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Food availability and food habits among Ghanaians: Tracking the dietary transition in Ghana

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Abstract

Background: Although extreme hunger has reduced significantly, people are eating nutrient-poor cheap foods that are unhealthy and environmentally unsustainable. Even though dietary practices are changing in Ghana, there is minimal national-level analysis of the changes and their implication for population health. **Aim:** This study describes shifts in food availability and consumption in Ghana from 1983–2013. **Methods:** Data from the Food and Agriculture Organisation (FAO) food balance sheets and a scoping review were used. Descriptive analysis was conducted in excel for the FAO data, and Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews recommendation was followed for the scoping review. **Results:** The availability of total calories increased from 1527 kcal in 1983 to 3016 kcal in 2013, representing 608 kcal above the daily recommended allowance for women. Sugar and sweeteners was the food group with the highest increase of 1075%. Vegetables contributed the least to food availability, with less than 40 kcal a day. Rice contributed the most to food availability among cereals (56 kcal in 1983 to 304 kcal in 2013), replacing maise as the primary cereal. **Conclusion:** After the 1983 famine, there were significant increases in food availability in Ghana. The provision of rice, sugars and tubers meant to end hunger, changed dietary patterns and has resulted in low dietary diversity, high energy intake and overweight/obesity. Therefore, there is a need to intervene and increase the availability of other food groups.

Keywords

Food availability, Food consumption, Food environment, Eating behaviours, Nutrition transition, Ghana

Introduction

Globally, there is a shift in nutrition behaviour and outcomes due to the change from traditional food systems to modern food systems (Campbell et al., 2017). The transformation of food supply systems has facilitated a change in national and community food availability (Friel et al., 2020). Personal dietary choices are affected by food availability (Johnson et al., 2012). Food availability determines the type, quality and quantity of food residents have access to and are most likely to consume (Dake et al., 2016). Although extreme hunger has reduced significantly, food habits are unhealthy and environmentally unsustainable (Godfray et al., 2010; Gordon et al., 2017; Willett et al., 2019). The unhealthy food habits have resulted in a high prevalence of obesity, hypertension and diabetes, and stunting and micronutrient deficiencies (Gil et al., 2019; International Food Policy Research Institute, 2016). These shifts have negative implications for population health, mortality and environmental sustainability (Von Grebmer et al., 2017; Willett et al., 2019).

Ghana is experiencing malnutrition and an epidemiological transition (Agyei-Mensah and de-Graft Aikins, 2010; Kushitor et al., 2020). National surveys report high rates of obesity, undernutrition, micronutrient deficiency, hypertension, diabetes and other non-communicable diseases (NCD) (Jones et al., 2018; Lartey et al., 2019; Sanuade et al., 2018). In 2013, NCDs contributed 22.2% to mortality at the Korle-Bu Teaching Hospital (Sanuade et al., 2014). In 2014, only one out of three women had normal weight and was not anaemic (33%) (Kushitor

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et al., 2020). Due to inadequate funding, infrastructure, lack of human resources and other challenges, the health system cannot provide adequate care for persons living with NCDs (de-Graft Aikins et al., 2014; Kushitor and Boatemaa, 2018).

Food availability is one of the significant systemic drivers of the change in the epidemiological transition in Ghana. Yet, national-level analysis of food availability is limited due to the lack of data. Sub-national studies have reported the over-abundance of unhealthy foods but limited healthy foods (Buxton, 2014; Dake et al., 2016). This has resulted in low consumption of fruits and vegetables (Amo-Adjei and Kumi-Kyereme, 2015), high intake of sugary drinks (Vuvor and Harrison, 2017) and risky food beliefs (Boatemaa et al., 2018). This study addresses this gap by using national data from the Food and Agriculture Organisation (FAO) to examine the quanitites and types of food available in Ghana over a given period.

