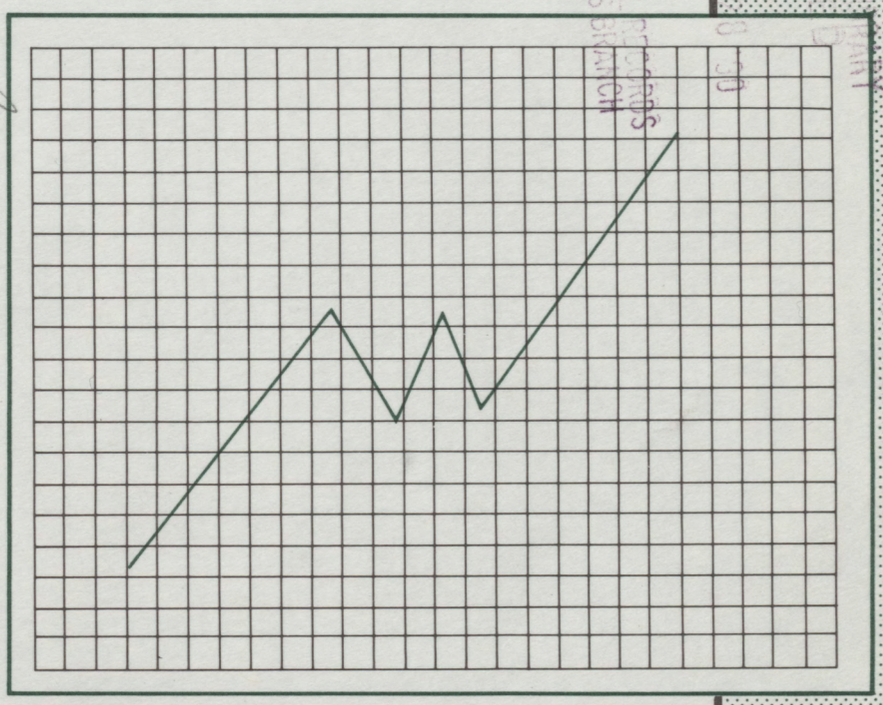

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FOOD AND NUTRITION OPTIONS AND RELATED STRATEGIES FOR SOUTH AFRICA

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ABSTRACT

This article starts with an explanation of some food policy concepts and goes on to look at the availability of food in South Africa. Availability will be discussed in terms of demand and supply and the quantification of certain marketing functions in the food chain will be examined. The article concludes by looking at policy options for improving food security.

CONCEPTS REGARDING FOOD POLICY

In a comprehensive World Bank publication (Gittinger *et al.*, 1987: p. 11) it is stated that "the World Food Conference of 1974 convened in Rome amid an atmosphere of crisis. Delegates feared that the world was entering a period of chronic food shortage; most discussion focused on the simple core issue of how global food production could be increased." Today the situation could not be more different. Food supplies throughout the world are more than adequate, and large surplus stocks are building up in the industrialised food-exporting countries. "As the crisis atmosphere has receded, the world community has had time to refine and deepen its understanding of the structure of food availability, the formulation of food policy and the political context of policy implementation. Analysts have disaggregated the problem of hunger into elements more susceptible to resolution by perceptive food policies. Falcon is quoted as saying that 'Experts no longer perceive the hunger problem as one of starvation or protein deficiency, but rather of chronic undernutrition, affecting a range of vulnerable groups whose common bond is their poverty'. (Falcon, *et al.*, 1987)" (Gittinger, *et al.*, *op. cit.*, 1987).

Focusing on what Falcon and his group term the dichotomy of "the world *hunger* problem and the world *food* problem" (Falcon, *et al.*, 1987), most experts now agree that hunger issues centre either on catastrophes - natural or man-made - or on chronic problems of food availability among vulnerable groups (Mellor & Gavian, 1987; Sen, 1987; Reutlinger, *et al.*, 1986; Gittinger, *et al.*, 1987). "This emphasis on the links between hunger and poverty is the most important change in thinking about world food policy since the World Food Conference" (Gittinger, *et al.*, 1987).

Reutlinger and his associates at the World Bank (Reutlinger, *et al.*, 1986), as well as Sen (Sen,,1987), say that the millions of poor people who do not share in the world's food abundance suffer from a lack of food security caused mainly by a lack of purchasing power. Reutlinger and his associates define *food security* as "access by all people at all times to enough food for an active, healthy life". Its essential elements, according to Reutlinger, are the availability of food and the ability to acquire it, which tie in with what has been said above. *Food insecurity*, in turn, is defined as a lack of access to enough food. This source distinguishes between two kinds of food insecurity: chronic and transitory. *Chronic food insecurity* is a continuously inadequate diet caused by an inability to acquire food. It affects households that consistently lack the ability either to buy enough food or to produce their own. *Transitory food insecurity* is a temporary decline in a household's ability to gain access to enough food. It is the result of instability in food prices, food production or household incomes - and in its worst form it results in famine (Reutlinger, *et al.*, 1986).

For Mellor and Gavian famine and chronic hunger are both the symptoms of poverty and of a lack of food, but famine is the extreme on the hunger continuum. The costs of famine are considerable and include large-scale loss of life, an unstable community and economic chaos, which destroy production potential (Mellor & Gavian, 1987).

