

Colonisation, the New World Order, and the eradication of traditional food habits in East Africa: historical perspective on the nutrition transition

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Abstract

Objective: To discuss factors which have underpinned the nutrition transition in the countries of East Africa, including Kenya, Uganda and Tanzania, from early colonisation to the current, oppressive political–economic structure.

Results: Colonisation and neocolonisation in accordance with the desires of the New World Order have ensured the systematic extirpation of indigenous and traditional food habits in East Africa. These indigenous and traditional food habits, associated with myriad health benefits, have been progressively replaced by the globalised food system of the multinational corporations, a system inherently associated with the creation of non-communicable disease (NCD) epidemics throughout this region and globally. While the simplification of the East African food culture may be most apparent today, the nutrition transition has actually occurred over the past 400 years, since the onset of colonial occupation.

Conclusions: It is imperative that greater efforts be directed towards exposing the colonial and neocolonial forces which have undermined food security and health status in East Africa. Heightened awareness of these forces is essential for proposing genuine solutions to the nutrition transition and related NCD epidemics throughout this region and, indeed, worldwide.

Keywords
Tanzania
Kenya
Uganda
Transnational
Multinational
International Monetary Fund
World Bank

Since the 1500s, when the imperial powers of Europe sought to rapidly expand their empires through the colonisation of sub-Saharan Africa, ancient indigenous knowledge, including an incredible wealth of knowledge about food habits, health and longevity, has progressively waned¹. Over the past several centuries, the methods implemented to excise this indigenous knowledge have generally shifted from the use of overt force (e.g. slavery, religious conversion, seizure of arable land and food supply)² to the implementation of a neocolonial, political–economic structure inherently designed to oppress through the creation of economic dependence^{3–6}.

The deleterious influence of these colonial and neocolonial forces in sub-Saharan Africa becomes glaringly evident with any legitimate inquiry into the root causes of the various disease epidemics currently afflicting the marginalised, indigenous people of this vast continent⁷. Over the past several decades, sub-Saharan Africa has experienced a rapid upsurge of non-communicable diseases (NCDs), which includes epidemics of obesity, diabetes,

cardiovascular disease (CVD) and various cancers⁷. Within the next 20 years, the region can expect a threefold increase in deaths due to CVD and a near threefold increase in the incidence of type 2 diabetes⁸. Further, NCDs have not replaced infectious and malnutrition-related diseases in sub-Saharan Africa: they coexist alongside classic nutritional deficiencies, famine and infectious diseases such as HIV/AIDS, resulting in a polarised and protracted double burden of disease^{9–12}. By 2020, it is predicted that NCDs will account for 80% of the global disease burden, and will cause 70% of deaths in developing countries⁷. The health-care systems in sub-Saharan Africa are either non-existent or are grossly inadequate to deal with this burgeoning double burden of disease and its myriad repercussions^{13–15}.

The NCD epidemics currently sweeping sub-Saharan Africa have been directly attributed to the nutrition transition, whereby traditional foods and food habits have been progressively replaced by the globalised food system of the multinational corporations^{10,16,17}. This transition in dietary practices has resulted in the increased consumption of refined flour, cheap vegetable fats, refined sugars and food additives such as monosodium

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glutamate¹⁸, all of which are known to hasten the development of the major NCDs (obesity, diabetes, CVD)¹⁹. In stark contrast, we have recently presented evidence that the traditional foods of East Africa, including a broad range of indigenous cereals, roots, tubers, fruits and vegetables, spices, animal fats, fish and wild bush meats, are associated with myriad health benefits, including protection against various NCDs²⁰. Thus, while the globalised food culture exerts a pathogenic effect^{21–23} and traditional foods exert a protective effect^{24–31}, it is the globalised food culture which continues to be propagated and adopted.

Development of the globalised food system, a system inherently connected to the global epidemics of NCDs, is rooted in the creation of policies and institutions which govern the production, trade, distribution and marketing of food^{32,33}. Currently, a handful of multinational corporations control this system and, as such, exert direct control over the creation of NCD epidemics. Control of the population by the transnational corporations is exerted by a scarcity-through-abundance philosophy. These corporations are as such committed to the eradication of quality whole foods (scarcity) and the widespread dissemination of insidious, low-quality processed foods (abundance)²⁰. This corporate philosophy is summarised succinctly by Ray Kroc, the founder of McDonald's, as cited in Eric Schlosser's *Fast-Food Nation*³⁴:

We have found out...that we cannot trust some people who are nonconformists... We will make conformists out of them... The organization cannot trust the individual; the individual must trust the organization.

Throughout history, external influences have brought about changes in African food culture^{35–37}. In centuries past, the overall objective of the colonial powers was to subjugate the population through the seizure of arable land and control of the food system. Control of the population via the globalised food system today continues to be inherent to the desires of the New World Order, an agenda for global hegemony driven by the multinational corporations, their political allies and the global elite, as exposed by innumerable authors^{3,4,38}. Indeed, the globalised food system has recently been described as a weapon of control³⁹. Susan George⁴⁰ revealed this perspective over 30 years ago, when she stated:

This is what food has become: a source of profits, a tool of economic and political control; a means of ensuring effective dominance over the world at large and especially over the 'wretched of the earth'.

While the simplification of African food culture may be most apparent today, the nutrition transition has actually occurred over the past 400 years^{34–37,41}. At present, there is an imperative need to investigate and disseminate information related to the factors historically responsible

for the nutrition transition in sub-Saharan Africa. Such inquiry is required to fully comprehend current NCD epidemics, and improve the health status of the marginalised indigenous people. The abatement of NCD epidemics could potentially be facilitated by the resurrection of the ancient, indigenous knowledge pertaining to traditional foods and food habits²⁰.

The purpose of the present article is to discuss factors which have underpinned the nutrition transition in the countries of East Africa, including Kenya, Uganda and Tanzania, from early colonisation to the current, oppressive political-economic structure. A conceptual framework which outlines the colonial and neocolonial contributors to the eradication of traditional food habits throughout East Africa over the past few centuries is provided in Fig. 1 and is discussed herein.

Ancient and traditional food habits of East Africa

Approximately 5000 years ago much of East Africa was occupied by hunter-gatherers commonly called the *ndorobo*⁴¹. These ancestors primarily consumed wild game, wild birds and eggs, wild fish, wild insects (e.g. grasshoppers, ants, caterpillars, termites) and wild plant foods (e.g. fruits, nuts, tubers, honey)⁴¹. The *ndorobo* were later assimilated by migrants and lost much of their cultural identity, which included the loss of these food habits⁴¹. Interestingly, Eaton and Konner³⁵, who have advanced awareness of dietary changes over several millennia in Africa, have concluded that the human diet was far superior with the hunting and gathering subsistence of palaeolithic times compared with the current globalised food system.

Agriculture in East Africa was pioneered by the Cushitic speakers arriving from the Ethiopian highlands and other cultivators arriving from the south, west (Bantu), and north-west (Nilotes) approximately 1000 years ago. During the initial stages of the agricultural age, nutrient-dense, indigenous grains and foods from pastured animals (e.g. milk, lard, offal and blood) became incorporated into the local diets⁴¹. The earliest food crops of agriculturalists in East Africa included sorghum, finger and pearl millets, hyacinth (*lablab*) beans, bambara groundnuts, bottle gourds, cowpeas and yams^{41–43}. These staple foods are associated with many health benefits²⁰. Cultivated and wild vegetables, especially wild green leaves including amaranth, black nightshade and red sorrel, as well as various other wild plant foods were important ingredients for sauces accompanying the carbohydrate staples⁴¹. The traditional East African diet was also based on high amounts of fat-soluble vitamins which enabled proper physical development, low susceptibility to chronic diseases, high tolerance to infectious diseases and an absence of tooth decay according to the investigations of Dr Weston A Price⁴⁴.

