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### **Chile: From Malnutrition to Obesity-The New Epidemic**

Catherine Bertini, the 2003 World Food Prize Laureate, said, “We need a new definition of malnutrition. Malnutrition means under- and over-nutrition. Malnutrition means emaciated and obese.” On the southwest side of South America on a narrow strip one can find the Republic of Chile. Chile is undoubtedly one of the leading agricultural producers in Latin America. Its economy was liberalized in 1990, and the government reduced tariffs and free trade came into effect. The country transitioned from traditional agrarian to an export economy. With economic prosperity has come an increase in obesity rates and associated health costs. In many developing countries like Chile, there has been a shift to a diet high in fat and sugar or a “westernized” lifestyle. Current policies have helped alleviate malnutrition and hunger in most sectors; however, a new crisis has emerged and must be handled by creating new public policies. A lack of education about nutritional values and public policies has not kept up with nutrition excess problems. All Chileans need a multifaceted approach involving primary prevention strategies, education, school programs, and return to economic policies providing affordable local commodities like fish and vegetables.

The population of Chile is sixteen million people. Of those peoples eighty-eight percent live in an urban setting. Chile has the second worst wealth distribution in Latin America. There are three classes: lower, middle, and upper (Zacks). The top twenty percent earn twelve times as much as the bottom twenty percent (OECD). The unemployment rate was 6.6 percent in March of 2012 (Zacks). Unemployment in ages fifteen to twenty-four was 22.6 percent. Chile has a compulsory primary education system with a literacy rate in males ages fifteen and over of 95.8 percent and females 95.6 percent (CIA). The job market in Chile is very competitive. The main occupation for 15 percent of the population is agriculture related.

The average household size is 3.7 persons with 2.5 children on average. The family composition consists of a husband, wife, and two to three children. Chileans keep in close contact with elderly relatives, some living under the same roof. They normally eat four to five times a day. A light breakfast consists of toast with butter and instant coffee with milk. Lunch is the largest meal of the day. There are two main dishes served. One may be some kind of a salad such as the ensalada chilena. The second dish includes beef or chicken with vegetables. At 5 P.M. they have afternoon tea with bread and jam, and also cheeses and avocados. Dinner is served at 9 P.M. and is a single dish with wine. Parents make financial sacrifices for the education of their children. Schooling is mandatory for eight years, ages six to fourteen; then children choose from the “humanistic” or “scientific” branch of schooling preparing them for Liceos or higher education. Young adults normally enter Liceos at age fourteen and leave at age eighteen. About 90 percent of Chileans access health care. Public insurance accounts for 61 percent and private insurance accounts for 28 percent of people insured. The upper and middle classes make use of the services and private clinics with great physicians and the newest medical technology. The lower class is forced to make use of poorly equipped public care centers and hospitals.

Until 1940, Chile was a self-sustaining country. From the beginning of World War II, severe food deficits have surfaced. In 1962, the first agrarian reform law in Chile was passed giving the government permission to expropriate and subdivide abandoned or poorly cultivated land and compensate the landowner in installments. Nineteen Sixty-Seven brought about more reforms to clarify expropriation and settlement procedures and permitted an increase in turnover rate. The acceleration of expropriation increased because of the Allende government. The Allende government took over all of the land which

was the subject to redistribution under the 1967 reform act transforming the Chilean land tenure system. The land reform law was replaced by new legislation that removed restrictions on the land size holdings in 1978. Agrarian reform was the only logical solution to better and cheaper nutrition. The production and productivity did not go up as expected, explaining some of the nutritional hardships suffered in the country, especially by the poor. The recession of 1982 severely affected agriculture, but it quickly bounced back by the mid-1980s (Schuftan).

The average family farm is 23 hectares. The main crops produced include grapes, apples, pears, wheat, corn, oats, peaches, garlic, asparagus, and beans. Farms also produce meat, wool, and fish. The natural barriers to agriculture include the arid Atacama Desert to the north, the high Andes Peaks on the east, the cold waters of the Drake Sea to the south, and the South Pacific Ocean on the west. The Great Central Valley consists of very fertile land and a total area of 292,260 square miles. Because of the limited available land for agriculture, practices including water reserves, management techniques, land distribution, and land use patterns have been developed. However, there are significant barriers to improving the agriculture.

Barriers to improving agriculture include sewage polluted water, environmental deterioration, urban air pollution, high forest harvest rate, and soil erosion. Chile is rich in natural resources. The foreign trade is approximately 20 percent of the Gross Domestic Product. Half of the total exports are from the rich mineral resources including copper, nitrates, and iron. Agricultural products and the fishing industry comprise 12 percent of the exports. Through exports, Chile's economy has thrived. Chile is ranked number forty-six in exports, making \$83.66 billion annually (CIA). With these advantages also comes disadvantages. Since Chile exports a large number of agricultural products, prices in the markets in Chile are driven up. High prices for fresh fruits and vegetables and other food with high nutritional quality make nutritional food inaccessible to low income groups (Peña).