Policy programmes through the Ministry of Health, such as the National Health Policy of 2007 and the NCD Policy of 2012, have been developed to address unhealthy dietary practices and food availability challenges (Ministry of Health, 2007). However, the impact of these policies on food availability has been limited (Laar et al., 2019). Best practices on food price, food retail, promotion of unhealthy food to children and food availability were given low ratings by an expert panel of reviewers (Laar et al., 2019). At the socio-cultural level, the importance of food in the production and shaping of identities, mainly wealth and socioeconomic status, modernity and youthfulness, has reshaped how individuals use and consume the foods available to them. Yet, the evidence of these in the Ghanaian context is fragmented. With this paper, I make two significant contributions. First, I examined food availability and the changes that have occurred over two decades in Ghana to demonstrate how the country transitioned from a period of hunger to abundance. Second, I demonstrate how food habits have been reshaped to suit the current food availability in the country. The findings are essential for monitoring food availability and improving nutrition and health outcomes.

Table 1. Selected food groups and food items from the FAO FBS based on the West Africa food composition table used in this study.

Food group	Food items
Animal products	Bovine meat, mutton and goat, meat, pigmeat, poultry meat, eggs, milk excluding butter, fish/seafood
Cereals excluding beer	Wheat and products, rice (milled equivalent), maise and products, millet and products, sorghum and products
Starchy roots	Cassava and products, sweet potatoes, yams, roots others
Vegetables	Tomatoes and products, onions, vegetables other
Fruits	Oranges, lemons, limes and products, bananas, plantains, pineapples and products, fruits other
Sugar and artificial sweeteners	Sugar, raw equivalent, sweeteners, others

Methods and materials

Food and Agriculture Organisation food balance sheets

This study used data from the Food Balance Sheets (FBS) developed by the FAO (http://faostat.fao.org) and selected papers and reports on food availability in Ghana. The FAO's FBS has comprehensive information for single food items and food groups. This data has been available since 1961, and it is updated annually. This study used data on Ghana from 1983 to 2013. At the time of this study, the data were available up to 2013—the FAO data provided per capita data for different food groups and items. The West African Food Composition Table guided the food groups and food items selected for the analysis from the FBS (Food and Agriculture Organisation, 2012) (Table 1).

Ghana experienced severe famine in 1983 due to droughts, wildfires and other environmental shocks (Dei, 1988; Editorial Staff, 2013). With 1983 as the starting year, data for every five years were selected. FBS data for 1983, 1988, 1993, 1998, 2003, 2008 and 2013 were selected and downloaded for each year into excel. The data were analysed using frequencies and estimation of per cent change.

Scoping review

Scoping reviews have been recommended as the most suitable approach when a review aims to identify key characteristics related to a concept (Munn et al., 2018). In this paper, the goal of the scoping review was to give context to the FAO data. The review was guided by the methodology proposed by Arksey and O'Malley (Arksey and O'Malley, 2005). The following steps were followed in the scoping review (i) identifying the research question, (ii) identifying relevant studies, (iii) selection of eligible studies, (iv) charting the data, and (v) collating and summarising the results. The research question of the review was to identify the food habits and beliefs associated with the FAO food items. This included examining how the items are produced and consumed, and the social-cultural values associated with them.

Academic papers and reports were selected through Web of Science. Each of the food groups was combined with the search term availability, production and use in Ghana. Examples of the search terms included "cereal production Ghana", "fruit availability Ghana" and "use of tubers Ghana." The period of the search was 1983–2019. The titles and abstracts of the papers were screened. Articles

Table 2. Papers selected for the scoping review and study findings relevant to study objectives.

