

Review Article

Diet and long-term health: an African Diaspora perspective*

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The life-stage approach, which views the behaviours and exposures of an individual from the preconceptional situation of the parent through pregnancy, infancy, childhood and adolescence, and into the advancing years through adulthood, is the basis of analysis of strategies to improve long-term health. Among the behaviours of note is the dietary selection pattern, conditioning our exposure to nutrients and dietary constituents that influences growth, nutrition, cognitive and physical performance, and disease resistance and susceptibility. The African Diaspora created a population displaced from Africa to the Western Hemisphere as part of the African slave trade from the 16th to 18th centuries. It continues to manifest distinct dietary and lifestyle practices in the context of a health experience that is different both from the population in their African countries of origin and from the other ethnicities in their countries of displacement and current residence. Afro-Americans are more susceptible to a series of diseases and conditions including low birth weight, violence, and HIV/AIDS, as well as the non-communicable diseases: obesity, diabetes mellitus, cardiovascular disease, hypertension, stroke, renal failure, breast cancer, prostate cancer and lead poisoning. The differential nature of dietary practices are conditioned at times by the poverty and marginalisation of the populace, resulting in either disadvantageous or beneficial outcomes relative to others' eating habits. Serious consideration must be given to the possibility that ethnic difference give rise to different requirements and tolerances for essential nutrients and distinct protective or adverse responses to foods and dietary substances. The major challenges to health improvement for the African Diaspora is coming to grips with the policy and programmatic nuances of differential treatment and the effecting the behavioural changes that would be needed in a population skeptical of the motives of media and of the power elites of their societies.

Key Words: Africa, Caribbean, Africa-American, diet, long-term health, chronic diseases, discrimination, energy metabolism

Introduction

"However, consumers do not choose their foods exclusively for the nutrients they provide. Eating behaviour is complex and an understanding of the impact of the factors that affect food choice is vital given priority of population dietary change".

Pollard, Kirk & Cade, 2002⁸⁰

"However, explanations for between-country differences in health will require an appreciation of the complex interactions of history, culture, politics, economics, and the status of women and ethnic minorities".

O'Dea & Piers, 2002²

The fortune and misfortune of ethnic diasporas

The Webster's New Dictionary defines *diaspora* as "dispersion, as of people originating from one nation".¹ It is a Biblical concept, used first to refer to the dispersion of the Jews from Palestine after Babylonian captivity. At one level, diaspora represents a migration, but it has implications that go beyond migration. At the base are issues such as: 1. the motivations of the original movement of the population; 2. the selection factors in differentiating those who stayed, those who left, and those who arrived at their destination; and 3. the conditions of opportunity and

environmental and social stress at the new point(s) of the populations location.

A diaspora can also occur when: 1) the land that is inhabited no longer becomes habitable, as occurred with the potato famine in Ireland in the mid 1800s; 2) when the previous settlers of a region are driven off their land, as happened with the Jews of Palestine in 400 A.D.; or 3) by the capture and enslavement. O'Dea and Piers² make the differentiation between migrated (migrant) and "transplanted" populations, generalizing that the forced transplantation leaves the greatest damage across the subsequent generations.

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Accepted 30 June 2003

*Presented at Symposium on "North & West African Foods and Health" February 8th 2003, Marrakech, Morocco

The African Diaspora

The subject of this analysis is the *African Diaspora*, and this relates to a specific set of events, a continuous event from the early 1500s to the late 1800s, and the reflection to present times. In its specific usage, the African Diaspora does not relate to northwest Africa, but rather to western equatorial Africa. It refers to the population that survived enslavement, forced transport (transplantation) to the New World and resettlement as artisans, domestic workers and field labourers under a system of chattel slavery, and then some 100-plus year history of legal emancipation.

Geographic differentiation in the Americas

Major concentrations and subcultures of the African Diaspora are found in the Caribbean, the United States and Brazil. The geographical particulars of the African Diaspora may be relevant and, for the purpose of the present analysis, the contemporary groupings from the African Diaspora can be classified into four broad groups (Table 1). With respect to African-(North)-Americans, their origin is in slaves imported into the British and French colonies of that continent beginning in the late 16th century. They were settled primarily in the southern half of the region to work in plantation farming. With respect to Afro-Caribbeans, their origin is Western Africa, having been brought in slave ships to the islands of the Caribbean. There are English speaking sites (eg Jamaica, Trinidad, Tobago, Bahamas), French islands (eg Haiti, Martinique, St Martins), Dutch islands (eg St Marteen, Aruba, Curacao) and Spanish islands (eg Cuba, Puerto Rico, Dominican Republic). The linguistic and cultural divides among the European colonizers gave rise to different traditions among the descendants of slaves entering the New World in the Caribbean Sea.

Table 1. Archetypical African Diaspora classifications

Afro-Caribbean
African-(North)-Americans
African-(South)-Americans
African-American re-migrants

With respect to African-(South)-Americans, the major concentration is in Brazil, to which they were brought by Portuguese slavers to work the agriculture of the north and northeast region. The nations with Caribbean shorelines, Venezuela, the former Guyanas, and Colombia (including Panama, which was once a Colombian province) have sizeable populations of African descent as a legacy to the slaves imported to these coastal lowlands. Even in the Andean countries of Ecuador and Peru, there are pockets of populations of African descent along the coasts, and even in some highland regions. Finally, there is a group of African-American re-migrants, who have moved residence in the Americas back to the European nations that had colonized their lands, along a linguistic axis. This "secondary diaspora" is responsible for the Surinamese population in Holland, the Haitians in France, the Jamaicans in the United Kingdom and the Brazilians in Portugal.

Generalizations of the diaspora experience, with concentration on continental North America

Another series of generalizations need to be made regarding specific eras in the history of the African Diaspora in the Americas. This chronology is outlined in Table 2. Overall, five European colonial powers were involved in the colonization of the Americas (the Spanish, Portuguese, French, English and Dutch). Each nation was also represented in the slaving activity on the equatorial coast of West Africa. From the settlement of the coastal areas of the American continents beginning in the Caribbean in the early 1500s, Africans were brought in shackles to work the land and serve the European colonists. The concentrated focus was first the colonies of the Caribbean islands, including the largest ones (Cuba, Hispaniola, Jamaica, and Puerto Rico) as well as the myriad of minor islands. With the Portuguese colonization of Brazil, it became the northeast region at Salvador in the state of Bahia which emerged as the focus of importation and dispersion of African slaves. With the English and French colonization of the continental mainland, slaves shipped through the Caribbean arrived on the rim of the Caribbean and Atlantic coasts.

Table 2. Generalized African Diaspora chronology

Slaving and Slavery Era
in Early Colonial Agriculture
in Intensive Plantation Agriculture Era
Post-Emancipation Era
in Rural Agriculture
in Urban Industry

African slavery allowed certain systems of agricultural economy to flourish in Northern Brazil, in the Southern United States and in the Caribbean. In the sugar plantation culture of the Caribbean, the intensive use of manpower in agricultural fields emerged from the very early period and continued until emancipation. Elsewhere, on the continent, both on North and South American shores, the agriculture was initially less intensive. Slaves were probably "farm hands" and "domestic help" more than "field labourers" until the invention of the cotton engine (cotton 'gin) in 1791. This innovation made feasible the milling of cotton on a massive industrialized scale. Moreover, in the times before the mid-1750s, slaving and slave importation had flourished making slaves a "renewable resource" at the import level. In the supply-demand paradigm of earlier days, slaves had not been particularly "dear."

When cotton became "king" in the southern British colonies, it led to a mono-crop agriculture which transformed the cultivation of the region into an intensive, plantation-based cotton culture; with it came a more repressive labour model adapted to accommodate intensive field labour. However, slaving had ceased by the mid-1700s, and the only source of new slaves came from breeding them from the stock that had already been brought to the New World. A system of "slave husbandry" developed; demand outstripped supply, making the slave a valuable commodity for the plantation economics. This was the era of the calculated "dehumanization" of the African,³

in order to justify the impersonal and often brutal system that emerged when slave labour became a premium in the years leading to the U.S. Civil War.³ Interestingly, in Brazil, intensive mono-crop agriculture never really developed, and the diversified farming model probably was the experience for the Afro-Brazilian culture. This is reflected in the firm preservation of some of the original African religious, cultural and linguistic pursuits among the blacks of northeastern Brazil.

