

FOOD AND NUTRIENT AVAILABILITY IN SOUTH AFRICAN HOUSEHOLDS

DEVELOPMENT OF A NATIONALLY REPRESENTATIVE DATABASE



Technical Report

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The Household Food and Nutrient Availability electronic database for 1995 can be obtained for further analysis from Lesley Bourne. (Note: It would need to be analysed in combination with the 1995 Income and Expenditure Survey data that can be obtained directly from Statistics South Africa, info@statssa.pwv.gov.za)

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Preface

The South African government recognizes the basic human right of all people to food, and this is entrenched in the Bill of Rights: 'Everyone has the right to have access to sufficient food and water' (Constitution of South Africa 1996). Yet South Africa faces nutrition problems, compounded by the legacy of poverty and inequitable access to food perpetuated by the apartheid system. One of the factors hindering effective action to combat these problems is the lack of information on a national scale to enable better decision-making. Since 1994, one of the challenges for South Africa has been to construct a suitable database on which to formulate policy regarding food security and nutrition. In many spheres data simply has not been available for the vast majority of the population. The field of nutrition is no exception.

Food and agricultural policy in South Africa has for many years been based on data of food availability at the national level (Food balance sheets). In more recent years, nutrition surveys such as the South African Vitamin A Consultative Group study (1994) and the National Food Consumption Study (1999) have given us information on nutritional status and food consumption at the individual level, and some information at the household level. This timely report helps to fill in the gap in information between the national and the individual level by giving us an indication of food and nutrient availability at the household level, and will provide useful comparisons to the National Food Consumption Study & further validation of the methodology employed in this report.

The information provided in this report is an example of an innovative approach, which conserves resources by analysing data on a large, nationally representative sample that is already available. The recall of food expenditure of a household over one month enables an estimate of the throughput of daily food and nutrient availability to be calculated. This would allow the tracking of household food availability trends, and as the authors of this report suggest, become part of an active nutrition surveillance system for South Africa. The availability of food at the household level in South Africa is a reflection of the extent to which we are transforming and moving towards equity in the country. The history of South Africa dictates that data needs to be analysed both by geographic area (province, urban/rural), and also by population group, as has been done in this report.

Sustainability and infra-structural capability is often cited as a criterion for successful nutrition surveillance systems. These issues have been addressed by the use of the StatsSA October household survey, which is conducted annually, so the mechanism is available to include a detailed questionnaire on household food expenditure again. The MRC has also ensured clear and careful documentation of all data manipulations, which will facilitate this research being repeated in a consistent and compatible manner.

The detail on food availability at the household level gives further clarity to the access and food supply side of the food security equation. The proportion of food in households provided by subsistence agriculture, challenges perceptions on the rural communities reliance on food production. Furthermore, the information on foods available at the household level will contribute to the development of appropriate nutrition education such as the Food Based Dietary Guidelines in South Africa. It is hoped that the information available in this report will also be communicated in a format that can be disseminated to relevant role players.

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Executive Summary

Although nutrition problems affect individuals, it is the household that provides the entry point for many nutrition intervention efforts, since that is where food is procured and distributed. This report outlines the development of a nationally representative database that describes the foods and nutrients available to South African households. Data on household food spending and home food production for 28,704 households from the October 1995 Income and Expenditure Survey (IES) form the core of this work. This information was combined with data on food prices from Statistics South Africa, data on the nutrient composition of foods from the Medical Research Council, and various other data sources.

The final database provides information on the amounts of food available to households in at-home food supplies for seven broad food groups – cereals, meats, poultry, fish, dairy, eggs, and fruits and vegetables. The database also provides information on the energy value of at-home food supplies and the amounts of eight other nutrients – protein, fat, saturated fat, cholesterol, alcohol, total carbohydrates, total sugars, and total fibers. Detailed data tables are supplied with this report that summarize mean household availability of these foods and nutrients by province, urbanisation, and race of household head.

Consumption of cereals, expressed as a percent of energy availability, was highest among rural Africans and lowest among urban whites. The opposite pattern was found with respect to the availability of meats. Mean food energy available to South African households was 2480 kilocalories (10,376 kilojoules) per day per adult female equivalent. Availability of fat in the diet was lowest among rural Africans and highest among rural whites, though when expressed as a percentage of energy, it was highest among urban Indians. Availability of saturated fat and cholesterol were highest among rural whites and lowest among rural Africans.

Results for total energy and the proportion of energy from selected macro-nutrients were compared with a large meta-analysis of nutrient intake data from surveys conducted throughout South Africa employing the 24-hour dietary recall instrument. Mean proportion of energy from fat, based on the IES data, ranged from 18 percent for rural Africans to 33 percent for whites. Data from the meta-analysis of 24-hour recalls ranged from 19 to 36 percent for the same two groups. For every racial group, estimates of mean energy available in IES food supplies, when expressed as a percent of recommendations, was greater than meta-analysis results on energy intake measured from the 24-hour recall. These results are as expected, since the 24-hour recall instrument is known to underestimate true intake and household food availability data – which does not encompass losses due to cooking, plate waste, and other factors – is known to be greater than intake. Thus, the IES estimates of energy availability can be considered as upper bounds on intake.

The database developed here is based on a very-large representative survey that is conducted every five years. Given the very reasonable nature of these results and the potential for detailed analysis by population group, this type of database could become a key component of a national nutrition monitoring system.

Food and Nutrient Availability in South African Households: Development of a Nationally Representative Database

Introduction

Accurate and representative information about a nation's dietary habits is an important element in planning for successful nutrition interventions. Although the Government of South Africa has made clear its commitment to delivering nutritional services to the Republic's neediest citizens, nationally representative data on food and nutrient consumption – a useful input for targeting such services – are scarce.

Recent efforts have been marshalled to address this lack of information. The South African National Nutrition Survey Study Group (Vorster et al., 1995) compiled an extensive analysis of the literature to provide a description of what was known about the nutrient intakes of South Africans. The Health Systems Trust sponsored a follow-up to this review which provided additional information from various studies on other indicators of nutritional status (Vorster et al., 1997). But both these efforts represent compilations of existing data that came from regional or small ad-hoc studies; studies that were initiated for a variety of purposes and that used different sampling methods and survey instruments. Only the recently-conducted Nationwide Food Consumption Survey will provide national estimates of food and nutrient intake, although these are of children one to nine years of age (Steyn et al., 2000).¹

This project seeks to make use of previously collected data about household spending patterns to describe the food available to South African households. The work is based on a very-large representative survey that is conducted every five years and could therefore become a key component of a national nutrition monitoring system. Although nutrition problems affect individuals, it is the household that provides the entry point for nutrition intervention efforts, since that is the unit at which food is procured and distributed. A survey focussed on the household thus provides important insights into targeting of nutrition and other related services. It should be emphasized that the survey which underlies this work – the 1995 Income and Expenditure Survey – gathered information on what was purchased by households, rather than what was eaten by individuals. Thus, throughout this paper, reference is made to food and nutrient availability, rather than food and nutrient intake. Because not all food purchased by a household is eaten, the estimates of availability presented here can be considered as upper bounds for intake.

This paper describes the development of this food and nutrient availability database. The next section describes the study sample used in this work. Following that, various methodological sections describe the treatment of food purchases, home food production, nutrient content data,

¹ The Department of Health-sponsored initiative to determine the food and nutrient intakes of 1-9 year old South African children was fielded in 1999 by a nine-university consortium. The survey will provide detailed nutrient intake information on a representative sample of South African children. The work described in this paper can be seen as complementary to the DOH study in that it covers all age groups of the population and provides information at the household level – a key unit of analysis for addressing most food-based interventions.

and information on household composition. A final results section consists of a short text description of a series of data tables documenting key results on food and nutrient availability in South African households. In particular the variations between provinces, urban rural and population groups are reported. A breakdown by population group has been included given the cultural diversity of eating patterns.

Methods

Study Sample

The database developed here is primarily based on the 1995 Income and Expenditure Survey (IES). The IES was conducted by Statistics South Africa in October of 1995 (concurrently with the 1995 October Household Survey) to determine expenditure patterns of South African households. Among other purposes, data from the IES are used to form the "basket" of consumer goods and services used in the calculation of the Consumer Price Index.

Unlike previous Income and Expenditure Surveys in South Africa, which are conducted every five years, the 1995 version covered all areas of the country including metropolitan, urban and rural areas. The sample stratified by race, province, urban, and non-urban area consisted of 30,000 households, of which 29,595 co-operated. The 1991 population census was used as a frame for drawing the sample, and included estimates of the size of the population in the formerly independent TBVC (Transkei-Bophuthatswana-Venda-Ciskei) states. Additional details regarding sampling procedures have been published previously (CSS, 1996).

The IES database contained 13 duplicate records and 22 households in which there was no home food consumption. These observations were excluded. In addition, a number of households had unreasonably high or low values for food expenditures. After converting food expenditures to food energy (see rest of Methods section for details), households with greater than 11,000 or less than 400 kilocalories per adult equivalent per day from at-home food consumption were excluded. The recommended energy allowance for an adult female is 2200 kilocalories per day. Thus, this range extends from approximately one-fifth of this allowance at the lower end to five times this allowance at the upper end. A broad range was chosen since this is an availability study, rather than intake study. Legitimate low values could occur in households that rely on away-from-home foods and high values could occur if foods were purchased, but not eaten. At the lower end, 640 households were excluded, while 216 households were excluded at the upper end. The total sample size after all of the above exclusions was 28,704 households.

Table 1 presents the sample size breakdown by province, urbanisation, and race of household head. Statistics South Africa presents their results on the IES by urban and non-urban areas. "Urban" refers to towns, informal settlements, hostels, and institutions in either urban or suburban areas. "Non-urban" refers to towns, villages, tribal settings, informal settlements, hostels, institutions, and farms in rural areas. The same dichotomisation is used here, although "rural" is used in place of "non-urban."

Population expansion factors were supplied with the 1995 IES which allow one to weight up the sampled households to the level of the South African population. These expansion factors, or weights, were used for all results presented in this report. In order to preserve representativeness, the weights were adjusted to account for the exclusions described above.

Table 1 – Sample size by province, urbanisation, and race of household head

Province		Race of household head				Total
		African	Coloured	Indian	White	
Western Cape	Rural	80	419		110	609
	Urban	446	1172	54	917	2589
	Total	526	1591	54	1027	3198
Eastern Cape	Rural	907	108		91	1106
	Urban	1028	536	32	453	2049
	Total	1935	644	32	544	3155
Northern Cape	Rural	1854	202		80	2136
	Urban	634	420	10	287	1351
	Total	2488	622	10	367	3487
Free State	Rural	747	44		25	816
	Urban	1097	156		586	1839
	Total	1844	200		611	2655
KwaZulu Natal	Rural	2406	21	74	153	2654
	Urban	1342	196	533	529	2600
	Total	3748	217	607	682	5254
NorthWest	Rural	1120	5		44	1169
	Urban	850	112	50	300	1312
	Total	1970	117	50	344	2481
Gauteng	Rural	195	17		173	385
	Urban	1655	233	196	925	3009
	Total	1850	250	196	1098	3394
Mpumalanga	Rural	1294	8	1	42	1345
	Urban	584	50	60	431	1125
	Total	1878	58	61	473	2470
Northern Province	Rural	1886	4		54	1944
	Urban	510	13	9	134	666
	Total	2396	17	9	188	2610
Total	Rural	10489	828	75	772	12164
	Urban	8146	2888	944	4562	16540
	Total	18635	3716	1019	5334	28704

The population count in each province-race-urbanisation cell was determined pre and post exclusion, using the weights supplied with the database. Each household's weight was then adjusted upwards by the ratio of the full population (pre-exclusion) to the remaining population (post-exclusion) for that particular province-race-urbanisation group. This method preserves the weight of each case in a province-race-urbanisation cell relative to other cases in that cell as well as preserving the influence in overall estimates of each province-race-urbanisation group relative to other groups.

