

## Food consumption changes in Botswana since 1966

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### Abstract

*Historically, Botswana has predominantly been an agricultural country (mainly cattle farming) until the discovery of diamonds in the 1970s. This caused dramatic changes in food consumption patterns towards western oriented diet and this will likely to continue to change. Hence, to shed light on the issue, this paper analyses consumption patterns of different food items for Botswana, using data from Food Agricultural Organization Statistics Tables. This information is ideal in shedding light on possible public health interventions to be undertaken as efforts to curb the consumption of some preventable NCDs whose risk factor are associated with high intake of food items such as fat and sugar. Our results suggest that there has been an increase in consumption of meat, fruits and vegetables, sugar and oil. Hence, from the policy perspective, these shifts in food consumption patterns towards sugar and oil are of concern. This is so because for some NCDs, risk factors are associated with a high intake of these food items for which this paper finds a rise in their consumption.*

**Keywords:** food consumption, changes, non-communicable diseases, choices, policy interventions

### Introduction

While food consumption is affected by food accessibility, availability and choice, food intake choices are influenced by disposable income, geography, season, marketing, religion, culture, time, social networks, globalization and urbanization, education and government policy interventions among others (Guo et al., 2000; Kearney, 2010; Wenhold, 2012). Historically, Botswana has predominantly been an agricultural country (mainly cattle farming) until the discovery of diamonds in the 1970s (Sekwati, 2010). Since then, there has been a decline in the agriculture sector's contribution to gross domestic product (GDP).

In 1966, the agricultural sector contributed about 42.7 % to GDP. However, in 1976, this contribution had declined to around 20.7 % and by 2011, it was around 2.1 % (Bank of Botswana, 2011). While such a decline may have affected food consumption patterns, a significant growth in retail supermarkets realized in Botswana around the mid-1990s (Weatherspoon and Reardon, 2003), may have influenced food availability, accessibility and choice for consumers. Alongside growth in urbanization and a widespread of retail supermarkets that has been sparked by globalisation, there has been an increase in prevalence of non-communicable diseases in developing countries (Bloom et al., 2011). Hence, in order to suggest whether or not there is need for policy intervention to promote healthier eating habits, develop and monitor progress against food-based dietary guidelines, knowledge of food consumption patterns is necessary. It is against this background that this paper is aimed at analyzing food consumption patterns in Botswana for a period from 1966 to 2011. This is

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to document changes that have occurred over time in the eating patterns of Botswana consumers and to note on which food items are such changes geared to. In this regard, the aim of this is to analyse changes in food consumption patterns in Botswana and examine which food items constitute a larger portion of each different food category.

## **Methods**

To analyze changes in food consumption in Botswana, this paper relies on data obtained from Food Agricultural Organization (FAO) Food Balance Sheet (FBS). FBS data are publicly available online from FAOSTAT website for Botswana. The data is tracked annually and describes consumption of foods per capita for a country. Per capita food consumption is obtained by dividing total food consumed by the total population hence, is a crude estimate of consumption and does not take into account wastage, losses in storage, urban/rural distribution differences or distribution differences within households (Ronquest-Ross, 2014). In this paper, food items are grouped into: (1) cereals; (2) meat, eggs, fish and milk; (3) vegetables, fruits and nuts (4) fats and oils; (5) sugar and stimulants (tea and coffee) and these were analyzed for intervals of five years from 1966 to 2011, in order to determine the consumption trend of each food category over the specified time period.

## **Results and Discussion**

### *4.1 Cereals*

While cereals form an important part of diet among many households particularly for poor households world-wide (Abdelrahman, 1998; Basavaraj and Rao, 2011; Olwande, 2012; Ranum et al., 2014), according to results presented in Table 1 below, for Botswana there seem to have been a decline in cereal consumption annually per kg, per capita. From 1966 to 2011, the results suggest that cereal consumption declined by 5.4 %. Partly, the decline was driven by decreasing trends in consumption of maize and sorghum while there continued to be an increasing pattern for millet and wheat. While wheat is an imported commodity in all of Africa as compared to sorghum and maize, an increasing pattern in wheat consumption has also been observed in African countries (Macauley, 2015; Sekholi and Morojele, 2016). Largely, such a pattern is due to changing food preferences and socio-economic change associated with urbanization while for the maize and sorghum, despite increases in their consumption, due to environmental conditions and resource constrained low-input farming systems, there has been a decrease in crop productivity of these crops (Basavaraj and Rao, 2011; Macauley, 2015).