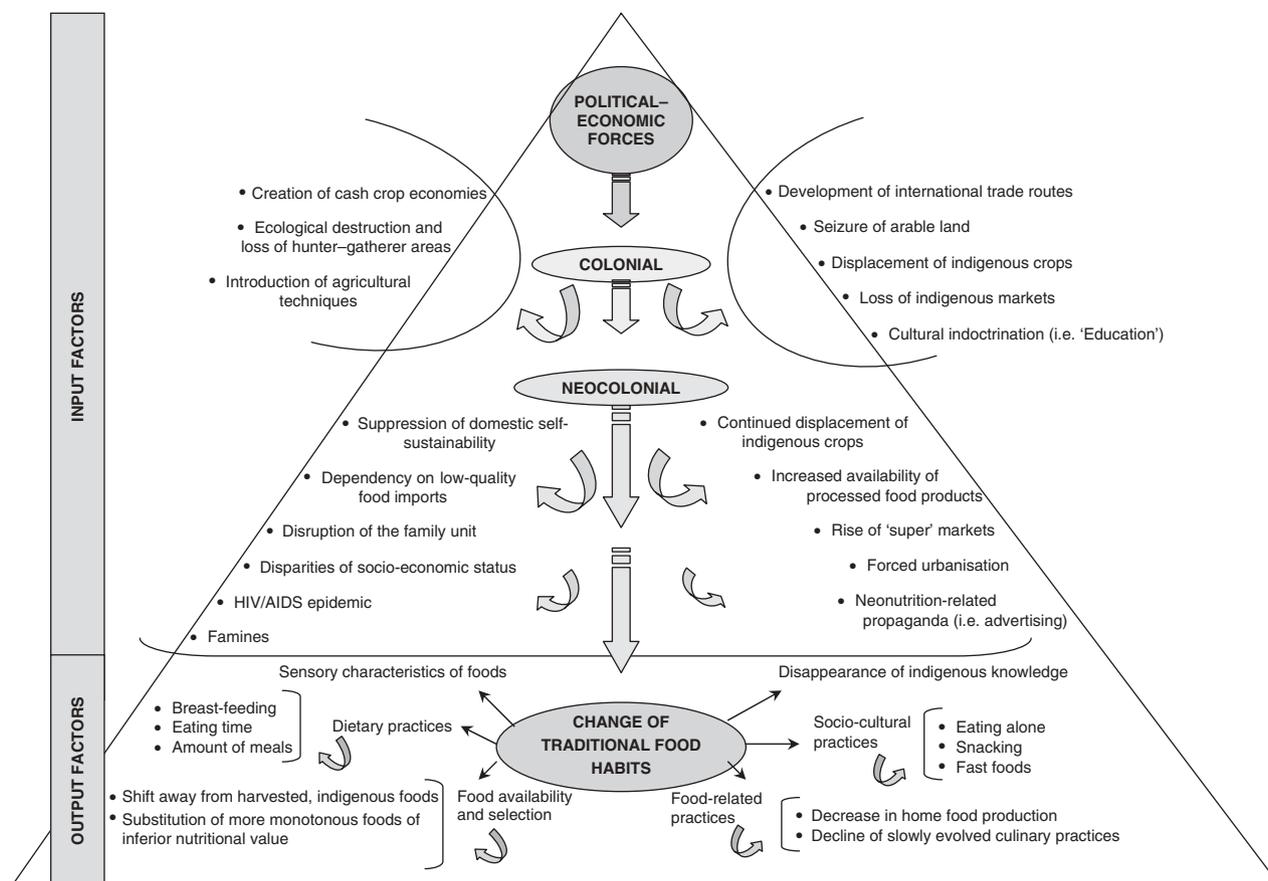


Fig. 1 Colonial and neocolonial factors related to the eradication of traditional food habits in East Africa

Colonisation and the nutrition transition

Development of international trade routes

Food habits in East Africa began to shift dramatically in the 1400s with the development of coastal trading towns, the creation of international trade routes⁴⁵ and the onset of European colonial occupation^{2,3,5}. Two distinct events in relation to international trade had a profound influence on the food habits of the East African population. The first was the discovery and use of the sea route to India and South-East Asia in the late 15th and early 16th century, and the second was the development of the international Columbian Exchange system which occurred with the ‘discovery’ of the Americas by Christopher Columbus in 1492⁴⁵.

Through trade with Asia, East African farmers acquired a number of crops, such as plantain, banana, cocoyam, coconut and sugar cane, which were rapidly assimilated into the local diets⁴¹. Columbian Exchange also led to the introduction of staple crops from the Americas, including, most notably, maize, rice, peanut (groundnut), tomato, sweet potato, English potato, kidney bean, pumpkin, cassava (manioc), European cabbage and kale (*Sumuka wiki*)^{41,46}. These particular foods proved to be ecologically sustainable and thus rapidly altered and diversified

the dietary intake of East Africans. Use of these introduced foods became widespread throughout the colonial period⁴¹, and the indigenous people commonly replaced indigenous crops with overseas varieties. Some of these introduced staple crops threatened to replace robust, nutrient-dense, indigenous crops including varieties of millet and sorghum spp.⁴⁷.

Seizure of arable land

Land pressures in Kenya, Tanzania and Uganda during colonisation fundamentally arose from colonial policies which enabled European settlers to seize control of so-called ‘empty lands’^{48,49}. These empty lands were in fact some of the best arable lands in East Africa^{48,49}. Driven from their lands, and denied equitable access to the natural resources, indigenous farmers were typically forced to congregate on small plots of marginal lands, which could not support agriculture⁴⁸⁻⁵⁰. The seizure of arable lands also resulted in reduced livestock ownership among the indigenous people⁵⁰. This loss of livestock drastically reduced intake of animal protein⁵⁰⁻⁵². Inadequate animal protein intake, resulting in a high prevalence of protein-energy malnutrition among the local, indigenous people of East Africa, has been well documented from the 1960s⁵³ to the present day⁵⁴.

Creation of cash-crop economies

By the end of the 19th century, the colonial powers (i.e. Portugal, Great Britain and Germany) in East Africa aimed to advance a trading system which predominantly served the European elite and their industries⁵⁵. Primarily, it was the imperial power of Great Britain that exploited the production and export of East African-grown staple crops and other valuable commodities in order to consolidate their power³. This exploitation of the 1950s resulted in the creation of 'cash-crop economies'⁵⁶. These cash-crop economies were primarily based on the production of coffee, copra, cotton, sesame, peanuts and sugar for the Western markets (i.e. Europe, North America and Australia) and persist today^{6,57}. From the outset, rural communities were encouraged by the British to grow food crops for export in order to earn money to 'improve their standards of living' under a new economic system⁵⁶. As such, domestic food production became neglected by East Africans now forced to pay taxes⁵⁸.

The onset of cash-crop farming dramatically reduced the domestic availability of robust, nutrient-dense, traditional crops, including sorghum spp., pearl millet (*Pennisetum glaucum*), finger millet (*Eleusine corocana*), cowpea (*Vigna unguiculata*), bambara groundnut (*Vigna subterranea*) and pigeonpea (*Cajanus cajan*), all of which are drought-tolerant to a considerable extent^{43,59,60}. The introduction of foods of 'modern commerce', such as refined sugar, refined wheat and maize flour, canned food and condensed milk, occurred rapidly⁴⁴ as there was little respect shown by the colonial powers towards the nutritional and cultural benefits of indigenous and traditional African foods⁶¹⁻⁶³.

Ecological destruction

Diverse forest ecosystems were rapidly cleared for land needed to support cash-crop farming⁵⁶. This ecological degradation eliminated many indigenous food trees and gathered foods from the diet⁶⁴. Several indigenous fruit species and wild food plants diminished in the traditional diets, affecting the taste and nutrient content of common dishes^{43,65,66}. Utilisation of wild bush meat decreased, given fewer areas for hunting⁵⁶.

Food habits were also drastically altered with the introduction of new agricultural techniques assimilated for the production of cash crops⁶⁷. These techniques promoted the adoption of higher-yielding monocultures of maize, rice and wheat. Monocultures displaced traditional African food crops grown with traditional cultivation techniques including 'shifting cultivation' and 'intercropping', which historically evolved to suit the local agricultural conditions^{43,68}. Traditional cultivation patterns protected the soil, minimised weeds, provided communities with a variety of food, and reduced the risk of crop failure, pests and plant diseases, whereas monocultures provide none of these benefits⁴³.

The systematic loss of indigenous crop varieties has reduced biodiversity and hastened dietary simplification^{66,79}. The shift towards monocultures and reduced dietary diversity has also resulted in a loss of knowledge of ancient agricultural practices⁷⁰. Overall, the introduction of new agricultural methods has benefited the Western powers economically, but has caused incredible ecological devastation and human suffering throughout East Africa⁷¹. Numerous plant and animal species are no longer available because habitats have been irreparably destroyed, cleared for commercial agriculture. Traditional foods such as the wild *Dioscorea* spp., which have historically played an important role in sustaining the population during periods of drought and famine, are now on the verge of extinction due to the ecological damage incurred⁷².

Loss of indigenous markets

The marketplace was the heart of pre-colonial African society⁶. Markets were not only the centre of economic activity, but also the centre of political, social, judicial and communication activities⁶. In East Africa, studies by Gulliver⁷³ have revealed that the indigenous markets were extremely important to the Arusha people because the markets provided them their main opportunity for personal contact with the Maasai in the conscious effort to learn and imitate all they could of the Maasai culture⁷³.

Women in Africa have always played a prominent role in market activities and trade⁷⁴. For example, local farm produce was almost invariably marketed and sold by women⁷⁴. Today, female traders and some indigenous economic systems still exist. However, when Africa was colonised, the colonialists began to control indigenous economic activities to their advantage⁶. Attempts to reduce or destroy these local market operations resulted in the decline of female participation in market activity, sending shockwaves through the larger family unit, and as such the entire food system⁷⁵. Further, loss of the indigenous marketplace has resulted in reduced access to quality whole food options and reduced knowledge of traditional food habits⁷⁵.

Cultural indoctrination (i.e. 'education')

Indoctrination has negatively impacted traditional food habits in East Africa since early colonisation. The primary vectors for the cultural indoctrination were the mission schools, boarding schools and public health programmes responsible for educating the youth⁷⁰. These methods of 'education' have uniformly reduced knowledge related to the cultivation and preparation of traditional and wild foods⁷⁶. Traditional knowledge has been devalued as the education of children has shifted away from the tribal elders, the primary educators in the past, to the imperial powers via the church and school^{64,77}. 'Education'

encouraged 'sophistication', which included a repugnance for traditional foods and ancient methods of food preparation⁷⁶, explaining, at least partially, why nutritious, indigenous foods are drastically underutilised and undervalued today^{66,78–81}.