Food Purchases

Monthly expenditure data on 124 foods were obtained in face-to-face interviews in the sampled households. These foods are displayed in **Table 2**. The first data column of Table 2 lists the number of households that purchased each food during the interview month. The second data column shows the average monthly food expenditure, in rands, on each food item for all households that purchased that food. For each household, the amount of money, in rands, spent on each of these 124 foods was then divided by the price of that food in order to determine the monthly *quantity* consumed by the household of each food. The third data column lists the average price for these foods, while the fourth data column lists the average quantity purchased by those households that purchased each particular food.

Data on the price of foods were obtained primarily from the Statistics South Africa (SSA) series on retail prices (CSS, 1996b) and supplemented, when necessary, with price data from the Household Subsistence Level Series (Potgieter, 1995).² The SSA retail price series is published on a monthly basis, so data from October 1995 were used to match the period of expenditure information obtained in the IES. Prices were usually listed by unit of food as commonly purchased (e.g. per dozen eggs, per kilo of apples, or per 750 ml of cooking oil). All prices were then expressed on a rands-per-gram basis, using standard quantity conversions (MRC, 1991). On occasions in which there was not an exact match between the IES food and the SSA price series, a close substitute was used, for example, the price of cake flour instead of the price of bread flour. In other cases, IES foods were really food groups, composed of many individual food items (e.g. food code 21013 "other fresh vegetables"). In these instances, a simple average was calculated of SSA prices from the foods that made up that group. There were two broad groups of foods with no price information baby foods and foods purchased and consumed away from home. The treatment of foods from these groups is discussed in sections below.

The SSA price data are listed as national averages. To account for spatial variation in prices across South Africa, two different techniques were employed. In one technique, a provincial price index for food was developed, which allowed for the adjustment of the SSA national data to reflect variation in prices from one province to the next. The provincial price index was developed using the cost of the food component in the August, 1995 version of the Bureau of Market Research Minimum Living Levels Series (Martins and Maritz, 1995),

² For example, this series was used to supply price data on spices and condiments, and legumes.

Table 2 – Purchased food items in the IES database

Purchased IES Foods		N Hholds with Food Expend	Mean Fd Expend (rands per mnth)	Mean Price (rands per kg)	Mean Qty Purchase (kg per month)	MRC Calorie Value	N MRC Foods
Code	Food Item						
15001	Cake flour	11484	21.82	3.09	7.14	354	2
15002	Bread flour	10160	26.30	2.93	9.22	371	2
15003	Mealie-meal flour	21607	38.95	2.09	18.65	409	9
15004	Sorghum-meal flour	1597	16.66	2.60	6.41	382	0
15005	Other meal & flour	2159	11.11	2.62	4.30	381	5
15006	Oats, flakes, brkfcers	8717	20.59	13.34	1.54	398	18
15007	Rice	22434	18.01	3.83	4.69	360	2
15008	Mealie rice & samp	10030	14.51	2.33	6.22	418	3
15009	Spagh, maca, pasta	8634	13.18	5.95	2.22	377	4
15010	White bread	15852	37.42	2.70	13.88	269	2
15011	Brown, whol wht brd	14194	33.37	2.34	14.22	262	3
15012	Other bread, rolls	3282	14.79	2.55	5.81	272	4
15013	Other baked products	5295	19.06	17.31	1.11	412	33
15014	Baby food - cers only	2445	26.72	17.48	1.53	395	8
15015	Other cereal prods	953	21.00	5.57	3.79	386	5
16001	Beef and veal, bulk	7367	70.60	11.57	6.10	223	1
16002	Muttn, lamb, goat, bulk	6360	77.02	14.79	5.21	206	1
16003	Pork, bulk	3110	32.50	13.44	2.42	173	1
16004	Poultry, bulk	8058	46.93	9.56	4.92	147	1
16005	Other meat, bulk	2105	41.61	12.36	3.38	187	0
17006	Beef and veal	11609	52.62	17.92	2.94	223	1
17007	Mutton, lamb, goat	9088	56.02	19.11	2.91	206	1
17008	Pork	4927	30.35	14.69	2.06	173	1
17009	Poultry	13788	38.97	9.63	4.04	147	1
17010	Saus, boerewors	11967	28.74	15.47	1.86	388	1
17011	Other sausages	2125	19.32	14.32	1.35	309	3
17012	Cold mts, vienna, polony	7052	22.35	14.52	1.54	330	3
17013	Biltong, dried sausages	2114	21.88	14.49	1.51	325	4
17014	Bacon	4089	15.23	27.55	.56	446	2
17015	Mt pastes, can, frz mt dishes	1977	15.40	27.09	.58	214	9
17016	Baby food - meats	911	15.29	16.32	.94	48	5
17017	Other meats	1211	20.10	26.90	.75	157	3
18001	Fresh, chilled fish	7348	28.06	17.39	1.61	154	8
18002	Frzn fish, fish prods	6566	25.49	18.52	1.38	231	2
18003	Smkd, dried, can fish, paste	8094	17.20	25.28	.68	175	21
18004	Other fish	1446	13.87	20.46	.68	187	0
18005	Other seafood, excl fish	888	20.39	25.29	.81	144	9
19001	Butter, ghee	9300	14.82	18.51	.80	727	3
19002	Margarine, spreads	17368	13.67	9.41	1.53	722	2
19003	Cook, salad oils	20085	13.51	5.26	2.58	884	10
19004	Peanut butter	10535	8.07	11.64	.70	626	1
19005	Other fats, oils	3434	9.06	9.63	.95	884	7
20001	Fresh milk	18588	29.97	2.35	12.76	56	2
20002	Sour milk, maas, but milk	7505	13.38	2.34	5.73	61	2
20003	Cream, yoghurt	4410	13.65	2.35	5.81	95	9
20004	Ice cream, sorb, frz yog	5232	15.18	9.53	1.59	190	6

Purchased IES Foods		N Hholds with Food Expend	Mean Fd Expend (rands per mnth)	Mean Price (rands per kg)	Mean Qty Purchase (kg per month)	MRC Calorie Value	N MRC Foods
Code	Food Item						
20005	Milk powd, whiteners	9455	13.35	18.71	.71	443	6
20006	Cond, evap milk	3980	10.35	9.67	1.07	213	4
20007	Ster, UHT, longlife milk	3611	18.42	2.32	7.90	56	1
20008	Cheese, cott chees	8833	20.40	22.50	.91	299	14
20009	Baby food - milk prods only	2282	28.29	34.21	.83	498	20
20010	Other milk, cheese prods	611	12.66	12.54	1.01	130	9
20011	Eggs, egg powder	16047	17.15	6.52	2.63	130	1
21001	Potatoes	25780	13.68	2.00	6.92	87	1
21002	Swt potatoes	5441	6.91	2.51	2.78	83	1
21003	Green mealies	2898	6.56	3.00	2.21	70	1
21004	Onions	22925	7.20	1.49	4.86	41	1
21005	Tomatoes	21371	10.16	3.75	2.73	20	1
21006	Green beans	6951	7.53	9.14	.83	29	1
21007	Cabbage	19938	7.64	1.26	6.09	27	2
21008	Carrots	11328	6.56	3.56	1.86	36	1
21009	Pmpkin, marrow, gem sq	10100	8.65	1.83	4.76	29	3
21010	Beetroot	8056	6.34	2.26	2.83	35	1
21011	Lettuce	5085	6.24	1.93	3.28	12	1
21012	Marogo	3282	7.34	3.01	2.45	16	1
21013	Other fresh vegies	2372	11.45	2.98	3.89	31	3
21014	Beans, frzn	4260	10.90	10.60	1.03	40	1
21015	Peas, frzn	3839	8.62	11.04	.79	87	1
21016	Carrots, frzn	2468	8.03	10.57	.77	39	1
21017	Other frzn	2025	11.14	9.91	1.14	51	14
21018	Canned vegies	4442	13.55	5.97	2.30	44	8
21019	Dried peas, beans, lent	4262	11.51	3.96	2.96	366	9
21020	Baby food - veg prods	1018	12.13	15.97	.76	48	4
21021	Other veg prods	314	14.60	9.04	1.61	60	0
22001	Apples	15647	10.28	4.34	2.39	59	1
22002	Other decid fruit	4858	10.68	6.18	1.74	55	9
22003	Bananas	13906	8.74	2.11	4.17	58	1
22004	Other subtr fruit	4070	10.12	4.58	2.23	46	6
22005	Oranges	12254	9.00	2.45	3.71	40	1
22006	Other citrus fruit	2239	8.09	2.46	3.32	34	4
22007	Other fruit	2407	9.81	3.90	2.54	44	11
22008	Canned frsh fruit	4385	12.21	7.58	1.63	80	24
22009	Dried fruit	2037	8.75	17.25	.51	291	10
22010	Frt juices, drinks	6445	18.65	3.73	5.03	52	43
22011	Nuts, includ dr cocon	1961	8.21	11.64	.71	392	20
22012	Baby food - fruit prods	1217	11.61	15.93	.73	70	7
22013	Other frts, nuts	403	9.78	6.36	1.54	81	2
23001	White sugar	26939	24.34	2.91	8.37	406	1
23002	Brown sugar	3415	12.14	2.89	4.21	392	1
23003	Sweeteners	1860	9.99	2.87	3.47	0	0
23004	Other sugar prods	1635	7.56	2.89	2.62	506	2
24001	Syrup, honey	5096	9.71	11.19	.87	318	3
24002	Jam	14390	8.52	8.69	.98	286	1
24003	Jelly powders	6306	7.07	14.49	.49	279	1