Religion was undoubtedly part of the culture of the Africans in their sites of origin, and it flourished in very different manners among the captive populations of the New World. Relying on the work of Raboteau⁴ and E. Franklin Frazier,⁵ Carter has concluded: "Historians note that African-American religion originated in the regions of ancient Africa, e.g., Cush, Punt, and Egypt, and was subsequently influenced by the institution of slavery and colonialism. Therefore, it is argued that African-American religion, to a large extent, is a re-worked Christianity that has its own character and style".⁶ Syncretism is the amalgamation of a new religion with the indigenous religions. In the case of North Eastern Brazil provides a classic example of syncretism, where the Yoruba origins of the African transplants are still clear from their physiognomy and language to Yoruba religious practices enmeshed with the Catholicism of their former Portuguese masters. Difference between Protestantism in the English and Dutch colonies, and Roman Catholicism in the Spanish, Portuguese and French colonies, moreover, is credited with conditioning the difference in regard for the African, specifically in the area of the slave family.

Matriarchal organization of the black family throughout the world has been a subject of discussion.⁷ It has recently emerged to a concern in the U.S. for the lack of stable, joint-parent-headed households. In the Caribbean, the experience of serial free unions during the reproductive years of island women is documented. It is not hard to comprehend the origins of a matriarchal system of black households if one analyzes the logical consequences of chattel slavery in which adult slaves could be sold and bought throughout life. The dependent children would have to remain with the mothers in such transplantations among plantations. Slave stigma is another widely-discussed aspect of black social psychology. It is interpreted as the persistent psychological burden of having been in degrading and dehumanizing bondage which feeds into internalization of inferiority feelings, complemented by ongoing and enduring institutionalization of discriminatory practices.

O'Dea and Piers² comment: "Ethnicity transcends racial designation of genotypic groupings and represents instead the aggregate of cultural practices, lifestyle patterns, social influences, religious pursuits and racial characteristics that shape the distinctive identity of a community." We can conclude from this rapid survey that the distinctions at all levels from preferences in popular music and dance and other elements of the plastic and performing arts, through the use of language in distinct dialect, eubonics (black U.S. English) or creole (black Caribbean English), to religion, social arrangements, and cuisine, the descendants of the African Diaspora constitute separate ethnicities in their nation of residence.

Slaves undoubtedly had very little control over their own dietary selection, or on the times of day or portion-sizes of their meals. They possessed neither land for subsistence cultivation nor herds for meat and dairy products. Limited access to firearms precluded hunting. Foraging, fishing and trapping small game (rodents, birds, lizards, amphibians) was probably the extent of independent initiatives that were allowed for the majority of slavery circumstances. Slaves were largely dependent on the "rations" provided by their masters. For the latter, the notion was probably that of providing "feed" or "fodder" to their chattel; cheap, monotonous and low-quality staples constituted the fare. In this scenario, long-term health – beyond the reproductive years and the most efficient field-work period – was not really an issue for black slaves or their owners. For the slave-holder, the cost of feeding and maintaining an older slave, who was no longer productive nor reproductive, was not returned. For the slave, the life-expectancy was shortened by all of the conditioners of pre-technological mortality risk plus the additional stress and demands of the slave life circumstances. What would have satisfied the economics of the slavery system would have been the dietary feeding that maximized breeding and supported the demands of physical labour.

The distinct, archetypal models of slavery of the Caribbean rim, the United States South and the northeast of Brazil remained in place until emancipation of the slave population occurred in the latter part of the 19th Century. This occurred in 1863 on the North American mainland, but actually it was not until two decades later, in the 1880s, that emancipation of blacks was completed in the Caribbean and in Brazil. The agricultural business model changed, but the crops did not, which led to the model of "sharecropping" of cotton or sugar on small parcels in North America and blacks working as voluntary agricultural labour in the Caribbean. However, emancipation presented the first opportunity for blacks to seek work in other vocations. They sought these in the same region in which they had been slaves. World War II marked the beginning of the final (present) transformation.

World War II had an effect on American blacks to widen their geographic and occupational horizons. The war effort saw the men drafted into the armed services (albeit into racially segregated units), and women moved into factory work to support the war effort. Migration from the rural South to the urban and industrial North was an aftermath consequence of the War, and it was the demographic trend of note in the last half of the 20th Century. The blacks maintained racially segregated residential lives⁸ which favoured preservation of the cultural traditions and linguistic idiosyncracies. Educational opportunities and employment did not open up as rapidly as the migration to the northern cities. Government employment, including service in the armed services, emerged as an opportunity for jobs and income for blacks across the U.S. in the last half of the 20th Century.

African American (secondary) Diaspora

A "back to Africa" movement has always existed, and many slaves who escaped or were granted freedom found ways to return to Africa. Liberia in West Africa was in part a refuge for returned blacks from North America. The returned

slaves did not re-integrate with the native population in the back country, however, and a dysfunctional nation with a deep schism has persisted to the present era in Liberia.

More recently, in this aspect, the Afro-Caribbean population in the U.K. the Afro-Brazilian population in Portugal, or the Suriname population in the Netherlands would represent the serial progression of the original act of transplanting from Africa to the New World, and then a later and recent voluntary migration to the country of the colonial power back in the northern part of the Old World, namely Europe. Epidemiologists today have begun, in fact, to pursue the study of this third phase of the diaspora, that is, from the Americas back to Old World residence.⁹⁻¹¹

The health implications of the African Diaspora

Being part of the African Diaspora has implications for the health of the transplanted black populations.¹² The overriding theme is that of disparity and disadvantage. This is true at all levels of residence in the Americas, ie North America, the Caribbean, and South America. One can divide the formats for exploring the epidemiology of the African Diaspora into two (complementary) alternatives: 1) that focusing on the common genetic thread of African descendants and making comparisons between the contemporary residents of Africa and continental descendants residing elsewhere; a body of this research is growing;¹³⁻¹⁶ or 2) that focusing on disparity and differential exposures interacting with diversity of genetic constitution, by comparing different ethnic groups occupying the same regions or nations.^{17,18}

Within the latter paradigm, disparity is clearly a reality. It is in the U.S. in which the greatest outcry is currently being voiced, and is focused on equity in access to and quality of health care. In 2002, the prestigious Institute of Medicine, a division of the National Academy of Sciences, published a report: Unequal treatment: Confronting racial and ethnic disparities in healthcare.¹⁹ It documents a litany of disparities highlighted by death rates from cancer, heart disease and diabetes, that are higher in blacks than whites, adjusting for insurance status, income, age and severity of conditions. The fundamentals are outlined in Table 3. This situation has been commented upon in the most prestigious medical journals of that nation.²⁰ Multiple disparities in the application of health care for blacks can be listed. For example, in the middle period of the HIV/AIDS epidemic, African Americans in the U.S. were less likely to be receiving the prophylactic treatment for opportunistic infections and first generation of protease inhibitors.²¹ This is also true in a discrepancy for use of coronary angioplasty.²² It is typified by the fact that "a black man living in central Harlem, New York in 1990 had less chance to reach age 65 than a comparable man in Bangladesh".²³

Table 3. The fundamental elements of the health disparity for the African Diaspora

Higher neonatal and infant mortality, a selection factor for who enters
Lower birth weight
Poorer access to care and receipt of lower quality care
Differential susceptibility to certain diseases and health conditions and differential resistance to others

The National Medical Association (NMA), which is an association primarily of black physicians, has taken the revelation to the level of legal redress. In a lead editorial in the official organization of that field, entitled "Leveling the health delivery field",²⁴ the past-president of the NMA has called for congressional hearings to be held on racial bias and the impact of racism in healthcare in America.

Current concepts of diet, nutrition and long-term health

Human life-expectancy is relentlessly expanding. The concept of long-term health is based on a life-stage approach to human epidemiology. If human maximal survival is 120 years, the life-stages would be divided (sequentially) among: pre-conceptual; intra-uterine; infancy; childhood; adolescence; reproductive adulthood; older age; and advanced old-age. Accidental or violent injury is a potential cause of injury or death at all stages.

The concept of "nutrition transition," introduced by Popkin for developing countries,²⁵ has relevance for the blacks in Brazil and the Caribbean islands, which are so classified. The concept is also applicable for the North Americans of African descent. What the nutrition transition concept recognizes is that, while damage from under-nutrition continues in a population, the ravages of over-consumption and dietary imbalance begin to emerge. As such, as the director of one of the United States Department of Agricultural research centres has recognized: "Some nutrients can affect chronic disease risk, and we are waking up to the recognition that foods can have health values beyond those attributable to their nutrient contents".²⁶ Hence, prevention or avoidance of acute and chronic illnesses for each of the stages will avoid disability, promote survival, and assure passage to the next stage. Moreover, a concept of "wellness" (beyond the mere absence of disease) is a component of overall health. At any given life-stage, diet and lifestyle influence not only the course of the current state but also of all future ones. Precariously, it may not be possible, simultaneously to maximize all life-stage goals.

