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Brazil, Factor 11

Brazil: Nutritional Education to Improve Dietary Composition

Brazil is currently undergoing an epidemiological and nutritional shift from a largely rural country afflicted with widespread nutritional deficiencies, to an increasingly urban country that is facing the burden of chronic diseases such as obesity, cardiovascular disease, and diabetes. Brazil is a developing country with drastic social and economic disparity issues. Population-based surveys of Brazil show a steady downward trend in malnutrition, coupled with an increase in excess weight at different life stages (Coutinho, et al.). Both malnutrition and obesity are still very imminent threats to the health of Brazilians at this time, but it seems as though the shift towards urbanization has promoted obesity more so than malnutrition. The inversely proportionate relationship between malnutrition rates and obesity rates can generally be attributed to improved economic conditions and extensive urbanization. Therefore, rapid development has directly influenced public health in Brazil.

The typical urban Brazilian family has few formal rules, but there is a strong emphasis on social tradition. Brazilians place a very high value on family relationships, and usually have a large circle of aunts, uncles, and cousins. That being said, the average family size in Brazil is fairly moderate per household, with three to four family members being common. Compared to the typical American family, Brazilians are significantly more collectivist, and more accepting of these social inequalities. As such, there is a greater distinction between the poor and wealthy families of Brazil (Dessen and Torres). The high average per capita income for Brazil (US \$4,086 in 1995) is misleading when it comes to determining how severe poverty is, as there is such a drastic gap between the wealthy and the impoverished families (Rex). Poverty is currently running rampant throughout Brazil, most significantly impacting rural areas. However, many urban families in some of Brazil's largest cities are also suffering from extreme poverty.

This impoverished lifestyle has created unhealthy eating habits. When it comes to the typical diet of the average poor urban family, they rely on rice and beans as their main food staples. This is supplemented with whatever meats are currently available to them, and very few green vegetables, if any at all. Due to the government subsidies, wheat, pasta, and bread have also become staples in the diets of poor urban families. It has become common for employers to provide workers with meal tickets to use at local food markets, so that they do not need to bring their own lunches (Rex). Food for their families is typically purchased in local markets, with the aforementioned staples being the mainstay. While a varied and nutritious diet is not the main focus of the average urban family out grocery shopping,

When it comes to access to proper health care and education, even the most impoverished of poor urban families are in luck. In Brazil, the constitution of 1988 and the Organic Health Law of 1990 granted all Brazilian citizens the right to universal health care (Rex). The educational system in Brazil is much like its social structure, with high end universities at one end of the spectrum and rampant illiteracy at the other. Urban Brazilian families have placed a very high value on education, evidenced in the fact that it is the main factor for deciding where to live. (Rex). Brazilians typically work in mining, manufacturing, construction, commerce, and service industries. The major barrier for the average poor urban family is earning a living wage, and therefore access to adequate nutrition.

One of the main factors driving Brazil's rapidly worsening obesity problem is the rapid urbanization of the countryside. Urbanization reduces the chance of spontaneous exercise such as walking or cycling in favor of condensing the population into cities where everything that is needed can be reached via a short walk, or public transportation. It is this aspect of convenience which accompanies urbanization that puts even the poor urban families at increased risk of weight gain from either sedentary lifestyles, or over-

consumption. Traditional dietary intervention methods to combat obesity involve lowering daily caloric intake to match the amount of calories burned via lifestyle and exercise. However, this can prove psychologically difficult considering the low caloric burn of a sedentary lifestyle (Brown). Thus, the sedentary lifestyles encouraged by Brazil's recent urban transition are putting the country at increased risk for abdominal obesity, while at the same time decreasing the risk of malnutrition.

As of the 2010, nearly half of Brazilians are now considered overweight, with one in seven classified as obese, according to statistics from Brazil's Ministry of Health. Obesity is a serious health issue that currently plagues countries across the globe, but it has not been a major issue in Brazil until recently. Abdominal obesity puts individuals at increased risk for a plethora of medical illnesses and complications, including diabetes and cardiovascular disease. If these trends continue for Brazil, the obesity epidemic could deal a serious blow to Brazil's healthcare system, along with the average quality of life.

While the issue of rising obesity in urban areas along with the overall decrease in rates of malnutrition is a complex issue, it appears as though impoverished urban families are less at risk for obesity. In the words of S.V. Subramanian, an associate professor of society, human development, and health at Harvard School of Public Health, "There appears to be a clear positive correlation between wealth and body mass index in low- and middle-income countries, showing that it is the richer segments of these societies that are experiencing increased incidence of being overweight or obese." (Powell). This would mean that the typical low-income urban family would not only be at a decreased risk for malnutrition due to Brazil's recent urbanization, but that they would also be at a decreased risk for obesity because of their lower income status. Conversely, certain studies performed on similar developing populations in Turkey, Egypt, and Columbia indicate that the underprivileged actually tend to gain weight faster than the wealthy (Powell). This is to be expected, as modern agricultural systems are more than capable of making calorically dense food more readily available and affordable, even for those with little disposable income. This, combined with the convenience of food markets in the typical urban environment, puts the average low income urban family in Brazil at a much higher risk for being overweight.