Purchased IES Foods		N Hholds with Food Expend	Mean Fd Expend (rands per mnth)	Mean Price (rands per kg)	Mean Qty Purchase (kg per month)	MRC Calorie Value	N MRC Foods
Code	Food Item						
24004	Chocolates	7486	14.71	30.84	.48	508	9
24005	Other sweets	2169	10.41	20.74	.50	401	15
24006	Other sweet prods	344	9.06	17.13	.53	356	1
25001	Instant coffee	18728	15.43	33.53	.46	2	1
25002	Grnd coffee, beans	3563	11.55	31.68	.36	2	0
25003	Tea	21129	10.64	31.28	.34	1	1
25004	Rooibos, herb tea	6583	8.35	38.30	.22	1	2
25005	Cocoa, warm drnks	2682	9.77	20.14	.49	387	5
26001	Ovn-ready dishes, meals	1599	24.08	23.53	1.02	159	1
26002	Custard pwd, inst puddng	6585	8.46	18.80	.45	179	4
26003	Yeast, baking powder	12942	5.89	29.34	.20	180	2
26004	Salt, pepper	21299	5.12	38.45	.13	168	2
26005	Vinegar	13560	4.11	2.83	1.46	4	1
26006	Herbs, spices	8932	9.77	45.70	.21	159	7
26007	Chutney, pickles, other conds	9686	14.49	10.58	1.37	153	21
26008	Can soup, soup pwders	7946	9.72	23.33	.42	94	25
26009	Potato crisps, cheese curls	4148	12.00	2.51	4.78	534	3
26010	Popcom	2345	5.91	2.52	2.35	495	2
26011	Other food prods	478	17.51	21.06	.83	343	1
27001	Meals, sncks in rest, hotels	2863	120.67				
27002	Take-away meals	3636	56.09				
27003	Meals, sncks in staff cafet	982	45.50				
28001	Carb bvrgrs, away	2989	27.26				
28002	Minrl water, away	356	17.29				
28003	Fruit squash, away	1267	17.31				
28004	Other soft dr, away	752	17.80				
29001	Carb bvrgrs	10423	32.16	3.70	8.72	42	1
29002	Minrl water	1045	16.14	3.70	4.36	0	1
29003	Fruit squash	4791	16.88	3.71	4.55	28	1
29004	Other soft dr	4184	16.24	3.71	4.37	200	4
30001	Brndy, whsk, gin, away	754	55.45				
30002	Liquers, other spir, away	176	35.47				
30003	Beer, cider, away	1507	58.68				
30004	Sorgum beer, away	373	27.18				
30005	Wines, away	696	39.19				
30006	Fortified wines, away	107	16.95				
30007	Other alcohol, away	36	23.46				
31001	Brndy, whsk, gin	2933	58.96	38.16	1.54	249	1
31002	Liquers, other spir	552	26.76	31.95	.84	214	2
31003	Beer, cider	5507	59.07	5.35	11.01	17	5
31004	Sorgum beer	1355	27.80	1.79	15.49	15	1
31005	Wines	2566	39.27	13.70	2.87	6	1
31006	Fortified wines	527	15.75	20.03	.79	33	2
31007	Other alcohol	248	18.81	18.58	1.02	89	0

which covers 26 urban areas throughout South Africa.³ For each province, the national food prices were then multiplied by this provincial price index to give food prices that more closely reflected actual prices.

The above price index technique assumes that the variation in the price of foods from one province to the next is constant for all foods. However, bananas may be more expensive in one province than another, while maize could be cheaper. In order to reflect that fact that *relative* food prices vary from one province to the next, a second technique was developed in which *food-specific* provincial price indices were used. The Minimum Subsistence Level series (Potgieter, 1995) contains unit cost information for 23 foods for 17 different locations. Thus, 23 provincial food price indices were developed, one for each of the foods for which price data were available from UPE.⁴ For each province and for each food, the national food prices were then multiplied by the appropriate provincial food price index to give food prices that more closely reflected actual food prices in each of the provinces.

These methods for adjusting food prices do not take into consideration the differences in the specific types of foods purchased by consumers from different socio-economic backgrounds. With 124 food items, the IES is very detailed for a recall food expenditure survey. Yet many of the food items are still relatively broad, especially considering the wide variety of foods that can be selected in South African markets. For example, there are many different types of pasta that would be included in the ‘spaghetti, macaroni, and pasta’ item or, similarly, many varieties of cheese could be included in the ‘cheese’ item. Product choices typically vary by consumer characteristics, including race, urbanisation, and especially household income. Households with higher incomes typically spend more on food to purchase the same amount of kilocalories than those with lower incomes. Their rands go to purchasing other characteristics besides calories, such as taste, convenience, or simply high-end brand names. This relative inefficiency at purchasing calories is well-known and was incorporated into another method for adjusting price data in which the price paid by higher-income households for specific items

³ More formally, the provincial price index is given by:

$$I_p = \text{FDBSKTPR}_p \div \text{FDBSKTPR}_n$$

where I_p is the provincial price index for province p , FDBSKTPR_p is the average price of the food basket of the Minimum Living Level for province p , and FDBSKTPR_n is the average price of the food basket throughout the nation. Averages for each province were obtained by weighting the MLL observations in that province by the population share for each observation site.

⁴ The provincial food price index is given by: $I_{fp} = \text{FDPR}_{fp} \div \text{FDPR}_{fn}$

where I_{fp} is the value of the provincial food price index for food f and province p , FDPR_{fp} is the average price of food f for province p , and FDPR_{fn} is the average price of food f throughout the nation. Averages for each province were obtained by weighting the UPE observations in that province by the population share for each observation site.

was adjusted upwards to reflect this relative inefficiency.⁵

Each of the different price series discussed above has advantages and disadvantages. The single national price series based on the SSA data has the advantage of simplicity. Although it does not allow for regional price variation, many economists who work with time-series data consider spatial price variation within a country to be relatively small compared to year-to-year variations in prices. The second series is based on an index in which prices vary by province and thus does incorporate spatial price variation, which is likely to exist to some extent in this cross-sectional dataset. This index is based on UNISA Bureau of Market Research data which has better coverage in Mpumalanga and Northern Provinces, than does the UPE data. The third price series, though based on the UPE data, allows for the fact that food prices vary in a relative fashion from one province to the next, and thus more closely approximates reality. The fourth price series derived by applying an index of relative calorie purchasing efficiency to the third price series attempts to approximate reality even further by incorporating aspects of consumer behaviour. However, it rests on a specific assumption that the relative calorie purchasing efficiency between two socio-economic groups is the same for a general class of foods (e.g. grains) as it is for each specific food within that class (e.g. pastas). While this is a

⁵ First, the average cost of a calorie paid by each household for nine broad food groups was determined by dividing the total food expenditures on a given food group by the kilocalories in those foods. More formally,

$$KCALCOSTig = \sum FDEXigj \div \sum KCALigj$$

where $KCALCOSTig$ is the average cost per kilocalorie paid for food group g by household i , $FDEXigj$ is the amount spent for food *item* j in food group g by household i , and $KCALigj$ is the amount of kilocalories in this food item. The nine food groups are cereals, meats, fish products, fats & oils, dairy and eggs, vegetables, fruits, sugars, and jams. See Table 2 for a complete listing of food items that make up these groups.

Households were then grouped into 21 socio-economic status (SES) groups based on the race of the household head (African, Coloured, Indian, White), urbanisation status (rural, urban), and income group (one of three per capita income terciles for each of the race-urbanisation cells). Due to the limited number of Indian households in rural areas, Indian urban and rural households were combined (thus, 7 race-urbanisation groups X 3 income groups = 21 SES groups). Mean kilocalorie costs for each of the nine food groups were determined for each of the 21 SES groups by averaging the values derived above for all households in an SES group, that is

$$KCALCOSTsg = \sum KCALCOSTsig \div Ns$$

where $KCALCOSTsg$ is the average cost per kilocalorie paid for food group g by SES group s , $KCALCOSTsig$ is the average cost per kilocalorie paid for food group g by household i (within SES group s), and Ns is the number of households in SES group s .

Price adjustment indices, used for all food items in each of the nine broad food groups were based on the kilocalorie purchasing efficiency of each SES group relative to that of rural Africans of middle income. That is,

$$Isg = KCALCOSTsg \div KCALCOSTrang$$

where Isg is the adjustment index applied to food prices in food group g for purchases by those in SES group s , $KCALCOSTsg$ is the average cost per kilocalorie paid for food group g by SES group s , and $KCALCOSTrang$ is the average cost per kilocalorie paid for food group g by rural Africans of middle-income. Note that these adjustment indices were applied to food prices in the third price series (see text and footnote 4) for all foods in the nine food groups. On average these groups account for over 95 percent of caloric intake in the sample. For other items (coffees, beverages, and other foods), prices in the third price series were used and no other adjustment was made.

reasonable assumption, it has not been tested empirically. In addition, many economists might object to the incorporation of consumer behaviour into a price vector, which is typically considered to be exogenous. Thus, for all of these reasons, the third price series was chosen for use here and underlies all of the results presented in this report. In order to compare the effects of this decision, see **Table 3** and **Table 4** on the mean calorie availability per adult equivalent using each of the four price series.

Purchased Baby Food

The IES asks respondents to report on the amounts spent on different baby food products (cereals, meats, milk products, vegetables, and fruits). Neither the retail price series from Statistics South Africa, nor the other price series that were used, contains information on the price of these baby foods. Price data for baby foods was obtained using a convenience sample of baby food items in each food group taken from supermarkets in Johannesburg in August 2000. These prices were deflated to price levels of October 1995 using the ratio of current baby food prices to those of 1995, for products from a prominent South African baby food company.⁶

Food Purchased and Consumed Away from Home

Neither the retail price series from Statistics South Africa, nor the other price series that were used here, contains information on the price of food consumed away from home. The variety of eating places and menu entries in a typical South African city confound any such data collection effort. Although the IES does have *expenditure* data on foods consumed away from home, the overly aggregate nature of these IES food groups (e.g. “Meals and snacks consumed in hotels, restaurants, etc.”) is equally limiting. Thus the results presented for food and nutrient availability refer to *availability from at-home food supplies*.

For some purposes, it might be desirable to calculate nutrients available to South African households in their total food supply, i.e. those from at-home supplies plus those purchased away from home. To this end, estimates of total calorie availability in South African households (see final column of Tables 8 and 9) were developed. These estimates are simply a sum of calories available in at-home supplies plus an estimate of calories available in food

⁶ This method replaced an earlier approach developed to estimate the energy value of baby foods purchased by the household. The earlier approach relied on an assumption that the cost of a kilocalorie in purchased baby food was about 1.5 times the cost of a kilocalorie in other purchased foods from the same broad food group. Empirical data from the convenience sample revealed this was clearly not the case, with baby food kilocalorie costs varying wildly from 4 to 10 times the cost kilocalories from other purchased foods, depending on the food group. Thus, empirical data from the convenience sample was used.

Table 3 – The effect of different pricing methods on estimates of mean at-home calorie availability, by province and urbanisation *

Province		Daily Calorie availability in at-home food supplies			
		Method 1	Method 2	Method 3	Method 4
Western Cape	Rural	2335	2335	2175	1992
	Urban	2453	2453	2324	1989
	Total	2437	2437	2303	1989
Eastern Cape	Rural	2126	2101	2274	2226
	Urban	2472	2442	2612	2277
	Total	2331	2303	2474	2256
Northern Cape	Rural	1946	1946	2169	2147
	Urban	2321	2322	2568	2256
	Total	2054	2054	2284	2179
Free State	Rural	1678	1641	1726	1674
	Urban	2322	2268	2381	2080
	Total	2061	2014	2116	1916
KwaZulu Natal	Rural	2128	2088	2163	2124
	Urban	2568	2517	2640	2301
	Total	2335	2290	2388	2207
NorthWest	Rural	1760	1755	1759	1743
	Urban	2354	2348	2380	2094
	Total	2021	2015	2032	1897
Gauteng	Rural	2758	2671	2765	2551
	Urban	2862	2773	2865	2467
	Total	2855	2766	2858	2472
Mpumalanga	Rural	2007	1868	2006	1956
	Urban	2233	2074	2232	1938
	Total	2088	1942	2087	1949
Northern Province	Rural	2609	2608	2609	2570
	Urban	3023	3022	3023	2650
	Total	2664	2663	2664	2580
Total	Rural	2153	2124	2202	2156
	Urban	2596	2544	2617	2268
	Total	2401	2359	2434	2218

* Method 1 is based on a single national price series. Method 2 incorporates an index of overall price variation by province. Method 3 incorporates variation in relative food prices by province. Method 4 starts with method 3 prices and incorporates relative calorie purchasing efficiency of different socio-economic groups.