The International Union of Nutritional Sciences (IUNS) is sponsoring this Symposium. I have the privilege to serve as the chair of its Task-Force on Diet, Nutrition and Long-Term health. This Task-Force takes a lifespan vision of how the foods one eats, the exposures that brings and the constituents one retains will impact favourably or unfavourably with one's function, well-being and susceptibility to disease, the latter with important relation to one's genetic make-up. This variation in genetics is both individual and also aggregate as in ethnic and racial groups. This sets the obvious stage for the juxtaposition and interaction of long-term health issues of diet and nutrition with the plight and evolution of the African Diaspora.

Corn and a classical discrepancy

Maize (*Zea mays*) has played an interesting role in the life and health of Africans from the home continent to the situation after transplantation to the Americas. Today, corn is a staple of the diet in much of West and Southern Africa. Of course, this crop is of New World origin, having been developed by Native Americans. The Mayan creation myth holds that the gods created humans from the corn dough used for making tortillas. However, when the slave trade was at its peak in West Africa, there was a need for a hearty

and rapidly-growing food crop with a high energy yield per acre. The millets and sorghums were well adapted but did not serve to feed the populations herded into holding areas prior to embarkation for the New World. Maize cultivation was the solution for feeding the multitudes on the Old World side of the slavery transaction.

Once in the Americas, corn continued to be part of the diet as the traditional cuisine of the Bahía province of Brazil attests to, and as hominy grits, corn pone, corn fritters and corn bread testify for in North America. Unlike the Native Americans, who evolved corn and evolved with its consumption, the *nouveau* consumers of maize did not realize the importance of alkali treatment of the grain when consumed as a human food. Both the niacin in corn and its content of the amino acid, tryptophan (a precursor of niacin) are poorly available from the kernel, except with the application of acid or alkali treatment.²⁸ Dependence on corn as a prime staple can result in niacin deficiency states.

Although few contemporary physicians have ever seen a clinical case, the mnemonic of the "4 Ds" (dermatosis, diarrhea, dementia, and death)²⁷ are etched in the mind of every medical student as the clinical course of pellagra. The adoption of maize by immigrants to the New World – be it by the colonists or, more so by their slaves – took a devastating toll on health, the more dependent became one's diet on the energy and protein contribution of this grain.²⁸

Differential health experience of the African Diaspora: a contemporary portrait

Life expectancy is 6 y shorter for blacks than whites, and the gap has held steady for decades. This gap shows no signs of narrowing.²⁹ If we take a life-stage view of differential health, beginning with pregnancy and infancy, the problems of prematurity, low birthweight and infant mortality dominate. In the U.S. city of Milwaukee, black women were 3 times less likely to receive prenatal care than white women, and poor black women were 8 times less likely to receive prenatal care. Infant and neonatal mortality rates, and low-birthweight incidences were twice as high in black as white women.⁸ Generalized across the African Diaspora, this has led to persistent differentials in birth weights³⁰ and infant mortality with blacks at constant disadvantage.³¹

The biological and social bases of these health disadvantages may be explained by further examination of a differential experience of infants from foreign-born and voluntary migrant black mothers compared to those born in a given country.^{30,32,33} For instance, in New York City, the adjusted odds-ratio for low birth weight from domestically-born mothers was 1.32 compared to the births of black immigrants for the English-speaking Caribbean (64% of the comparison group) and Haiti (22% of the comparison group). In Canada, moreover, infants born of migrant Caribbean blacks have greater birth weight than those of all-race native Canadian populations, including Canadian-born blacks.

Violence, drug-related complications and infections, such as HIV and tuberculosis, are major causes of disability and mortality of black men in the U.S. Women contemporaries are not exempt from these afflictions. Blacks in the Caribbean are susceptible to the same constellation of health-threats in adolescence and young

adulthood. It is clear that violence and contagion are elements of *favela* life in urban Brazil. In Africa, the epidemic of HIV/AIDS is devastating to the health of individuals, the integrity of families, and the fabric of whole societies. The human immunodeficiency virus is also more common in Caribbean populations and among minority groups within the U.S. than among non-Hispanic whites in the Western Hemisphere. Dietary pattern and prior nutritional status probably play only the most remote and indirect role in these acute conditions.

It is with survival to mid-life that the diet-related health conditions begin to emerge for the black populations of the African Diaspora in North and South America. This was highlighted for urban North American population in a recent feature article in the *Sunday New York Times* entitled "As Black Men Move into Middle-Age, Dangers Rise".²³ Death rates for heart disease, all cancers and diabetes are twice as high in mid-life for black men, compared with their white compatriots. This is not, however, to negate the differential health disparities of women.

Table 4 presents a roster of diseases and health conditions for which populations of African descent have been found to have greater rates of incidence or prevalence. Each of the entities listed has a plausible connection of dietary intake. The list begins with obesity. Data for the classification of "overweight" and "obese" from national surveys from 1960 through 1994 in the United States have been compiled,³⁴ and recently extended by a follow-up survey to 2000.³⁵ It includes sequential, nationally-representative samples of men and women aged 20-74y. The age-adjusted prevalence of persons with a body mass index (BMI) between 25.0-29.9 kg/m² has remained steady in the 30-32% range for 40y. What has advanced is the prevalence of obesity, that is persons with a BMI of ≥ 30 kg/m² defined as frankly obese. For the entire population, this obesity rate rose from 12.8% to almost 32% over the four decades. For men, no differences have been seen across the ethnic groups in any era. For American women, the Afro-Americans have higher prevalences of every category of excess weight as compared to white women. For instance, by 1994, more than 10% of black women aged 40 to 59 y had class III obesity, or a BMI ≥ 40 kg/m². By 2000, more than half of non-Hispanic black women aged 40 years or older were obese and more than 80% were overweight.

Table 4. Disease conditions with higher prevalences in persons of African descent

Intake Related

Obesity
Diabetes Mellitus
Cardiovascular disease
Hypertension
Stroke
Renal failure
Breast cancer
Prostate cancer
Lead poisoning

Non-Intake Related

Glaucoma
Systemic lupus erythematosus

The response of black women is to be more passive and accepting of their body size. For instance, of 307 women in a convenience sample of clinic patients in Atlanta, 80% were overweight (35% pre-obese; 45% obese).³⁶ Seventy-eight per cent were hypertensive. Only 40% were attempting weight-loss: 80% of these by caloric reduction but only 50% with a physical activity.

For Brazil, serial evaluations of national survey data also show a net increase in the prevalence of overweight and obesity.³⁷ Although the data have not been analyzed by ethnicity – but rather by social class – in Brazil, two things are clear. First, that the lower-class urban populace has the major increase in obesity. Second, that Afro-Brazilians constitute the major fraction of this demographic group.

A concurrent international family study of Nigerians, Jamaicans and North American blacks in metropolitan Chicago provides a transnational view of relative excess weight.¹³ Through this prism of socio-cultural gradient, obesity rates (>30 kg/m²) were 5%, 23% and 39% at the respective sites. In this continuum, Jamaicans are intermediary, and equidistant from the two polar obesity rates.

With modern sensitive methodology to assess energy expenditure, the question of lower metabolic rates, either in the basal state or for the cost of work have been explored.³⁸ Although slightly lower weight and body-composition adjusted metabolic rates have been observed, the difference is insufficient to explain the wide racial gap in obesity and severe obesity rates for black women. The more likely mechanism is a more sedentary life pursuit, as can be shown in contrasts between Nigerian and North American population samples in which obesity rates are inversely related to habitual energy expenditure.³⁹

Of course, an important caveat surrounds the application of cut-off criteria for BMI to diagnose degrees of overweight. This was recognized by Kuczmarski and co-workers,⁴⁰ whose modeling of prevalences for U.S. obesity rates varied whether national or international standards of the day were applied. An even more important issue of the BMI cut-offs, however, is a biological one. The body mass index also fails to represent the same relative partition of fatness when applied across races.^{41,42} Specifically, with respect to American blacks and Europeans, the former will have relative less body fat at any comparable BMI value.⁴² A recent multiethnic comparison of BMI and body composition in adults all from the metropolitan New York area in the U.S. fails to confirm the differential fatness by BMI,⁴³ but the trend is consistent with the previous consensus. For persons of West African descent, this increased leanness at any given BMI could be related to the difference in the proportions of leg-to-trunk ratios, long documented by biological anthropologists. Since the tissue composition of extremities more muscular than that of the abdomen, the additional leg length of African Americans would militate in favour of more lean tissue for any given height. It is also not inconceivable that the selective breeding for strength and endurance in the era of slavery could have produced a shift in the distribution of frame-size and body composition. In any case, the diagnostic implications of this would be that applying the 25 kg/m² for "overweight" and the 30 kg/m² for "obesity" will overestimate the prevalence of abnormalities in a black population. Interestingly, Ethiopian Africans are actually fatter

at any BMI than whites, and considerably more so than African Americans.⁴²

More interesting as the issues of calibration and titration of the BMI may be the discordance in its behaviour as a predictor of mortality and morbidity between the white and black populations of women in the U.S., in data analyzed by Stevens and co-workers⁴⁴ from ongoing longitudinal monitoring within the national sample. Performing a complex and robust analysis to determine what BMI value in Afro-American women would convey the same risk as 30 kg/m² does for white compatriots for a series of outcomes. For diabetes mellitus risk, the 30 kg/m² cut-off matched that of whites. The hypertension risk of an obese white woman comes in for black women at BMIs below 20 kg/m². For total mortality and for dyslipidaemia in black women, BMI was virtually not a predictor of differential risk across the spectrum for African-American women. So, the application of "lessons learned" in the larger society for outcome-specific risk based on BMI cut-offs may be inappropriate and misleading for the ethnic enclaves within.