**Table 1: Cereal consumption in Botswana assessed by FAOSTAT Food Balance Sheet (FBS)**

Food item	FAOSTAT FBS (kg/capita/year)										% change (1966 – 2011)
	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011	
Total cereals (excl. beer)	121.2	135.9	121.2	123.2	146.5	105.5	124.3	111.1	112.6	114.7	-5.4
Wheat	8.6	12.5	21.0	27.7	21.2	26.9	30.5	30.9	34.8	35.9	317.4
Rice	0.0	0.0	1.1	1.8	4.1	4.3	7.0	10.5	12.8	10.9	-
Barley & products	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-
Maize & products	41.9	52.2	54.0	65.5	72.8	44.9	38.4	43.1	37.5	35.6	-15.0
Rye & products	0.0	0.0	0.0	0.0	0.0	0.9	0.1	0.1	0.0	0.6	-
Oats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	-
Millet & products	0.4	7.5	3.5	1.5	0.8	0.7	1.2	0.0	0.2	0.7	75
Sorghum & products	70.4	63.7	39.9	20.9	38.9	26.6	35.1	25.6	25.31	24.0	-65.9
Cereals, other	0.0	0.0	1.7	6.2	9.0	1.2	12.0	0.9	1.90	6.2	0.0

Source: Author’s calculations using FAO Food Balance Sheet (FBS) data for Botswana.

#### 4.2 Meat, eggs and Fish

As standard food based dietary guidelines recommend that for protein giving foods, either chicken, fish, meat, milk or eggs should be eaten daily, we found that over time, this has been upheld by Batswana. Overall we find that between 1966 and 2011, meat consumption has increased by 0.3 % and such increase has largely been driven by consumption of poultry meat, other meat and then pig meat. Particularly, while a decline was observed in consumption of bovine meat and that of goat and mutton, we observe in Table 2 that Batswana consumed 4.7 kg of poultry meat per annum more in 2011, than they did in 1966. While there is an increasing trend in the consumption of meat, there has been a reduction in the consumption of offals by 45 %. This is in contrast to the pattern that is observed in South Africa by Ronquest-Ross et al. (2014). In the study by Ronquest-Ross et al. (2014), they observed an increase in the consumption of both meat and offal.

Our findings also suggest that while fish, eggs and milk also play an important role in the diet of Batswana, fish and eggs show to be of major importance than milk. From 1966 to 2011, consumption of milk for example, saw an increase of about 14 % from 1966 to 2011 while fish and eggs increased by over 100 %. Similar patterns of meat consumption are also documented by Ofwona (2013) when examining patterns of food consumption among Kenyan households using the 2005-06 Intergrated Household Budget Surveys. Hence, these increasing patterns towards protein in the form of meat, eggs, fish and milk in different countries, underscores the fact that these food stuffs have always been an important part of human diet

and remain central to most meals in different countries.

**Table 2: Total meat, eggs and fish consumption in Botswana assessed by FAOSTAT Food Balance Sheet (FBS)**

Food item	FAOSTAT FBS (kg/capita/year)										% change (1966 – 2011)
	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011	
Total meat	29.7	39.7	15.9	15.3	14.2	31	31.1	20.8	25.5	29.8	0.3
Bovine meat	18.3	27.8	4.9	6.0	4.8	14.7	15.7	3.6	10.9	8.0	-56.3
Mutton & goat meat	4.5	5.6	3.9	3.0	3.6	4.9	5.0	4.3	4.0	3.9	-13.3
Pig meat	0.4	0.8	0.6	0.3	0.4	0.9	1.2	0.7	0.4	0.6	50
Poultry meat	0.5	0.3	1.0	1.6	1.9	5.4	4.7	5.5	3.3	5.2	940
Meat, other	6.0	5.2	5.5	4.4	3.5	5.1	4.5	6.7	6.9	12.1	101.7
Total offal	7.1	6.7	7.0	5.5	5.5	4.1	4.2	3.1	3.1	3.9	-45.1
Total eggs	0.7	0.5	0.9	1.0	0.8	1.5	0.7	2.7	2.3	2.0	185
Total fish and seafood	1.0	1.5	1.9	3.7	3.0	7.4	3.0	3.6	2.5	3.1	210
Total dairy(excluding butter)	87.2	82.2	80.6	90.8	100.1	124.8	114.4	142.3	90.6	100.0	14.7

Source: Author’s calculations using FAO Food Balance Sheet (FBS) data.