Table 4 – The effect of different pricing methods on estimates of mean at-home calorie availability, by race and urbanisation *

Race of household head		Daily Calorie availability in at-home food supplies			
		Method 1	Method 2	Method 3	Method 4
African	Rural	2107	2079	2158	2135
	Urban	2222	2177	2253	2061
	Total	2155	2119	2197	2105
Coloured	Rural	1983	1975	1986	1796
	Urban	2188	2172	2168	1845
	Total	2148	2134	2132	1835
Indian	Rural	2908	2852	2976	2427
	Urban	2879	2816	2942	2509
	Total	2880	2818	2943	2505
White	Rural	3573	3493	3605	3089
	Urban	3322	3247	3339	2732
	Total	3341	3266	3359	2759
Total	Rural	2153	2124	2202	2156
	Urban	2596	2544	2617	2268
	Total	2401	2359	2434	2218

* Method 1 is based on a single national price series. Method 2 incorporates an index of overall price variation by province. Method 3 incorporates variation in relative food prices by province. Method 4 starts with method 3 prices and incorporates relative calorie purchasing efficiency of different socio-economic groups.

purchased away from home. To estimate the calories in away-from-home food, expenditures on these foods were divided by the implicit cost of a calorie.⁷

Home Food Production and Livestock

Approximately 7 percent of households in the 1995 IES reported consuming food that they produced themselves. The IES asked households to report on quantities consumed from home production during the previous year for 18 different foods. **Table 5** presents the number of households who consumed foods from home production as well as the average monthly quantity consumed. Information was also collected on the number of animals—cattle, sheep, goats, and chickens—from each household's herd that were slaughtered during the previous year. The IES did not ask households about consumption of livestock, *per se*. In order not to omit the consumption of this important food group for rural households, the quantity killed of each type of animal during the year was used as a proxy for household consumption. While this is a reasonable approximation for subsistence farmers and small-scale commercial livestock producers, this does not make sense for large-scale producers. For these producers, their consumption was assumed to be at the maximum consumption level of small-scale commercial producers. Assumptions were also made about the average size of a slaughtered animal, since these data were not obtained in the IES.⁸

Food Group Availability

In order to summarize food consumption into some meaningful statistics the 124 food items in Table 2 as well as the 22 home-produced items in Table 5 were aggregated into seven broad groups: cereals, fruits and vegetables, meats, poultry, fish, dairy products, and eggs. **Table 6** shows which IES food items were aggregated into each of these broad groups. See Tables 10 and 11 for mean household availability of these food groups.

⁷ Total calories consumed, $KCAL_{total}$, is given by the following equation,

$$KCAL_{total} = KCAL_{home} + KCAL_{away}$$

where $KCAL_{home}$ refer to calories consumed from at-home food supplies and $KCAL_{away}$ is an estimate of calories purchased and consumed away from home. This is estimated by the following equation,

$$KCAL_{away} = FOODEXP_{away} \div KCALCOST_{away}$$

where food expenditures away from home ($FOODEXP_{away}$) were obtained for each household from the IES data and divided by $KCALCOST_{away}$, the implicit cost of a calorie for food consumed away from home. Following Klasen and Woolard (1998), it was assumed here that the cost of a calorie in food purchased away from home was twice as high as the cost of a calorie from at-home food sources. The cost of a calorie in at-home food supplies was calculated by dividing each household's total expenditures on food by the total calories in that food. These calorie cost figures were averaged for each per capita income tercile for each racial/urbanisation group (21 groups total -- see Footnote 5).

⁸ Households who owned more than 20 head of cattle, or 40 head of sheep, goats, or chickens at the time of the survey were considered commercial producers for these purposes. Maximum consumption levels for small-scale producers were set at 12, 36, 36, and 72 head per year of cattle, sheep, goats, and chickens, respectively. Carcass weights for commercial producers were assumed to be 215, 27.5, 20, and 1.5 kilograms per head of cattle, sheep, goat, and chicken, respectively. For subsistence producers these weights were assumed to be 120, 12.5, 12.5, and 1.5 kilograms, respectively.

Table 5 – Home-produced foods in the IES database

IES Home-Produced Foods		N Households	Mean Quantity Consumed
Code	Food Item		(kg per month)
72001	maize	830	12.93
72002	other grain	101	5.70
72003	milk	136	44.52
72004	eggs	135	4.56
72005	fruit, deciduous	38	8.02
72006	banana	48	7.43
72007	fruit, other tropical	5	4.70
72008	fruit, citrus	32	8.26
72009	fruit, other	2	12.71
72010	potatoes	391	3.43
72011	sweet potatoes	79	3.22
72012	green mealies	57	5.27
72013	onions	183	2.85
72014	tomatoes	156	3.51
72015	cabbage	207	3.04
72016	pumpkin	222	5.25
72017	marogo	88	2.03
72018	vegetables, other	38	3.37
76001	cattle	650	18.19
76002	sheep	489	11.65
76003	goats	372	3.65
76004	chickens	1035	0.84

Table 6 – IES foods and aggregate food groups

Food Group	IES Foods			
Cereals	15001	Cake flour	15009	Spagh, maca, pasta
	15002	Bread flour	15010	White bread
	15003	Mealie-meal flour	15011	Brown, whol wht brd
	15004	Sorghum-meal flour	15012	Other bread, rolls
	15005	Other meal & flour	15013	Other baked products
	15006	Oats, flakes, brkf cers	15014	Baby food - cers only
	15007	Rice	15015	Other cereal prods
	15008	Mealie rice & samp	26010	Popcorn
Fruits and Vegetables	21001	Potatoes	21018	Canned vegies
	21002	Swt potatoes	21019	Dried peas, beans, lent
	21003	Green mealies	21020	Baby food - veg prods
	21004	Onions	21021	Other veg prods
	21005	Tomatoes		
	21006	Green beans	22001	Apples
	21007	Cabbage	22002	Other decid fruit
	21008	Carrots	22003	Bananas
	21009	Pmpkin, marrow, gem sq	22004	Other subtr fruit
	21010	Beetroot	22005	Oranges
	21011	Lettuce	22006	Other citrus fruit
	21012	Marogo	22007	Other fruit
	21013	Other fresh vegies	22008	Canned frsh fruit
	21014	Beans, frzn	22009	Dried fruit
	21015	Peas, frzn	22010	Frt juices, drinks
	21016	Carrots, frzn	22012	Baby food - fruit prods
	21017	Other frzn	22013	Other frts, nuts
Meats	16001	Beef and veal, bulk	17010	Saus, boerewors
	16002	Muttn, lamb, goat, bulk	17011	Other sausages
	16003	Pork, bulk	17012	Cold mts, vienna, polony
	16004	Poultry, bulk	17013	Biltong, dried sausages
	16005	Other meat, bulk	17014	Bacon
	17006	Beef and veal	17015	Mt pastes, can, frz mt dishes
	17007	Mutton, lamb, goat	17016	Baby food - meats
	17008	Pork	17017	Other meats
Poultry	16004	Poultry, bulk	17009	Poultry
Fish	18001	Fresh, chilled fish	18004	Other fish
	18002	Frzn fish, fish prods	18005	Other seafood, excl fish
	18003	Smkd, dried, can fish, paste		
Dairy	20001	Fresh milk	20007	Ster, UHT, longlife milk
	20002	Sour milk, maas, but milk	20008	Cheese, cott chees
	20003	Cream, yoghurt	20009	Baby food - milk prods only
	20004	Ice cream, sorb, frz yog	20010	Other milk, cheese prods
	20005	Milk powd, whiteners	26002	Custard pwd, inst puddng
	20006	Cond, evap milk		
Eggs	20011	Eggs, egg powder		

Nutrient Availability

The South African Food Composition Database Version 1.2 (MRC, 1999) was used to determine the nutrient content of foods that were reported as purchased or consumed from home production in the IES. The MRC database includes nutrient information for over 1400 food items, whereas the IES collected information on 124 purchased foods and 22 home-produced foods (including livestock). Thus, food items from the MRC database were selected that matched the IES foods. On occasions in which the IES foods could be represented by more than one MRC food, simple averages were taken for the nutrients from the appropriate MRC foods. The penultimate column in Table 2 displays the average energy value (kilocalories/100 gram) of the IES foods, while the final column in this table shows the number of foods from the MRC database that were used to form this average.

The nutrient data in the MRC database are reported per 100 grams of edible portion, whereas IES data represent foods as purchased. Thus, values for raw foods from the MRC tables were used whenever possible. When data for cooked foods were used (e.g. boiled rice), a conversion factor was applied to the IES food quantity data to adjust the raw weight to that of a cooked weight. These conversion factors were obtained from the U.S. Department of Agriculture's nutrient database (USDA, 1999). To adjust the weight of foods as purchased to the appropriate weight of an edible portion the refuse for each food item was also subtracted. Common refuse factors (e.g. the percent of a banana's weight that is peel) were also obtained from the USDA's nutrient database (USDA, 1999). The USDA database was additionally used for particular food items with missing nutrient values in the MRC database or for when composite indices were available from USDA, but not from MRC (e.g. a single composite of retail cuts of raw beef for all grades, lean and fat).

Tables 14 and 17 present information on energy sources in the diet. The percentage of calories from protein, fat, saturated fat, alcohol, carbohydrate, and sugar was calculated by multiplying the amount of the macronutrient available to the household by the energy value of that macronutrient and dividing by the total energy available to the household. Standard conversion factors were used for the energy value of macronutrients: 4 kilocalories per gram of protein, 9 kcal/g of fat, 4 kcal/g of carbohydrate, and 7 kcal/g of alcohol.⁹

⁹ For purposes of calculating the percentage of calories from different sources, the total energy available to the household was calculated in the following manner:

$$\text{TOTKCAL} = (\text{PROTEIN} \times 4) + (\text{FAT} \times 9) + (\text{CARBOH} \times 4) + (\text{ALCOHOL} \times 7)$$

where each of the macronutrients are expressed in gram quantities. In the case of fats, for example, the calculation is:

$$\text{PCTFAT} = (\text{FAT} \times \text{KCALCONV}_n) \div \text{TOTKCAL}$$

where PCTFAT is the percent of energy that comes from fat in the foods available to the household, FAT is the total amount of fat (in grams) available to the household, KCALCONV_n is the calorie conversion factor for different nutrients (in this case 9 kilocalories per gram of fat), and TOTKCAL is the total kilocalories available to the household.

Household Size and Adult Equivalence

Since households vary greatly in size it is important to take this into account when reporting available quantities of foods or nutrients. One method is to report quantities on a per capita basis, that is, the total amount available to the household, divided by the number of persons in the household. The problem with this sort of expression is that individuals vary greatly in their nutritional needs. A three-person household composed of an adult male, an adult female, and an adolescent male has a very different set of requirements than a three-person household composed of an adult female and two pre-school children. One way to address this issue is to express household size in terms of the number of equivalent adults, where adult equivalence is determined by recommended energy allowances. An adult female has an energy recommendation of 2200 kilocalories per day (NRC, 1989). All other individuals can be expressed in equivalent terms to the adult female, with reference to their energy needs, by dividing their energy recommendation by that of the adult female's. For example, a two-year old girl has an energy recommendation of 1300 kilocalories per day. Dividing this by the adult female's recommendation ($1300 \div 2200$), gives a result of 0.59, the equivalent size, with respect to energy needs, of a two-year old relative to the adult female. **Table 7** presents the energy recommendations, and adult female equivalence, for different age and gender groups.