Over the last twenty years Chile has gone from a malnutrition state to an increasingly obese state. A study conducted in the 1980s in Santiago found that 5 percent of men and 28 percent of women were obese, noting that obesity was more frequent in the poorest socioeconomic sectors (Peña). Sixty-two percent of the total Chilean population is overweight or obese. Almost 22 percent of first grade students are obese and 25 percent of all adults (Bonney). The rate of obesity in pregnant women is 24 percent. Obesity is greater in low income families and twice as great among adults with only high school education. Women have more limited opportunities, bare heavier social burdens, and have an undervalued body image. Also, their traditional social subordination to men increases their susceptibility to that complex set of unfavorable influences. Many factors have contributed to this increasing trend. Chileans living in urban areas have changed diets, increasing fat and sugar consumption, and increasing fiber consumption. With the increase in wages, Chileans spent more money at popular fast food restaurants like McDonald's, Kentucky Fried Chicken, Burger King, and Domino's Pizza. The food industry offers foods high in energy density or rich in fats and sugars but are deficient in other essential nutrients. These foods' ability to satiate, have a pleasing taste, and low cost make them socially acceptable and preferred by the poorest sectors (Peña). Schools spend \$180 million every year to feed 1,300,000 students from low income families. A typical school lunch consists of rice, beef, a roll, cabbage salad, avocado, apricot, lemon wedge, orange juice, and fruit with yogurt ("What's For School Lunch?"). There are soda and junk food machines in schools, doctors' offices, and hospitals. The inequities in access to health promotional messages, health education, and adequate health care services make it difficult to know the importance of changes in behavior needed to achieve a healthier lifestyle. Ninety percent of Chileans lead sedentary lives. An aggressive and insecure environment that characterizes life prevents the poor from physical exercise (Peña).

Over the last twenty years an overall set of interventions were implemented by Chile to alleviate malnutrition. These included a wage policy, which gave differential salary readjustments favoring low

income sections and increased welfare benefits expanding social security to rural populations and urban slum dwellers; increased government subsidization for improved food distribution for school food programs and free milk distribution; increased health budgets and services available with emphasis on preventive medicine; decreased imports and high prices for luxury goods; price controls by having producers' prices kept low by creating a state of monopoly to buy agricultural commodities, and food staple prices were subsidized; a new higher minimum wage for agricultural workers; women entering into the work force; an acceleration of land redistribution and development of agricultural cooperatives; subsidized agricultural credits; and comprehensive rural development program providing minimum peasant wages with unions, agricultural extension, and technical assistance. These initial income redistribution policies created new demands on primary goods. They generated new employment with full employment as a long term goal. They made primary education universal and placed a new emphasis on rural health. All of these measures have been successful in the progress of the Chilean levels of malnutrition (Schuftan).

I agree with Catherine Bertini that over nutrition is indeed malnutrition. Over nutrition leads to obesity, which is associated with increased mortality rates from cardiovascular disease, diabetes, and certain tumors. Through the wage earning policies the average wage of the Chilean population has increased; however, there remains a significant sector of the low income poor. High export rates of produce and fish have decreased availability of these products in Chile. Low income families have increased fat and high calorie consumption of foods due more affordable prices. The lack of education about nutritional values and policies have not kept up with the changes in nutrition excess problems. These problems are worsening as measured by increased medical morbidity and mortality rates of obesity related diseases. Continuing to improve existing policies and creating effective nutritional guidelines will improve the overall health and well being of Chileans, specifically focusing on low income and poverty-stricken families and women.

In July of 2012, Chile's congress approved a government bill raising the monthly minimum wage to 193,000 pesos or \$396, an increase of six percent without taking inflation into account (Woods). In theory, this wage policy should help improve the living conditions of low paid workers; however, if minimum wage adjustments are not in phase with the rest of the economy, the conditions of the workers remain largely unchanged (Infante). Wage policies need to address all aspects of the economy, including consumer price index and gains in labor productivity particularly when the economy enters recession in order to be effective.

Since 1990, the Chilean government under democratic rule has increased subsidization for improved food distribution, including school food programs and free milk. These subsidies have decreased the percentage of low income families without adequate nutrition. With the increase in prices of nutritional goods and placement of cheaper high fat and sugar foods in schools, obesity is now on the rise. Policy changes need to include taking soda and junk food out of the schools, doctors' offices, and hospitals; increased funding for nutritional programs that are redesigned toward education at lower age groups; and increased money specifically for healthy foods.

