statistics (Table 2).

If one excludes milk consumed on farms and in homelands one comes to the figure for milk produced for commercial purposes and that is:

Fresh milk	777 000
Industrial milk	780 000
TOTAL	1 557 000 (72 per cent of total)

Table 2

The consumption of milk and its products by various population groups and in various localities

Type of milk	Quantity (Metric tons of milk)
1. Fresh milk and fresh milk products	
Whites on farms	170 000
White in cities and towns	510 000
Coloureds on farms	52 000
Coloureds in cities and towns	78 000
Asiatics	57 000
Blacks in Homelands	265 000
Blacks on farms	145 000
Blacks in cities and towns	114 000
	1 391 000
2. Industrial milk	730 000
3. Milk for other purposes	50 000
	780 000
Total consumption	2 171 000

It is interesting to note that 50 per cent of milk commercially produced is sold as fresh milk and 50 per cent as industrial milk.

Consumption per capita

Total consumption per capita of all milk amounts to 81 kg. Details are given in Table 3.

Table 3

*Milk consumption per capita per year (kg or ℓ of milk)**

	Fresh milk and its products	Industrial	Total
WHITES			
Cities and towns	134	85,3	219,3
Farms	297	87,6	384,6
BLACKS			
Cities and towns	18,4	9,9	28,3
Farms	32	—	32,0
Homelands	31,5	14,3	45,8
COLOUREDS			
Cities and towns	42,6	28,2	70,8
Farms	86,4	29,5	115,9
ASIATICS	74,4	—	74,4

*These figures were calculated on the basis of available statistics for multiple households in the study of the Bureau of Marketing Research.

The large variation in consumption between various groups is of basic importance for future projections.

The price

Price fixation is by far the most important tool in milk policy. Milk produced for commercial purposes is priced in four different ways.

1. Milk for fresh milk and fresh milk products in areas controlled by the Dairy Control Board through the Board and Marketing Council by the Minister of Agriculture.
2. The same for milk or cream for industrial milk products and butter.
3. Industrial milk utilised for other purposes than controlled products is uncontrolled in price. Prices are normally the same or somewhere between fresh milk and industrial milk price and are fixed by voluntary agreement.
4. Fresh milk prices in certain areas are fixed through the price controller.
5. Fresh milk prices in non-controlled areas are fixed by mutual agreement between the buyer and the producer and are normally the same or somewhat lower than official fresh milk prices.

The controlled prices are those that determine the development in the industry.

It is well known that fresh milk and industrial milk prices differ widely. This is shown in Table 4 (Jordaan, 1978).

The realised fresh milk price consists of the average of the income of milk sold on the fresh milk and industrial milk markets. Realisation is therefore highest in winter when surpluses sold at lower industrial milk prices are negligible.

During the last three years the milk farmers and especially the industrial milk producers suffered severe setbacks because of levies imposed on their milk for the purpose of removing surpluses. Because of the surplus situation prices did not keep pace with cost increases. This was a very unfortunate period which discouraged producers and created a poor image amongst consumers. The irony of the situation was firstly that the industrial milk producers who were levied very heavily did not produce one single kilogram of milk too much and secondly that the bulk of the surplus was imported. The locally produced surplus was of no practical importance and easily manageable.

Table 4

A comparison between the realised prices of industrial milk and fresh milk

Month	Year	Realised price – cent per liter (1)			
		Fresh milk (2)	Industrial milk (3)	cent	Difference (%)
January	1977	14,87	9,73	5,14	(52,8)
February	1977	15,60	9,89	5,71	(57,7)
March	1977	15,81	10,07	5,74	(57,0)
April	1977	15,83	10,17	5,66	(55,6)
May	1977	15,98	10,13	5,85	(57,7)
June	1977	15,69	9,94	5,75	(57,8)
July	1977	15,23	9,79	5,44	(55,5)
August	1977	15,26	9,69	5,57	(57,4)
September	1977	15,08	9,74	5,34	(54,8)
October	1977	14,93	9,66	5,27	(54,5)
November	1977	15,21	10,41	4,80	(46,1)
December	1977	14,34	10,39	3,95	(38,0)
January	1978	14,85	10,49	4,36	(41,5)
February	1978	15,53	10,58	4,95	(46,7)
March	1978	15,58	10,79	4,79	(44,3)
April	1978	16,02	11,20	4,80	(42,7)
May	1978	16,01	11,04	4,97	(45,0)
June	1978	17,94	12,66	5,29	(41,8)
July	1978	16,90	12,33	4,57	(37,0)
August	1978	17,16	12,30	4,86	(39,5)
September	1978	17,05	12,26	4,79	(39,0)
AVERAGE					
(12 months)(4)		15,93	11,00	4,93	(44,8)

(1) After levies

(2) Source: Milk Board, Statistical News Releases

(3) Calculations: Central Dairy Co-operative Ltd

(4) Weighted (according to monthly primary production) average

The relationship between prices of concentrates and that of milk is a generally accepted economic indicator. Table 5 shows the changes during the past three years (Jordaan, 1978).