#### 4.3 Fats and Oils

In line with studies that have reported an increasing trend in consumption of fats and oils (Ofwona, 2013; Ronquest-Ross et al., 2014; Kearney, 2010), our paper finds an increase in consumption of oil but a decrease in consumption of animal fat. While from a health perspective an increase in oil consumption would be worrisome, what is commendable is that this increase is on consumption of oil that has either been extracted from crops or vegetable crops hence, tend to be a better alternative to oil (or fats) extracted from animals.

**Table 3: Total fats and oil consumption in Botswana assessed by FAOSTAT Food Balance Sheet (FBS)**

Food item	FAOSTAT FBS (kg/capita/year)										% change (1966 – 2011)
	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011	
Total animal fats	1.4	1.5	1.5	1.2	1.2	3.7	1.3	0.7	0.8	1.0	-28.6
Total oil crops	1.6	1.8	3.4	5.1	4.3	7.2	7.6	6.5	9.0	10.3	543.8

Source: Author’s calculations using FAO Food Balance Sheet (FBS) data.

#### 4.4 Vegetables, Fruits and Nuts

With the exception of pulses, results presented in Table 4 suggest a positive trend in consumption of fruits, vegetables, nuts and starchy roots. Consumption of vegetables saw an

increase of around 113 %, largely driven by consumption of other vegetables besides tomatoes and onions. For starchy roots, consumption of potatoes contributed more to the positive trend observed in this food category while for fruits, oranges are the main contributors to that food category. From a health perspective, the relative increase in consumption of fruits and vegetables as compared to consumption of meat and fats and oils is commendable and to some extent could be signaling adoption of healthier eating lifestyles among Botswana, though a lot still needs to be done given the current increasing trend of non-communicable diseases in the country some of whose risk factors are attributed to consumption of these food items.

**Table 4: Total vegetables, fruits and nuts consumption in Botswana assessed by FAOSTAT Food Balance Sheet (FBS)**

Food item	FAOSTAT FBS (kg/capita/year)										% change (1966 – 2011)
	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011	
<b>Total vegetables</b>	17.3	16.9	18.9	23.1	19.4	29.9	25.6	34.6	26.1	36.9	113.3
Tomatoes	0.0	0.0	0.0	0.0	0.0	2.6	3.1	4.5	5.5	1.9	-
Onions	2.3	1.4	1.6	1.2	1.8	2.1	2.8	3.3	2.4	2.3	0.0
Vegetables, other	15.0	15.5	17.3	21.9	17.6	25.2	19.7	26.8	18.2	32.7	118
<b>Total fruits, excl wine</b>	12.0	12.0	12.5	15.5	13.6	39.0	33.2	46.5	42.9	47.0	291.7
Oranges, mandarin	2.0	1.4	1.6	1.7	1.9	9.2	7.1	11.1	2.9	9.5	375
Lemons, lime	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	-
Grapefruit	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.1	0.2	-
Citrus, other	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.4	0.1	0.6	-
Bananas	0.0	0.0	0.0	0.0	0.0	1.9	1.8	5.5	3.2	3.2	-
Apples	0.0	0.0	0.0	0.0	0.0	3.5	3.0	5.0	4.5	3.5	-
Pineapples	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	-
Grapes	0.0	0.0	0.0	0.0	0.0	0.7	1.2	0.3	0.6	0.7	-
Fruits, other	10.0	10.6	10.9	13.8	11.7	22.8	19.8	23.8	31.3	29.1	191
<b>Total pulses</b>	14.6	14.3	17.9	14.6	11.8	12.1	12.6	13.6	5.1	4.6	-68.5
Beans	0.0	0.0	0.0	0.0	0.0	0.2	2.2	2.4	1.4	3.2	0.0
Peas	0.0	0.0	0.0	0.0	0.0	0.1	1.3	1.1	0.2	0.0	0.0
Pulses, other	14.6	14.3	17.9	14.6	11.8	12.2	9.1	10.1	3.5	1.4	-90.4
<b>Total tree nuts</b>	0.3	0.6	0.3	0.2	0.0	0.4	0.6	1.3	0.4	1.4	366.7
<b>Total starchy roots</b>	48.4	57.8	47.0	44.6	45.5	52.8	52.7	58.5	57.6	52.9	9.3
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
Potatoes	1.0	11.1	1.7	2.0	3.1	11.2	10.2	12.7	14.1	9.4	840
Sweet potatoes	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.1	0.4	
Roots, other	47.4	46.7	45.3	42.6	42.4	41.4	42.4	45.4	43.4	43.0	-9.3