The direct consequence of chronic food insecurity caused by inadequate diet is an increase in susceptibility to disease and parasites. This reduces the strength necessary for tasks requiring physical effort, it curtails the benefit of schooling and training programmes and results in a general lack of vigour, alertness and vitality. Wider consequences are a lowering of the productivity of people in the short and long term, a sacrifice of output and income and greater difficulty for families and nations in escaping the cycle of poverty (Reutlinger, *et al.*, 1986).

The essence of what has been said above is that food security hinges on (a) the availability of food and (b) the ability of consumers to acquire it. Availability depends on the ability (a) to produce the basic food products and (b) to process the products in order to service them with person, time, form and place utility. The extent to which these utilities are added to the raw product depends on the community's demand for them, income and state of

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TABLE 1. Supply and demand of agricultural products 1985 and 1986

Products	Production		Domestic consumption		Imports		Exports		Supplies		Domestic production minus domestic consumption		Production - domestic consumption ÷ production	
									End	Begin				
	1 000 t		1 000 t		1 000 t		1 000 t		1 000 t		1 000 t		%	
	1985	1986	1985	1986	1985	1986	1985	1986	1985	1986	1985	1986	1985	1986
Grain	11 634	10 951	8 145	7 711	488	457	1 400	3 620	1 589	-964	3 489	3 240	30,0	29,6
Maize	8 444	8 633	5 270	5 094	224	34	1 204	3 538	1 601	-579	3 174	3 539	37,6	41,0
Wheat	2 352	1 680	2 036	1 944	179	358	91	1	52	-291	316	-264	13,4	-15,7
Other	838	638	839	673	85	65	105	81	-64	-94	-1	-35	-0,1	-5,5
Vegetables	2 767	2 753	2 759	2 743	11	8	26	25	-7	-7	8	10	0,3	0,4
Fruit	1 878	2 158	1 026	1 303	1	1	846	854	5	-8	852	855	45,5	39,6
Deciduous	1 277	1 432	831	991	0	0	441	449	5	-8	446	441	34,9	30,8
Citrus	562	674	181	293	1	1	380	380	0	0	381	381	67,8	56,5
Dried	39	52	14	19	0	0	25	25	0	0	25	33	64,1	63,5
Dairy	2 940	2 819	2 874	2 753	0	0	89	153	-23	-87	66	66	2,2	2,3
Fresh milk	2 439	2 291	2 439	2 291	0	0	0	0	0	0	0	0	0,0	0,0
Butter	16	18	11	13	0	0	0	1	5	4	5	5	31,3	27,8
Cheese	36	34	30	37	0	0	0	2	6	-5	6	-3	16,7	-8,8
Other	449	476	394	412	0	0	89	150	-34	-86	55	64	12,2	13,4
Meat	1 437	1 394	1 479	1 447	79	75	31	22	0	0	-42	-53	-2,9	-3,8
Beef & veal	620	592	648	630	57	58	29	20	0	0	-28	-38	-4,5	-6,4
Mutton & lamb	212	182	224	194	12	12	0	0	0	0	-12	-12	-5,7	-6,6
Pork	113	110	112	108	1	0	2	2	0	0	1	2	0,9	1,8
Chicken	492	510	495	515	9	5	0	0	0	0	-3	-5	-0,6	-1,0
Fats and oils	116	139	158	230	47	99	5	8	0	0	-42	-91	-36,2	-65,5
Miscel-laneous	3 807	5 100	3 752	5 217	185	150	728	207	*	*	55	-117	1,4	-2,3
Eggs	167	166	163	163	0	0	5	4	-1	-1	4	3	2,4	1,8
Sugar	2 370	2 200	1 351	2 226	4	4	711	156	312	-178	1 019	-26	43,0	-1,2
Rice	-	-	145	130	145	130	0	0	0	0	-145	-130		
Other	1 270	2 734	2 093	2 698	36	16	12	47	*	*	-823	36	-64,8	1,3

*Not available

Source: Department of Agricultural Economics and Marketing

urbanisation. Schuh (Schuh, 1987) points out, by way of example, that one of the most powerful forces a country experiences as it undergoes economic development (and urbanisation) is the rising value of human time. Increased per capita incomes raise the opportunity cost of human time, given that time is the one finite resource. An effect of the rising value of time is that it leads to changes in the agricultural commodity mix that consumers demand. For example, rice or maize meal are reasonably time-intensive since they require preparation. In contrast with this, wheat is converted into bread in modern factories and the family has only to consume it directly. As the value of time rises, the commodity mix can be expected to change in favour of less time-consuming goods; i.e. an increase in the demand for market service utilities. Market functions such as storage, transport, processing, etc., will automatically become necessary.

In order to judge the availability of food in South Africa we will look at South Africa's potential and record of food production and at the marketing infrastructure and income position of the population. This analysis will also give an indication of the population's ability to acquire food.

THE DEMAND FOR AND AVAILABILITY OF FOOD IN SOUTH AFRICA

To judge the availability of food, it is necessary to get some idea of the demand.

The demand for food

It is expected that South Africa's present population of about 33 million will increase to approximately 45 million by the year 2000 (i.e. by 36 per cent) and to approximately 54 million or by 66 per cent by 2010. In general terms the quantity of locally produced food will have to increase at an annual compound rate of 2,4 per cent in order to maintain the current level of food availability. During the 13 years 1973 to 1986, food production increased by 1,76 per cent per annum. During these 13 years the Republic experienced a severe drought, but unstable weather conditions are in any case an integral part of our agriculture (Spies, 1987). It should be noted that during the seventies the growth rate of total food production outstripped that of the population by approximately 1 per cent per annum. Recent information (Table 1) based on the food balance sheet shows that even in the drought conditions of the past few years only a few food products had to be imported.