Neocolonisation and the nutrition transition

Colonial influences on Kenya, Tanzania and Uganda abated during the late 1950s to early 1960s when these countries reportedly gained independence. The 1960s and 1970s were marked by relative economic growth; however, economic deterioration soon ensued as these developing countries were unable to fulfil their financial obligations to the banks and official development agencies of the industrialised world^{6,82}. Hence, a need for economic policy reforms was created. The implementation of privatisation and cost recovery initiatives (structural adjustment) by the international financial institutions, primarily the World Bank and the International Monetary Fund (IMF), from the 1970s through to the present day, has adversely affected the food habits of the East African population, contributing markedly to the deterioration of health status and the creation of NCD epidemics^{82–84}.

In the 1980s, one of the core objectives of debt rescheduling in the form of structural adjustment programmes and trade liberalisation was to 'make domestic agriculture more market-oriented'^{85,86}. Trade policy reforms accelerated in the 1990s as the East African countries liberalised their economies^{4,6}. Invariably, however, economic policy shifts in East Africa over the past 20 to 30 years have resulted in the increased centralisation of power to the benefit of the multinational corporations^{87,88}. The corruption underlying the World Bank and IMF programmes and the inherent connection between these agencies and the New World Order agenda has been effectively exposed *ad infinitum*^{6,38,82,84,89,90}.

The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) pledged to improve tariffs, export subsidies and domestic agricultural support for struggling African countries^{4,91}. However, once again, these measures led to restructuring of the national economy which increased export exploitation by consolidating power among a few multinational corporations^{4,92}. As such, trade policy reforms have enabled greater control of corporations over households through the direct and indirect control of employment opportunities, earnings, and daily expenditures related to subsistence living (i.e. food, clothing, shelter)^{92–94}.

Delocalisation of food production, food distribution and food marketing has redistributed power over food systems from the local economy to a few multinational corporations^{34,95}. In the case of wheat, a handful of companies dominated the world market several decades

ago⁹⁶. However, economic power has become increasingly centralised and the world grain market is now dominated by one company, Cargill⁹⁷. Four multinational corporations now own approximately 45% of all patents for staple crops such as rice, maize, wheat and potatoes⁹⁸. This rapid centralisation of power has resulted in a globalised food system and commercially driven changes in food habits and tastes⁹⁹, and is inherently implicated in the development of NCD epidemics in East Africa and, indeed, worldwide.

Suppression of domestic self-sustainability

The monopolisation of arable land in East Africa has benefited the transnational corporations and their Western consumers^{3,32}. Indigenous African farmers, who would normally rely on this arable land for growing food crops for the local marketplace and local consumers, continue to be displaced or are employed by the corporations for extremely low wages^{69,71}. Instead of growing basic food crops for local people, the indigenous farmers are being encouraged to focus on 'high-value' agricultural products such as fresh flowers and exotic fruits for export⁵⁷.

Dependence on low-quality staple food imports

With all hopes of self-sustainability virtually obliterated by trade policy reforms, East Africans have been increasingly forced to rely on low-quality food imports. In 2001, Africa accounted for 18% of world food imports, up 10% from 1985¹⁰⁰. According to the Food and Agriculture Organization of the United Nations⁹¹, food imports have increased in East Africa due to a decline in domestic agricultural investment⁶.

Wheat, which currently dominates world food trade¹⁰¹, is currently exported from just five countries: the USA, Canada, Australia, Argentina and France¹⁰¹. Increased reliance on imported wheat has been documented in East Africa¹⁰¹. Wheat importation in Kenya, Tanzania and Uganda has increased markedly since the early 1990s (Fig. 2)¹⁰². Wheat is nutritionally inferior to indigenous, drought-resistant alternatives, including various millets and sorghum spp.²⁰. Increased reliance on imported wheat has been attributed to domestic food insecurity, which can in turn be attributed to trade policy reforms^{32,103}.

With the exception of a downward trend from the mid-1990s to 2001, perhaps due to the fluctuation of oil prices and the loss of subsidies, the importation of hydrogenated vegetable fats has also increased in East Africa over the past decade and a half (Fig. 3)¹⁰⁴. Elevated intake of *trans*-fatty acids (all types of isomers) has been shown to increase serum low-density lipoprotein cholesterol and decrease high-density lipoprotein cholesterol concentrations¹⁰⁵, and as such increase the risk of CVD^{106,107}. The increased availability and affordability of industrial, hydrogenated oils vs. traditional alternatives (e.g. oil of

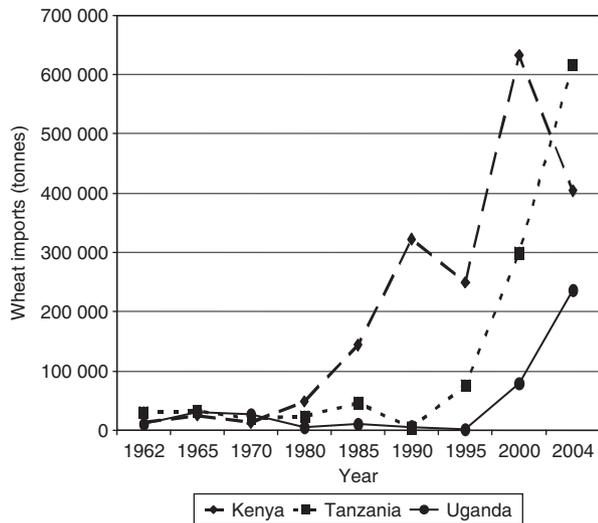


Fig. 2 Wheat importation (metric tonnes) in Kenya, Tanzania and Uganda from 1962 to 2004¹⁰²

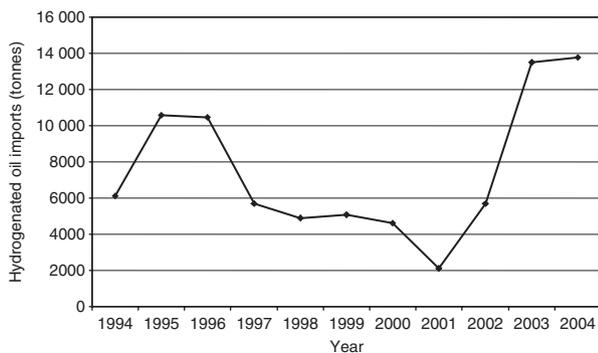


Fig. 3 Importation of hydrogenated oils (metric tonnes) in Uganda from 1994 to 2004¹⁰⁴

shea butter nut and lard) has contributed markedly to dietary simplification and the development of NCD epidemics in East Africa^{11,12,108}.

Continued displacement of indigenous crops

Recent macroeconomic trade policy reforms have further displaced indigenous crops⁹¹. In Kenya and Uganda, dietary patterns have shifted away from the use of indigenous crops (e.g. millets, sorghum spp., pulses and starchy roots) (Figs 4 and 5)¹⁰² to a greater consumption of introduced staple foods, including wheat, rice and hydrogenated vegetable fats¹⁰¹.

In Tanzania, the availability of sorghum spp. and millets has generally been maintained over the past 60 years (Fig. 6)¹⁰² due to their importance as drought-resistant, staple foods for various ethnic groups¹⁰⁹. However, a decline in the availability of indigenous starchy roots and an increase in the availability of rice and maize have been observed since the early 1970s

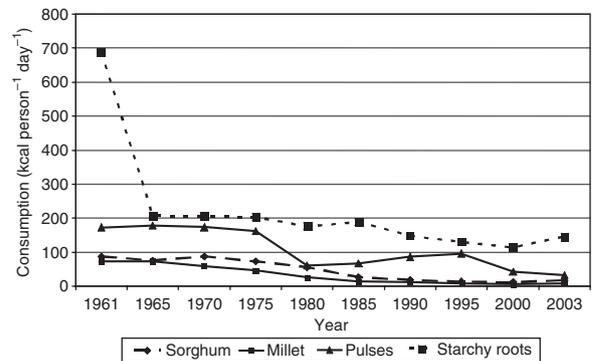


Fig. 4 Traditional crops available for consumption in Kenya from 1961 to 2003. *Source:* Food balance data from FAOSTAT database¹⁰²

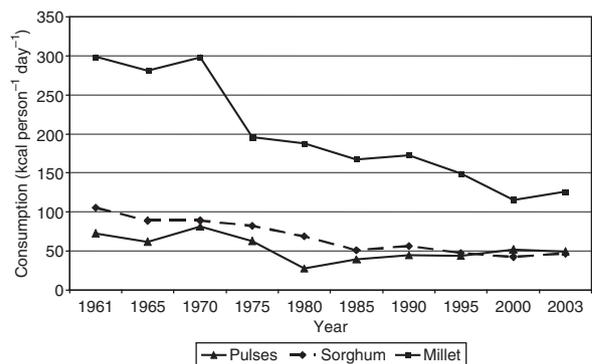


Fig. 5 Traditional crops available for consumption in Uganda from 1961 to 2003. *Source:* Food balance data from FAOSTAT database¹⁰²

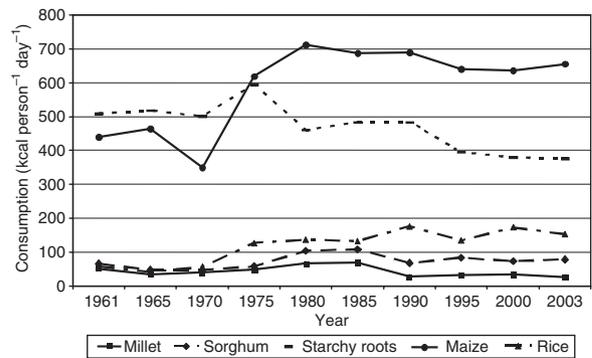


Fig. 6 Introduced and traditional crops available for consumption in Tanzania from 1961 to 2003. *Source:* Food balance data from FAOSTAT database¹⁰²

(Fig. 6)¹⁰². Although maize has become the most available staple food in Tanzania over the past 45 years (Fig. 6), its availability decreased slightly from the 1980s onwards¹⁰⁹. This stagnation may have been due to reduced maize fertiliser subsidies, as well as adverse weather conditions^{109,110}. The increased availability of rice between 1970 and 2000 is due to an increase in the importation of this staple¹¹¹.