Fresh milk is therefore at the same level where industrial milk was in October, 1975.

In the U.S.A. this relationship was 1,84 in October, 1977 (Market Frontier News, 1978).

The sharp and constant increases in concentrate prices are disturbing. Although this is largely governed by increases in raw materials the movement of these prices requires some more attention, as these products are responsible for such a large percentage of milk production costs. It seems wrong that a controlled commodity is so strongly influenced by an uncontrolled item. This is not very serious as long as free competition is maintained, but the tendencies to price binding in this particular industry give rise to serious concern.

Price fixing by the Control Boards was more than often severely criticised. The increasing gap between the prices of fresh and industrial milk which was widened as late as February, 1979, leaves one speechless. The Control Board system has many positive attributes and the Dairy Control Board has attained a lot of good, as pointed out previously (Hermann, 1977). The cumbersome process in which the Dairy Board, the Marketing Council, the Minister and the Cabinet take part, does however not provide for a flexible industry. Decisions are therefore mostly too late and in a time of rapid inflation one price movement in 12 to 18 months appears very drastic and meets with consumer resistance. A much more flexible Dairy Board which can take its own decisions, within some policy framework, is a vital necessity.

In a free economy market forces determine price. Friss, (1978) Chairman of the New Zealand Dairy Board, cites the U.S.A. Secretary of Agriculture, as saying: "Farm prices are neither made in heaven nor in Washington. They are made in the market place."

Table 5

Kg of concentrate equal to the value of 1 kg of milk*

Month	Year	Concentrate c/kg	Industrial milk		Fresh milk	
			c/kg*	Kg concentrate per kg milk	c/kg*	Kg concentrate per kg milk
October	1975	7,83	10,29	1,31	14,33	1,83
January	1976	7,83	10,29	1,31	13,64	1,74
April	1976	8,08	11,05	1,37	14,50	1,79
July	1976	9,28	10,86	1,17	15,63	1,68
October	1976	9,28	10,45	1,12	14,20	1,53
December	1976	9,66	9,36	0,97	13,38	1,38
January	1977	9,66	9,45	0,98	14,43	1,49
April	1977	9,72	9,87	1,01	15,36	1,58
July	1977	11,21	9,51	0,85	14,78	1,32
October	1977	11,29	9,37	0,83	14,49	1,28
January	1978	11,30	10,18	0,90	14,41	1,28
April	1978	11,47	10,89	0,95	15,55	1,36
July	1978	12,59	11,91 (1)	0,95 (1)	16,41	1,30
October	1978	12,82	11,90	0,93	16,58	1,29

*Dairy meal

(1) Revised, December 1978

This is however seldom true and Friss also said, in relation to world dairying:

“Prices are widely used as an expedient to try to achieve purposes which are political or social. Producer prices are set, not by the forces of demand, but by Government acting under political pressures.”

In a controlled environment this will always be true, and is something to take due regard of and to be avoided as much as possible. In the complicated South African Society socio-economic as well as strategic factors will however have to be taken into account in long term policies. Such factors could be:

Self sufficiency

Better nutrition of low income groups

The reversal of the depopulation of the rural areas.

Future projections

A producer without a consumer is doomed to extinction (Friss, 1978). Production policy will therefore firstly have to be centred around future local demand and secondly around export.

Local consumption (including newly independent states)

Future demand is determined by consumption per capita and population. In South Africa the picture is quite complicated as already indicated in Table 2.

Various population groups have different rates of natural increase as well as markedly different consumption patterns. Within population groups there are, furthermore, decided differences between per capita consumption in rural and metropolitan areas. Demand for commercially produced milk will furthermore be influenced strongly by urbanisation.

Because of the complicated nature of such calculations a consumption estimate has been made for the year 2000 only.

The natural increase rate in South Africa dropped markedly in the case of whites and Coloureds during the last couple of years. (Department of Statistics, 1978.) The same tendencies are not so clearly noticeable in the case of Asians and Blacks, but can be expected. This decrease in demographic growth is worldwide, except for most of Africa. The latest report of the U.S. Census Bureau indicates a 5 per cent drop in growth rate during the last seven years (Market Frontier News, 1978). An estimate on the basis of current trends therefore yielded a lower total population figure and it is not impossible that this figure could be even still lower.