On the income side, the Government is committed to decreasing the income gap that exists between race groups. Brand and Dreyer projected the change in income between the race groups for the period 1978 to 1990 (see Table 2). They base this projection on the assumption that the "correct" economic policies are followed. According to their projections the total income in 1990 will be much more evenly distributed than in 1978. Based on this finding and on the increased rate of urbanisation, they predict that in the production sector agriculture will benefit, i.e. the demand for agricultural products will increase at a faster rate than that for most of the other sectors. In the manufacturing sectors the same trend is expected in respect of foodstuffs (Dreyer & Brand, 1986).

TABLE 2. Projected changes in the distribution of income 1978-1990

	Whites	Coloureds	Asians	Blacks	Total
Percentage of total income: 1978	62,40	7,40	3,10	27,10	100,00
Yearly percentage increase in per capita income: 1978-1990	0,04	2,55	1,74	3,56	-
Yearly percentage increase in population: 1978-1990	0,70	1,81	1,86	2,70	2,24
Percentage of total income: 1990	48,00	8,70	3,40	39,90	100,00

Source: Dreyer & Brand, 1986

It is therefore clear that the demand for food in South Africa will grow as a result of our fast population growth, urbanisation and the redistribution of growth in income.

The ability to produce enough food depends on our natural resources, technology and the farmer as manager.

Food availability

Agriculturally speaking, South Africa is poorly endowed. Of the 105,37 million hectares in the white farming areas, only approximately 15,3 million hectares or 14,5 per cent is deemed fit for regular crop production, with about one million hectares under irrigation. Only 4 million of the 15,3 million hectares deemed fit for cultivation can be described as of high potential; another 7 million is of average potential (Schoeman & Scotney, 1986).

Unfortunately, reports are that "the natural grazing is still deteriorating and excessive losses of soil still occur on the lands ... The conservation position of vleis and catchment areas in general leaves much to be desired" (Department of Agricultural Economics and Marketing, 1988).

Although technology has changed the situation, an international rule of thumb in the mid-seventies was that 0,4 hectares per capita of the population is necessary to produce sufficient food. In 1975 Verbeek estimated that for South Africa the arable area per capita was 0,52 hectares. At present it is 0,38 hectares per person. With our present growth in population taken as given this figure will decrease to 0,28 hectares by the year 2000 and to 0,23 hectares by 2010. (Verbeek, 1975; Spies, 1987).

Perhaps the single most important restriction on growth in general and on agriculture in particular is water. Taking into account the available water supply in South Africa and the TBVC and BLS countries and our population growth at the present growth rate, the total demand for water will be greater than the total supply by about 2025. "Luckily" the water consumers in South Africa have up to now used this resource very uneconomically, and an upward adjustment in water prices could

force the urban and rural users of water to adjust their water consumption downwards (Spies, 1987). Research into the economic application of water on farms has already produced promising results (Schlesinger, 1988).

The successful production of food in agriculture rests in the hands of the farmer and the agricultural researcher. To say at this point that agriculture will not be able to feed the nation would at best be speculation. At the most an "if" statement can be made : if agriculture can keep control of the available high potential land, and if the farmers can be more conscientious in their approach to natural resources and if the present body of knowledge can be successfully applied in agriculture, then agriculture will be able to feed the nation.

A second aspect of food availability has to do with the creation of utility and therefore the marketing functions. This can be described as the filling between the farm gate and the consumer. A short description of the food retail trade, wholesale trade and manufacturing gives an idea of the availability of food past the farm gate.

The filling between the farm gate and the consumer

From the consumer side the food industry is big business. In 1986 (Table 3) the total private consumption expenditure on food amounted to R20 718,6 million, i.e. 26,9 per cent of the total private consumption expenditure (SA Reserve Bank, 1988). The latest available data (1977) have it that 24 490 retail establishments, which employed 153 915 employees, were the final link in the food distribution chain (Table 4).

The value of retail sales of groups of food merchants selling only food amounted to R11 942,5 million in 1986, i.e. 34,3 per cent of the total wholesale trade (Table 5).

TABLE 4. Retail food establishments, 1977

	Quantity	Employment
Butchers	4 208*	26 440
Dairies and dealers in dairy products	365	6 719
Grocers and other dealers in foodstuffs	15 607	86 790
Catering services	4 311	33 966

*1987 Retail 6 241; Cafes 3 218: Meat Board June 1988
Source: Central Statistical Services, 1986

TABLE 5. Value of retail sales of food retailers, 1985 and 1986

	1985		1986	
	R million	%	R million	%
Retail				
Butcheries	1 745,4	5,7	1 884,5	5,4
Dairies and dealers in dairy products	303,6	1,00	318,4	1,0
Grocers and other dealers in foodstuffs	11 634,1	37,9	13 260,1	38,1
Total retail foodstuffs	**13 683,1**	**44,6**	**15 463,0**	**44,5**
Food (meat and other foodstuffs)	10 537,0	34,3	11 942,5	34,3
Grand total retail	**30 695,6**		**34 780,1**	