Finally, with respect to adult obesity in the African Diaspora, accepting that the diagnostic marker may over diagnose fatness and the prevalences of excess weight, the situation is still grave. Recent understanding related to the metabolic syndrome (below) that the distribution of fat within the body is an independent factor of risk. Fat deposited in the truncal region conveys greater risk than that of peripheral distribution. Among adults of all major U.S. ethnic groups, including those of the African Diaspora, the clustering of metabolic syndrome was associated with an abnormally high abdominal circumference.⁴⁵

The disempowerment and debilitation of the black American woman has motivated major concerns in the growing epidemic of excess body fat and weight which is documented in its descriptive sense from comparative survey data. The lack of control over lifestyle, diet and social circumstances may be entrenched factors that both explain the epidemic and militate against a facile solution.⁴⁶

The situation for body composition in the juvenile segment of the U.S. population has been analyzed separately. A steady increase in the percentage of North American children classified as "obese" or "overweight," based on BMI criterion related to age-adjusted percentiles has been seen in national survey data from 1963 to the present.^{47,48} There had been no differences with respect to ethnicity, education or income through the stage of the NHANES III, ending in 1994. The prevalence of overweight among non-Hispanic black and Mexican-American adolescents increased more than 10 percentage points between 1988-1994 and 1999-2000, compared to a 5 point increase nationally. Concern is beginning to grow with respect to earlier emergence of risk for metabolic consequences for the youth of the African Diaspora in North America.

In addition to obesity, per se, African Americans have a higher prevalence – and often a more severe presentation – of associated conditions that constitute the so-called metabolic syndrome.⁴⁹ One of these is diabetes mellitus and blacks have a higher prevalence of diabetes; excess prevalence of Type 2 diabetes is 1.6 times that of whites.⁵⁰ In addition to hypercholesterolemia, hypertension and smoking, i.e. conventionally recognized risk factors for

coronary heart disease and stroke, in African Americans with diabetes mellitus, blood coagulation factors (factor VIII, Willebrand factor) and inflammatory markers (white blood cell count), and renal impairment were independent factors for cardiovascular disease.

Using the NHANES III data, Okosun⁵¹ has provided two important insights on the differential diabetes rates for black and white women, for which the former has twice the overall age-adjusted prevalence. In fact, if they are obese, white women are twice as likely to have diabetes than blacks. However, the higher overall obesity rates of African-American women is such that obesity explains 39% of the variance in the higher national diabetes mellitus rates in black women in the U.S.

The African Diaspora in the Caribbean provide additional insights on diabetes risk. On the island of St. Croix in the U.S. Virgin Islands, in which more than 50% of the population are migrants from other Caribbean locations and the lifestyle is similar to that of the U.S. mainland, the diabetes prevalences were found to be as high as those among Afro-Americans on the mainland, and twice that of the rates in neighbouring Caribbean sites. These high rates were found both for those who declared their ethnic origin as "African-Americans" (English-speaking heritage, 80% of the black samples) or "Hispanic blacks" (Spanish-speaking heritage, 20% of the black sample);⁵² this provides evidence for a strong influence of affluence and lifestyle interacting with genetic constitution in the aetiology of diabetes in blacks. Butler *et al.*,⁵³ working in the English-speaking island of Dominica, looked within the population at who had – and who did not have – glucose intolerance. From the results, they have postulated that the psychic factor of internalized racism is a stigma-based component of the mediation of abnormal glucose tolerance leading to diabetes.

Cardiovascular disease (CVD) is a double burden for the North American African Diaspora. Blacks have more heart disease and less comprehensive health-care management.⁵⁷ This is reflected in their access to, participation in, and outcomes from the modern intervention procedures.²² Blacks, for instance, had a 40% increase in short-term mortality after carotid surgery.⁵⁸ It has been suggested, however, that those of the Caribbean branch of the diaspora are relatively spared from CVD given the magnitude of their hypertensive problem.¹⁴

The prevalence of hypertension in African-Americans is among the highest in the world.⁵⁹ It is also high among Afro-Caribbeans, with one study documenting a rate of hypertension of >85% in elderly persons on the island of Barbados.⁶⁰ The genetic issues are centred around salt-sensitivity and the gamut of genes that predispose to it which are currently being documented in the African descendants.⁶¹

Hypertension rates vary substantially within African Americans.⁶² Being younger, but still obese, is associated with a prevalence as low as 7%. Being middle-aged or older, less educated, overweight or obese, physically inactive, and having diabetes were associated with hypertension rates as of >70%. In terms of blood pressure management, being younger, a male, and with infrequent health-care contacts of African American hypertensives with poor control and not on antihypertensive medications.

Sowers *et al.*,⁶³ focus on the emergence of hypertension, even in the juvenile black population of the United States, and suggest that biological and social factors from childhood combine with genetics to constitute the enhanced hypertension risk for African-Americans throughout their lifespan.

Hand in hand with arterial hypertension is the problem of stroke. Prevalences of cerebral vascular episodes are higher in North American blacks. In the U.S. for men between 55 and 64 y, the death rate from stroke for whites is 40 per 100,000, whereas that for blacks is 121 per 100,000.²³ It is also high among the secondary diaspora from the Caribbean to the U.K.⁶⁴ Curiously, for the rates and severity of hypertension among Caribbean blacks, rates of stroke seemed to be lower than would have been expected.¹⁴ An under-recognized, but enormously expensive and debilitating problem among blacks is renal failure which has as its risk factors hypertension and diabetes, as well as a racial component of its disposition.⁶⁵ African Americans comprise 12.6% of the U.S. population, but >30% of the patients with end-stage renal disease.^{66,67}

Jemal *et al.*,⁶⁸ have remarked: "African Americans still carry the highest burden of cancer with later-stage cancer diagnosis and poorer survival compared with whites." This applies notably to breast and prostate cancer. With respect to the former, breast cancer in women 30-38 y has twice the incidence, more ominous prognostic features.⁶⁹ Prostate cancer is the leading cause of cancer mortality in African American men with a 60% higher incidence and a 100% greater mortality as compared to whites.⁶⁸

Lead poisoning incidence is much higher in black populations in the United States.⁷⁰ This seems to be attributable primarily to economic disadvantage and social marginalisation, with African American occupying the sub-standard housing that is likely still to contain lead-based paints from an earlier era.⁷¹

As shown in Table 4, some additional diseases have a higher incidence or prevalence in people of African descent, but without any strong implications of eating patterns or diet. For instance, glaucoma (elevated intraocular pressure) is 4 times more common in blacks than in whites in both U.S. mainland populations⁷² and Caribbean blacks.^{73,74} In Barbados, blood pressure elevations were documented in 9% of persons over 30 y of age. Similarly, systemic lupus erythematosus⁷⁵ has a higher incidence. It also has a distinct presentation across ethnicities, with a more aggressive presentation in blacks.