Author and year	Food production and availability	Food utilisation
Ackah et al., 2014a, 2014b		Yam customs and traditions in Ghana
Aidoo et al., 2009		Household expenditure and use of diary in Ghana
Akpene, 2017		Food preference of street food consumers in Ho
Al-Hassan and Adaku, 2014	Local production of chicken and its high price relative to imported chicken	
Amo-Adjei and Kumi-Kyereme, 2015		Consumption of fruits and vegetables in Ghana
Angelucci, 2013	Production of sorghum in Ghana	Dietary uses of sorghum
Ashitey, 2017	Quantity of poultry imported into Ghana; chicken parts imported into the country	
Asuming-Brempong et al., 2011	Rice policy, the price of imported rice versus locally produced rice	
Banson et al., 2015	The cost of producing broilers in Ghana	
Boatemaa et al., 2018		Perceptions of healthy and unhealthy food habits and food preferences
Buxton, 2014		Adolescents intake of fruits and vegetables
Christian et al., 2019		Dietary diversity and food insecurity in rural areas
Dake et al., 2016	Spatial analysis of food availability in poor urban communities and the risk of overweight and obesity	
de-Graft Aikins, 2014		Pregnancy food beliefs and related foods
Graham and Klomegah, 2019		Dietary practices, frequency of food consumption in urban areas and food governance
Hiamey et al., 2015		Use of street food by market traders
Mensah et al., 2002		Safety of street foods
Nkegbe et al., 2013		The consumption level of different meat products in Ghana
Omari et al., 2013		Characteristics of fast foods in Accra
Osseo-Asare, 2002		Foodways of Ghanaians
Poku et al., 2018	Seed variety challenges for maise farmers in Ghana	
Ragasa et al., 2014	Maise productivity in Ghana	
United Nations Conference on Trade and Development (UNCTAD), 2017	Commodity dependence in Ghana	
United States Agency for International Development (USAID), 2019	Production of orange-fleshed potatoes in Ghana	
Vuvor and Harrison, 2017		Use of soft drinks among adolescents and its metabolic impact
Weible and Pelikan, 2016	Chicken imports and their impact on the domestic poultry industry	

were selected if they focussed on food production, consumption and beliefs. The study must also have been conducted among Ghanaians living in Ghana. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018) recommendation and the PRISMA-P chart method (Moher et al., 2015) were followed.

A hand search was conducted for reports by institutions (such as the FAO, Crop Research Institute, United States Agency for International Development (USAID), International Food Policy Research Institute (IFPRI)). The reports of these institutions were automatically selected because of their history of agricultural interventions in Ghana. The most recent search was March 2019. A total of 1038 papers were title screened after removing 108 duplicates. The abstracts of 150 articles were reviewed, and 25 were selected for inclusion in the scoping review. To chart the data, a form was created to capture the title of the study, type of publication, the aim of the study, study setting and population, sampling method, data collection and analysis, and most relevant findings. A thematic

analysis approach was adopted for the analysis. The data was analysed under the following themes: food production, type of product, and uses of each food group and item (Table 2). The full-text papers were then coded based on the absence or presence of these themes.

Results

Total calories

Per capita availability of total calories has increased over two decades (Figure 1). Total calories increased by 97% between 1983 and 2013 (1527 vs. 3010 kcal/capita/day). The Ministry of Health recommends 2040 kcal per day for women (Ministry of Health, 2010). Between 1983 (1527 kcal/capita/day) and 1988 (1912 kcal/capita/day), the calories available per day was below the recommended daily allowance. But in 2013, calories available had increased to 3016 (kcal/capita/day), over 608 (kcal/capita/day) above the daily recommended allowance. The findings show that Ghana has made progress in increasing food availability since the 1983 famine.

Changes in energy available from food group 1983 and 2013

Starchy roots and cereals provided the highest calories over the period (Table 3). While there was a marginal increase of 37% in animal source foods (ASF), sugar and sweeteners had a 1 075% increase over the period. Over the years, vegetables had the most minor contribution to food availability, providing less than 40(kcal/capita/day).