Source: Central Statistical Services, 1988

Looking back, we see that in 1986 food factories processed foodstuffs to the value of R13,6 million, i.e. 15,6 per cent of the total value of factory production (Table 6). In 1982 the total book value of investment in food factories was R1,5 billion or 9,9 per cent of investment in all factories (Table 7). Over the period 1925 to 1982 the relative contribution of value added by food, beverages and tobacco to the total value added by manufacturing declined steadily from 32,4 per cent to 13,8 per cent (McCarthy, 1988). This does not mean that the importance of the food industry is declining. If one looks at the increase in value added by manufacturing at constant 1980 prices for the years 1970 to 1982, one sees that the food industry grew at an average real rate of 4,0 per cent per year and contributed 8,9 per cent of the increase in real manufacturing value added and, of total manufacturing, made the highest contribution to the increase in employment, namely 11,3 per cent (McCarthy, 1988).

TABLE 6. Total value of foodstuffs processed by food manufacturers, 1985 and 1986

	1985		1986	
	R1 000	%	R1 000	%
Food	11 843 308	15,6	13 606 926	15,6
Total manufacturing	**75 878 629**		**87 112 119**	

Source: Central Statistical Services, 1988

TABLE 3. Private consumption expenditure on food, 1980 - 1986

Year	Meat		Bread and grain products		Vegetables and fruit		Milk, milk products and eggs		Sugar, preserved fruit and jam		Other		Total	
	R milj	%	R milj	%	R milj	%	R milj	%	R milj	%	R milj	%	R milj	%
1980	2 506,8	28,6	1 875,7	21,4	1 533,9	17,5	841,4	9,6	631,1	7,2	1 376,1	15,7	8 765,0	100
1981	3 288,2	30,3	2 268,1	20,9	1 736,3	16,0	1 096,0	10,1	759,6	7,0	1 703,8	15,7	10 852,0	100
1982	3 792,4	29,8	2 697,9	21,2	2 163,4	17,0	1 209,0	9,5	865,4	6,8	1 998,0	15,7	12 726,1	100
1983	3 893,0	28,0	2 989,3	21,5	2 558,3	18,4	1 362,5	9,8	917,6	6,6	2 182,9	15,7	13 903,6	100
1984	4 423,8	28,9	3 291,0	21,5	2 586,9	16,1	1 500,1	9,8	1 102,1	7,2	2 403,2	15,7	15 307,1	100
1985	4 781,7	27,4	4 083,6	23,4	2 931,8	16,8	1 657,9	9,5	1 256,5	7,2	2 739,9	15,7	17 451,4	100
1986	5 739,0	27,7	4 868,9	23,5	3 418,6	16,5	2 030,4	9,8	1 408,9	6,8	3 252,8	15,7	20 718,6	100

Source: Department of Agricultural Economics and Marketing

TABLE 7. Capital structure of food manufacturing at book value, 1982

Item	Food manufacturing		Total manufacturing	
	R	%	R	%
Land	119 633 000	8,0	541 439 000	3,6
Buildings and works	484 274 000	32,2	3 883 688 000	25,7
Plant, machinery and other equipment	787 322 000	52,3	10 125 542 000	66,9
Vehicles	113 342 000	7,5	592 898 000	3,8
Total	**1 504 571 000**	**100,0**	**15 143 567 000**	**100,0**

Source: Central Statistical Services, 1982

Inputs used and economic impact

The value of the total intermediate inputs used by the food-processing industries in 1985 was R12 126,6 million (Table 8).

The three major suppliers of inputs were agriculture, forestry and fishing (41,3 per cent : R5 011,8 million) followed by grain mill products (6,3 per cent : R768,93 million) and the slaughtering, preparation and preservation of meat (3,9 per cent : R471,73 million). Of the 10 groups of food-processing industries the biggest consumer of inputs is the slaughtering, preparation and preservation of meat R2 856,49 million : 23,6 per cent) followed by grain mill products R2 589,49 million : 21,4 per cent) and bakery products R1 221,27 : 10,1 per cent). Note that more than 50 per cent of the inputs used originate in sectors other than agriculture.

According to Table 9, for every R10's worth of gross production, the food-processing industry uses intermediate inputs to the value of R8,31 for every R1 of gross output, grain mill producers buy R0,95; meat processors (slaughtering, preparation and preservation) buy R0,92; and producers of vegetable and animal oils and fats, including whale oil, use R0,91 of intermediate inputs.

It is interesting to note that for every R10 of gross production, the food-processing industry utilises inputs to the value of only R2,80 (33,1 per cent from the agricultural, forestry and fishing industries; the rest, namely R5,50 or 66,3 per cent of the inputs used, originate in the rest of the economy.

The total impact of a sector or an industry on the rest of the economy is described by its total requirements (direct and indirect) per rand of delivery to final demand. The 10 food-processing industries in Table 10 buy intermediate inputs directly and indirectly to the value of R28,63 per R10,00 of delivery to final demand. This quotient measures the inter-linkages between an industry and the rest of the economy.

It is obtained using the Leontief inverse of the basic input-output matrix. The summation of the figures in the columns produces the so-called column multipliers. The higher the value of a column multiplier, the greater the impact of an industry on the economy. In Table 10 (last line) the food-processing industries are ranked according to their column multipliers. From this it can be seen that bakery products have the highest multiplier and need R3,15 input from other industries in order to deliver R1,00 final demand. To put it another way: in order for the food-processing industries to meet an increase of R1 000 in final demand for their products, the other industries with which they are linked must increase their production by R2 863,11.