Increased availability of processed food products

International trade and the liberalisation of foreign direct investment under GATT¹¹² has consolidated food systems for the multinational corporations^{68,88,113,114}. In 2001, 12 transnational food product manufacturers ranked among the top 100 list of foreign asset holders worldwide, double the number in 1990^{115,116}. From 1990 to 2002, the combined foreign assets of these companies increased from approximately \$US 34 billion to \$US 258 billion^{115,116}. During that same period, the foreign sales of these companies increased from approximately \$US 89 billion to \$US 234 billion^{115,116}. Multinational corporations, the primary control mechanism of the New World Order, fundamentally drive the integration of world markets and, as such, affect the indigenous and traditional food habits of developing countries^{33,117,118}. The displacement of indigenous and traditional foods is innate given an economic structure which favours these corporations¹¹⁹.

The rise of 'super'markets

Shoprite[©], the largest supermarket retailer in Africa, has become a deeply entrenched aspect of East African culture^{120,121} and serves as a primary vector for the dissemination of low-quality, packaged food products of the multinational corporations¹²². The transformation of food retail in Africa including the development and widespread propagation of supermarkets first occurred in South Africa, followed by Kenya during the mid-1990s¹²³. In 2002, Kenya had approximately 206 supermarkets and 10 hypermarkets (which contain 10 times the floor space of a supermarket)¹²⁴. Currently, supermarket expansion is occurring rapidly in Kenya, particularly into poorer demographic areas, and in secondary cities and towns¹²⁰. Access to cheap convenience foods by way of supermarkets has reduced the prevalence of local markets and the availability of indigenous and traditional foods^{120,123}. Tanzania and Uganda are currently in the early stages of supermarket development¹²⁰.

Consequences of urbanisation

Economic pressures have resulted in mass migration from rural areas to urban centres in East Africa¹²⁵. In Kenya the percentage of the population living in urban areas increased from 10% in 1970 to 30% in 1997¹²⁵. In Tanzania and Uganda, the annual urban population growth rate was 7.4% and 5.9%, respectively, from 1980 to 1990 and 7.1% and 3.8%, respectively, from 1990 until 2000¹²⁶. Several consequences related to rapid urbanisation have contributed to the nutrition transition in East Africa.

Urbanisation in East Africa has contributed to a shift away from traditional high-fibre, home-cooked foods to the consumption of pre-prepared, packaged and processed ready-to-eat foods¹²⁷⁻¹²⁹. The elevated consumption of *trans* fats, refined sugars, refined flours and

preservatives, and low intake of dietary fibre and vital micronutrients, as a result of these new foods, has resulted in adverse health effects in the urban East African population^{108,130-132}. Recent evidence from the urban centre of Dar es Salaam in Tanzania revealed a positive relationship between the consumption of a Westernised (globalised) diet and the prevalence of NCDs, including risk factors which comprise the metabolic syndrome^{108,133-137}. The urban East African population is constantly confronted with the widespread availability of packaged food products^{32,118,119,138}. The shift in preferences away from traditional, indigenous foods and commodities to diets based on Westernised consumption patterns has been encouraged by governments and their corporate allies, particularly in the last five years with the rapid expansion of fast-food restaurants chains which are catering to the East Africa urban centres, and even to some of the smaller rural towns^{120,139,140}. Many people residing in urban areas are unaware of the health benefits of indigenous African foods^{47,141}. Thus, the knowledge of traditional food habits in the urban centres has waned from one generation to the next⁷⁰. The extent to which globalised dietary patterns and food habits are adopted in rural towns has not been effectively investigated to date; however, recent evidence suggests that Westernised meal patterns are in fact infiltrating the rural areas of Tanzania¹¹⁸. Urban residences in East Africa are generally characterised by small living spaces, poorly equipped kitchens or outdoor cooking spaces, and poor access to natural fuel sources and clean water, which all contribute to a disruption of traditional dietary practices^{142,143}. As such, urban consumers become more reliant on highly processed, non-home-prepared foods^{117,142,144}. Street foods and foods from kiosks are the major sources of non-home-prepared foods in the poor urban areas in East Africa¹²⁷⁻¹²⁹. The fact that street foods are inexpensive, time-saving and convenient are the main purchasing incentives among poorer, urban East Africans^{129,145,146}. Often street foods are prepared using the least expensive ingredients, including refined flour, maize and hydrogenated oils. These foods contain few essential nutrients, and are high in refined sugars. In addition, problems of hygiene and food safety are bound to arise in the unsanitary conditions of the shanty towns and slums where the poorest groups live and consume street foods¹⁴⁴. The consumption of street foods may also be coupled with adverse eating patterns, including such behaviours as eating alone and frequent snacking¹²⁷.

Disruption of the family unit

Macroeconomic policy reforms in East Africa have disrupted the family unit by placing greater demands on women. Increasingly, women have been forced to enter the urban labour market to improve family survivability. This has included spending longer hours on the job to

meet basic needs⁶. Demands on women living in the rural setting have also increased recently, particularly with the continued migration of rural men seeking employment to urban centres¹⁴⁷. Rural women in East Africa have been forced to work longer hours to meet cash-crop demands⁹².

The absence of women from the family unit has increasingly displaced traditional foods which are time-consuming to prepare compared with easily prepared import grains and high-calorie/low-nutrient fast foods and street foods^{32,148}. Kennedy and Reardon¹³¹ have asserted that increased labour demand on women is the primary factor responsible for the increased consumption of pre-packaged bread in urban Kenya.

With women entering the economic employment sector, the breast-feeding of infants has declined¹⁴⁹. A study in urban Morogo, Tanzania, revealed unusually shortened breast-feeding periods¹⁵⁰. Reduced breast-feeding periods are associated with poorer nutritional status and increased susceptibility to diseases, particularly diarrhoea and measles, among infants and children¹⁴⁹.

Disparities of socio-economic status

Gray¹⁵¹, among many others, has suggested that with economic liberalisation differences in incomes between various segments of society have increased dramatically, causing marked inequities in food access. Dietary choices are dependent on the socio-economic status of the family⁵⁶, and lower-income families have less access to higher-quality whole foods. The cost of traditional staple foods in urban areas is generally higher than the cost of processed foodstuffs¹⁵². This has generally led to the increased consumption of easy-to-prepare foods and snacks among the urban poor, resulting in dietary deficiencies^{127,129,153}. Several studies have revealed higher consumption of street foods among urban dwellers of lower socio-economic status in East Africa^{129,145}.

Nutrition-related propaganda (i.e. advertising)

Today, the mass marketing of packaged food products is ubiquitous and the negative effects of such advertising campaigns have been well documented^{154–156}. Perhaps the most notorious example of such propaganda was the mass marketing and sale of artificial milk powders for infants and children by Nestlé³⁰. The use of these 'milk' formulas reduced the extent of breast-feeding and resulted in deaths from intestinal infections, diarrhoea and dehydration due to a contaminated water supply¹⁵⁷.

Marketing strategies have often deliberately appealed to existing cultural viewpoints^{113,158}. Clear contradictions and bizarre connections abound in these advertising campaigns. For example, McDonald's uses its resources and popularity to promote the United Nations Children's Fund and its mission to eradicate malnutrition in children¹⁵⁹, perhaps insinuating that children should be 'nourished back to health' with McDonald's food.

Children in particular have become the primary targets of international marketing campaigns promoting packaged foods¹⁶⁰. Advertising is now well recognised as a significant contributor to the nutrition transition and the general acceptance of a globalised food culture¹⁵⁸. Brand marketing has been facilitated by the dramatic improvement in packaged food distribution within and between countries³². It is rather ironic yet unsurprising that advances in food distribution systems (i.e. transportation) have benefited the multinational corporations, yet have not been effectively used to facilitate the widespread distribution of quality whole foods to nourish the needy.

Engineering of famines

While climatic variables play a role in triggering famines, famines in the age of globalisation are also markedly influenced by the neocolonial (political-economic) forces of the New World Order^{5,161}. Sectoral adjustment under the IMF and World Bank undermines food security and reinforces a developing country's dependency on the world market. The engineering of famines through the economic policies of these institutions has been superbly exposed by Chossudovsky¹⁶² in the *Globalization of Poverty and the New World Order*.

Consequences of disease epidemics

In addition to NCDs, HIV/AIDS, malnutrition and infectious disease epidemics continue to escalate in East Africa¹⁶³. Together, or in isolation, these epidemics exert a devastating effect on population health, which drastically alters work and earning capacity and, as such, food purchasing power and food habits. The morbidity and mortality associated with AIDS has been shown to affect farm labouring in the rural setting^{164,165}. Infectious and NCD epidemics also markedly increase expenditures for medical treatments, transportation and funerals, resulting in reduced affordability of quality foods^{166–169}.