Animal source foods. Per capita availability of animal source foods increased marginally over the period (Table 3). Calories from ASFs increased from 103 (kcal/capita/day) in 1983 to 141 (kcal/capita/day) in 2013. Fish and seafood have been the dominant ASF consumed in Ghana (58 kcal/capita/day in 2008) (Table 4). Most of the fish are locally produced through wild harvesting from the sea and freshwater bodies, and aquaculture. Some of the popular species are tilapia, herrings, sardines, tuna, mackerel, and shrimps. Frying, drying, smoking, and grilling are the most common cooking and preservation methods (Osseo-Asare, 2002).

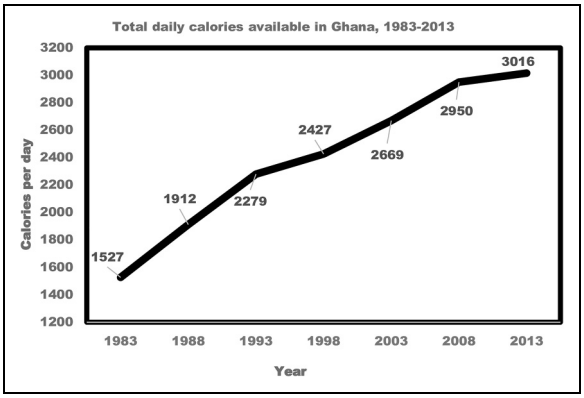

Figure 1. Total calories available per day in Ghana, 1983–2013.

The availability of poultry increased significantly from 3 kcal/capita/day to 9 kcal/capita/day between 1998 and 2003. Poultry meat has become a versatile ASF in Ghanaian meals (Nkegbe et al., 2013). Ghana does not produce much of it, and the majority is imported, frozen chicken parts, thighs, wings, feet and gizzards (GNA, 2018). Between 1998 and 2004, poultry imports increased from 4000 tonnes to 124,000 tonnes (Banson et al., 2015). In 2013, 170,600 tonnes of poultry were imported, the quantity was three times higher than domestic production (Weible and Pelikan, 2016). Imported poultry are relatively cheaper than locally produced chicken (Ashitey, 2017). Over ten years (2001–2010), the price gap between local and imported chicken was 60.4% (Al-Hassan and Adaku, 2014). Frozen chicken is served by high-end restaurants as well as street food vendors such as the *check check* (cheaper kiosk versions of fast food) and *chop bars* (traditional eateries) (Agyei-Mensah and de-Graft Aikins, 2010). Chicken has become a common ASF at daily family meals and special occasions. The availability of bovine meat, mutton and eggs have been relatively steady. Milk availability has increased because of its use in breakfast meals (porridge and beverage) and as baby food for children after six months. The common type available is evaporated tinned milk, followed by yoghurt and powdered milk (Aidoo et al., 2009).

Cereals. Cereals form part of the staple foods consumed in Ghana. Over the years, maise, wheat and rice have been the dominant types consumed. In 1983, maise was the foremost cereal (Table 4). Maise was the second-highest cereal available in 2013. Most of the maise is locally produced. According to IFPRI, maise accounts for 50% of cereals produced in 2014 in Ghana (Ragasa et al., 2014). However, there is a production deficit. Average maise yields are 2–3 times below the expected yield (Ragasa et al., 2014). Therefore, the Crop Research Institute and Harvest Plus project are improving the nutritional value and yield of maise with the high lysine maise (*Obatampa*) and Vit A maise interventions (Poku et al., 2018). The whole maise is used to make local staples such as *kenkey* (sourdough dumpling), *banku*, *apkle* (cornflour pudding), *apaparansa* (roasted corn flour cooked in palm nut soup with beans) and porridge (Mensah et al., 2002).

In 2013, rice contributed the most to food energy among cereals. The calories available per day increased from 56 kcal in 1983 to 304 kcal per day in 2013 (Table 4). The rapid increase started in 2003 when there was a 170% increment in calories available from the previous year (1998). A third of the rice consumed in Ghana is imported polished white rice from Asia and the Americas (Asuming-Brempong et al., 2011). Rice is used to prepare *jollof rice* (rice boiled in tomatoes stew), plain rice, rice

Table 3. Contribution of food groups to food availability in kcal/capita/day.