The food industry in South Africa is well developed and can meet the needs of consumers; it can make food available to the population. A matter that is giving rise to concern is that for the period 1966 to 1976 there were only 61 qualified food technologists in South Africa.

That is too few by far to serve a food industry as large as ours (De Muelenaere, 1976). This author holds the view that if we look at the economic and demographic facts, we will see that this kind of research in South Africa is concentrated on high-income food technology, whereas it should focus more on the consumer in the lower income bracket.

The availability of food in the market is by no means a guarantee that everybody is willing *and* able to buy. The whole entitlement problem raised by Sen is still relevant (Sen, 1987).

According to the information given in Table 11 the real per capita income of blacks for the specified periods was 13 per cent of that of whites. The differences in income per ethnic group and the related question of entitlement to food or the link between hunger and poverty is verified by anthropometric information.

Anthropometric researchers have found on more than one occasion that significant differences exist between the four ethnic groups as far as body mass, height and rate of growth are concerned (Kotzé *et al.*, 1986). Although an improvement in height and body mass was found for Coloured and white children in the Cape Peninsula between 1958 and 1980, and in respect of black children in both urban and rural areas (1973-1975), a high percentage of South Africa's primary school children are still below the extrapolation of the Boston third percentile for specific age groups (Kotzé, *et al.*, 1982).

Income is not the only determinant of food accessibility. Researchers have found that for a particular ethnic group significant differences exist in protein-energy malnutrition between the urban and rural communities (Kotzé, *et al.*, 1988). Research by Habicht has been quoted as showing that the ethnic effect on the growth of average pre-school children was small in comparison with regional factors (Kotzé, 1986). Ethnic differences are, however, of major importance when it comes to malnutrition. A general observation based on the anthropometric research publications studied and quoted is that malnutrition is found in all ethnic groups. For food and nutrition planning purposes it might therefore be wise to construct a food and feeding pyramid. At the bottom one will find the broad base consisting of low-income people who find themselves in Maslow's first category of human needs (Van der Merwe, 1986; Maslow, 1954).

TABLE 8. Value of intermediate inputs (R million) bought by the food-processing industries from the 10 biggest suppliers, 1985

Supplying industries	Slaughtering, preparation and preservation of meat	Dairy products	Canning and preservation of fruit and vegetables	Canning, preservation and processing of fish	Vegetable and animal oils and fats, incl. whale oil	Grain mill products	Bakery products	Sugar factories and refineries	Cocoa, choc. and sugar confectionery	Other food products	Total	%
	R million											
Agriculture, forestry and fishing	1 854,84	213,91	108,08	176,36	214,52	1 623,00	9,67	466,85	76,68	267,89	5 011,80	41,3
Grain mill products	18,65	2,92	1,79	4,18	49,53	34,93	637,91	0,00	3,61	15,41	768,93	6,3
Slaughtering, preparation and preservation of meat	439,38	3,09	2,36	0,00	0,00	0,00	15,98	0,00	0,00	10,92	471,73	3,9
Transport and storage	129,99	24,32	19,03	15,41	23,53	112,93	32,28	62,01	17,32	29,47	466,29	3,8
Business services	50,41	27,08	37,89	23,60	23,92	82,38	34,94	23,16	13,24	37,57	354,19	2,9
Sugar factories and refineries	0,68	20,79	30,74	0,03	0,04	5,72	14,97	186,57	49,46	15,57	324,47	2,7
Other fabricated metal products, excluding machinery and equipment	45,72	41,86	135,52	25,07	14,25	6,54	5,99	21,12	5,59	22,60	324,26	2,7
Wholesale and retail trade and motor trade	40,84	24,49	24,85	14,70	31,52	51,10	29,86	28,61	27,51	25,57	299,05	2,5
Canning and preservation of fruit and vegetables	0,19	20,54	191,47	6,64	0,59	0,30	22,02	0,00	22,02	14,60	276,37	2,3
Other food products	45,61	4,41	21,03	4,96	1,41	4,19	60,28	0,00	36,77	97,31	275,97	2,3
Total intermediate inputs	**2 856,49**	**920,90**	**839,43**	**445,07**	**673,58**	**2 589,49**	**1 221,27**	**1 077,00**	**547,54**	**955,83**	**12 126,60**	**100,0**
%	**23,6**	**7,6**	**6,9**	**3,7**	**5,5**	**21,4**	**10,1**	**8,9**	**4,5**	**7,9**	**100,0**	

Source: Central Statistical Services, 1985

TABLE 9. Value of inputs used per rand of gross output: input-industries listed from whom more than R0,20 per rand gross output is used by the food-processing industries, 1985