Interestingly, one can list a handful of diseases and conditions for which the prevalence among persons of African descent is lower than that of other ethnic groups. Some of these are listed in Table 5. That bone mineral density is higher in blacks compared to whites has been demonstrated by *in vitro* research on fossilized bones and in contemporary *in vivo* studies.^{76,77} This tends to be reflected in lower rates of osteoporosis and pathologic skeletal fractures in those of African descent worldwide.⁷⁸ Malignant melanoma and other skin tumors are seen in blacks, but they are much rarer than in the dominant population, presumably due to the melanin-based skin sun-screening as an adaptation to tropical evolution. Rates of dyslipidaemia and hypertriglyceridaemia are lower among African American women compared to whites in two nested

Table 5. Disease conditions with lower prevalences in persons of African descent

Osteoporotic fractures
Malignant melanoma
Dyslipidaemias
Atrial fibrillation

surveys in the U.S.⁴⁴ Curiously, the irregular heart rhythm known as atrial fibrillation has one-third the prevalence in blacks as compared with whites.⁷⁹

Ethnic differences in dietary habits

Not only do the blacks of the African Diaspora not consume what their ancestors ate at the time of their enslavement, but the indigenous Africans of today have a diet far different from what was eaten at the time their diaspora brothers and sisters were crated off the Continent. The contact of the European slave traders with the indigenous cultures of coastal Africa is responsible for setting in motion the changes in diet of the descendants on both sides of the Atlantic divide. Moreover, although there can be great homology among the edible plants and animals that constitute the dietary intake of the inhabitants of a specific region, given the nature of the climatic and soil conditions that influence what can grow and graze, the concept of different ethnicities – beyond skin colour – implies some cultural differentiation;² this includes cuisine and food habits as a manifestation of ethnic identity. Our understanding of ethnic difference in dietary habits comes from: 1) social and cultural anthropology and 2) dietary studies, based either exclusively on a description of a given ethnic group of a region, or on national surveys that include subsamples from across the ethnicities that make up the nation.

Process issues in dietary habits

The pellagra story, alluded to above, already has provided evidence for differential dietary habits. To this very date, in the U.S., the black population has been resistance to certain aspects of assimilation into the larger consensus culture. It can be debated whether this is the result of active or passive exclusion due to discrimination, or whether it is a conscious and collective resistance to being assimilated. I would suggest that it is a mixture of both. In the Caribbean, the population of African descent constitutes the majority, and has a cuisine that is distinct from the less-numerous subpopulations such as the whites of the colonial origin, and other minorities (South Asian, East Asian, indigenous) who co-inhabit the islands. In Brazil, in which the ethnic ration of black and white is nationally balanced – but regionally skewed, the African influences have clearly touched the dietary habits for the general population. Moreover, for the Africans in the State of Bahía, a cuisine with African roots in the style of preparation, including the use of red palm oil, but adapted to the use of maize and inclusion of seafood (Bahian food), is a recognized cultural variant with international appeal.

According to Pollard *et al.*,⁸⁰ four classes of factors can affect food choices: personal; practical; economic; and social. They point out that food habits are learned behaviours incorporated into personal attitudes; arriving at the level of self-expression "are the reason why cultures and

traditions persist so strongly".⁸⁰ Using the chattel slavery basis for the diaspora experience of blacks in the New World, the food provided by their masters served more the function of "feed" or "fodder" (as in animal husbandry) than food as cuisine. But availability and accessibility are the external constraining factors for expressing individual choice. It may be that blacks coveted the more savoury delicacies that they saw in white culture, but higher costs (beyond their income possibilities) and sale in certain shops (restricted to black consumers by segregation practices) proscribed both accessibility and availability.

Time constraints are an interesting consideration in terms of the opportunities for meal creation in black homes, assuming that a common food culture and tradition developed among slaves and the descendants of slaves. In the post-bellum South, black women's work options were exceedingly narrow, serving as domestic servants in white households or being housewives on sharecropping rural parcels. The time for food preparation in one's own household were contrasted. The maid spent less time in food preparation for her own family, but probably gained familiarity with the more diverse cuisine of the white culture; her problem must have been the constraints on getting traditional meals prepared for her own household. The sharecropper's mate had her day involved in household chores, with cooking among them, but her stock of food resources was limited by what could be grown, foraged, hunted, battered, or bought. Technology was another constraint in the late 19th and early 20th century. Storage and preservation of food was problematic before electrification, and the capacity to maintain perishable ingredients and prepared meals characterized what could be obtained and what was prepared.

Consumption of milk and dairy foods are lower among American blacks, as compared to whites. Clearly, the confinement in slavery in the rural South was not conducive to having dairy animals. There is, however, a genetic and physiological characteristic common to persons of west African descent which may indeed influence the intake of milk and dairy derivatives. The emergence in adulthood of low levels of the intestinal lactase enzyme, the enzyme required to digest milk sugar (lactose), is genetically determined and the recessive genetic constitution of lactase non-persistence is highly prevalent in West Africa. Nigerian Yoruba constitute a case in point.⁸¹ Undigested lactose after a meal of milk or soft cheese can produce untoward gastrointestinal symptoms (lactose intolerance). It has been recommended by certain paediatricians that milk not be a part of lactose-maldigesters' diets.^{82,83} Since consuming 2 to 3 servings of dairy products daily is one of the postulates of the U.S. Food Pyramid guidelines, a public-interest group, Physicians Committee for Responsible Medicine, has taken the U.S. Department of Agriculture to court, alleging that compliance with this provision damages a subclass of the population, namely blacks. They contend that its inclusion in government assisted feeding programs, in schools or elderly day-centres prejudices the lactose-intolerant consumers, primarily Afro-Americans. Still unresolved, in fact, is the degree to which blacks' eschewing dairy consumption is more cultural or physiological in its origins.

A typical (stereotypical) selection of preparation style and "Soul food" as a cultural statement follows. The notable elements of this cuisine include: fried chicken; barbecued pork ribs; ham hocks; pig's feet; collard greens; biscuits and gravy; hominy grits; corn pone; corn fritters and cornbread. The hallmark of "soul food" is "chitterlings," (pork entrails), and the dessert delicacy is sweet potato pie. The assertion of unique black identity that came in the 1960s' rise of the civil rights movement in the United States brought the creation of soul-food eateries variously known as "soul kitchens," "rib shacks," or "chicken shacks." Taken en masse, the archetypical "soul food" menu is a fatty and calorie-rich fare.

On the other hand, a food associated stereotypically with blacks, but one which has never been embraced with pride – and remains an aspect of derision today – is that of eating watermelon. The black writer, James Baldwin, used as his metaphor for an eventual reversal of social roles and power with the white society in the U.S, as whites' "learning to eat my watermelon." An ironic circumstance arises with respect to the excessive susceptibility of black men to prostate cancer which has been demonstrated.²³ The carotenoid compound, lycopene, has putative properties for preventing the progression of prostatic dysplasia.⁸⁴ Watermelon's red pigment is derived from its extraordinarily rich lycopene content. Whether stereotype exaggeration or historical fact, any substantial consumption of this melon would, in fact, act to reduce a health threat preferentially skewed to the black population. Was any affinity for watermelon a fortuitous cultural adaptation for long-term (prostatic) health?

An interesting cross-cultural phenomenon which has implications for self-perception of dietary intake and which has relevance to the validity of findings in the dietary research on contemporary evidence was recorded in a multinational study of the Cameroon, Jamaica and the US. Using three cut-off levels for energy intake/estimated basic metabolic rate, the putative rates of underreporting one's actual habitual dietary habits was only 4-6% in rural and urban Cameroonians, 28% in urban Jamaicans, and 39% in urban black citizens of the United States.⁸⁵ As anticipated energy intakes were highest in the least sedentary populations, namely on the African continent.

The contemporary evidence record

As noted, anthropology, regional dietary studies and national surveys provide the prism through which the current dietary habits in the African Diaspora are seen. An example of the anthropometric contribution comes from ethnographic research in enclaves of Ecuadorians of African descent. One such area is the El Chola Valley in the Ecuadorian highlands, where descendants of slaves, imported by Jesuit missionaries to work their sugarcane plantations, have remained in agricultural pursuits on parcels of land distributed after the abolition of slavery in 1852. The description of contemporary household food consumption in a town of 130 households, of which 21 (16%) were female-head has been presented by Guerrón-Montero and Moreno-Black.⁸⁶ Overall, 48 of these households were selected for ethnographic study in quite complete depth and detail. The four food items that all households consumed every day were sugar, salt, rice and bread. Over 45% of households also consumed, on a daily

basis: coffee, noodles, potatoes, banana, yucca, plantain, onion, carrots, tomatoes, bell peppers, lemon, and cheese. Milk and meat were only infrequently consumed. To what extent this selection differs from that of indigenous or hispanic inhabitants in the region or is prepared differently with any African influences is not a matter of record in this study.

In fact, the analysis was based on comparing 15 female-headed households with 33 households with a male household head to examine the phenomena of enforced matriarchy, and the question of any food security deficit for families without a male head. The female household heads were 44 y of age on average, whereas the male figures in the nuclear family settings has a mean age of 33y. Comparative income assessment found a weekly income, on average, equivalent to \$47.9 (US) in female headed households and \$131.2 (US), in those with a male head, a 2.7-fold increase. Nevertheless, the absolute weekly expenses on food, \$16.1 and \$17.6, respectively, were virtually identical. Income does not appear to limit food security in this setting. In terms of food patterns across household types, daily intake of sweet peas, lentils, lettuce, papaya, butter, seasonings, candy and herbal teas was greater in the households headed by males, whereas only the daily consumption of bananas, oranges and eggs inclined in favour of families headed by a woman. Ecuador is an interesting case of the African Diaspora in which the isolation from other blacks and the cutting off from African roots may be at the extreme of the spectrum for South American.