Year	Animal Products	Cereals - Excluding Beer	Starchy Roots	Vegetables	Fruits - Excluding Wine	Sugar and Sweeteners
1983	103	354	606	13	151	12
1988	105	427	751	14	197	79
1993	110	629	963	17	191	80
1998	121	498	1175	31	249	43
2003	113	623	1170	21	269	69
2008	135	724	1140	20	344	95
2013	141	725	1171	32	363	141
% Change 1983-2013	36.9	105	93.23	146	140.4	1075

balls, fried rice, rice porridge and *waakye* (boiled rice and beans). These meals are staples sold by street vendors, restaurants and also made at home (Dake et al., 2016; Hiamey et al., 2015; Mensah et al., 2002; Rheinländer et al., 2008). These rice meals are consumed at breakfast, lunch, and supper.

Wheat is predominantly consumed as bread, followed by pastries, biscuits, and cakes. Refined wheat flour is very common and used to make butter bread, sugar bread and tea bread for breakfast porridges, beverages and snacks. Whole wheat bread is also available, but its production and consumption are relatively low compared to refined wheat bread.

The consumption of millet has reduced over the years, from 62(kcal/capita/day) to 36(kcal/capita/day) between 1983 and 2013. Almost all the millet is consumed as breakfast porridge and sold by street vendors. The availability of sorghum has fluctuated across the years. Between 1983 and 2013, only a 2% increase was recorded. According to the FAO, sorghum production has been reduced because government interventions have been devoted to maise production in Northern Ghana (Angelucci, 2013). Sorghum is used to prepare meals such as *tuo zaafi* (sorghum meal/corn dough cooked with cassava flour), porridge and *masa* (fried fermented sorghum), as well as a local beer called *pito* (Angelucci, 2013).

Fruits. The FBS data shows that oranges, bananas, and pineapples are the most consumed fruits. Energy from oranges increased from 8 kcal per day to 19(kcal/capita/day) between 1983 and 2013 (Table 4). Similar trends are available for pineapple: it increased from 2(kcal/capita/day) in 1998 to 20(kcal/capita/day) in 2013. Most of these are produced locally. Fruits are consumed mainly as snacks from street vendors (Hiamey et al., 2015). When in season, oranges are affordable and cost less than the equivalent of $0.19 per one.

Sugar and sweeteners. Data were available for raw sugar and artificial sweeteners from the FBS. The energy available from raw sugar increased from 12(kcal/capita/day) in 1983 to 80(kcal/capita/day) in 1993. In 2007, sugar availability reduced to 43(kcal/capita/day) from 80(kcal/capita/day) in 2004. By 2013, the energy available from sugar stood at 1369(kcal/capita/day). The sugars might be coming from raw sugar in the form of sucrose added to porridge and beverages by individuals and from the consumption of sugar-sweetened beverages. In 2013, sugar was the fourth largest food commodity imported into Ghana (Ministry of Trade and Industry, 2019).

Tubers. Cassava was the commonest tuber consumed. It is used to make *fufu* (cassava pudding), *gari* (cassava grits) and *banku* (cornmeal and cassava dough pudding). Yam is the second most-consumed tuber. Preference has been shown for white yams over yellow yams (Ackah et al., 2014a, 2014b). Other tubers such as cocoyam and sweet potatoes are also consumed in Ghana. Recently, orange-fleshed sweet potato is being promoted in the country to solve Vitamin A deficiency (USAID, 2019).

Vegetables. The vegetable data component from the FBS had information on the availability of onions, tomatoes, and other vegetables. Tomatoes and onions provide less than 20(kcal/capita/day). In particular, the availability of other vegetables such as the fruited pumpkin, bottle gourd, African cucumber and vegetable sponge in Ghana has been reducing over the years 22(kcal/capita/day) in 1998 versus 8(kcal/capita/day) in 2013. There is now the availability of foreign vegetables such as cabbages, carrots, lettuce, cucumbers etc. Ghana's leafy green vegetables include cocoyam leaves, okro, ayoyo (jute leaves), and *alefu* (African spinach). Information about these vegetables were not provided in the FBS.