The IES collected age and gender information on each household member. This information was used to calculate the equivalence to an adult female, in terms of energy needs, for each household member. Then the size of each household, in terms of adult female equivalents, was calculated by adding up these numbers for all members of a household. Mean values for household size, both in terms of the number of persons and the number of adult female equivalents, are presented in **Table 8** and **Table 9**. These tables also display the energy availability to the household both in per capita and per adult equivalent terms. All other food and nutrient availability tables display results on a per adult female equivalent (AFE) basis.

Consumption by Domestic Workers

Information on food expenditures in the IES refers to total monthly purchases. This includes food purchased for household members *and* for domestic workers. To derive food and nutrient availability figures for household members, it was necessary to determine the percent of food that went exclusively to them.

Fortunately, in a separate section of the survey dealing with domestic workers, the IES obtained information on the number of workers in each household, their salaries and other cash payments, and the value of in-kind benefits, such as food, shelter, and clothing. The value of food given to all workers in a household was summed and converted to calories, by dividing by the implicit cost of a calorie from at-home food supplies (see footnote 7). The amount of calories available to household members was determined by subtracting off the amount given to domestic workers from the total amount purchased. This was then expressed in percentage terms. This "household member percent" is shown in the first data column of Tables 8 and 9. It was applied to all food and nutrient availability totals presented in

Tables 3, 4, and 8 18. Thus, the figures in these tables refer to availability to household members, and are net of amounts given to domestic workers.¹⁰

In addition to mean values, the medians are also presented.

Table 7 – Energy recommendations and adult equivalence

Age group (years)	Males		Females	
	Average energy allowance (kcal)	Adult female equivalence	Average energy allowance (kcal)	Adult female equivalence
1-3	1300	0.59	1300	0.59
4-6	1800	0.82	1800	0.82
7-10	2000	0.91	2000	0.91
11-14	2500	1.14	2200	1
15-18	3000	1.36	2200	1
19-24	2900	1.32	2200	1
25-50	2900	1.32	2200	1
51 +	2300	1.05	1900	0.86

¹⁰ While the IES collected information on the value of food given to domestic workers it did not collect information on the amounts of different types of foods. An implicit assumption in the calorie cost method for determining the percent given to workers is that the mix of foods given to domestic workers is the same as that for household members. Two other assumptions structured the calculations here. First, it was assumed that in no case would the per capita value of food given to workers be more than the per capita value of food available to household members. Second, it was assumed that in no case would the amount of calories per worker be more than the amount of calories per household member.

Table 8a – Mean household size and daily calorie availability, by province and urbanisation

Province		Consumed by hhold members (%)*	Household size		Daily Calorie availability		
			Persons	Adult female equivalents (AFE)	At-home, per capita	At-home, per AFE	Total, per AFE
Western Cape	Rural	.989	3.72	3.87	2337	2175	2212
	Urban	.985	3.93	4.08	2414	2324	2389
	Total	.985	3.90	4.05	2403	2303	2365
Eastern Cape	Rural	.993	4.55	4.63	2344	2274	2288
	Urban	.974	4.08	4.20	2670	2612	2653
	Total	.981	4.27	4.37	2537	2474	2504
Northern Cape	Rural	.996	5.25	5.25	2190	2169	2182
	Urban	.981	4.17	4.24	2639	2568	2603
	Total	.992	4.94	4.96	2319	2284	2303
Free State	Rural	.991	2.95	3.08	1993	1726	1732
	Urban	.973	3.69	3.82	2450	2381	2409
	Total	.981	3.39	3.52	2265	2116	2135
KwaZulu Natal	Rural	.997	5.51	5.64	2252	2163	2180
	Urban	.975	4.24	4.40	2762	2640	2719
	Total	.987	4.91	5.06	2492	2388	2434
NorthWest	Rural	.997	4.78	4.83	1802	1759	1785
	Urban	.982	3.85	4.00	2517	2380	2436
	Total	.990	4.37	4.47	2116	2032	2071
Gauteng	Rural	.976	3.00	3.14	3029	2765	2855
	Urban	.980	3.71	3.91	3062	2865	2948
	Total	.980	3.66	3.86	3060	2858	2942
Mpumalanga	Rural	.995	5.27	5.46	2131	2006	2025
	Urban	.977	4.49	4.66	2306	2232	2268
	Total	.989	4.99	5.18	2194	2087	2112
Northern Province	Rural	.996	5.27	5.36	2684	2609	2636
	Urban	.979	3.89	4.05	3306	3023	3079
	Total	.994	5.09	5.19	2766	2664	2694
Total	Rural	.995	4.94	5.04	2295	2202	2224
	Urban	.979	3.93	4.09	2751	2617	2682
	Total	.986	4.37	4.51	2550	2434	2480

* Percent of at-home calories available to household members after subtraction of share to domestic workers.

Table 8b - Median household size and daily calorie availability, by province and urbanisation

Province		Consumed by hhold members (%)*	Household size		Daily Calorie availability		
			Persons	Adult female equivalents (AFE)	At-home, per capita	At-home, per AFE	Total, per AFE
Western Cape	Rural	1.000	4.00	3.73	1831	1722	1727
	Urban	1.000	4.00	3.91	2067	1989	2037
	Total	1.000	4.00	3.91	2038	1960	1992
Eastern Cape	Rural	1.000	4.00	4.23	1963	1930	1935
	Urban	1.000	4.00	3.86	2215	2167	2201
	Total	1.000	4.00	4.05	2099	2051	2068
Northern Cape	Rural	1.000	5.00	5.05	1871	1846	1857
	Urban	1.000	4.00	3.91	2144	2095	2118
	Total	1.000	5.00	4.68	1937	1910	1921
Free State	Rural	1.000	3.00	2.91	1098	1026	1029
	Urban	1.000	3.00	3.45	1981	1912	1923
	Total	1.000	3.00	3.14	1658	1593	1600
KwaZulu Natal	Rural	1.000	5.00	5.45	1868	1833	1848
	Urban	1.000	4.00	4.14	2374	2270	2324
	Total	1.000	5.00	4.68	2090	2022	2050
NorthWest	Rural	1.000	4.00	4.45	1506	1476	1502
	Urban	1.000	3.00	3.64	2146	2017	2054
	Total	1.000	4.00	4.05	1743	1682	1702
Gauteng	Rural	1.000	3.00	2.77	2527	2301	2319
	Urban	1.000	4.00	3.68	2617	2464	2540
	Total	1.000	3.00	3.64	2608	2456	2530
Mpumalanga	Rural	1.000	5.00	5.18	1759	1689	1700
	Urban	1.000	4.00	4.32	1921	1855	1867
	Total	1.000	5.00	4.91	1807	1750	1771
Northern Province	Rural	1.000	5.00	5.27	2224	2183	2194
	Urban	1.000	4.00	3.82	2595	2497	2516
	Total	1.000	5.00	5.05	2255	2199	2225
Total	Rural	1.000	5.00	4.73	1877	1831	1848
	Urban	1.000	4.00	3.82	2303	2199	2248
	Total	1.000	4.00	4.18	2090	2025	2052

Table 9a – Mean household size and daily calorie availability by race and urbanisation

Race of household head		Consumed by hhold members (%)*	Household size		Daily Calorie availability		
			Persons	Adult female equivalents (AFE)	At-home, per capita	At-home, per AFE	Total, per AFE
African	Rural	.998	5.05	5.14	2244	2158	2176
	Urban	.996	4.36	4.54	2418	2253	2290
	Total	.997	4.76	4.89	2316	2197	2223
Coloured	Rural	.998	3.98	4.12	2124	1986	2000
	Urban	.996	4.67	4.83	2247	2168	2198
	Total	.996	4.54	4.69	2223	2132	2160
Indian	Rural	.982	4.56	4.87	3267	2976	3017
	Urban	.973	4.18	4.39	3082	2942	3034
	Total	.974	4.20	4.41	3090	2943	3033
White	Rural	.915	3.00	3.14	3837	3605	3746
	Urban	.946	2.90	3.03	3441	3339	3458
	Total	.944	2.91	3.04	3471	3359	3480
Total	Rural	.995	4.94	5.04	2295	2202	2224
	Urban	.979	3.93	4.09	2751	2617	2682
	Total	.986	4.37	4.51	2550	2434	2480

* Percent of at-home calories available to household members after subtraction of share to domestic workers.

Table 9b – Median household size and daily calorie availability by race and urbanisation

Race of household head		Consumed by hhold members (%)*	Household size		Daily Calorie availability		
			Persons	Adult female equivalents (AFE)	At-home, per capita	At-home, per AFE	Total, per AFE
African	Rural	1.000	5.00	4.91	1853	1802	1818
	Urban	1.000	4.00	4.23	1919	1830	1854
	Total	1.000	5.00	4.64	1880	1816	1834
Coloured	Rural	1.000	4.00	3.91	1685	1625	1628
	Urban	1.000	4.00	4.64	1902	1842	1862
	Total	1.000	4.00	4.41	1860	1810	1830
Indian	Rural	1.000	4.00	4.68	2428	2351	2351
	Urban	1.000	4.00	4.27	2770	2640	2706
	Total	1.000	4.00	4.27	2768	2631	2681
White	Rural	1.000	3.00	2.91	3346	3160	3283
	Urban	1.000	3.00	2.91	3031	2956	3052
	Total	1.000	3.00	2.91	3053	2971	3065
Total	Rural	1.000	5.00	4.73	1877	1831	1848
	Urban	1.000	4.00	3.82	2303	2199	2248
	Total	1.000	4.00	4.18	2090	2025	2052

Results

Household consumption of foods from the cereals, vegetables/fruits, meats, poultry, fish, dairy, and eggs groups is presented in **Table 10** by province and urbanisation. Households in the rural areas of Northern Province consume the greatest amount of cereals, while those in rural Western Cape consume the least. Average consumption of fruits and vegetables is highest in urban areas of the Western Cape and meats consumption is highest in urban Gauteng. Food consumption is presented by race and urbanisation in **Table 11**, where it can be seen that whites consume the largest amounts of many different food groups.

This is also reflected in the energy availability data, which shows whites with the highest kilocalories per adult equivalent of any of the other racial groups (**Table 13**). Rural coloured households have the lowest energy availability, followed by rural African, urban coloured and urban Africans. Details on energy availability by province and urbanisation are presented in **Table 12**.

Tables 12 and 13 also present data on the availability of protein, fat, saturated fat, cholesterol, alcohol, total carbohydrate, total sugars, and total fiber in at home food supplies. **Table 14** and **Table 15** present information on the proportion of available energy from different macronutrient sources.

The percentage of calories from broad food groups is presented in **Table 16** and **Table 17**. Cereals contribute the most to the diets of all racial-urbanisation groups. Consumption of this group was highest among rural Africans and lowest among urban whites. The opposite pattern was found with respect to the availability of meats.

Nutrient availability data in this report were compared with nutrient intake data from the meta-analysis of 24-hour recall data, conducted by the South African National Nutrition Survey Study Group, or SANSS (Vorster et al., 1995). The SANSS report summarizes mean intakes of energy and other macronutrients by eight age-gender groups and five racial-urbanisation groups.¹¹ Since IES data are collected at the household level and SANSS data are reported at the individual level, it was necessary to create a household composite variable that would enable a fair comparison between the two data sources. This composite variable – the SANSS household energy adequacy ratio – reflects the age- gender composition of households in the IES and the mean intakes (expressed as a percent of recommendations) for each of these individual types in the SANSS report.¹² These averages are reported in the second data column of **Table 18**. This table also reports estimates of the adequacy of household food energy supplies from the IES data. This was calculated by dividing total energy available to the household by the sum of its members' recommended energy allowances.