Discussion

A nutrition transition has been occurring in East Africa over the past 400 years and has been underpinned by both overt and covert methods of control, from colonisation to the current, oppressive political-economic structure. Uniformly, colonisation and neocolonisation have excised the ancient, indigenous knowledge, destroyed the environment, suppressed domestic self-sustainability, prevented economic independence, forced rapid urbanisation, destroyed the family unit, and introduced a globalised food system. This globalised food system, advanced through the economic reforms of the World Bank and IMF and now controlled by a handful of multinational corporations, has been directly implicated in the recent upsurge of NCDs throughout East Africa, including the countries of Kenya, Uganda and Tanzania.

It is essential that knowledge of the contributing factors related to the disappearance of traditional foods and foods habits in East Africa become widely acknowledged, accepted and understood. Greater efforts must continue to be directed towards exposing the control mechanisms (i.e. multinational corporations) of the New World Order, disseminating knowledge, and proposing effective solutions to the nutrition transition. Such efforts might very well be underway today.

Awareness of the health-related benefits of traditional foods and food habits in East Africa is improving due in part to recent scientific investigations and new online information sources^{20,170–174}. Adoption of these traditional foods and food habits along with the underlying ancient knowledge is likely to hold the key to overcoming the globalised food system and current NCD epidemics. Grass-roots efforts may be underway at Bioversity International (formerly the International Plant Genetic Resources Institute)¹⁷⁵ to empower local farmers and producers, and improve the availability, conservation and use of under-utilised and neglected species. Furthermore, IndigenoVeg is currently promoting the production of indigenous vegetable varieties in urban and peri-urban areas of Africa¹⁷⁶.

The dissemination of traditional knowledge and grass-roots campaigns must continue. Importantly, such efforts must elude being hijacked by the very forces they are intending to thwart, including individuals and organisations intending to profiteer from the patenting of particular crops and their genes. Ultimately, it is the individual, the family unit and the local community that must unite to reclaim their birthright to grow and consume their own local whole foods according to their own traditional practices. Such concerted efforts are required to circumvent the New World Order and their multinational corporations which currently control the global food system.

In summary, it is imperative that greater efforts be directed towards exposing the colonial and neocolonial forces which have undermined food security in East Africa and throughout the rest of the world. Heightened awareness of these forces is essential for proposing genuine, holistic solutions to the nutrition transition and related NCD epidemics in East Africa and indeed worldwide.

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References

- 1 Mutwa V. *Indaba, My Children*. Johannesburg: Grove Publisher, 1999.
- 2 Dugan P, Gann L, Turner V. *Colonialism in Africa 1870–1960*. Cambridge: Cambridge University Press, 1972.
- 3 Cannon G. Why the Bush administration and the global sugar industry are determined to demolish the 2004 WHO global strategy on diet, physical activity and health. *Public Health Nutrition* 2004; **7**(3): 369–80.
- 4 Chossudovsky M. *The Globalization of Poverty and the New World Order*. Quebec: Global Outlook, 2003.
- 5 Davis M. *Late Victorian Holocausts: El Nino Famines and the Making of the Third World*. London: Verso, 2001.
- 6 Ayittey G. *Africa Unchanged: The Blueprint for Africa's Future*. New York: Palgrave Macmillan, 2005.
- 7 World Health Organization (WHO). *The World Health Report: Today's Challenges*. Geneva: WHO, 2003; 1–22.
- 8 Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for 2000 and projections for 2030. *Diabetes Care* 2004; **27**(5): 1047–53.
- 9 Popkin BM. The nutrition transition and prevention of diet-related disease in Asia and the Pacific. *Food and Nutrition Bulletin* 2001; **22**(4): S1–58.
- 10 Popkin BM. An overview of the nutrition transition and its health implications: the Bellagio meeting. *Public Health Nutrition* 2002; **5**(1A): 93–103.
- 11 Popkin B. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *American Journal of Clinical Nutrition* 2006; **84**(2): 289–98.
- 12 Bourne LT, Lambert EV, Steyn K. Where does the black population of South Africa stand on the nutrition transition? *Public Health Nutrition* 2002; **5**(1A): 157–62.
- 13 Kitange H, Machibya H, Black J, Mtasiwa DM, Masuki G, Whiting D, *et al*. The outlook for survivors of childhood in sub-Saharan Africa: adult mortality in Tanzania. *British Medical Journal* 1996; **312**(7025): 216–20.
- 14 Setel P, Unwin N, Alberti K, Hemed Y. Cause-specific adult mortality: evidence from community-based surveillance – selected sites, Tanzania, 1992–1998. *Morbidity and Mortality Weekly Report (MMWR)* 2000; **9**(19): 416–19. Also available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4919a2.htm>
- 15 Unwin N, Setel P, Rashid S, Mugusi F, Mbanya JC, Kitange H, *et al*. Noncommunicable diseases in sub-Saharan Africa: where do they feature in the health research agenda? *Bulletin of the World Health Organization* 2001; **79**(10): 947–53.
- 16 Popkin BM. The nutrition transition and its health implications in lower income countries. *Public Health Nutrition* 1998; **1**(1): 5–21.
- 17 Popkin BM. Dynamics of the nutrition transition and its implications for the developing world. *Forum of Nutrition* 2003; **56**: 262–4.
- 18 Voster H, Bourne L, Venter C, Oosthuizen W. Contribution of nutrition to the health transition in developing countries: a framework for research and intervention. *Nutrition Reviews* 1999; **57**(11): 341–9.
- 19 World Health Organization (WHO). *Chronic Disease: A Vital Investment*. Geneva: WHO, 2005.
- 20 Raschke V, Oltersdorf U, Elmadafa I, Wahlqvist M, Cheema B, Kouris-Blazos A. Content of a novel online collection of traditional East African food habits (1930s–1960s): data collected by the Max-Planck-Nutrition Research Unit, Bumbuli, Tanzania. *Asia Pacific Journal of Clinical Nutrition* 2007; **16**(1): 140–51.
- 21 Poulter N, Khaw K, Hopwood B, Mugambi M, Peart WS, Rose G, *et al*. Blood pressure and its correlates in an African tribe in urban and rural environments. *Journal of Epidemiology and Community Health* 1984; **38**(3): 181–5.
- 22 Poulter N, Khaw K, Hopwood B, Mugambi M, Peart WS, Rose G, *et al*. Blood pressure and associated factors in a