Discussion

This study examined trends in food availability in Ghana from 1983 to 2013 using the FAO's food balance sheet dataset. The findings show that after the 1983 famine, there were significant increases in food availability in Ghana. The highest increase was recorded for sugar and sweeteners. The results indicate that the highest contributions to calories are carbohydrate-rich foods such as rice and tubers. The scoping

Table 4. Calories available from food items in Ghana, 1983–2013.

	Kcal per capita per day						
Food group	1983	1988	1993	1998	2003	2008	2013
Animal source foods							
Bovine meat	10	8	13	6	7	8	5
Mutton and goat meat	3	3	3	3	5	6	7
Pigmeat	7	7	6	7	7	8	9
Poultry meat	1	1	2	3	9	12	19
Eggs	2	2	2	3	3	4	4
Milk - excluding butter	6	5	5	8	10	15	13
Fish, Seafood	44	54	54	69	50	59	58
Cereals							
Wheat and products	70	89	106	85	88	133	109
Rice (Milled Equivalent)	56	80	152	79	213	264	304
Maize and products	113	129	199	173	187	199	222
Millet and products	62	64	61	57	52	51	36
Sorghum and products	52	65	110	102	80	76	53
Fruits							
Oranges, mandarines	8	3	5	11	12	17	19
Lemons, limes, and products	1	1	0	1	1	0	1
Bananas	0	0	0	1	1	4	5
Plantains	139	190	182	234	252	317	311
Pineapples and products	0	0	0	1	1	2	18
Fruits, other	2	2	2	2	2	3	8
Sugar							
Sugar (raw equivalent)	12	79	80	43	68	94	136
Sweeteners, other	0	0	0	0	0	2	5
Tubers							
Cassava and products	323	448	626	707	674	633	642
Sweet potatoes	0	0	0	13	14	12	13
Yams	170	152	191	290	324	367	437
Roots, Other	114	151	146	165	157	127	79
Vegetables							
Tomatoes and products	2	3	4	6	8	11	16
Onions	2	2	1	2	2	2	7
Vegetables, other	8	9	12	22	12	8	8

review showed that these food items have been integrated into the food habits of Ghanaians. This section explains the underlying drivers of the change in food availability.

Firstly, the findings can be explained by agricultural and trade policies designed at the global level and implemented by different governments to increase international trade (Odutayo, 2015). Examples of such policies include structural adjustment policies and the promotion of a private sector-led economy (Ackah et al., 2014a, 2014b). These policies resulted in the liberalisation of imports and privatisation of services. Food imports have increased rapidly and still constitute a significant proportion of all imports. In 2014–2015, 58% of all imports were food (UNCTAD, 2017). Rice and poultry have been predominant. Between 1998 and 2001, rice imports into Ghana surged more than two times (Paasch et al., 2007). Other interventions include lowering import taxes on rice, poultry, and other food imports between 2004 and 2008 (The Lens, 2005). As reported in different countries and Ghana, the impact of these trade policies have facilitated a change towards an industrial food system managed by multinational companies (50).

Secondly, urbanisation can also explain the findings. Between 1984 and 2010, the urban population increased in Ghana, and by 2010, about half of the population lived in urban areas (Owusu and Yankson, 2017). According to sub-national studies, the availability of rice, soft drinks, and frozen chicken is high in urban areas compared to rural areas (Dake et al., 2016). In urban centres, local and foreign fast-food restaurants (such as Papaya, KFC, Chicken Inn, Barcelos) have also specialised in the selling of these food items (Agyei-Mensah and de-Graft Aikins, 2010; Omari et al., 2013). With limited spaces and time for cooking in urban areas, most urban residents rely on these food vendors (Graham and Klomegah, 2019). In poor urban communities, buying cooked food from local food vendors is also a strategy to reduce food expenditure (Boatemaa et al., 2018).