When considering the nutritional habits of any typical family member, the dietary habits of pregnant or nursing mothers are perhaps the most important. The diet of a pregnant or nursing mother has a profound impact on the health and well being of the baby, and malnourishment of any kind during this time could have disastrous effects for the poor urban family. Malnutrition during pregnancy puts the baby at severe risk for being born underweight, and according to the American Journal of Clinical Nutrition, "Small body size at birth has been reported to be associated with an atherogenic lipid profile in humans, and animal experiments have shown that undernutrition during pregnancy permanently alters cholesterol metabolism in the offspring." (Roseboom, et al.). In addition to the risks presented by malnourishment during pregnancy, it has been shown in a recent study that the overall eating habits of the mother during pregnancy may significantly affect the child's nutritional preferences later on in life. Pre, and postnatal exposure to certain flavors, such as carrot juice, have been shown to increase the child's preference for that flavor during weaning (Menella, et al.). As such, it is of the utmost importance that pregnant or nursing mothers consume a balanced and varied diet full of nutritious whole foods, such as fruits and vegetables. Most importantly, however, is the fact that current research shows that children during their first few years of life are the most at-risk from the ill effects of malnutrition (Powell). Consequently, when it comes to addressing either malnutrition or improving dietary habits overall, pregnant or nursing mothers and their children should be the top priority.

Additionally, it has been shown that children suffering from stunted growth due to malnutrition may actually be at greater risk for obesity later on in life. While this may at first seem contradictory in nature, stunted children from a shantytown in São Paulo, Brazil, were shown to have significantly impaired fat oxidation compared to the control group (Hoffman, et al.). Impaired fat oxidation has been previously

been linked to obesity as a major risk factor. Stunted growth in children stays with them throughout their entire lives, along with all of the health complications that come with it. Even though malnutrition is currently on the decline in Brazil, citizens who suffered from stunted growth as children decades ago are still dealing with those adverse health effects. For example, these adults are now at-risk for obesity or other nutrition-related illnesses.

The single most efficient method for improving the health, productivity, and well being of a population is by improving their dietary habits. Resolving the factor of obesity and malnutrition through nutrition education, and improved eating habits, would benefit every single citizen of Brazil. Making healthy food choices is a relatively small change that can be made to fit the lifestyle of any family in Brazil. Choosing low-calorie, whole foods, as opposed to high-calorie, processed foods, can have profound effects on quality of life, health status, and overall physical fitness. Reduced calorie diets have been shown to prolong life span, and slow the rate of aging (Cassiday). This doesn't mean that just any low-calorie diet will confer these benefits, it needs to be nutritionally complete to show the same results. In the words of Laura A. Cassiday, "Caloric restriction is about more than just being thin and fit. Something about eating a diet that is low in calories but nutritionally complete causes a dramatic reprogramming of cellular metabolism that can't be replicated by exercise or by eating smaller amounts of high-calorie foods." In addition to the health benefits offered to the citizens of Brazil, growing a diverse array nutritious fruits and vegetables would lower their cost to the consumer and promote environmental sustainability. Unfortunately, some environmental factors affecting agriculture may prove to be a significant obstacle to growing a sufficient supply of these wholesome foods, such as water scarcity.

When attempting to make healthy and nutritious foods widely available to combat the issues of obesity and malnutrition, environmental concerns such as water scarcity will prove to be significant obstacles. Water scarcity, which is another major issue that threatens to worsen for all countries across the globe due to increased demands, is another factor that will unfortunately affect the dietary habits of Brazilians. Water plays a key role in regulating nearly all of the processes of the human body, including mineral balances, resting metabolism, and even hunger. Proper hydration is therefore key to overall health, and is highly beneficial for managing healthy weight. Without proper fluid intake, the body's cells will decrease in overall volume, triggering a catabolic state throughout the body that is harmful to overall health and wellbeing. In addition to this, dehydration has been shown to lead to overall decreases in resting metabolic rate. A decrease in metabolic rate would be a definite obstacle to combating the growing obesity problem in Brazil, which highlights water scarcity as a potential threat towards our efforts to solve the issue. Proper hydration should always be the top priority when it comes to maintaining good health, and as such water scarcity is a growing global issue that cannot be ignored.