- rural Kenyan community. *Hypertension* 1984; **6**(6 Pt 1): 810–13.
- 23 Poulter N, Khaw K, Hopwood B, Mugambi M, Peart WS, Rose G, *et al.* The Kenyan Luo migration study: observations on the initiation of a rise in blood pressure. *British Medical Journal* 1990; **300**(6730): 967–72.
- 24 Pauletto P, Puato M, Caroli M, Casiglia E, Munhambo AE, Cazzolato G, *et al.* Blood pressure and atherogenic lipoprotein profiles of fish-diet and vegetarian villagers in Tanzania: the Lugalawa study. *Lancet* 1996; **348**(9030): 784–8.
- 25 Pavan L, Casiglia E, Braga L, Winnicki M, Puato M, Pauletto P, *et al.* Effects of a traditional lifestyle on the cardiovascular risk profile: the Amondava population of the Brazilian Amazon: comparison with matched African, Italian and Polish populations. *Journal of Hypertension* 1999; **17**(6): 749–56.
- 26 Yamori Y, Miura A, Taira K. Implications from and for food cultures for cardiovascular diseases: Japanese food, particularly Okinawan diets. *Asia Pacific Journal of Clinical Nutrition* 2001; **10**(2): 144–5.
- 27 Cockerham W, Yamori Y. Okinawa: an exception to the social gradient of life expectancy in Japan. *Asia Pacific Journal of Clinical Nutrition* 2001; **10**(2): 154–8.
- 28 Trichopoulou A, Critselis E. Mediterranean diet and longevity. *European Journal of Cancer Prevention* 2004; **13**(5): 453–6.
- 29 Serra-Majem L, Roman B, Estruch R. Scientific evidence of interventions using the Mediterranean diet: a systematic review. *Nutrition Reviews* 2006; **64**(Suppl. 1): 27–47.
- 30 MacLennan R, Zhang A. Cuisine: the concept and its health and nutrition implications – global. *Asia Pacific Journal of Clinical Nutrition* 2004; **13**(2): 131–5.
- 31 Liu X, Li Y. Epidemiological and nutritional research on prevention of cardiovascular disease in China. *British Journal of Nutrition* 2000; **84**(Suppl. 2): 199–203.
- 32 Lang T. Diet, health and globalization: five key questions. *Proceedings of the Nutrition Society* 1999; **58**(2): 335–43.
- 33 Hawkes C. Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Global Health* 2006; **2**(4): 1–18.
- 34 Schlosser E. *Fast Food Nation: The Dark Side of the all-American Meal*. New York: Houghton-Mifflin, 2001.
- 35 Eaton S, Konner M. Paleolithic nutrition. *New English Journal of Medicine* 1985; **312**(5): 283–90.
- 36 Robson J. Changing food habits in developing countries. *Ecology of Food and Nutrition* 1976; **4**: 251–6.
- 37 Oniang'o RK, Komokoti A. Food habits in Kenya: the effects of change and attendant methodological problems. *Appetite* 1999; **32**(1): 93–6.
- 38 Icke D. *And the Truth Shall Set You Free: The 21st Century Edition*. London: Bridge of Love, 2004.
- 39 Action AH. *The Geopolitics of Hunger, 2000–2001*. Boulder, CO: Lynne Rienner Publishers, 2001.
- 40 George S. *How the Other Half Dies: The Real Reasons for World Hunger*. Harmondsworth: Penguin, 1976.
- 41 Maundu P, Imbumi M. East Africa. In: Katz S, Weaver W, eds. *Encyclopedia of Food and Culture*. New York: Thomson and Gale, 2003; 27–34.
- 42 Maundu P, Ngugi G, Kabuye C. *Traditional Food Plants of Kenya*. Nairobi: Kenrik, 1999; 1–269.
- 43 Gura S. A note on traditional food plants in East Africa: their value for nutrition and agriculture. *Food and Nutrition* 1986; **12**(1): 18–26.
- 44 Price W. *Nutrition and Physical Degeneration*. La Mesa, CA: Price-Pottenger Foundation, 2000.
- 45 Coupland R. *East Africa and Its Invaders*, 2nd ed. London: Oxford University Press, 1956.
- 46 Smith I. *Foods of West Africa: Their Origin and Use*. Ottawa: Kwik Printing, National Library of Canada, 1998.
- 47 O'Ktingati A, Temu R, Kessy J, Mosha T. Indigenous African food crops and useful plants: their preparation for food, and home gardens in Tanzania. In: Baidu-Forso J, ed. *Africa's Natural Resources Conservation and Management Surveys, Summary Proceedings of the UNU/INRA Regional Workshop*. Accra: United Nations University/Institute for Natural Resources in Africa (UNU/INRA), 1998; 1–3.
- 48 Ogutu Z. Responding to population pressure in rural Kenya. *GeoJournal* 1993; **30**(4): 409–19.
- 49 Caldwell C. The social repercussions of colonial rule: demographic aspects. In: Boahen A, ed. *Africa under Colonial Domination 1880–1935*. Paris: UNESCO History, 1985; 483.
- 50 Anderson D. Depression, dust bowl, demography, and drought: the colonial state and soil conservation in East Africa during the 1930s. *African Affairs* 1984; **83**(332): 321–43.
- 51 Taylor D. Changing food habits in Kikuyuland. *Canadian Journal of African Studies* 1970; **4**(3): 333–49.
- 52 Bohdal M, Gibbs N, Simmons W. *Nutrition Surveys and Campaigns Against Malnutrition in Kenya*. Report to the Ministry of Health of Kenya. Geneva: World Health Organization/Food and Agriculture Organization/United Nations Children's Fund, 1969; 1–71.
- 53 Raschke V, Oltersdorf U, Elmadafa I, Wahlqvist M, Cheema B, Kouris-Blazos A. Investigation of the dietary intake and health status in East Africa in the 1960s: a systematic review of the historic Oltersdorf collection. *Ecology of Food and Nutrition* 2007; in press.
- 54 Ramakrishnan U. Prevalence of micronutrient malnutrition worldwide. *Nutrition Reviews* 2002; **60**(5 Pt 2): S36–52.
- 55 Winter-Nelson A. *International Trade and Africa*. Urbana-Champaign, IL: University of Illinois Center for African Studies, 2004; 1–3.
- 56 Read M. Native standards of living and African culture change. *Africa* 1938; **11**(Suppl. 3): 1–64.
- 57 Chopra M, Darnton-Hill I. Responding to the crisis in sub-Saharan Africa: the role of nutrition. *Public Health Nutrition* 2006; **9**(5): 544–50.
- 58 Turshen M. The impact of colonialism on health and health services in Tanzania. *International Journal of Health Services* 1977; **7**(1): 7–35.
- 59 Harlan J. Genetic resources in Africa. In: Janick J, Simon J, eds. *New Crops*. New York: Wiley, 1993; 65.
- 60 Abegaz B, Demissew S. Indigenous African food crops and useful plants: their preparation for food, and home gardens in Ethiopia, Kenya, Tanzania and Uganda, with special emphasis on medicinal plants and issues associated with their management. In: Baidu-Forson J, ed. *Africa's Natural Resources Conservation and Management Surveys, Summary*. Accra: United Nations University/Institute for Natural Resources in Africa (UNU/INRA), 1998; 1–4.
- 61 Allen K. The monotonous diet of the African. *East African Medical Journal* 1955; **32**: 95–7.
- 62 Burgess H. Protein-calorie malnutrition in Uganda. I. General. *East African Medical Journal* 1962; **39**: 357–61.
- 63 Latham M. Malnutrition in East Africa. *American Journal of Tropical Medicine and Hygiene* 1964; **67**: 90.
- 64 Tabuti J, Dhillion S, Lye K. The status of wild food plants in Bulamogi County, Uganda. *International Journal of Food Sciences and Nutrition* 2004; **55**(6): 485–98.
- 65 Food and Agriculture Organization of the United Nations (FAO). *Traditional Food Plants: A Resource Book for Promoting the Exploitation and Consumption of Food Plants In Arid, Semi-arid and Sub-humid Lands of Eastern Africa*. Food and Nutrition Paper No. 42. Rome: FAO, 1988.
- 66 Okigbo B. Broadening the food base in Africa: the potential of traditional food plants. *Food and Nutrition* 1986; **12**(1): 4–17.