A very important but uncertain factor is the increase in urbanisation. Where 37 per cent of Blacks currently live in cities and towns it is expected that this figure will increase to 75 per cent in 2000 (Dewar, 1976). It is doubted, however, if this figure will be higher than approximately 60 per cent.

Table 6

Population estimates for the year 2000

	Whites	Blacks	Coloureds	Asiatics	Total
Benbo (1976)	6 843	34 748	4 689	1 269	47 549
Sadie (1973)	6 726	37 293	4 890	1 215	50 124
Own estimate	6 162	33 774	3 849	1 262	45 947

The following could be a possibility which can be influenced very markedly by economic developments (Table 7).

If the current per capita consumption figures are applied to these population figures increase in consumption can be as in Table 8.

The commercially produced requirements will therefore increase by approximately 1 000 000 tons or 62 per cent. Increases in consumption by Blacks and/or increases in their urbanisation can increase this figure markedly. If the very low per capita consumption by Blacks of fluid milk and milk products in urban areas increases to the still very low levels in rural areas and additional 400 000 tons will be required.

In contrast, the possibility of far stronger inroads by substitute products which are cheaper, more readily available and more palatable to the Blacks must not be ignored. The danger of substitute products is just as great amongst the other population groups.

Active market development and a positive production strategy will therefore go hand in hand.

Export

South Africa is not enough of a dairy country to compete on the world market without subsidization. Subsidization is of course nothing new in world trade. Exporting countries currently subsidize dairy products down to less than one-third of the price imposed on their own consumers. Only New Zealand seems to be able to produce at current world prices.

Table 7

Possible population distribution in the year 2000

	Urban areas	Rural areas	Total
Whites	5 562 000	600 000	6 162 000
Blacks	20 000 000	13 774 000	33 774 000
Coloureds	3 199 000	650 000	3 849 000
Asiatics	1 262 000	—	1 262 000
Total	30 023 000	15 024 000	45 047 000

Table 8

Projected milk consumption in the year 2000

	1978	2000	Increase
Fluid milk in urban areas	777 544	1 343 504	565 900
Industrial milk	730 000	1 100 000	370 000
Milk for other purposes	50 000	75 000	25 000
Fluid milk in rural areas	613 456	675 128	61 672
Total	2 171 000	3 193 632	1 022 572

Our neighbouring countries are natural markets for South Africa. Only Rhodesia was up to now in a position to fully supply its own requirements. With the political changes in that country it can be expected that milk production will drop substantially as was the case in all the neighbouring states after independence.

The total population in the neighbouring countries is currently roughly the same as the South African population. Milk requirements in these states can be expected to grow with at least 500 000 tons of which most will be imported by them in the form of powder, condensed milk and U.H.T.-milk.

The potential market growth in South Africa and its neighbouring countries can therefore be substantial and at least in the order of 1 500 000 tons.

A production goal

According to Table 8 we are going to need 73 per cent more fluid milk. To increase the production per lactation with 73 per cent will be impossible. More cows will therefore be needed in fresh milk. If one assumes a 30 per cent increase in production per lactation as possible (giving an average production per lactation of 4 200 kg) the additional 320 000 tons will have to be produced by approximately 100 000 additional cows. If these cows come from the cows which are currently producing industrial milk, the available cows in industrial milk will drop to 847 000. There is currently a shortage of approximately 20 per cent in industrial milk production. Add to this the expected increase of 50 per cent and this brings us to a required increase of 70 per cent in industrial milk production. This is a quantity of approximately 500 000 tons.

Our aim should furthermore be to produce at least 15 per cent of 400 000 tons more than the required quantities. This will be needed for sales in neighbouring countries and can serve as a buffer in times of drought.

To be able to produce this the production per lactation of the remaining industrial milk cows will either have to increase to approximately 3 000 kg or the number of cows will more or less have to double.

This means that the industrial milk sector will have to be developed to the current level of the fresh milk sector.

The total quantity of milk can be produced by approximately 7 000 producers of the size of the current fresh milk producers.

One could probably develop to the following situation:

3 000 intensive large producers, producing milk at a constant level throughout the year.

3 000 intensive large producers, producing milk at a varying level with the lowest quantity during the dry months.

10–15 000 smaller extensive producers, producing milk at a varying level.