¹¹ The age-gender groups were children 2-5 and 6-10 years; males 11-15, 16-24, and 25-64; and females 11-15, 16-24, and 25-64. The race-urbanisation groups were rural and urban blacks, coloured, Indian, and whites.

¹² There is an implicit assumption here that intra-household food distribution in the IES households was the same as households from which individual intake data were obtained for the SANSS report.

As can be seen from this table, adequacy ratios for *available energy* from the IES data are greater than the adequacy ratios for *energy intake* from the SANSS data, for every racial-urbanisation group. For whites and Indians, availability is about two times the intake data, whereas for rural African households available energy supplies are only slightly greater than intakes. The results for Coloured households and for urban Africans are in between these other racial-urbanisation groups. These results make sense for several reasons. First, it is expected that household energy supplies will be greater than intakes since availability data measure all food going into the house and thus do not account for plate waste, cooking losses, and other food distributions (e.g. scraps to pets). In addition, it is expected that the amount of losses due to these reasons will be higher in higher-income households, since they are more able to afford “waste.” This is also borne out by the IES data, since higher-income households are disproportionately represented in the Indian and white groups, the two groups with highest energy availabilities relative to published intake data.

The IES data on the percentage of calories from different food sources was also compared to estimates from the SANSS meta-analysis of different intake studies. In a similar method as above, a household composite average was formed by combining the IES data on household age-gender composition with the SANSS review on the mean amounts of protein, fat, and carbohydrates for individuals from different age-gender groups. Table 18 shows the results from this analysis. In general, the IES data track the SANSS data reasonably well, although for most racial groups, estimates from the IES are a little lower for the percentage of calories from protein and fat and a little higher for the percentage of calories from carbohydrates. The one exception to this is among the Coloured population, where the percentage of calories from fat is considerably lower (and carbohydrate considerably higher) in the IES data than in the SANSS. Several reasons could explain this, including: the under-reporting of carbohydrate rich foods in the 24-hour recall data (upon which SANSS is based); the study sites of the SANSS data, which are focussed largely in the urban areas of the Western Cape (four of the five studies summarized by SANSS were conducted there); the under-reporting of fat-rich foods in the IES purchase data; and a higher percentage of plate waste and other food refuse coming from carbohydrate-dense foods as opposed to other types of foods.

Table 10a – Mean household food group availability, by province and urbanisation

Province		Cereals	Vegetables & Fruits	Meats	Poultry	Fish	Dairy	Eggs
		(Grams per day per AFE)						
Western Cape	Rural	269.9	317.5	72.9	33.4	11.8	117.7	16.5
	Urban	304.9	399.8	90.1	38.4	15.8	196.0	17.6
	Total	300.0	388.4	87.8	37.8	15.2	185.2	17.5
Eastern Cape	Rural	375.5	201.4	36.6	22.4	2.4	105.7	6.9
	Urban	376.6	354.1	78.9	34.0	8.7	150.7	14.1
	Total	376.1	291.8	61.7	29.3	6.1	132.4	11.1
Northern Cape	Rural	374.4	196.1	36.9	21.8	2.8	83.3	7
	Urban	383.4	333.3	81.9	35.7	7.5	126.7	14
	Total	377.0	235.6	49.9	25.8	4.1	95.8	9
Free State	Rural	336.5	116.6	34.1	12.2	2	55.4	5
	Urban	342.2	280.1	96.8	29.4	8.2	141.2	15.7
	Total	339.9	213.9	71.4	22.4	5.7	106.5	11.4
KwaZulu Natal	Rural	361.6	186	45.4	21.2	4.4	59	8.6
	Urban	368.3	299.4	101.7	40.9	13.8	171.9	17.3
	Total	364.7	239.4	71.9	30.5	8.8	112.2	12.7
NorthWest	Rural	290.5	198.5	30.8	22.5	4.3	43.9	9.3
	Urban	351.0	300.1	82.3	39.3	8.3	159.4	17.6
	Total	317.1	243.1	53.4	29.9	6.1	94.6	12.9
Gauteng	Rural	405.5	298.4	96.2	39.3	14.0	153.8	16.5
	Urban	399.9	392.0	111.1	35.9	15.5	177.4	17.9
	Total	400.3	385.9	110.1	36.1	15.4	175.8	17.8
Mpumalanga	Rural	346.8	199.0	39.3	22.0	5.8	64.2	11.6
	Urban	320.3	297.2	77.5	27.4	10.5	139.3	16.0
	Total	337.3	234.3	53.0	23.9	7.5	91.2	13.2
Northern Province	Rural	512.6	186.2	38.7	26.7	5.2	52.1	9.6
	Urban	508.5	297.4	106.7	45.0	9.1	186.8	17.0
	Total	512.1	200.8	47.7	29.1	5.7	69.8	10.5
Total	Rural	385.8	194.2	41.5	23.1	4.7	67.6	9.1
	Urban	369.1	351.3	97.7	36.6	12.9	169.5	17.0
	Total	376.5	282	72.9	30.6	9.3	124.6	13.5

Table 10b – Median household food group availability, by province and urbanisation

Province		Cereals	Vegetables & Fruits	Meats	Poultry	Fish	Dairy	Eggs
		(Grams per day per AFE)						
Western Cape	Rural	216.9	228.7	30.6	25.5	7.2	34.0	10.5
	Urban	252.3	301.7	63.9	29.5	10.4	141.3	13.1
	Total	248.3	290.1	58.0	28.6	9.9	129.7	12.8
Eastern Cape	Rural	312.5	151.8	14.1	14.7	0.0	26.6	0.0
	Urban	305.2	259.7	41.3	20.3	2.2	82.5	5.6
	Total	307.9	204.7	27.5	17.7	0.0	55.7	0.0
Northern Cape	Rural	315.8	151.7	12.2	14.5	0.0	56.4	0.0
	Urban	311.1	247.6	39.5	21.8	3.3	69.3	7
	Total	314.5	170.5	17.2	15.6	0.0	59.7	0.0
Free State	Rural	160.2	82.4	19.4	0.0	0.0	18.0	0.0
	Urban	271.0	193.1	49.5	14.1	3.1	75.4	9.1
	Total	234.3	136.2	28.5	4.6	0.0	51.5	0.0
KwaZulu Natal	Rural	305.3	142.1	23.5	10.4	0.5	27.3	0.0
	Urban	312.5	230.3	72.4	29.0	7.3	115.5	13.5
	Total	308.1	178.8	40.4	17.3	3.1	55.5	7.8
NorthWest	Rural	241.1	150.6	15.1	14.9	2.0	14.0	1.3
	Urban	287.3	222.2	49.4	28.8	3.4	100.6	11.2
	Total	261.1	170.7	25.1	19.0	2.4	38.5	5.8
Gauteng	Rural	292.2	206.0	54.9	29.4	0.0	105.6	7.7
	Urban	322.0	285.5	78.6	26.7	8.1	115.7	13.2
	Total	321.0	279.7	77.1	26.8	7.8	114.7	12.8
Mpumalanga	Rural	289.8	146.2	21.4	15.4	2.4	34.3	6.8
	Urban	265.5	221.2	41.6	17.3	4.8	71.7	11.8
	Total	281.1	167.5	26.3	15.9	3.0	43.5	8.3
Northern Province	Rural	433.7	124.3	15.9	16.2	0.8	17.2	0.0
	Urban	390.6	205.1	59.6	34.6	3.4	100.6	9.2
	Total	424.0	132.5	19.0	17.4	1.0	22.9	0.0
Total	Rural	313.2	141.0	18.6	13.9	0.0	28.8	0.0
	Urban	298.7	256.1	64.2	25.9	6.4	107.5	11.9
	Total	305.2	195.5	37.3	19.5	3.2	63.9	7.0

Table 11a – Mean household food group availability, by race and urbanisation

		Cereals	Vegetables & Fruits	Meats	Poultry	Fish	Dairy	Eggs
		(Grams per day per AFE)						
African	Rural	388.6	182.3	34.6	22.3	3.9	60.2	8.4
	Urban	368.5	254.9	62.9	29.1	6.5	102.9	13.1
	Total	380.2	212.4	46.3	25.1	5.0	77.9	10.4
Coloured	Rural	280.4	210.4	53.7	23.5	7.1	62.6	10.4
	Urban	307.5	308.6	73.9	32.8	13.7	121.8	14.9
	Total	302.3	289.6	70.0	31.0	12.4	110.3	14.0
Indian	Rural	457.1	321.1	76.1	45.2	12.8	144.5	12.7
	Urban	379.5	372.0	106.3	53.1	24.0	213.4	16.9
	Total	382.9	369.8	105.0	52.8	23.5	210.4	16.7
White	Rural	419.5	497.3	218.6	45.2	22.3	275.5	25.1
	Urban	391.9	522.6	162.5	47.9	21.4	290.6	24.0
	Total	394.0	520.7	166.8	47.7	21.5	289.4	24.1
Total	Rural	385.8	194.2	41.5	23.1	4.7	67.6	9.1
	Urban	369.1	351.3	97.7	36.6	12.9	169.5	17.0
	Total	376.5	282.0	72.9	30.6	9.3	124.6	13.5

Table 11b – Median household food group availability, by race and urbanisation

		Cereals	Vegetables & Fruits	Meats	Poultry	Fish	Dairy	Eggs
		(Grams per day per AFE)						
African	Rural	316.7	136.6	17.3	13.3	0.0	27.3	0.0
	Urban	288.5	184.5	38.4	17.9	2.9	61.8	7.6
	Total	305.5	154.1	25.6	14.9	1.4	40.4	0.0
Coloured	Rural	222.3	164.0	28.0	15.9	3.7	14.7	0.0
	Urban	258.1	241.5	50.2	24.4	9.0	81.4	10.6
	Total	251.2	224.2	46.0	22.8	7.9	67.7	9.3
Indian	Rural	331.4	239.4	55.8	40.0	9.0	118.6	9.9
	Urban	338.6	280.4	90.0	42.7	17.3	185.4	13.7
	Total	337.5	278.1	88.5	42.4	16.8	181.9	13.4
White	Rural	325.9	403.7	138.4	35.1	13.3	206.3	17.6
	Urban	324.9	418.6	131.6	36.6	14.8	236.8	18.9
	Total	325.1	417.5	132.3	36.5	14.8	234.9	18.8
Total	Rural	313.2	141.0	18.6	13.9	0.0	28.8	0.0
	Urban	298.7	256.1	64.2	25.9	6.4	107.5	11.9
	Total	305.2	195.5	37.3	19.5	3.2	63.9	7.0

Table 12a – Mean nutrients available in at-home food supplies, by province and urbanisation