Not all comparative studies in the U.S. on dietary habits between its black citizens and the larger society have shown differences, but a majority of those focused either on national samples or in specific localities can demonstrate differential patterns of food intake. There are an abundant set of studies that focus on differential consumption of nutrients across the races. Two of them would seem to be illustrative of the persistent divergence in food selection between blacks and whites. Lewis *et al.*,⁸⁷ from the U.S. Food and Drug Administration, tried to assess the differential impact that the suggested voluntary folic acid fortification of milled grains from 1998 forward had effected in terms of intake of this vitamin. Afro-American women benefitting less from the enrichment of the diet in terms of increased folic acid intakes. A recent report from the CDC, monitoring the change in serum and red cell folic acid concentrations, confirms the lesser impact on black women as compared to Mexican-American and non-Hispanic white women in the U.S.⁸⁸

Nesby-O'Dell *et al.*,⁸⁹ examined data on vitamin D intake in young American women and found a significantly lower intake of vitamin D-rich sources in the diet in the population of African descent. A common denominator in this differential intake of these vitamins was the different breakfast habits: white women's consumption of ready-to-eat-cereals with milk was high and determinant of their additional superior intake of folate and vitamin D; black women eschewed cereals for other, less processed breakfast fares that are poorer in fortificants. Historically, Southerners, rural populations and blacks have been more consistent in consuming breakfasts and hearty meals than Northerners, urban residence or non-blacks.^{90,91} This "resistance" to assimilating into the ready-to-eat breakfast

products keeps African-American women outside of the loop, given the increasing dependency of the American public on fortified and enriched processed foods, especially cereals.⁹²⁻⁹⁴

In the comparison across the diasporan continuum, rather than across contiguous ethnicities, is another approach. In 1996, Airhihenbuwa *et al.*,⁹⁵ commenting on cultural aspects of African American eating patterns ventured the speculation that: "The high mortality from diet-related diseases among African Americans strongly suggests a need to adopt diets lower in total fat, saturated fat and salt and higher in fibre. However, such changes would be contrary to some traditional African American cultural practices." Mennen *et al.*,⁹ provided an unexpected resolution of this issue in a study of macronutrient intakes in blacks in four settings: rural Cameroon; urban Cameroon; Jamaica; and the UK (Manchester). Using food-frequency questionnaires they assessed the dietary intake of representative samples in the four climes. Contrary to the expectation of a transitionally lesser contribution of carbohydrate and a greater intake of total and saturated fats along the gradient, the data revealed an equivalent contribution of these macronutrients as a percent of total energy. Highest expenditures and intakes of energy were seen in the rural Cameroon, as was the highest consumption of ethanol. Along this advancing continuum, any advancing rates of non-communicable diseases cannot be attributed to progressively "unhealthier" diets.

In any address of the theme of long-term health, we would need to take our dietary inquiry, beyond the domain of nutrient adequacy to that of a dietary pattern to maximize function and minimize non-communicable diseases. In many ways, dietary research on the African Diaspora has led the way in this regard. In a comparative survey conducted in Louisiana in a sample of 675 women coming for breast-cancer screening, of whom 43% were white and 47% black, a difference in reported consumption of fresh vegetables was documented.⁹⁶ Whereas 51% of white women reported daily consumption of fresh vegetables, only 29% of black women reported this pattern. Interestingly, in the same study, there was no difference between the 27% and 29%, respectively, of reported daily intakes of fats and oils. No quantitative estimates of the cumulative intake of either of the index foodstuffs can be derived from this survey.

When it comes to nationally-representative samples, an evolutionary pattern of comparative "healthful eating" has been documented, not without its paradoxical aspects. A classical study in this area was published in the *New England Journal of Medicine* by Popkin and coworkers,⁹⁷ entitled "A comparison of dietary trends among racial and socioeconomic groups in the United States." It was based on the 16-point Dietary Quality Index, in which a low score <5, is considered to be a more healthful diet based on considerations of nutrient density and food choice, and used United States Department of Agriculture serial national consumption survey data from 1965 through 1991. Of note was the fact that, in 1965, 16.4% of low-income blacks, 9.3% of low-income whites and only 4.7% of whites of higher socioeconomic strata had DQIs below 5. The gap narrowed by 1991 due to improved patterns in the white groups. Was it a "diet of poverty"⁹⁸ that had been protective

of the black population from risk of non-communicable diseases? Similar findings were documented for the subgroup of women of childbearing age, contrasted across ethnic categories in the U.S.

Placing a national focus on the sources of dietary protein as divided between animal and plant can provide a perspective regarding cultural differentiation. National survey data shows that all ethnic groups in the U.S. derive about the same contribution of dietary energy from protein. The overall division of protein sources for the national population is 69% of animal origin and 31% of plant origin.⁹⁹ Sources of animal dietary protein, however, differed by ethnicity, with blacks having 18% from poultry and 11% from pork, higher than in whites. Whereas whites consumed 22% of protein from dairy sources, African Americans received 14%. Eggs accounted for 4-5% of protein in both ethnic groups. In terms of plant protein, 18% came from grains in whites and 16% in blacks, whereas both groups derived 4% of protein from legumes. Similarly, although fat intake has stabilized at lower levels than previously observed in the U.S.,¹⁰⁰ with equivalent contribution of fat to total energy across all ethnic groups, the sources of dietary fat still differ between blacks and the other major U.S. ethnicities.

To the extent that fruits and vegetables contribute to a more healthful diet, accessibility for contemporary mainland blacks may still be limited. In studies in other societies, the UK for instance,⁸⁰ it has been shown that purchasing the requisite amounts of fruits and vegetables is expensive, costing more for those consumers with the most healthful diets. This rule probably obtains in North America. Blacks have a lower median income than that of the national population as a whole. In Britain, cost would be a deterrent to optimal fruit and vegetable consumption and the same principles are applying in the U.S. By virtue of their high potassium and low sodium content, (unsalted) fruits and vegetables would theoretically be a boon to health of blacks given their genetically high prevalence of salt-sensitivity conditioning hypertension.

The use of dietary supplements is steadily growing throughout developed and developing countries. When the demographics of supplement-users have been studied in the U.S., the typical consumer is female, white and affluent.¹⁰¹ In fact, African-(North) Americans are lesser participants in prophylactic use of nutrient supplements and also when afflicted by specific diseases.¹⁰² However, as shown by the experience in the Caribbean, traditional herbal supplements, such as herbal teas and infusion, have a long tradition;¹⁰³ they are still regularly used as household remedies. How closely tied to an oral tradition that survived the transplantation from Africa to the islands of the Caribbean sea are the practices of herbals is an enduring question.

Fatty fruits and the African Diaspora

The central theme of this symposium is the discussion of fatty fruits: avocados (*Persea americana*); cocoa (*Theobroma cacao*); olives (genus, *Simarouba & Olea*); and palm fruits (genus, *Elaeis*). Three of the four originated in Northwestern Africa. How these contribute to the contemporary diet to the African Diaspora has probably not been systematically investigated; personal observations and common consensus is the only guide.

With respect to avocados, they are commonly consumed in Caribbean and Brazilian regions, where they grow both wild and cultivated. In the U.S., they are largely experienced through Mexican cuisine, as guacamole and salad ingredients. Recent studies have documented a high content of diverse – and potentially beneficial phytochemicals, specifically flavonoids in chocolate.¹⁰⁴ Consumption of chocolate beverages is not deeply rooted in black cuisine. Given the high prevalence of lactase non-persistence, the recommendation to take chocolate milk to avoid intolerance would be applicable. Consumption of chocolate candies is universally accepted, a clear example of the global extension of a certain foods.

With respect to olives, the oil pressed from their mesocarp (pulp) is the central element of the so-called "Mediterranean diet" consumed in Greece, Albania, Italy, France, Spain and Portugal.^{105,106} Salad consumption is not favoured at any setting of the African Diaspora; in some tropical climes, uncooked vegetables present a finite hazard of food-borne microbiological contamination. As traditional frying fat, other edible oils (or lard) are established in Brazil, the Caribbean and U.S. With respect to the palm fruit and its derivative products, palm stearin is used in processed foods which may or may not reach the table of black populations in the Americas, but not in any differential manner vis-a-vis the companion ethnicities. The refined, clear liquid oil derivative (palm olein)¹⁰⁷ is produced largely in Malaysia for exportation into the world market. On the other hand, the crude or semi-processed red palm oil (RPO), which is a major cooking oil throughout west Africa, is also commonly prepared in at the artisan level in coastal regions of Brazil. It specifically imparts the red colour to many of the traditional dishes of Bahian cuisine. This red pigment is derived from provitamin A carotenes in high concentration.¹⁰⁷ Ironically, the practice of using RPO in Brazilian cuisine did not prevent the poor black populations of northern and northeastern Brazil from being among the most notoriously endemic for hypovitaminosis A.¹⁰⁸

Are there ethnic differences in nutrient requirements ?