Based on my research, it is clear that the first step in combating the problems of both obesity and malnutrition should be nutritional education. By providing Brazilian citizens with the knowledge to make informed decisions regarding their daily diets, there will be a vast improvement in not only the weight of the average Brazilian, but more importantly their overall health and wellbeing. I recommend that the Brazilian governments focus their efforts on educating the children in particular, as healthy eating habits that are developed early in life are more likely to continue well into adulthood (Powers, et al.). Simple methods of nutrition education can prove to be very effective in positively changing the dietary behaviors of children (e.g., games in school). In fact, when nutritional education games were administered to a group of school aged children, overall dietary behavior significantly improved (Powers, et al.). Positive reinforcement methods should be used to encourage the students to bring in healthy snacks. School cafeterias should prioritize nutrition over taste or convenience if at all feasible. Overall, the nutritional education efforts with children should focus on making healthy food choices, rather than things caloric restriction.

The need for increased physical activity is also of the utmost importance when dealing with the issue of

obesity in urban environments. As previously mentioned, Brazil's urbanization is one of the primary factors driving the country towards a possible health crisis. This is due, in large part, to the more sedentary lifestyles that urban environments encourage. Decreased activity is a given as global modernization is dramatically increasing the need for desk jobs, but that is not to say that we are doomed to inactive lifestyles. Physical activity should be encouraged throughout Brazil to increase awareness of the need for daily exercise. This could be accomplished by constructing local parks and recreation areas, televising events promoting fun ways of exercising, and encouraging people to walk or bike to work. One example of such a program is the "Worldwide Day of Play 2011", an event hosted in Washington, DC, to promote activity among young people. These types of events make it entertaining and exciting rather than something that would be considered working out.

As another method of addressing improper nutrition in Brazil, I recommend that grains such as rice and wheat, be enriched with added vitamins and minerals. The human body needs an adequate supply of vitamins and minerals in order to function properly, and many individuals with limited financial income may find themselves facing a deficiency in one or more of them. As a matter of fact, deficiencies in micronutrients such as vitamin A or iodine are a major cause of death worldwide (Welch and Graham). By making staple products like rice more nutritionally dense, a diet that meets sufficient levels of micronutrients will be much more feasible for low income families. One potential problem with this method of adding vitamins to processed grains is that they must be added after the crops are already grown, which could prove impractical in some circumstances. Alternatively, due to recent advances in food science, crops can now be genetically modified in order to produce higher levels of certain vitamins and minerals. A perfect example is Golden Rice, a biofortified variety of traditional rice that accumulates pro-vitamin A in the grain (Welch and Graham). Grains such as this could be distributed to farmers throughout Brazil to combat deficiencies in micronutrients, and promote overall health even in those without a balanced diet. In order to implement all of these changes to solve the issues of obesity and malnutrition in Brazil by the year 2015, we will need a coordinated effort from not only the Brazilian government, but also groups such as the United Nations and UNICEF. Investments need to be made to promote the education of Brazil's poor urban and rural families concerning proper nutrition, food choices, and portion control.

The final, yet most pertinent of my recommendations for resolving the issues of obesity and malnutrition in Brazil is narrowing the gap between the rich and the poor. It is the Brazilian way to accept the great differences between social classes that exist today, but this needs to change if we are to successfully address the issues of obesity and malnutrition. Uneven distribution of property during the colonial period has resulted in a society of physical segregation where those without property have been driven to the slums of urban districts (Kalafatis). The largest barriers faced by those living in these urban slums to earning a living wage are distance from the center of the city, and lack of overall education. After all, how can we expect these Brazilian citizens to make the proper food selections in the store, if all that they can afford is a few loaves of bread? This is a call to action for the government of Brazil to increase the availability of both education and transportation for those who cannot afford it. By implementing widespread programs lowering the cost of basic education and public transportation for impoverished urban dwellers, we can improve the foundation of the typical poor Brazilian family, on which we can build healthy eating habits that will solve the issues of both obesity and malnutrition in Brazil.

Hence, the changes needed in order to address the issues of obesity and malnutrition in Brazil are the implementation of nutrition education programs, fortification of staple crops with added vitamins and minerals, and closing the gap between the rich and the poor in order to increase access to healthy food choices. The initial investment necessary to implement these changes will surely prove worthwhile in the effort to combat malnutrition and obesity in Brazil. Nutritional education is our first tool in the fight against these growing health epidemics, and should serve as the foundation of our approach towards

combating the twin dangers of obesity and malnutrition. The fortification of staple foods that may lack in overall nutrition is another necessary step in achieving this goal. However, a change may also be necessary for the Brazilian mindset of social classes as a whole, as the current level of discrimination and segregation between the rich and the poor does not provide the necessary foundation for achieving our goals. By improving the economic and educational condition of the typical urban family in Brazil, we will have addressed the underlying issues leading to improper nutrition. Equality amongst the varying social classes, genders, and races of Brazil's population will be a major step forward in ensuring food security, and prosperity in Brazil. With a cooperative effort from the Brazilian Government, and humanitarian organizations benefitting impoverished peoples such as UNICEF, we will surely be able to make these necessary changes and, as the fruit of our labor, see the issues of obesity and malnutrition resolved in Brazil by the year 2015.

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