In the 2007 agricultural census, 43 percent of agricultural landholdings in Chile had five hectares or less of land but they controlled less than one percent of the total farm land in the country. About 195,000 farms hold six percent of the total hectares. Family farms make up 23 percent of the total agricultural holdings with 13 percent of the total farm land in Chile (Berdegué). While Chile has substantial land mass, its different ecosystems limit available agricultural productivity. Agriculture is dependent on irrigation systems, especially north of Santiago where water is scarce. During the last decade, there has been a reduction in rainfall. High water use in the north and presumed continued urban expansion will be driving agricultural production to the south. Over the last decades, temperatures have also been rising, with an estimated total increase of 0.8 degrees Celsius since the 1960s. Soil degradation and urban

expansion will continue to reduce agricultural land. More water will be required on marginal land areas for agriculture. Increased fossil fuel use in the form of fertilizers and fuel will be required to enable mechanization. Most of these fossil energies are imported. With rainfall dynamics pointing to less rain and little doubt that climate change will take place, Chile will have to adjust to a series of natural resource management challenges. Policies in agriculture will need to continue to promote acceleration of land redistribution and the development of agriculture cooperatives, increased agricultural credits, and a comprehensive rural development program providing minimum peasant wages and increased incentives for farm families to be able to afford new technologies to manage land, water, and waste disposal.

In urban and peri-urban settings, programs need to be implemented involving local growers, development of co-ops, marketing, and processing for agricultural products. Locally, farming companies can be set up to provide micro loans through revolving funds obtained from private industries and government subsidies. Training would be provided through the Department of Agriculture relating to marketing and processing of agricultural products to farmers in the program. Urban farming will have to be integrated into the economic and ecologic systems. This would include the use of urban resources such as organic waste as compost, rain water storage, and water waste for irrigation. Land use would include integration with local parks, abandoned land, land along streams, buffer zones between residential and industrial areas, and private land. Land use would include community gardens, back yard gardens, rooftop gardens, nurseries and green houses, small livestock areas, and hydroponics. Economically, urban farming stimulates activity with the development of organic waste collection and production of compost companies, agro-processing, and marketing. Attention has to be paid to linking the various types of agricultural enterprises at all levels. The positive effects of urban agriculture include environmental management of urban waste, upgraded neighborhoods, and economic opportunities.

A potential model for community based interventions would involve national policies, the local government, schools, and the families. Committees can be developed to assess needs of the community and develop plans of action. Local school authorities and educators can develop and implement nutritional educational programs for all educational levels. These classes should include basic nutritional data, benefits of taking part in every step of meal preparation, and healthy food choices. Teachers and students can be involved with raising produce used at the schools in raised bed gardens. Teachers and students would be encouraged to eat together and discuss the benefits of healthy meals. Advanced classes could include further education in agricultural practices as well as environmental management. Local colleges could offer credits through these high school classes in sustainable agriculture. Farming subsidizes need to include incentives for local production of fruits and vegetables to be sold locally and not exported. Wage increases need to be in line with inflation and provide enough resources for adequate nutrition and housing for poor and low income families. School lunch programs should be closely monitored for nutritional content and all junk food taken out of schools.

Healthy lifestyles must also include activities to maintain a healthy weight. Physical education classes in schools, athletics, and community based programs such as the YMCA all could offer opportunities for education. Incentives for involvement in these programs could come from many sources. Incentives to be involved could come from local employers in the form of bonuses for healthy living, decreased health insurance costs, and tax credits for involvement in green roofs and raised bed gardening. Prenatal classes can offer value points for healthy living, prenatal check-ups, and well child visits that can be applied toward food and clothing at vendors in the community. In addition, money needs to be diverted into the improvement of the structure of the community, including improving access to parks and other institutions to provide and to promote opportunities for family activity. Community level programs will need the assistance on a national level through grant programs and cooperation of the Departments of Agriculture and Health. These departments would be responsible for research and development of sustainable agriculture practices that can be applied on the local level as well as educating local communities desiring to adopt these practices. Government grants should be made available for the

development of these programs.

Barriers to the development of a healthy Chilean people include lack of interest and unwillingness to change, inexpensive and less nutritional options, outdated bio-safety and sanitary systems, lack of coordination between the government and communities, and lack of strategic planning.

Chile is a beautiful country composed of diverse natural resources giving the country high production of food and fiber products as well as minerals. Chile's agricultural sector has developed itself in an increasingly globalized setting. This has contributed to the development of the country, financially. With the financial increases there are negative effects including increased obesity rates and sedentary lifestyles particularly in low income and poor families. Public policy needs to focus on efforts to improve educational resources, nutrient rich foods, and active lifestyles, all which have been shown to decrease obesity rates and associated with morbidity and mortality.

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