Recommendations for daily intake of nutrients for persons of different ages, sexes and physiological states are made for both nations and regions¹⁰⁹ and for the entire world,^{110,111} based on a serious assessment of average (human) nutrient requirement. Both nation's and the world's population as a whole is multi-ethnic, and one would have to question a "one size fits all" approach to nutrient requirements and recommendations if, for instance, different ethnic groups had distinct nutrient requirements, chemical tolerances and responses to dietary constituents.

Is it reasonable that different ethnic groups should have different nutrient-based daily intake recommendations?

The policy and programmatic implications of this query have militated against its formulation by public health decision makers. However, it does little justice to maximizing health for the African Diaspora, and its understanding by avoiding the issue of possibly different daily nutrient requirements across ethnic groups.

The discussion of iron nutrition for blacks and whites can now take on deeper dimensions. It began as a discussion

surrounding diagnostic cut-off criteria for haemoglobin in defining anaemia. There is a statistically-significant difference in "normative" packed cell volume (haematocrit) between blacks and whites, at least as far as Caribbean blacks¹¹² and North American blacks^{17,113,114} are concerned. The difference is about 5 g/L. If a common cut-off standard for "anaemia" is applied, a higher relative diagnosis of deficiency will be found among blacks.¹¹⁵ If we add a dimension of body composition consideration to his finding, then the amount of total circulating iron needed to reach full haemoglobin capacity for the erythron is 4% less, and storage requirements being equal, the daily replacement requirement would be 4% lower for Africans. If one assumes that individual regulation of iron stores is perfect,¹¹⁶ this would have an asymmetrical interpretation. Blacks could meet iron sufficient on a dietary supply (slightly) lower than that required by whites, but having more than the recommended iron would not prejudice either group, as homeostatic regulatory control would exclude the excess dietary load. Beard,¹¹⁷ however, has challenged the prudence of complacency regarding the assumption of perfect body iron control.

Vitamin D requirements raise ethnic-related issues, as well. Using data biochemical and questionnaire data from the National Health and Examination Survey III, Nesby-O'Dell *et al.*,⁸⁹ compared 1546 non-pregnant African-American women with 1426 white compatriots, and examined the rates of circulating 25 hydroxyvitamin D concentrations of <37.5 nmol/L. Some 42% of black women and 4% of women of European descent had biochemical evidence of hypo-vitaminosis D. This rate was 28% in summer and 52% in winter in black subjects, compared to 2% and 11%, respectively, in the same polar seasons in white women. This suggests the obvious, that the melanin pigment in the skin of blacks filters the sun's energy and reduces intradermal production of vitamin D with considerable dampening compared to whites. Moreover, the rate of subadequate circulating levels was still 28%, even among African-American women who assured achieving the recommended dietary vitamin D intake by taking a daily supplement containing ≥ 5 μ g per day.

Based solely on these biochemical findings, one could indicate that, indeed, the "requirement" for the vitamin to maintain a "normative" circulating vitamin D is greater in African-American women. The authors of the study⁸⁹ recommended supplements. The more fundamental questions, however, is whether recommendation should be different and higher for blacks? The programmatic and pragmatic answer is probably is that it should not. The empirical evidence of greater bone mineral density, bone mineralization and resistance to osteoporotic fractures in blacks^{76,77} is clearly ingrained, and suggests that evolutionary adaptation allows blacks to make stronger and harder bone with lesser amounts of vitamin D.

Is it reasonable that different ethnic groups should have different nutrient tolerance limits?

An extension of the question of ethnic differences in nutrient requirements would be that of differential sensitivity to high exposures. As of the present deliberations since 1997 in the DRI,¹¹⁸ the U.S. and Canada have established, where possible, the age- and gender-specific

upper tolerance levels (UL) for daily oral exposure to dietary constituents.

The iron issue emerges again in the context of tolerance to dietary exposure. According to the DRI, the UL for iron in adults is 45 mg,¹¹⁸ although the rationale for this criterion has been challenged.¹¹⁹ The level of iron accumulation in the body, which can be assessed by circulating ferritin levels, appears to have some different implications for U.S. women of different racial classification, as explored by Ramakrishnan¹²⁰, using NHANES III data. In this national survey, Afro-American women had the highest average serum ferritin concentrations, as compared to Hispanic and white women. Moreover, after adjustment, the CVD risk profile was significantly more severe in the highest quartile of serum ferritin status as compared to the middle two quartiles. This association was not found in white women. If Beard¹¹⁷ is correct, that some sub-fraction of the population may be dysregulated, adverse implications of iron accumulation for black women are raised in this evidence from the U.S. population.

For adult women, the UL for vitamin A is 3000 µg;¹¹⁸ exceeding this intake presents a risk for fetal malformations at the onset of pregnancy. The Nurses Health Study, a massive longitudinal investigation that began two decades ago with 90,000 (predominantly white) female US health professionals, has raised concerns of the propriety of this limit as women age to an age of risk for postmenopausal bone loss and osteoporosis. A recent analysis of data on pathological bone fracture risk in this cohort¹²¹ showed that the amount of vitamin A in the diets was associated with low bone density and osteoporotic fracture risk, with >2000 µg daily intake being the critical tolerance point. In fact, analyzed as a continuous variable, "for every additional 500 µg/d increase in retinol intake, hip fracture risk increased significantly: 15% (95% CI, 8%-22%) for retinol from food plus supplements and 33% (95% CI, 9%-64%) for retinol for food only".¹²¹ Interestingly, provitamin A contribution to intake produced no risk for bone weakening in this analysis. The authors conclude: "Long term intake of a diet high in retinol may promote the development of osteoporotic hip fractures in women. The amounts of retinol in fortified foods and vitamin supplements may need to be reassessed".¹²¹

Again, as with the issues of vitamin D,⁸⁹ the higher bone mineral density, bone mineralization and resistance to osteoporotic fractures in blacks^{76,77} may raise interesting policy issues. Does preformed vitamin A increase the risk of bone loss in blacks, to the same degree and at the same doses? Logic would suggest not; investigations are non-existent. Curbing vitamin A intake for groups outside of the risk profile of the majority population might be unnecessary and prejudicial to their nutritional security.

Is it a reasonable consequence that different ethnic groups should have different food-based dietary recommendations?

The World Health Organization and Food and Agriculture Organization have processes under the United Nations agencies to establish recommended nutrient intakes with a view to the entirety of humanity; a revision of an early 1990 technical report¹²² has recently been concluded in 2003 and placed on the worldwide web. Dietary guidelines for

prevention of cardiovascular disease from the American Heart Association¹²³ and of cancers from the World Cancer Research Fund¹²⁴ also have a sense of universal application across geography and ethnicities across the globe. A variant on the issue of differential nutrient requirements is that related to ethnic selectivity in responses to the protective or injurious effects of foods. This would relate to differential dietary guidelines for different ethnic populations.

A potential example of the differential applicability of food-based guidelines, specifically as related to the putative anti-cancer properties fruits and vegetables arises in an ethnic comparison of biomarkers of malignancy from the University of Alabama at Birmingham in the U.S. In elegant molecular biological studies, it has been demonstrated that the degree of methylation of cytosine nucleotides residues to produce 5-methyl-2'-deoxycytidine is associated with the progression of malignancies.¹²⁵ Both hyper- and hypomethylation of DNA has been can be associated with cancer tissue, but as a precursor to carcinogenesis, deficient degrees of methylation seem to be predisposing. Nutritional status with respect to vitamin C, folate and vitamin B₁₂ can influence methylation in the cell nucleus. This could represent one of the mechanisms by which fresh fruit and vegetable consumption is cancer-protective. Comparison of tissue vitamin and methylation status of tissue samples from squamous cell carcinoma of white and black cancer patients revealed a strong relationship of vitamin status to methylation status and methylation status to malignancy in whites, whereas no relation was found in blacks.