Input-producing industries	Slaughter, preparation and preservation of meat	Dairy products	Canning and preservation of fruit and vegetables	Canning, preservation and processing of fish	Vegetable and animal oils and fats, incl. whale oil	Grain mill products	Bakery products	Sugar factories and refineries	Cocoa, choc. and sugar confectionery	Other food products	Total	%
Agriculture, forestry and fishing	0,59541	0,18431	0,09811	0,34822	0,28798	0,59221	0,00650	0,30225	0,10650	0,23333	2,75482	33,1
Grain mill products	0,00599	0,00252	0,00162	0,00825	0,06649	0,01275	0,42911	0,00000	0,00501	0,01342	0,54516	6,6
Transport and storage	0,04173	0,02095	0,01727	0,03043	0,03159	0,04121	0,02171	0,04015	0,02406	0,02567	0,29477	3,5
Other fabricated metal products, excluding machinery and equipment	0,01468	0,03607	0,12302	0,04950	0,01913	0,00239	0,00403	0,01367	0,00776	0,01968	0,28993	3,5
Business services	0,01618	0,02333	0,03439	0,04660	0,03211	0,03006	0,02350	0,01499	0,01839	0,03272	0,27227	3,3
Vegetable and animal oils and fats, including whale oil	0,00192	0,00298	0,00324	0,00683	0,17486	0,00581	0,03659	0,00000	0,01964	0,02128	0,27315	3,3
Canning and preservation of fruit and vegetables	0,00006	0,01770	0,17381	0,01311	0,00079	0,00011	0,01481	0,00000	0,03058	0,01272	0,26369	3,2
Paper containers	0,00672	0,02631	0,02359	0,02450	0,01775	0,01442	0,01635	0,01740	0,05561	0,04945	0,25210	3,0
Wholesale and retail trade and motor trade	0,01311	0,02110	0,02256	0,02902	0,04231	0,01865	0,02009	0,01852	0,03821	0,02227	0,24584	3,0
Dairy products	0,00112	0,18720	0,00063	0,00000	0,00136	0,00074	0,01209	0,00000	0,02422	0,00619	0,23355	2,8
Other food products	0,01464	0,00380	0,01909	0,00979	0,00189	0,00153	0,04055	0,00000	0,05107	0,08475	0,22711	2,7
Other basic chemical products and petroleum and coal products	0,00357	0,01181	0,01449	0,02901	0,03608	0,01423	0,03618	0,01158	0,01738	0,04475	0,21908	2,6
Total intermediate inputs	**0,91695**	**0,79345**	**0,76197**	**0,87877**	**0,90419**	**0,94487**	**0,82153**	**0,69726**	**0,76049**	**0,83250**	**8,31198**	**100,0**
%	**11,0**	**9,5**	**9,2**	**10,6**	**10,9**	**11,4**	**9,9**	**8,4**	**9,2**	**10,0**	**100,0**	

Source: Central Statistical Services, 1985

TABLE 10. The total requirements (direct and indirect) per rand of delivery to final demand for foodstuffs: input producing industries from whom more than R1,00 input per R1,00 final demand is bought are included, 1985

Input-producing industries	Slaughtering, preparation and preservation of meat	Dairy products	Canning and preservation of fruit and vegetables	Canning, preservation and processing of fish	Vegetable and animal oils and fats, incl. whale oil	Grain mill products	Bakery products	Sugar factories and refineries	Cocoa, choc. and sugar confectionery	Other food products	Total	%
Agriculture, forestry and fishing	0,77911	0,27990	0,16386	0,43793	0,44726	0,68266	0,35452	0,38352	0,20500	0,32899	4,06275	14,2
Grain mill products	0,01001	0,00612	0,00431	0,02134	0,08346	1,01758	0,44414	0,00131	0,01107	0,02012	1,61946	5,7
Vegetable and animal oils and fats, including whale oil	0,00728	0,00707	0,00671	0,01293	1,21551	0,01396	0,05288	0,00210	0,02910	0,03085	1,37839	4,8
Canning and preservation of fruit and vegetables	0,00114	0,2722	1,21111	0,01803	0,00184	0,00141	0,02009	0,00044	0,04137	0,01763	1,34028	4,7
Sugar factories and refineries	0,00130	0,02754	0,03936	0,00179	0,00121	0,00338	0,01540	1,13774	0,08659	0,01860	1,33291	4,7
Dairy products	0,00231	1,23148	0,00179	0,00112	0,00294	0,00174	0,01668	0,00059	0,03293	0,00917	1,30075	4,5
Other food products	0,01915	0,00745	0,02620	0,01358	0,00355	0,00240	0,04725	0,00059	0,06167	1,09462	1,27646	4,5
Slaughtering, preparation and preservation of meat	1,16604	0,00509	0,00431	0,00181	0,00151	0,00271	0,01487	0,00122	0,00197	0,01342	1,21295	4,2
Other basic chemical products and petroleum and coal products	0,10688	0,10213	0,09177	0,12600	0,14776	0,12327	0,13811	0,08648	0,12588	0,15025	1,19853	4,2
Cocoa, chocolate and sugar confectionery	0,00007	0,00815	0,00009	0,00017	0,00016	0,00003	0,00532	0,00002	1,06233	0,00246	1,07880	3,8
Canning, preservation, processing of fish, manufacture of fish oil and meat	0,00010	0,00009	0,00008	1,06544	0,00088	0,00016	0,00014	0,00009	0,00010	0,00010	1,06718	3,7
Bakery products	0,00026	0,00235	0,00215	0,02319	0,00024	0,00030	1,00753	0,00017	0,00466	0,00462	1,04547	3,7
Total intermediate inputs	**2,89989**	**2,83741**	**2,78877**	**2,85564**	**3,06610**	**2,89522**	**3,15322**	**2,47434**	**2,80820**	**2,85237**	**28,63116**	**100,0**
%	**10,1**	**9,9**	**9,7**	**10,0**	**10,7**	**10,1**	**11,0**	**8,6**	**9,8**	**10,0**	**100,0**	
Rank	**3**	**7**	**9**	**5**	**2**	**4**	**1**	**10**	**8**	**6**		