Province		Calories per day per AFE	Protein	Fat	Saturated fat	Cholesterol (Grams per day per AFE)	Alcohol	Carbohydrate	Sugars	Fiber
Western Cape	Rural	2175	59.2	61.6	18.5	162.0	3.4	315.7	130.7	23.6
	Urban	2324	69.2	72.7	22.8	199.9	2.5	317.8	129.2	23.6
	Total	2303	67.8	71.2	22.2	194.7	2.6	317.5	129.4	23.6
Eastern Cape	Rural	2274	54.9	42.2	11.8	78.6	.8	382.5	104.3	29.1
	Urban	2612	69.0	71.7	21.0	160.2	1.5	386.5	127.2	28.9
	Total	2474	63.3	59.7	17.2	126.9	1.2	384.9	117.8	28.9
Northern Cape	Rural	2169	53.9	38.4	10.7	75.3	.4	366.4	95.0	28.9
	Urban	2568	69.5	64.0	19.2	155.9	1.0	391.2	119.9	29.9
	Total	2284	58.4	45.8	13.1	98.5	.6	373.5	102.2	29.2
Free State	Rural	1726	43.0	27.5	7.9	58.0	1.8	299.2	85.3	22.1
	Urban	2381	64.0	68.1	20.6	172.2	2.3	349.3	123.1	21.9
	Total	2116	55.5	51.7	15.5	126.0	2.1	329	107.8	22
KwaZulu Natal	Rural	2163	52.5	48.9	13.4	89.2	1.3	349	95.2	23.1
	Urban	2640	74.5	85.6	25.7	202.1	2.5	361.2	126.0	24.7
	Total	2388	62.9	66.1	19.2	142.3	1.9	354.8	109.7	23.8
NorthWest	Rural	1759	42.7	38.6	10.2	79.5	1.0	286.6	86.5	19.2
	Urban	2380	65.9	70.8	20.6	178.4	3.0	340	116.3	23.4
	Total	2032	52.9	52.7	14.8	122.9	1.9	310.1	99.6	21
Gauteng	Rural	2765	74.3	74.9	22.4	188.8	5.3	412.3	143.2	27.1
	Urban	2865	80.3	86.6	26.6	216.6	3.4	404.9	143.9	28.2
	Total	2858	79.9	85.9	26.3	214.8	3.5	405.4	143.9	28.1
Mpumalanga	Rural	2006	49.8	44.8	12.1	100.3	1.8	323.5	93.1	22.3
	Urban	2232	60.4	63.4	19.0	165.1	1.9	327.5	115.1	21.3
	Total	2087	53.6	51.5	14.6	123.6	1.8	324.9	101.0	21.9
Northern Province	Rural	2609	64	44.3	11.2	90.5	.8	449.7	95.7	31.4
	Urban	3023	86.0	78.4	22.9	197.2	2.3	454.4	128.5	30.7
	Total	2664	66.9	48.7	12.7	104.5	1.0	450.3	100.0	31.3
Total	Rural	2202	54.4	44.1	12.0	89.9	1.3	364.8	96.7	25.8
	Urban	2617	73.3	78.3	23.8	195.5	2.6	371.6	131.2	26.0
	Total	2434	64.9	63.2	18.6	149.0	2.0	368.6	116.0	25.9

Table 12b – Median nutrients available in at-home food supplies, by province and urbanisation

Province		Calories per day per AFE	Protein	Fat	Saturated fat	Cholesterol (Grams per day per AFE)	Alcohol	Carbohydrate	Sugars	Fiber
Western Cape	Rural	1722	44.7	44.0	12.4	102.4	1.5	258.9	104.6	18.7
	Urban	1989	59.6	59.5	18.4	161.0	0.0	271.9	109.9	18.8
	Total	1960	57.7	57.3	17.4	153.7	0.0	269.7	109.2	18.8
Eastern Cape	Rural	1930	45.6	31.1	8.2	42.8	0.0	325.6	86.3	24.6
	Urban	2167	56.4	51.8	14.9	104.9	0.0	320.9	102.1	23.3
	Total	2051	51.0	40.6	11.1	68.4	0.0	323.6	94.7	23.9
Northern Cape	Rural	1846	44.4	28.7	7.6	42.9	0.0	314.6	78.3	24.3
	Urban	2095	55.5	45.5	12.4	96.9	0.0	328.1	94.2	24.5
	Total	1910	46.5	32.3	8.6	53.6	0.0	318.9	81.7	24.4
Free State	Rural	1026	23.1	19.1	5.6	39.7	0.0	177.6	64.7	11.2
	Urban	1912	48.4	47.5	13.7	110.7	0.0	288.8	99.7	17.1
	Total	1593	38.2	33.4	8.3	59.9	0.0	251.0	85.2	15.3
KwaZulu Natal	Rural	1833	43.3	38.5	10.0	58.8	0.0	297.6	76.3	18.9
	Urban	2270	62.5	69.8	21.0	162.6	0.0	309.4	104.2	19.9
	Total	2022	51.2	50.1	13.8	97.8	0.0	303.5	87.7	19.4
NorthWest	Rural	1476	34.8	29.6	7.6	47.5	0.0	239.4	72.0	16.0
	Urban	2017	55.5	53.3	15.0	129.6	0	293.6	95.8	19.2
	Total	1682	42.0	37.5	9.9	80.0	0.0	263.8	80.0	17.3
Gauteng	Rural	2301	59.7	50.1	15.0	127.5	0.0	348.3	121.4	21.1
	Urban	2464	68.5	69.5	21.0	172.2	0.0	337.7	116.8	22.8
	Total	2456	68.2	68.5	20.7	168.8	0.0	338.1	117.5	22.7
Mpumalanga	Rural	1689	41.7	34.5	8.7	67.5	0.0	277.2	74.4	18.5
	Urban	1855	49.0	47.4	13.6	121.0	0.0	279.8	91.0	18.0
	Total	1750	44.0	37.3	9.8	80.5	0.0	278.3	79.5	18.3
Northern Province	Rural	2183	51.9	33.9	7.9	53.7	0.0	379.2	75.9	26.5
	Urban	2497	69.1	57.6	15.7	145.3	0.0	360.1	103.0	23.2
	Total	2199	53.5	36.0	8.4	61.3	0.0	377.7	78.5	25.9
Total	Rural	1831	43.8	33.2	8.3	53.4	0.0	305.4	77.3	20.8
	Urban	2199	61.1	61.1	18.2	151.4	0.0	309.1	106.7	20.8
	Total	2025	52.3	45.3	12.5	97.1	0.0	307.5	91.8	20.8

Table 13a – Mean nutrients available in at-home food supplies, by race and urbanisation

Race		Calories per day per AFE	Protein	Fat	Saturated fat	Cholesterol	Alcohol	Carbohydrate	Sugars	Fiber
		(Grams per day per AFE)								
African	Rural	2158	52.6	40.9	10.9	80.4	1.1	363.0	92.8	25.7
	Urban	2253	59.7	55.9	16.2	132.2	1.8	346.6	102.5	24.8
	Total	2197	55.5	47.1	13.1	101.9	1.4	356.2	96.8	25.3
Coloured	Rural	1986	50.1	46.7	13.3	104.6	2.1	312.5	113.2	23.1
	Urban	2168	61.5	63.0	18.8	160.0	1.2	311.0	115.8	22.2
	Total	2132	59.3	59.9	17.8	149.3	1.4	311.3	115.3	22.4
Indian	Rural	2976	78.6	83.8	24.7	168.4	1.1	441.4	133.3	27.8
	Urban	2942	83.2	105.6	32.1	235.1	1.6	382.1	143.8	25.8
	Total	2943	83.0	104.7	31.8	232.2	1.6	384.6	143.3	25.9
White	Rural	3605	106.8	126.8	40.6	334.9	5.8	465.3	186.2	32.0
	Urban	3339	98.6	116.9	36.8	307.1	4.7	433.8	182.2	29.6
	Total	3359	99.2	117.7	37.1	309.2	4.8	436.3	182.5	29.8
Total	Rural	2202	54.4	44.1	12.0	89.9	1.3	364.8	96.7	25.8
	Urban	2617	73.3	78.3	23.8	195.5	2.6	371.6	131.2	26.0
	Total	2434	64.9	63.2	18.6	149.0	2.0	368.6	116.0	25.9

Table 13b – Median nutrients available in at-home food supplies, by race and urbanisation

Race		Calories per day per AFE	Protein	Fat	Saturated fat	Cholesterol	Alcohol	Carbohydrate	Sugars	Fiber
(Grams per day per AFE)										
African	Rural	1802	42.6	31.9	8.1	50.5	0	304.3	74.8	20.8
	Urban	1830	47.8	42.4	11.9	93.9	0.0	279.4	81.9	19.3
	Total	1816	44.8	36.4	9.4	65.9	0.0	294.3	77.4	20.1
Coloured	Rural	1625	40.2	37.6	10.3	74.0	0.8	253.1	94.9	18.2
	Urban	1842	52.3	50.3	14.6	122.4	0.0	265.7	97.8	18.0
	Total	1810	49.4	47.6	13.5	113.2	0.0	263.6	97.1	18.0
Indian	Rural	2351	61.1	73.9	20.9	143.3	0.0	321.8	126.2	21.5
	Urban	2640	75.1	90.7	27.7	200.8	0.0	342.3	126.3	21.5
	Total	2631	74.3	89.8	27.4	199.3	0	341.5	126.3	21.5
White	Rural	3160	91.9	106.4	33.2	258.6	1.6	391.2	158.9	27.4
	Urban	2956	86.4	102.4	32.4	264.2	0.5	374.5	153.8	24.5
	Total	2971	86.6	102.7	32.4	264.1	0.7	375.5	154.0	24.7
Total	Rural	1831	43.8	33.2	8.3	53.4	0.0	305.4	77.3	20.8
	Urban	2199	61.1	61.1	18.2	151.4	0.0	309.1	106.7	20.8
	Total	2025	52.3	45.3	12.5	97.1	0.0	307.5	91.8	20.8

Table 14a – Mean proportion of energy from different macronutrients, by province and urbanisation

		Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
Western Cape	Rural	2175	.111	.253	.074	.013	0.623	.261
	Urban	2324	.124	.284	.088	.007	0.586	.237
	Total	2303	.122	.279	.087	.008	0.591	.240
Eastern Cape	Rural	2274	.101	.169	.047	.003	0.728	.205
	Urban	2612	.110	.239	.070	.004	0.647	.207
	Total	2474	.106	.211	.060	.003	0.68	.206
Northern Cape	Rural	2169	.105	.160	.044	.001	0.734	.197
	Urban	2568	.112	.220	.065	.003	0.665	.206
	Total	2284	.107	.177	.050	.002	0.714	.200
Free State	Rural	1726	.098	.165	.049	.010	0.726	.249
	Urban	2381	.107	.246	.073	.006	0.641	.221
	Total	2116	.103	.213	.063	.008	0.675	.232
KwaZulu Natal	Rural	2163	.101	.209	.057	.004	0.686	.194
	Urban	2640	.115	.293	.088	.006	0.585	.202
	Total	2388	.108	.249	.072	.005	0.639	.198
NorthWest	Rural	1759	.101	.207	.055	.005	0.687	.227
	Urban	2380	.114	.263	.076	.009	0.614	.208
	Total	2032	.107	.232	.064	.007	0.655	.219
Gauteng	Rural	2765	.109	.247	.074	.014	0.63	.228
	Urban	2865	.116	.278	.085	.008	0.597	.209
	Total	2858	.116	.276	.084	.008	0.6	.210
Mpumalanga	Rural	2006	.102	.207	.057	.005	0.685	.208
	Urban	2232	.110	.249	.074	.005	0.635	.216
	Total	2087	.105	.222	.063	.005	0.667	.211
Northern Province	Rural	2609	.102	.159	.039	.002	0.737	.161
	Urban	3023	.117	.243	.070	.005	0.635	.183
	Total	2664	.104	.170	.043	.002	0.724	.164
Total	2202	.102	.187	.051	.004	.706	.200	

	Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
Urban	2617	.116	.270	.081	.007	.608	.212
Total	2434	.110	.233	.068	.006	0.651	0.207

Table 14b – Median proportion of energy from different macronutrients, by province and urbanisation

	Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
Western Cape							
Rural	1722	0.109	0.246	0.067	0.006	0.638	0.256
Urban	1989	0.124	0.287	0.088	0.000	0.582	0.232
Total	1960	0.123	0.280	0.085	0.000	0.590	0.236
Eastern Cape							
Rural	1930	0.100	0.155	0.042	0.000	0.74	0.197
Urban	2167	0.109	0.229	0.066	0.000	0.658	0.202
Total	2051	0.105	0.191	0.053	0.000	0.701	0.200
Northern Cape							
Rural	1846	0.103	0.150	0.040	0.000	0.746	0.188
Urban	2095	0.112	0.206	0.060	0.000	0.681	0.203
Total	1910	0.105	0.162	0.044	0.000	0.732	0.192
Free State							
Rural	1026	0.098	0.142	0.045	0.000	0.752	0.199
Urban	1912	0.107	0.240	0.069	0.000	0.648	0.214
Total	1593	0.103	0.202	0.058	0.000	0.686	0.211
KwaZulu Natal							
Rural	1833	0.100	0.198	0.053	0.000	0.698	0.180
Urban	2270	0.115	0.297	0.088	0.000	0.581	0.196
Total	2022	0.106	0.241	0.068	0.000	0.649	0.188
NorthWest							
Rural	1476	0.099	0.191	0.049	0.000	0.704	0.205
Urban	2017	0.113	0.263	0.074	0.000	0.614	0.195
Total	1682	0.106	0.218	0.058	0.000	0.672	0.199
Gauteng							
Rural	2301	0.110	0.252	0.077	0.000	0.627	0.215
Urban	2464	0.114	0.281	0.085	0.000	0.596	0.198
Total	2456	0.114	0.280	0.084	0.000	0.599	0.199
Mpumalanga							
Rural	1689	0.103	0.201	0.052	0.000	0.694	0.195
Urban	1855	0.109	0.244	0.069	0.000	0.641	0.209
Total	1750	0.105	0.213	0.056	0.000	0.678	0.199

	Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
Northern Province	Rural	0.101	0.147	0.034	0.000	0.750	0.149
	Urban	0.116	0.241	0.069	0.000	0.640	0.176
	Total	0.102	0.153	0.036	0.000	0.743	0.153
Total	Rural	0.101	0.173	0.045	0.000	0.721	0.282
	Urban	0.115	0.271	0.080	0.000	0.607	0.205
	Total	0.108	0.225	0.063	0.000	0.661	0.195

Table 15a – Mean proportion of energy from different macronutrients, by race and urbanisation

Race	Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
African	Rural	.101	.181	.048	0.004	.714	.197
	Urban	.110	.231	.067	0.005	.654	.197
	Total	.105	.202	.056	0.005	0.689	.197
Coloured	Rural	.105	.220	.062	.009	.666	.251
	Urban	.119	.264	.078	0.004	0.614	.230
	Total	.116	.255	.075	0.005	.624	.234
Indian	Rural	.113	.280	.084	0.003	.603	.217
	Urban	.118	.331	.100	0.003	.548	.204
	Total	.118	.328	.100	0.003	.550	.205
White	Rural	.121	.323	.103	0.012	.543	.222
	Urban	.123	.327	.103	0.01	.539	.232
	Total	.123	.327	.103	0.01	.540	.231
Total	Rural	.102	.187	.051	0.004	.706	.200
	Urban	.116	.270	.081	0.007	.608	.212

Race	Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
Total	2434	.110	.233	.068	0.006	0.651	.207

Table 15b – Median proportion of energy from different macronutrients, by race and urbanisation

Race		Calories per day per AFE	Protein	Fat	Saturated fat	Alcohol	Carbohydrate	Sugars
African	Rural	1802	0.101	0.169	0.044	0.000	0.726	0.178
	Urban	1830	0.109	0.228	0.065	0.000	0.657	0.186
	Total	1816	0.104	0.191	0.052	0.000	0.701	0.182
Coloured	Rural	1625	0.105	0.219	0.060	0.004	0.665	0.252
	Urban	1842	0.119	0.260	0.076	0.000	0.616	0.225
	Total	1810	0.116	0.254	0.073	0.000	0.626	0.229
Indian	Rural	2351	0.109	0.288	0.083	0.000	0.605	0.195
	Urban	2640	0.118	0.334	0.100	0.000	0.543	0.200
	Total	2631	0.118	0.331	0.099	0.000	0.544	0.200
White	Rural	3160	0.118	0.325	0.101	0.004	0.547	0.218
	Urban	2956	0.122	0.330	0.103	0.001	0.537	0.226
	Total	2971	0.122	0.330	0.103	0.002	0.537	0.225
Total	Rural	1831	0.101	0.173	0.045	0.000	0.721	0.282
	Urban	2199	0.115	0.271	0.080	0.000	0.607	0.205
	Total	2025	0.108	0.225	0.063	0.000	0.661	0.195

Table 16 – Mean proportion of energy from different food sources, by province and urbanisation

Province	Cereals	Meats	Fish	Fats	Dairy	Vegetables	Fruits	Sugars	Jams	Coffees	Other	Beverages	Alcohol
Western Cape	Rural	.422	.083	.010	.110	.047	.074	.171	.015	.000	.027	.020	.006
	Urban	.412	.115	.011	.102	.071	.065	.132	0.017	.001	.029	.015	.005
	Total	.413	.110	.011	.103	.068	.066	.137	0.017	.001	.029	.016	.005
Eastern Cape	Rural	.617	.041	.002	.074	.031	.048	.163	.006	.000	.006	.003	.002
	Urban	.516	.082	.006	.101	.045	.055	.134	0.011	.000	.021	.009	.003
	Total	.557	.065	.004	.090	.039	.052	.146	0.009	.000	.015	.007	.002
Northern Cape	Rural	0.63	.035	.002	.064	.031	.052	.165	0.004	.000	.006	.003	.001
	Urban	.534	.085	.005	.084	.040	.060	.140	0.009	.000	.018	.007	.002
	Total	.602	.050	.003	.070	.033	0.054	.158	.005	.000	.009	.004	.001
Free State	Rural	.572	.052	.003	.064	.025	.046	.187	0.012	.000	.011	.010	.007
	Urban	.500	.098	.006	.097	.048	.043	.149	0.01	.001	.018	.010	.004
	Total	.529	.079	.004	.084	.039	.044	.165	0.011	.000	.015	.010	.006
KwaZulu Natal	Rural	.584	.055	.004	.102	.028	.047	.149	0.007	.001	.008	.006	.003
	Urban	.459	.108	.009	.124	.055	.048	.119	0.014	.002	.030	.011	.005
	Total	.525	.080	.006	.112	.040	.048	.135	0.01	.001	.018	.008	.004
NorthWest	Rural	.548	.055	.005	.100	.032	.050	.170	0.006	.000	.010	.008	.004
	Urban	.493	.100	.006	.106	.058	.041	.124	0.009	.000	.021	.014	.007
	Total	.524	.074	.005	.103	.043	0.046	.150	0.007	.000	.015	.011	.005
Gauteng	Rural	.484	.098	.008	.098	.047	.040	.135	0.016	.001	.021	.024	.010
	Urban	.463	.110	.009	.107	.056	.048	.113	0.016	.001	.035	.015	.006
	Total	.465	.109	.009	.106	.055	.047	.114	0.016	.001	.034	.016	.006
Mpumalanga	Rural	.577	.058	.005	.098	.031	.040	.154	0.007	.000	.008	.007	.004
	Urban	.498	.091	.008	.100	.052	0.05	.133	0.013	.001	.020	.013	.004
	Total	.548	.070	.006	.098	.039	.044	.146	0.009	.000	.013	.009	.004
North Province	Rural	.696	.043	.004	.063	.019	.026	.127	0.005	.000	.005	.005	.001
	Urban	.554	.100	.006	.091	.047	.034	.108	0.012	.000	.018	.013	.004
	Total	.677	.050	.004	.066	.023	0.027	0.124	.006	.000	.006	.006	.002
Total	Rural	.604	.051	.004	.083	.028	.043	.153	.007	.000	.008	.007	.003
	Urban	.471	.104	.008	.106	.055	.051	.124	.014	.001	.028	.013	.005
	Total	.530	.081	.006	.096	.043	.047	.137	.011	.001	.019	.010	.004

Table 17 – Mean proportion of energy from different food sources by race and urbanisation

Province	Cereals	Meats	Fish	Fats	Dairy	Vegetables	Fruits	Sugars	Jams	Coffees	Other	Beverage	Alcohol	
African	Rural	.617	.047	.003	.081	.027	.042	.009	.153	.006	.000	.007	.006	.003
	Urban	.547	.084	.005	.096	.042	.045	.014	.129	.009	.001	.015	.009	.004
	Total	.588	.062	.004	.087	.033	0.043	.011	.143	.007	.000	.010	.007	.003
Coloured	Rural	.488	.071	.007	.100	.033	.062	.009	.180	.014	.000	.018	.015	.004
	Urban	.454	.100	.011	.106	.051	.063	.017	.142	.015	.001	.025	.013	.003
	Total	.460	.095	.010	.105	.047	0.063	.016	.150	.015	.001	.024	.013	.003
Indian	Rural	.452	.088	.008	.132	.051	.067	.013	.130	.014	.003	.024	.016	.003
	Urban	0.406	.111	.014	.143	.060	.059	.019	.110	.014	.002	.046	.014	.003
	Total	0.408	.110	.014	.143	.060	.059	.019	.111	.014	.002	.045	.014	.003
White	Rural	0.393	.126	.012	.120	.063	.049	.027	.118	.019	.001	.040	.024	.009
	Urban	0.362	.138	.012	.117	.079	.054	.029	.110	.022	.001	.047	.019	.008
	Total	.364	0.137	.012	.117	.078	0.054	.029	.111	.022	.001	.046	.020	.008
Total	Rural	.604	0.051	.004	.083	.028	.043	.009	.153	.007	.000	.008	.007	.003
	Urban	.471	.104	0.008	.106	.055	.051	.020	.124	.014	.001	.028	.013	.005
	Total	.530	.081	0.006	0.096	0.043	0.047	0.015	.137	.011	.001	.019	.010	.004

Table 18 –Comparison of mean nutrient availability from IES with mean nutrient intake from the SANSS meta-analysis

	Energy Adequacy Ratio*		Protein (percent of energy)		Fat (percent of energy)		Carbohydrate (percent of energy)	
	IES Available	SANSS Intake	IES Available	SANSS Intake	IES Available	SANSS Intake	IES Available	SANSS Intake
African Rural	.989	.952	.101	.136	.181	.191	.714	.654
African Urban	1.040	.693	.110	.144	.231	.274	.654	.570
Coloured	.982	.764	.116	.144	.255	.371	.624	.466
Indian	1.378	.695	.118	.136	.328	.355	.550	.492
White	1.581	.814	.123	.149	.327	.360	.540	.466
Total	1.127	.828	.110	.142	.233	.267	.651	0.574

* For “IES Available” this is the total energy available to household members divided by the sum of the members’ recommended energy allowances. “SANSS Intake” is a composite household measure created for this comparison, which simulates the intake of IES households if each member were to consume at the mean of intakes for his/her age-gender group, as given in the SANSS nutrient intake meta-analysis report.

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