A tentative conclusion might be that the protective effect against this neoplasm of increased vitamin intake may not operate for blacks. It is not so much that adherence to recommendation for generous consumption of fruits and vegetables by blacks will not be helpful in a series of nutritional and health-protective domains. It is that reliance on this measure for protection from certain classes of chronic diseases may not be as prudent for Afro-Americans, and other protective precautions, if available, should be emphasized to achieve equivalent benefits.

Tactics and strategies for long-term health

Despite the literature on differential ill health and dietary behaviour that one can mobilize in a literature review,⁸ the scientific knowledge bases is incomplete. It is urgent to go after that knowledge. The legacy of racism has led some to embrace compulsive "colour-blindness" as an intrinsic barrier to discrimination. As pointed out by Walker,¹²⁶ this principle has been applied to medical and health-care research in a South Africa emerging from *Apartheid*. I have gone on record as opposing this approach for the unintended downside consequences of ignoring the differential points.¹²⁷

Ethnic diversity, in both its genetic and cultural aspects, conditions health-risk diversity. What is lacking, at one level, is to address of subtleties on the biological side, that ethnicity for blacks is more a category of social marginalisation and stigma than anything representing genetic homogeneity. The legacy of miscegenation is a confounder; the wide spectrum of skin-colour hues and shades across those classified as "blacks" or "African-American," is probably proxy for the genetic variation in this group.¹²⁸ This genetic foundation interacts with environmental

exposures, poverty, and psychic stress to form a basis that is leading to poorer health outcomes for African descendants throughout the Americas.^{19,37,129} Individualized, ethnic-based and ethnic-specific research does not represent "discrimination" that should be discouraged, but rather an important inquiry to produce targeted solutions that will further the goal of equality in improvement of long-term health. This is the domain of research. More research on blacks – and performed by black professionals – is a theme which has recently be debated in the scientific press.^{125-128,130,131}

On the policy and program side of the ledger, that African-Americans' diet-lifestyle-health relationships may differ both from the larger society on aggregate, but also across the spectrum of those of pigmented skin colour as well, is a challenge to any notion of a "colourblind" social policy. The expression "different strokes – for different folks" resonates with me as a guide-post to health policy from diagnosis to therapy, and within prevention efforts and health and nutrition education. This is seen officially as "divisive" in most national and regional governance authorities.¹²⁸ When it comes to the prescriptions for health policy and program in multi-ethnic societies, we really must divide (and subdivide) in order to conquer the ills. Sims and Rainge⁸ suggest: "public health experts may want to explore potential pathways to narrowing health inequalities by considering the geographic inequalities that confront disadvantaged segments in society. Such pathways should focus on historical and contemporary discriminatory practices of racial residential segregation and how it leads to a concentration of poverty and poor health outcomes."

However, even if the tough decision to focus on a differential and ethnically-specific approaches is taken, effectively reaching the target population is an issue. The 20th Century North American scholar, Marshall McClewen, is credited with the expression: The media is the message. For those from the Caribbean to North America to Europe, the issues of behaviour change and targeted public information for the African Diaspora present a media challenge. What is the route for the messages to be derived from attention to the Diaspora, and who are the messengers? The relationship of African Americans to the dominant media outlets is quite distinct from that of society at large. There is active participation in television watching and radio listening but, in terms of the print media in newspapers and popular pulp (non) fiction paperbacks, blacks are much less avid reading consumers than whites. The "digital divide" has emerged as a term to describe lesser participation by blacks in home computer ownership and internet usage. The question of the vehicle(s) for the guidelines and recommendations for healthful behaviours, whether the be universal or racially-specific, is one to be resolved with difficulty.

Apart from lack of access to the message are challenges of distrust of the messenger and lack of motivation for health-seeking behaviours. There has been serious jading of the African-American community with their 400-year love-hatred relationship with Western society. Hearing a universal message, the black is likely to think with the skepticism: "this applies to them, but not to me"; on the other hand, any specific-to-blacks message raises suspicion as to any negative – or even genocidal – intent. This

produces a "catch-22" scenario. The descendants in the African Diaspora have an adverse heritage and one that makes them more wary and cautions regarding the intentions of those who would "target a benefit to them." Trouth *et al.*,¹³² have documented a surprising component of distrust in inner-city consumers of health services with respect to childhood immunizations, and exaggerated perceptions of severity of adverse side-effects. Hence, both "one size fits all" and "different strokes for different folks" intents may be doomed to a "damned if you do, damned if you don't" consequences for the education and motivation of African Americans toward more healthful behaviours.

How does one get less energy, or more micronutrients or more phytochemicals in the diet? Studies, for instance, have shown lower motivation and less success in weight-loss attempts among Afro-American women.¹³³ Experience on acceptance of diagnosis and adherence to weight-loss regimens in overweight and obese blacks is not encouraging.¹³⁴ Similar lesser acceptance of supplements has been documented.¹⁰² Among men, an ethic of presenting a strong image and enduring pain is credited with the infrequent physician contact among Afro-American men in United States.²³ A beginning framework for developing tactics and strategies is to understand the context of the culture of the African Diaspora, and to give it understanding and respect. Such an approach of working within the culture base, follows the tenets established by Wahlqvist¹³⁵ addresses the issue of developing novel foods within a context that respects and preserves the cultural base of the preexisting cuisine, among which is that they should be: ecosensitive in terms of sustainability, packaging, etc; plant-derived and of low energy density and high micronutrient content, if energy excess is a problem; with a regional origin and certification of foods; and consider affordability and sustainability. In the context of the portrait of the African Diaspora, all of these principles appear to be applicable.

Within the guidance from culture is the potential to explore technological solutions, as well. For instance, fruit and vegetable extracts in capsule form have been developed in Australia.¹³⁶ Four per day complement a fruit- and vegetable-poor dietary intake. Lower tendency to take supplements aside,¹⁰² this may prove more successful in increasing phytochemical exposures than attempts to modify the whole diet. Similarly, working within the limits of current intakes of plant protein, biotechnology to increase concentrations of phytochemicals and micronutrients in plant tissues would be an approach requiring minimal behavioural changes. What would be required is adherence to Wahlqvist's¹³⁵ principles on safety in novel foods, which includes "formulate a food-based educational and informational framework." The virtues and drawbacks of bio-engineering in the food supply is hotly debated in the current regulatory environment.^{137,138} All of this exists with a back-drop of the illustrations of widely differing disease susceptibilities, differing responses to dietary measures or both, may limit making any broad claims of beneficial effects for functional foods.

Against these theoretical and practical obstacles, efforts for promoting dietary and lifestyle changes for the African Diaspora are going forth. Kumanyika *et al.*,¹³⁹ have taken the paradigm of cultural uniqueness in proposing

intervention models for dietary change and weight control. A program to provide counseling and motivation to black women at a community level, documented in the state of Alabama, USA,¹⁴⁰ is emblematic of the tactics mobilized in response to the epidemics of obesity and metabolic syndrome in the black population. For the entire nation of Brazil, Coitinho *et al.*,¹⁴¹ have described a new national initiative on what was described as "innovative legislative and regulatory actions, mass communications and capacity building have been combined to create a comprehensive approach for addressing poor dietary and activity patterns in Brazil that are leading to obesity and NR-NCDs (nutrition-related noncommunicable disease)." They list among the elements of the strategy: food product labelling; menus in school-feeding programs; communication in mass media for communication of "smart shopping" tips and dietary food guidelines; and use of teachers and public health officials as change-agents.

Conclusion

The sage inscription on the cornerstone of the U.S. National Archives in Washington D.C. – "What is past is prologue" – could not be more justly applied than when it comes to understanding the issues confronting the populations in the Western Hemisphere (and re-migrated to Europe) who are part of the African Diaspora. This widespread population of persons of varying degrees of melanin pigmentation, subjected to marginalisation and discrimination within their societies, derives from the enslaving of Africans in from the 16th to 18th centuries and the three hundred year system of slavery "American style." What emerged is an evolving culture, poorly rooted and linked to its African heritage, wrought of deprivation and attempts at dehumanization, and replete with variations in dialect, religious practice, cuisine and lifestyle.

In South America, the Caribbean, and North America, the under- and overtones of diaspora culture are distinct. No uniform or unified theory for understanding the diaspora process nor practices for redress of its damage could be derived. Nevertheless, ethnic-specific inquiry and policy are an intrinsic requirement going forward. For understanding the issue of diet and long-term health, however, the emerging principles and general lessons learned from the African Diaspora are more important than the particulars for blacks in the Americas. The overriding lesson is that one size (of health guidelines) does not fit all. Ethnic diversity, in both its genetic and cultural aspects, conditions health-risk diversity. Individualized, ethnic-based and ethnic-specific health research does not represent "discrimination" that should be discouraged, but rather an important inquiry to produce targeted solutions that will further the goal of equality in improvement of long-term health.

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