Source: Central Statistical Services, 1985

TABLE 11. The nominal and real income (1980 prices) *per capita* of the four ethnic groups in South Africa (Agriculture excluded), 1978 and 1984

	1978		1984	
	Nominal R	Real	Nominal R	Real
Whites	2 119	2 727	4 899	2 597
Coloureds	460	592	1 189	718
Asians	629	810	1 767	1 066
Blacks	258	332	637	384

Source: Central Statistical Services

Their price sensitivity is high and a full stomach is their major concern. Moving upwards through the pyramid the consumption expenditure on food as a percentage of total consumption expenditure decreases.

Finally, food and feeding in South Africa cannot be discussed without mentioning the presence of obesity and the growing faith in the very expensive so-called health foods (Groenewald, 1980; De Muelenaere, 1976), a situation that has arisen from ignorance, a lack of co-ordination in feeding extension and not enough of a team approach to this problem.

POLICY OPTIONS FOR IMPROVING FOOD SECURITY

Up to now it has been said that (1) South Africa may face a food problem in the future, that (2) the reasons for this are the low potential of our natural resources used in agriculture and the state of these resources as a result of misuse, that (3) the growth rate of the population exerts pressure on the available agricultural land, that (4) income redistribution and growth plus urbanisation will increase the demand for food at a fast rate, that (5) we have a sophisticated agro-industry and that (6) South Africa does have a nutrition problem.

Reutlinger identifies three major interventions that can be used to improve food security (Reutlinger, 1986).

The *first* influences food supply through changes in domestic production, imports or exports. Such changes, he says, may or may not affect the domestic price of food. If they do, the effect is market-wide, acting on all consumers and producers of that food. The *second* intervention reduces prices of specific foods sold to some or all consumers without altering the prices paid to producers. Government funds offset the gap between the price paid by consumers and the price received by producers. The *third* intervention augments income by means other than changing food prices, such as by subsidising employment, subsidising non-food commodities or providing transfers of income in cash or kind.

Reutlinger argues that whether or not they are supported by food aid, these three policy interventions are likely to have different short-term effects on the three main groups of people facing chronic food insecurity: the urban poor, the rural landless and small-scale farmers (Table 12). Interventions that increase incomes or reduce consumer prices without lowering producer prices clearly improve food security. With such interventions, none of the people facing chronic food insecurity would suffer a decline in their real income. In contrast with this there are food supply policies that may increase food security for some poor groups, but reduce it for others. In addition, some of the initial effects of interventions can be eroded over time (Reutlinger, 1986). These three policy options can be targeted or market-wide interventions.

(i) Targeted interventions

Ideally, a targeted intervention increases the real income and food consumption of a target population without the cost of bringing those benefits to the rest of the population. The fiscal costs, owing to the high administrative costs of these programmes, are high compared with the low budgetary requirements of price-reducing trade interventions.

TABLE 12. Direct effects of interventions on chronic food insecurity

Kind of intervention	Price of food	Effect on chronic food insecurity					
		Urban poor		Rural landless		Small-scale farmers	
		Nominal income	Real income	Nominal income	Real income	Nominal income	Real income
Increasing the food supply							
Trade							
Reducing imports	+	0	−	(+)	(−)	+	+
Expanding imports	−	0	+	(−)	(+)	−	−
Subsidising food production							
Traded foods	0	0	0	(+)	(+)	(+)	+
Non-traded foods	−	0	+	(+)	+	(+)	(+)
Subsidising food prices for consumers (while maintaining producer prices)							
Targeted or market-wide	−	0	+	0	+	0	+
Augmenting incomes							
Targeted or market-wide	0	+	+	+	+		+

Note: 0 = no effect; + = improvement; - = deterioration. Parentheses indicate a slight effect
Source: Reutlinger, S., 1986

(ii) Market-wide interventions

These programmes change the open-market prices all people pay or receive for consumer goods and farm inputs. The most attractive feature of market-wide policies is that they are quickly and easily implemented. Some market-wide policies can be implemented without placing great demands on the government budget (Reutlinger, 1986).

The first policy option will now be discussed.

Increasing the food supply

Reutlinger (1986) identifies two kinds of food supply interventions: (i) through food exports or imports and (ii) by subsidising inputs or investing in agricultural infrastructure. What should be established is whether this intervention will affect the availability and price of food and therefore the real income of people facing chronic food insecurity. In other words, does it increase their nominal earnings?

Interventions that affect the volume of food trade always alter the availability and price of food, which in turn affects consumption, domestic production and food self-sufficiency (See Table 12).

Trade interventions

A variety of trade, aid and exchange rate mechanisms can be used to keep food prices lower than border prices. The short-term effect of lower food prices on food security is not clear-cut, however. In countries in which many of the people facing chronic food insecurity are among the rural landless or urban poor, who must buy their food, lower food prices will improve food security. In countries in which many of the poor produce more food than they consume, however, lower food prices will lower food security. In countries in which many of the poor are subsistence farmers who neither sell nor buy food, food prices have no effect on food security. It should not therefore be presumed that only the urban poor benefit from lower food prices and that the rural poor are always better off with higher prices. In fact, there is considerable evidence to the contrary.