- 67 Welch R, Graham R. A new paradigm for world agriculture: meeting human needs productive, sustainable and nutritious. *Field Crop Research* 1999; **60**: 1–10.
- 68 Shiva V. *Stolen Harvest*. London: Zed Books, 2000.
- 69 Hewitt de Alcantara C. *Modernizing Mexican Agriculture: Socioeconomic Implications of Technological Change, 1940–1970*. Geneva: United Nations Research Institute for Social Development, 1976.
- 70 Kuhnlein H, Receveur O. Dietary change and traditional food systems of indigenous peoples. *Annual Review of Nutrition* 1996; **16**: 417–42.
- 71 Tudge C. *So Shall We Reap*. London: Penguin Books, 2003.
- 72 Asfaw Z, Tadesse M. Prospects for sustainable use and development of wild food plants in Ethiopia. *Economic Botany* 2001; **55**(1): 47–62.
- 73 Gulliver P. The evolution of Arusha trade. In: Bohannan P, Dalton G, eds. *Markets in Africa*. Evanston, IL: Northwestern University Press, 1962; 431–46.
- 74 Hodder B. The Yoruba rural markets. In: Bohannan P, Dalton G, eds. *Markets in Africa*. Evanston, IL: Northwestern University Press, 1962; 103–17.
- 75 Skinner E. Trade and markets among the Mossi people. In: Bohannan P, Dalton G, eds. *Markets in Africa*. Evanston, IL: Northwestern University Press, 1962; 237–78.
- 76 Culwick G. Nutrition in East Africa. *Africa: Journal of the International African Institute* 1944; **14**(7): 401–10.
- 77 Cattell M. Knowledge and social change in Samia, Western Kenya. *Journal of Cross Cultural Gerontology* 1989; **4**(3): 225–44.
- 78 Farnsworth A. The diet of the African soldier. *East African Agriculture and Forestry Journal* 1943; **20**(7): 207–13.
- 79 Platt B. *Tables of Representative Values of Foods Commonly Used in Tropical Countries*. Special Report Series No. 302. London: Medical Research Council, 1962.
- 80 Plotkin M. The outlook for new agricultural and industrial products from the tropics. In: Wilson E, ed. *Biodiversity*. Washington, DC: National Academy Press, 1988; 106–16.
- 81 National Research Council. *Lost Crops of Africa. Vol. 1: Grains*. Washington, DC: National Academy Press, 1996.
- 82 Labonte R, Schrecker T, Sanders D, Meeus W, Cushon J, Torgerson R. *Fatal Indifference: the G8, Africa and Global Health*. Lansdowne/Ottawa: University of Cape Town Press/International Development Research Centre, 2004.
- 83 Breman A, Shelton C. *Structural Adjustment and Health: A Literature Review of the Debate, Its Role-players and Presented Empirical Evidence*. Paper No. WG6:6. Geneva: World Health Organization, Commission on Macroeconomics and Health, 2001.
- 84 Chossudovsky M. *The Globalization of Poverty: Impacts of IMF and World Bank Reforms*. London: Zed Books, 1997.
- 85 Milward B. *What is Structural Adjustment?* London and New York: Routledge, 2000.
- 86 Food Agriculture Organization of the United Nations (FAO). *The State of Agricultural Commodity Markets*. Rome: FAO, 2004; 1–52.
- 87 Pelto G, Pelto P. Diet and delocalization: dietary changes since 1750. *Journal of Interdisciplinary History* 1983; **14**(2): 507–28.
- 88 Lang T. The public health impact of globalization of food trade. In: Shetty P, McPherson K, eds. *Diet, Nutrition and Chronic Disease: Lessons from Contrasting Worlds*. London: J Wiley & Son, 1997; 173–90.
- 89 Pilger J. *The New Rulers of the World*. London: Verso, 2003.
- 90 Klein N. *No Space, No Choice, No Jobs*. New York: Picador, 2002.
- 91 Food and Agriculture Organization of the United Nations (FAO). *The State of Food and Agriculture 2005. Agricultural Trade and Poverty: Can Trade Work for the Poor?* Rome: FAO, 2005; 81–93.
- 92 Lugalla J. The impact of structural adjustment policies on women's and children's health in Tanzania. *Review of African Political Economy* 1995; **22**(63): 43–53.
- 93 Overseas Development Institute (ODI). *Adjusting to Recession: Will the Poor Recover?* ODI Briefing Paper. London: ODI, 1986.
- 94 Pinstrip-Andersen P. Macroeconomic adjustment policies and human nutrition: available evidence and research needs. *Food and Nutrition Bulletin* 1987; **9**(1): 1–10.
- 95 Lang T, Heasman M. *The Global Battle for Mouths, Minds and Markets*. London: Earthscan, 2004.
- 96 Morgan D. *Merchants of Grain*. London: Weidenfeld & Nicolson, 1979.
- 97 Kneen B. *Cargill and Its Transnational Strategies. Invisible Giants*. London: Pluto Press, 1995.
- 98 ActionAid. *Going Against the Grain*. London: ActionAid, 2003.
- 99 Stitt S, Jepson M, Paulson-Box E, Prisk E. Schooling for capitalism: cooking and the national curriculum. In: Koehler B, Feichtinger E, Barlosius E, Dowler E, eds. *Poverty and Food in Welfare Societies*. Berlin: Sigma, 1997; 363–74.
- 100 Food and Agriculture Organization of the United Nations (FAO). *The State of Food Insecurity in the World*. Rome: FAO, 2003; 1–40.
- 101 Food and Agriculture Organization of the United Nations (FAO). *Financing Normal Levels of Commercial Imports of Basic Foodstuffs*. Rome: FAO, Commodity Policy and Projections Service, Commodities and Trade Division, 2003; 1–35.
- 102 Food and Agriculture Organization of the United Nations (FAO). FAOSTAT [FAO Statistical Databases Online], 2006. Available at <http://faostat.fao.org>
- 103 Haan N, Farmer G, Wheeler R. *Chronic Vulnerability to Food Security in Kenya 2001. A WFP Pilot Study for Improving Vulnerability Analysis*. Rome: World Food Programme (WFP), 2001; 36.
- 104 Visvanathan M. *Environmental Management as a Tool to Access Global Trade: Case of Vegetable Oil*. New York: United Nations Industrial Development Organization, 2004; 1–70.
- 105 Katan M. Trans fatty acids and plasma lipoproteins. *Nutrition Reviews* 2000; **58**(6): 188–91.
- 106 Aro A. *Epidemiological Studies of Trans-fatty Acids and Cardiovascular Disease*. Dundee: The Oily Press, 1998.
- 107 Oomen C, Ocké M, Feskens E, van Erp-Baart M, Kok F, Kromhout D. Association between trans-fatty acid intake and 10-year risk of coronary heart disease in the Zutphen Elderly Study: a prospective population-based study. *Lancet* 2001; **357**(9258): 746–51.
- 108 Njelekela M, Ikeda K, Mtabaji J, Yamori Y. Dietary habits, plasma polyunsaturated fatty acids and selected coronary disease risk factors in Tanzania. *East African Medical Journal* 2005; **82**(11): 572–8.
- 109 Ministry of Agriculture Food and Cooperatives. *Some crops grown in Tanzania* [online]. Dar es Salaam: The United Republic of Tanzania, 2007. Available at <http://www.agriculture.go.tz/Agr-Industry/Crops-grown-tz.htm>. Accessed 22 May 2007.
- 110 Minot N. Prospects for increased staple food production in Eastern and Southern Africa and implications for regional and global markets. Presented at *Workshop on Trade Policy for Food Products Conducive to Development in Eastern and Southern Africa*, FAO Headquarters, Rome, 1–2 March 2007.
- 111 Africa Rice Center. *Rationale of the African rice congress* [online]. Dar es Salaam, Tanzania, 2006. Available at <http://www.warda.org/africa-rice-congress/rationale.html>. Accessed 22 May 2007.
- 112 Reardon T, Swinnen J. Agrifood sector liberalization and the rise of supermarkets in former state-controlled

- economies: comparison with other developing countries. *Development Policy Review* 2004; **22**: 515–23.
- 113 Hawkes C. Marketing activities of global soft drink and fast food companies in emerging markets: a review. In: *Globalization, Diets and Noncommunicable Diseases*. Geneva: World Health Organization, 2002; 1–59. Also available at <http://whqlibdoc.who.int/publications/2004/9241591579.pdf>
- 114 Hawkes C. The role of foreign direct investment in the nutrition transition. *Public Health Nutrition* 2005; **8**(4): 357–65.
- 115 United Nations Conference on Trade and Development (UNCTAD). *World Investment Report. FDI Policies for Development: National and International Perspectives*. Geneva: UNCTAD, 2003; 322.
- 116 Organisation for Economic Co-operation and Development (OECD). *Foreign Direct Investment, Development and Corporate Responsibility*. Paris: OECD, 2000.
- 117 Maletnlema T. A Tanzanian perspective on the nutrition transition and its implication for health. *Public Health Nutrition* 2002; **5**(1A): 163–8.
- 118 Mazengo M, Simell O, Lukmanji Z, Shirima R, Karvetti R. Food consumption in rural and urban Tanzania. *Acta Tropica* 1997; **68**(3): 313–26.
- 119 Cannon G. Nutrition: the new world disorder. *Asia Pacific Journal of Clinical Nutrition* 2002; **11**(Suppl.): 498–509.
- 120 Weatherspoon D, Reardon T. The rise of supermarkets in Africa: implications for agrifood systems and the rural poor. *Development Policy Review* 2003; **21**(3): 333–55.
- 121 Kaiza D. Steers, Nandos fast-food chains enter Dar, Kampala. *The East African*, 17–23 November 1999 [online]. Available at <http://www.nationaudio.com/News/EastAfrican/151199/Business/Business5.html>. Accessed 17 November 2006.
- 122 Neven D, Reardon T. The rise of Kenyan supermarkets and the evolution of their horticulture product procurement systems. *Development Policy Review* 2004; **22**(6): 669–99.
- 123 Reardon T, Timmer P, Barrett C, Berdegue J. The rise of supermarkets in Africa, Asia and Latin America. *American Journal of Agriculture and Economy* 2003; **85**(5): 1140–6.
- 124 ACNielsen. *Sub-Saharan universe: Kenya. Retail Store Data*. South Africa: ACNielsen, 2002.
- 125 World Bank. *1999 World Development Indicator*. Washington, DC: The World Bank, 1999.
- 126 Food and Agriculture Organization of the United Nations (FAO). *FAOSTAT data* [online]. Rome: FAO, 2005. Available at <http://faostat.external.fao.org/default.jsp>. Accessed 9 August 2006.
- 127 van't Riet H, den Hartog A, Hooftman D, Foeken D, van Staveren W. Determinants of non-home-prepared food consumption in two low-income areas in Nairobi. *Nutrition* 2003; **19**(11–12): 1006–12.
- 128 Mwangi A, den Hartog A, Foeken D, van't Riet H, Mwadime R, van Staveren W. The ecology of street foods in Nairobi. *Ecology of Food and Nutrition* 2001; **40**(5): 497–553.
- 129 Nasinyama D. *Study on street foods in Kampala, Uganda*. Rome/Kampala: Food and Agriculture Organization of the United Nations/Makerere University, 1992.
- 130 Njelekela M, Kuga S, Nara Y, Ntogwisangu J, Masesa Z, Mashalla Y, et al. Prevalence of obesity and dyslipidemia in middle-aged men and women in Tanzania, Africa: relationship with resting energy expenditure and dietary factors. *Journal of Nutritional Science and Vitaminology* 2002; **48**(5): 352–8.
- 131 Kennedy E, Reardon T. Shift to non-traditional grains in the diets of East and West Africa: role of women's opportunity cost of time. *Food Policy* 1994; **1**: 45–56.
- 132 Edwards R, Unwin N, Mugusi F, Whiting D, Rashid S, Kissima J, et al. Hypertension prevalence and care in an urban and rural area of Tanzania. *Journal of Hypertension* 2000; **18**(2): 145–52.
- 133 Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *Circulation* 2002; **106**(25): 3143–421.
- 134 Njelekela M, Negishi H, Nara Y, Tomohiro M, Kuga S, Noguchi T, et al. Cardiovascular risk factors in Tanzania: a revisit. *Acta Tropica* 2001; **79**(3): 231–9.
- 135 Njelekela M, Negishi H, Nara Y, Sato T, Tomohiro M, Kuga S, et al. Obesity and lipid profiles in middle aged men and women in Tanzania. *East African Medical Journal* 2002; **79**(2): 58–64.
- 136 Njelekela M, Sato T, Nara Y, Miki T, Kuga S, Noguchi T, et al. Nutritional variation and cardiovascular risk factors in Tanzania – rural–urban difference. *South African Medical Journal* 2003; **93**(4): 295–9.
- 137 Moshia T. Prevalence of obesity and chronic energy deficiency (CED) among females in Morogoro district, Tanzania. *Ecology of Food and Nutrition* 2003; **42**(1): 37–67.
- 138 Chopra M, Galbraith S, Darnton-Hill I. A global response to a global problem: the epidemic of overnutrition. *Bulletin of the World Health Organization* 2002; **80**(12): 952–8.
- 139 Regmi A, Gehlar M. Consumer preferences and concerns shape global food trade – global food trade. *Food Review* 2001; **24**(3): 2–8.
- 140 Food and Agriculture Organization of the United Nations (FAO). Rise of supermarkets across Africa threatens small farmers. *FAO News Room* [online]. Rome: FAO, 2003. Available at <http://www.fao.org/english/newsroom/news/2003/23060-en.html>. Accessed 17 August 2006.
- 141 Kinabo J, Mnkeni A, Nyaruhucha C, Msuya J, Haug A, Ishengoma J. Feeding frequency and nutrient content of foods commonly consumed in the Iringa and Morogoro regions in Tanzania. *International Journal of Food Sciences and Nutrition* 2006; **57**(1–2): 9–17.
- 142 van't Riet H, den Hartog A, van Staveren W. Non-home prepared foods: contribution to energy and nutrient intake of consumers living in two low-income areas in Nairobi. *Public Health Nutrition* 2002; **5**(4): 515–22.
- 143 Chandler D, Wane N. Indigenous gendered spaces: an examination of Kenya. *Jenda: A Journal of Culture and African Women Studies – Online* 2002; **2**(1). Available at <http://www.jendajournal.com/vol2.1/chandler-wane.html>
- 144 Food and Agriculture Organization of the United Nations (FAO). *Food Supply Systems in Africa. Agriculture Food and Nutrition for Africa – A Resource Book for Teachers of Agriculture*. Rome: FAO, 1997; 1–32.
- 145 van't Riet H, den Hartog A, Mwangi A, Mwadime R, Foeken D, van Staveren W. The role of street foods in the dietary pattern of two low-income groups in Nairobi. *European Journal of Clinical Nutrition* 2001; **55**(7): 562–70.
- 146 Food and Agriculture Organization of the United Nations-FAO. *Street Foods in Nigeria. Comparative Study of the Socioeconomic Characteristics of Food Vendors and Consumers in Ibadan, Lagos and Kaduna*. Rome: FAO/Food Basket Foundation International, 1991.
- 147 Kavishe F, Mushi S. The political economy of nutrition in Tanzania: policy and institutional context. In: *Nutrition-Relevant Actions in Tanzania*. Adelaide: Tanzania Food and Nutrition Centre/United Nations Administrative Committee on Coordination, Sub-committee on Nutrition, 1993; Chapter 2. Also available at <http://www.unsystem.org/SCN/archives/tanzania/ch06.htm#bm1-Introduction>