Steps to the goal

Reliable and sufficient statistics

One of the simplest current drawbacks is the lack of sufficient statistics. With the aid of statistics, like cow numbers, producer numbers, production figures and consumption per capita per population group, short term, five-year and ten-year projections revised on a yearly basis should constantly be made and policy adapted on an on-going basis. This would prevent the existing method of ad-hoc and crisis-decision making and would assist producers as well as manufacturers to plan ahead with confidence.

Sound price policy

It is very obvious that price is the key to production-stimulation. The milk price base for industrial milk products will have to be brought closer to that of fresh milk products in a planned manner. The existing approach which is completely the opposite will lead the country away from self-sufficiency. It will bring the whole of South Africa where Natal is today, namely a totally insufficient supply of industrial milk products. Thirty years ago Natal produced 28 per cent of the country's cheese, 12 per cent of the butter and virtually all of the condensed milk. Today only 6 per cent of the cheese, 5 per cent of the butter, a very small percentage of the condensed milk and only a small portion of its own requirements is being produced (Chaplin, 1977).

A price system has to be calculated which satisfies both intensive and extensive producers and it should be recognised that there is room and need for both types of producer. The author will not go into the details of a pricing system and will refer only to a previous paper (Hermann, 1977) on this subject. Many variations are possible on this theme.

As mentioned earlier, price fixing should be far more flexible. The current system is cumbersome and typical of a super socialistic approach.

Realistic health regulations

Existing health regulations are little more than trade barriers. It has been proven over many years and in many countries that the free flow of all milk must be made possible. A statement like this is normally met by an almost emotional rejection by health authorities. It is very necessary that responsible milk industry leaders

dairy scientists and health authorities should once and for all get to the basics of this matter. The longer this issue is evaded, the longer progress will be delayed.

Bulk milk

Bulk milk collection must be actively stimulated. It makes milk production easier, drastically reduces collection costs, stimulates production and enhances the image of the industry.

The existing premium for industrial milk producers on bulk milk can be at least doubled.

Electricity

Much has been said on this subject. It can be only emphasized again that the lack of electricity on so many farms is one of the most basic factors standing in the way of intensive milk production.

Roads

The roads in South Africa are very poor because of distances and cost. There seems to be an imbalance in money made available for roads in rural areas and for other infrastructural purposes. Much is being said these days on urban development for the millions of Blacks flocking into the cities. Rural development which could prevent many of these moving into the cities receives very little attention.

Milk collection and good roads should be synonymous. A well known German Dairy equipment manufacturer maintained that milk collection roads in South Africa are of the worst that he has seen in the world. The author tends to agree with him as far as the developed Western countries are concerned.

Feed supply

It is obvious that more milk will need more feed. One is however concerned over the fast increase in price of this important cost ingredient.

The need for concentrates should not be over emphasized. In view of the high prices a move in the direction of pasture development seems necessary and also quite possible. Industrial milk production could be increased substantially without an increase in concentrates usage, if more roughage of high quality is provided for.

Pasture development under irrigation as well as in high rainfall areas leaves much room for improvement.

It seems as if too much emphasis is being placed on cash crop production on our irrigation schemes. The possibility of introducing small well fed herds of 10

to 20 cows on irrigation farms should receive serious attention. Electricity is normally available in these areas, roads are good and farmer density high.

Milk recording and breeding

Milk recording developed far too slowly during the last decade. Far bigger and more ambitious schemes will be necessary. As available manpower is always a stumbling block the assistance of dairy companies should be considered.

Improvement of the genetical makeup of our herds can still go a long way. It is, however, also clear that the genetical production ability of the dairy herd is at least twice the existing production.

Management

It has been said (O.Dwyer, 1970):

“The managerial optimum differs from the technical optimum. The managerial optimum sets therefore not only a lower but also an upper limit to the scale of operation.”

Management will be our biggest limitation. Because of this we should be careful not to aim towards too many large production units. This could bring more instability than one would expect.

Farmers in South Africa tend to overstretch their managerial ability because they depend too much on readily available unskilled labour.

Milk farmers should be encouraged financially to make use of agriculturally trained managers. A scheme should be developed to create security for such managers. In New Zealand, conditions for farm assistants are accurately prescribed and it should not be difficult to devise a scheme for South Africa. One of the most important shortcomings is the lack of attention to dairy herds and this is basically because of the lack of availability of trained herd managers.

If this aspect is not tackled in an organized manner as soon as possible the year 2000 will see us holding a congress on the serious shortage of dairy products in South Africa.

A strategy for milk production in South Africa is highly complicated. The author trusts that he has given the reader some milk for thought.

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