Source: Author's calculations using FAO Food Balance Sheet (FBS) data for Botswana.

#### 4.5 Sugar and Stimulants

Consumption of stimulants in Botswana has increased by 90 % between 1966 and 2011. Since most of the retail super-markets in Botswana are South African based, food items that are sold in these stores sell similar products that are found in South Africa. For this reason, the tea market is divided into black tea (making a higher %age), rooibos while specialty tea takes the

remainder (Durham, 2011).

Botswana is one of the many developing countries that have not yet considered sugar tax in order to curb consumption of sugar. However, the results presented in Table 5 are worrisome and a cause for concern to public health policy with regards to the escalating prevalence of non-communicable diseases that are observed in the country. Table 5 suggests for instance, that there has been a positive trend in consumption of sugar (raw sugar) and sweeteners (honey) of about 82 %. Such positive trends have also been documented for South Africa though at a relatively lower value of 7.1 % (Ronquest-Ross et al., 2014) yet unlike Botswana, South Africa is in considering introducing sugar tax in April 2017 as efforts to promote preventive behavior by reducing consumption of sugar.

**Table 5: Total sugar and stimulants (coffee and tea) consumption in Botswana assessed by FAOSTAT Food Balance Sheet (FBS)**

Food item	FAOSTAT FBS (kg/capita/year)										
	1966	1971	1976	1981	1986	1991	1996	2001	2006	2011	% change (1966 – 2011)
<b>Total sugar</b>	16.4	16.6	17.4	21.9	22.8	27.4	22.2	24.4	29.7	29.9	82.3
Sugar cane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar (raw equivalent)	15.8	16.1	15.3	18.4	19.1	19.8	20.8	21.3	26.9	25.7	62.7
Sweeteners	0.6	0.5	2.1	3.5	3.7	7.6	1.4	3.1	2.8	4.2	600
Honey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total stimulants</b>	1.0	1.1	1.6	1.5	1.2	1.4	1.8	1.4	0.7	1.9	90
Coffee	0.0	0.0	0.2	0.5	0.4	0.5	0.9	0.6	0.6	1.0	0.0
Tea	1.0	1.1	1.4	1.0	0.8	0.9	0.9	0.8	0.1	0.9	-10
<b>Total spices</b>	0.0	0.0	0.2	0.6	0.3	0.5	0.6	0.7	0.7	1.5	

Source: Author’s calculations using FAO Food Balance Sheet (FBS) data for Botswana.

## Conclusion

The aim of this paper was to analyse changes in food consumption patterns in Botswana for the period from 1966 to 2011 and examine which food items constitute a larger portion of each different food category. In this regard, the results reported in this paper suggest an increase in consumption of protein-giving foods over time and so was an increase suggested for fruits and vegetables and oils. Worth noting is that consumption of vegetables is observed to have increased relatively much more than the increase in consumption of meat – finding that is good from public health perspective. Also good to note is that the consumption of oil is more towards oil that has either been extracted from trees or vegetables. However, what is more of a cause for concern is an increasing trend in consumption of sugar either in raw form or in sweeteners. This is worrisome given that some non-communicable diseases such as Type II diabetes, tend to be associated with a high intake of sugar. A deeper analysis of this finding is however needed particularly, at a household level to examine whether this result of an increasing pattern of sugar consumption will still be observed when data is disaggregated to the household level. This will guide policy on what possible interventions need to be undertaken in the country to promote preventive behavior by curbing consumption of some

diet that are considered as risk factors for non-communicable diseases which seem to be on the rise in the country.

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