The cost-effectiveness of any trade intervention to improve food security will depend on the leakages to unintended beneficiaries, the income losses of the poor who are adversely affected by the price change and the losses in efficiency as a result of price distortions in production. The trade-offs need to be examined: Maintaining an over-valued exchange rate will cause resources to be misallocated throughout the economy, with all tradable goods underpriced relative to non-tradable goods. Although an over-valued exchange rate may therefore slow economic growth because of inefficient use of resources, it can hold food prices down if food products are tradable goods. A drastic devaluation in the interests of efficiency can cause imported food prices to rise and therefore harm many of the urban poor and rural landless.

Interventions to enhance food security require a balanced, empirical analysis of the effects of changing food prices.

Production subsidies

The question to be asked is whether unsatisfactory food production - even more than unsatisfactory economic development - is at the root of chronic food insecurity (Reutlinger, 1986). Should special subsidies be used to promote food production? If so, when? Special encouragement to producers of food crops may improve food security either by raising the income of producers or by lowering food prices to consumers.

In the South African situation we are faced with an agricultural production dichotomy. In white agriculture it is not necessary to subsidise inputs for food security purposes. The subsidisation of inputs for black agriculturalists is looked upon as unfair competition by the white farmers since they compete in the same markets. There is, however, sufficient evidence to indicate that a small-farmer approach to agricultural development in the less-developed areas of South Africa will enhance regional food security (Van Rooyen, 1989).

Subsidising food prices

Reducing the prices food producers receive has at least two negative consequences. Firstly, low food prices inhibit incentive compromise resource efficiency and decrease growth - thereby indirectly inhibiting food security. Secondly, they can depress the real income of low-income households that are net sellers of food - thereby directly inhibiting food security.

Reducing food prices for consumers (without depressing producers' prices) has fewer adverse consequences if the interventions are cost-effective. Here one must distinguish between targeted and market-wide subsidies.

Targeted subsidies

The most popular targeted intervention is the food ration programme, which distributes food at a concessionary price to selected groups of households. Emergency food programmes run by the Department of Health and Population Development and by the three Houses of Parliament are examples of such programmes. A person receives a voucher to buy food from a retailer and the Government pays the bill.

In many cases rations may not be restricted to the neediest, either because of administrative difficulties in identifying them or because the programme serves several political purposes (Reutlinger, 1986).

A tricky problem with food ration programmes is determining who is eligible and keeping track of who remains eligible. Another problem is that some food may leak into the open market.

In assisting projects such as these over the years, the World Bank has learned that some form of targeting is usually feasible and that targeting does indeed lower food costs and improve the nutrition of the target groups (Reutlinger, 1986).

Market-wide subsidies

One way of overcoming the difficulties of targeting is to reduce prices of selected foods to all consumers without reducing the price paid to producers. The government then finances the difference between the two prices. Market-wide subsidies are clearly more costly than targeted subsidies, but the administrative costs can be much lower and the coverage of the target population much broader.

In South Africa the best example would be bread and maize subsidies. Bread and maize subsidies totalled R298 million in the 1986/87 financial year. At present (1988) brown bread is subsidised to the amount of 13c per loaf and white bread to 2,3c per loaf. Even poorly targeted food subsidies tend to benefit the poor more than the rich because they increase the income of the poor by a higher percentage. In South Africa, the black population, based on their estimated consumption of bread, receives approximately R0,47 per rand bread subsidy.

Augmenting incomes

Policies or programmes can be designed to directly augment the income of disadvantaged groups, particularly the rural poor who cannot be reached by food price subsidies. The extent to which interventions increase the income of the poor is a direct measure of the improvement in food security.

Targeted interventions

The three main programmes in this case are public employment programmes, income transfers to the self-employed and cash transfer payments.

In the case of public employment it is effective only if wages are substantially below market wages. Otherwise, public employment will attract people other than the poor and will displace employment. The money voted for the emergency employment and training scheme for the period 1985/86 to 1988/89 amounted to R1 235 million.

It can be more cost-effective for a government to augment the income of some of the rural poor through subsidies or transfers explicitly intended for the self-employed. These subsidies have the advantage of allowing people to remain where they are.

Why not simply give the target population cash? This makes sense if it is difficult and costly to generate added purchasing power by other means. If it costs R2, R3 or R5 to transfer R1 of income through public employment schemes or other income transfer programmes, cash payments may be more cost-effective.

Market-wide intervention

These interventions are highly cost-ineffective ways of augmenting the income of people facing chronic food insecurity. The full economic costs of these programmes often far exceed the income transferred because of the efficiency losses.

CONCLUSION

In South Africa we have chronic food insecurity at the base of the food and feeding pyramid. As people move up through this pyramid they can experience transitory food insecurity, but for the largest percentage of consumers at the base of the pyramid it is chronic food insecurity.

The demand for food will grow as a result of the fast population growth and the redistribution of income caused by structural changes in the South African economy. The responsibility for producing enough food rests on the shoulders of the farmers, technologists and conservationists. Our food retail trade, wholesale trade and manufacturing sector are well equipped to service the raw food products with market utility.

The three policy options for improving food security are to increase the supply of food, to reduce the prices of specific foods and to augment income. South Africa is active in all these fields, albeit on a very limited scale in the case of the last two policy options. In any food and nutrition strategy for South Africa these three policy options will have to be considered.

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