Lastly, changes in dietary preferences can also explain the findings. Over the years, status symbols have been attached to imported foods, and such food items are desirable to own and consume (Osseo-Asare, 2002). This changed dietary preferences, which turned occasional meals such as rice, chicken, and soft drinks into everyday food items (Omari et al., 2013). These imported food items have even been added to recommended pregnancy foods. In 2015, women listed foods such as beverages (tea, Milo, Ovaltine, Horlicks), dairy products (milk, yoghurt), and biscuits (digestives, cream crackers) as essential foods to consume during pregnancy (de-Graft Aikins, 2014). Among adolescents, a high preference has been reported for sugar-sweetened beverages compared with natural fruit juices and sugar bread compared with whole wheat bread (Buxton, 2014).

This study is without limitations; while the FBS provides information about food availability for the country, the data are not segregated by locality and other socioeconomic characteristics. Yet, different population subgroups may experience these dietary patterns differently. For example, in Ho in the Volta Region, banku served with okra sauce is preferred over boiled yam/plantain (Akpene, 2017). When Ghana is experiencing nutrition and epidemiological transition (Agyei-Mensah and de-Graft Aikins, 2010; Agyemang et al., 2015), it will be essential for national-level surveys to incorporate in-depth dietary questions and provide analysis of such for appropriate policy recommendations. Such surveys can be sensitive to how food is produced and consumed in Ghana (de-Graft Aikins, 2014; Mensah et al., 2002). Furthermore, this review may have omitted some studies that describe only the technicalities of food production. These studies were excluded because they focused on agricultural techniques of food production.

The types of food available, as shown by the findings of this study, have implications for Ghana's ability to achieve the sustainable development goals (SDGs) 2 (zero hunger), 3 (good health and wellbeing) and 15 (life on land). The majority of the food items available belong to only a few food groups, which explains the low dietary diversity levels reported in the country (Christian et al., 2019). Without increasing dietary diversity, the government will be unable to address the four pillars of food security, namely availability, access, utilisation and stability (Gil et al., 2019). Despite the consumption of these energy-dense foods, physical activity among Ghanaians is low (Afrifa-Anane et al., 2015). The increasing consumption of these carbohydrate-rich foods without physical activity results in energy imbalance which will intensify the rising burden of obesity and related NCDs and inhibit the achievement of SDG3. Therefore, positive public health intervention will have to go beyond education and awareness creation to improve the availability of diverse foods and make such foods accessible. Finally, some food items available, especially rice and wheat are produced using a mono-cropping system. This system of farming destroys soil ecology by depleting the diversity of soil nutrients. Although most rice is imported, the current government has made great campaigns towards local production and consumption of locally produced rice (GNA, 2019). Thus, efforts to combat soil degradation must be included in the eat Ghana rice campaign.

Conclusions

This study examined trends in national food availability in Ghana from 1983–2013 using FAO Food Balance Sheets data and a scoping review. Between 1983–2013, food availability has increased in the country. Sugar, rice and chicken, were the food items with the highest increase during the period. Future research might examine community and household food availability and dietary assessments to clarify the pathway from food availability to consumer purchases and consumption. Such studies can determine food availability within different geographical areas (urban vs. rural, urban rich vs. poor urban communities) and socioeconomic population subgroups (middle income, poor, adults, adolescents). Given that food availability affects nutritional outcomes, this study suggests room for improving the diversity of the types of food available.

Availability of data and materials

The dataset supporting the conclusions of this article is available in the Food and Agricultural Organisation data repository. The website link is http://faostat.fao.org. The papers included in the scoping review are listed in the study.

Author contributions

The author is the sole author of this manuscript. She read and approved the final manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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