- 148 Fouéré T, Maire B, Delpuech F, Martin-Prével Y, Tchibindat F, Adoua-Oyila G. Dietary changes in African urban households in response to currency devaluation: foreseeable risks for health and nutrition. *Public Health Nutrition* 2000; **3**(3): 293–301.
- 149 Kavishe F, Mushi S. Food security. In: *Nutrition-Relevant Actions in Tanzania*. Adelaide: Tanzania Food and Nutrition Centre/United Nations Administrative Committee on Coordination, Sub-committee on Nutrition, 1993; Chapter 5. Also available at <http://www.unsystem.org/SCN/archives/tanzania/ch09.htm#CHAPTER%205%20FOOD%20SECURITY>
- 150 Karegero M. Effects of selected breastfeeding practices on child nutritional status. Paper presented at the *Annual Scientific Meeting of the Tanzania Public Health Association*, 1989.
- 151 Gray J. *False Dawn: The Delusions of Global Capitalism*. London: Granta, 1998.
- 152 Ruel M, Haddad L, Garrett J. Some urban facts of life: implications for research and policy. *World Development* 1999; **27**(11): 1917–38.
- 153 Kavishe F, Mushi S. Analysis of the nutrition situation and trends in Tanzania. In: *Nutrition-Relevant Actions in Tanzania*. Adelaide: Tanzania Food and Nutrition Centre/United Nations Administrative Committee on Coordination, Sub-committee on Nutrition, 1993; Chapter 3. Also available at <http://www.unsystem.org/SCN/archives/tanzania/ch07.htm#CHAPTER%203%20ANALYSIS%20OF%20THE%20NUTRITION%20SITUATION%20AND%20TRENDS%20IN%20TANZANIA>
- 154 Hastings G, Stead M, McDermott L, Forsyth A, MacKintosh AM, Rayner M, et al. *Review of Research on the Effects of Food Promotion to Children*. Final report prepared for the Food Standards Agency. Glasgow: Food Standards Agency Online, 2003. Available at <http://www.foodstandards.gov.uk/multimedia/pdfs/foodpromotiontochildren1.pdf#search=%22Review%20of%20research%20on%20the%20effects%20of%20food%20promotion%20to%20children%22>. Accessed 21 August 2006.
- 155 Hawkes C. *Marketing Food to Children: The Global Regulatory Environment*. Geneva: World Health Organization, 2004; 1–75.
- 156 Dalmeny K, Hanna E, Lobstein T. *Broadcasting Bad Health. Why Food Marketing to Children Needs to be Controlled*. A report by the International Association of Consumer Food Organizations for the World Health Organization Consultation on a Global Strategy for Diet and Health. London: The International Association of Consumer Food Organizations, 2003. Also available at <http://whqlibdoc.who.int/publications/2004/9241591579.pdf#search=%22Marketing%20of%20to%20children%20WHO%22>
- 157 Akre J. Infant feeding: the physiological basis. *Bulletin of the World Health Organization* 1989; **68**(Suppl. 1): 1–108.
- 158 Lang T. Obesity: a growing issue for European policy? *Journal of European Social Policy* 2005; **15**(4): 301–27.
- 159 Dyer O. UNICEF comes under attack for Big Mac funding deal. *British Medical Journal* 2002; **325**(7370): 923.
- 160 James P. Marabou 2005: nutrition and human development. *Nutrition Reviews* 2006; **64**(5 Pt 2): 72–9.
- 161 Sen A. *Development as Freedom*. Oxford: Oxford University Press, 2001.
- 162 Chossudovsky M. Somalia: the real cause of famine. In: *The Globalization of Poverty and the New World Order*. Quebec: Global Outlook, 2003; 95–102.
- 163 World Health Organization (WHO). *Diet, Nutrition and the Prevention of Chronic Diseases*. Report of a Joint WHO/Food and Agriculture Organization Expert Consultation. Geneva: WHO, 2003; 1–148.
- 164 World Health Organization (WHO). *The World Health Report 2004 – Changing History*. Rome: WHO, 2004; 1–156.
- 165 Barnett A, Rugalema G. *HIV/AIDS*. 2020 Focus No. 05 – Brief 03. Washington, DC: International Food Policy Research Institute, 2001.
- 166 Rugalema G. *AIDS and rural livelihoods: a case study of smallholder households of Bukoba district, Tanzania*. PhD thesis, Institute of Social Studies, The Hague, 1998.
- 167 Barnett T, Haslwimmer M. *The Effects of HIV/AIDS on Farming Systems in Eastern Africa*. Rome: Food and Agriculture Organization of the United Nations, 1995.
- 168 Tumushabe J, Bantebya G, Ssebuliba R. The Effects of HIV/AIDS on Agricultural Production and Rural Livelihood Systems in Eastern Africa. FAO Project RAF/92/TO/A/08/12. Uganda: Food and Agriculture Organization of the United Nations, 1993.
- 169 de Waal A, Tumushabe J. *HIV/AIDS and Food Security in Africa. A report for DFID* (Department for International Development) [online]. Hatfield, South Africa: Southern African Regional Poverty Network, 2003. Available at http://www.sarpn.org.za/documents/d0000235/P227_AIDS_Food_Security.pdf. Accessed 23 August 2007.
- 170 Raschke V, Oltersdorf U, Elmadfa I, Wahlqvist M, Kouris-Blazos A, Cheema B. The need for an online collection of traditional African food habits. *African Journal of Food Agriculture Nutrition and Development* 2007; **7**(1). Available at http://www.ajfand.net/Issue-XII-files/PDFs/VERENA_2330.pdf
- 171 Raschke V. *East African Food Habits* [online]. In: Wahlqvist ML. Healthy Eating Club. Melbourne: HEC Press, 2005. Available at <http://www.healthyeatingclub.org/Africa>. Accessed 23 August 2007.
- 172 van der Walt R, Bezuidenhout C, Bouwman B. Initiative for the Development of Indigenous Food-plants of Africa (IDIFA). In: *Conference Proceedings of the Cape to Cairo Safari Conference*, North-West University, Potchefstroom, 17–18 September 2005; 22 (abstract).
- 173 Johns T, Kimiywe J, Waudu J, Mutemi E, Maundu P. Traditional dietary diversity against the nutrition transition: an East African case study. *Annals of Nutrition & Metabolism* 2005; **18**(Suppl. 1): 36.
- 174 Federation of African Nutrition Societies (FANUS). The Federation of African Nutrition Societies Online, 2006. Available at <http://www.africannutrition.org/>
- 175 International Plant Genetic Resources Institute (IPGRI). *Neglected and Underutilized Plant Species – Strategic Action Plan of the International Plant Genetic Resources Institute*. Rome: IPGRI, 2002; 27.
- 176 IndigenoVeg. *Networking to Promote the Sustainable Production and Marketing of Indigenous Vegetables through Urban and Peri-Urban Agriculture in Sub-Saharan Africa* [online]. EU Sixth framework programme, 2006. Available at <http://www.indigenoveg.org/>