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The feeding-nutrition connection, three aspects for its understanding

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Abstract

Feeding is not an isolated concept; it is linked to biological, psychological, cultural, political and economic determinants. Physiologically the meeting of the biological need is very important, but when a group is subjected to a diet that only satisfies hunger and does not provide for nutrients, chronic deficient nutritional stages appear that impact social welfare and health. In this paper, we present three instances of nutritional problems that affect the Mexican population: child malnourishment, obesity and food security. This article exposes some of its social determinants and public policies that address them considering the collective health and its sociology, in the context of social inequality. We highlight the need for public policies that consider social inclusion, for the collective food security, and not merely the pursuit of satisfying hunger, but also to have an accessible, nutritious, and varied diet to prevent alterations in the health of the people.

Introduction

Feeding is a process of ingestion by living beings in order to get energy for their necessary activities. On the other hand, nutrition is directly related to dietary need of each individual for a proper physiological functioning, through ingesting proteins and lipids, carbohydrates, vitamins, and water, in a balanced and moderate way in order to guarantee a good nutrition. Consequently, ingested food can condition a sufficient, necessary and adequate nutrition or poor nutrition [1],[2].

From its biological components it is conceptualized that human being, in order to maintain homeostasis, performs complex metabolic functions through 'catabolism' and 'anabolism' of food for getting over new cells, repair cellular structures, maintain vital activities (cellular transport, breath, muscle contraction, etcetera) and does the particular cellular translation for every functional system of the organism [3].

The food-nutrient process must be guaranteed for each individual with biological relationships within the cell maintenance of replacement, and body energy, and talking about human collectivity the availability, access and consumption of food and nutrients for getting a good nutrition, for getting a collective well-being and contend with vulnerability against diseases, getting a good physical and intellectual development, and ensure economic production [4]. The relationship between both levels of food-nutrition process should be analyzed through different theoretical tools.

Feeding-nutrition, a complex problem of different levels.

Safe and feasible feeding does not determine a healthy nutrition. In that sense, in this era of postmodernism and neoliberalism, populations are exposed to an unbalanced diet (cheap food and highly energizing), unstructured

(ingest of food without set times, without the possibility of taking adequate metabolic rate, due to extenuating working hours and long commutes from home to work and vice versa), *desregionalizada* (feeding by globalized consortiums), decontextualized (dietary imbalanced according to the needs of each person's wear) and besides that, genetically modified (food produced through genetic modification from original genetics of food) [5],[6],[7].

All this added to a sedentary lifestyle and low purchasing power. In this way human collectivities consume high caloric food with low-pocket spending, bad quality production, packaging, transport and exhibition; which will determine the cellular level replication of DNA (deoxyribonucleic acid) with probable inadequate translocations, which will be reflected in diseases of all types of cancer in all its variations from the mouth to the rectum [8].

This article presents a reflection about the consequences of food-nutrition, with three illustrative cases of the complex picture of health and public policy solutions. Each of these cases constitutes elements of argument from the perspective of collective health, to transcend the debate focused on only one aspect. Thereby, it is intended to show the complexity of the problem and the implications at different levels of reality for its understanding.

Child malnutrition despite breastfeeding: a case of feed without nutrients.

Malnutrition is a process that begins when the individual does not eat enough to cover their physiological needs and progresses to the emergence of functional and structural changes related to the duration and severity of the restriction, which affect adversely the health and quality of lifetime.

WHO (World Health Organization) and UNICEF (United Nations Children's Fund) in 1991 initiated a project entitled *Baby Friendly Hospital* in order to implement practices to protect, promote and support breastfeeding in newly born. This proposal came to fight malnutrition in developing countries, but so far one of the causes of death in children is the undernourishment in children under one year, with 50% of deaths worldwide [9].

Malnutrition in Mexico, along with other nutritional deficiencies, ranked eighth of all deaths in children under one year [10], placing below the endogenous mortality (congenital malformations, conditions originating in the perinatal period, gastrointestinal infections, and septicemia). In this way, malnutrition is the second exogenous cause of death in children under one year, followed by accidents, which makes a preventable threat. Breastfeeding is directly linked to full feeding, with many immune factors (IgA, IgG, IgM, IgA) as well as psychological of the newborn; reduces damage to the intestine of the newborn caused by ingestion of infant formula or other liquids where bacteria can enter; It contains the lysosomes with no specific antimicrobial functions with bactericidal action against 'enterobacteria' and 'gram-positive' bacteria. Breast milk contains

substances that act as mediators; establishing a biochemical communication between mother and child. Among these substances, there is the epidermal growth factor related to intestinal protective effect [11]. It also reduces hypothermia in the newborn and hypoglycemia.

There is scientific evidence of long-term benefits such as better psychomotor development, prevention of otitis media, obesity, growth factor insulin and its carrier protein contained in protective milk against diabetes type I and 2, leukemia, sudden infant death syndrome the individual [12]. It contains long-chain fatty acids related to brain development and retinal [11].

However, breastfeeding requires a mother who does not suffer from malnutrition, also during pregnancy, consumes supplements of iron and folic acid in order to avoid anemia in the dual-level defects and neural tube of newborn. In Mexico, anemia is reported in 27.8% of pregnant women between 13 and 46 years, prevailing hypochromic microcytic type, which is related to a lack of iron. From the total of these women, 43% attend underweight and 52% with short size [13],[14], which makes worse by the participation of women in labor activities, producing greater demand for energy that if it cannot be satisfied it also causes nutritional deficiencies and deteriorating health [15].

In this way, a malnourished and with a short stature mother, without supplementation of iron and folic acid during pregnancy, will provide low quality lactation, since concentration of fat and protein and caloric value will be very low [16]. This conditions a pernicious circle due to inequality, since in Mexico according to the National Health and Nutrition Survey 2012, there are 1,194,805 children with chronic malnutrition, which is presented in urban areas 10.1% and 19.9% in rural areas there. Mexico is the second country with the highest economic inequality level, 45.5% of the population (53.3 million people) lives in poverty, of which 9.8% (11.5 million) live in extreme poverty, 23.3% (27 million) of the population suffers food poverty and 12.5% endures from chronic malnutrition [17].

Current economic characteristics cause adverse conditions for the acquisition and disposition of nutrients to great groups of population. With direct consequences for breastfeeding, with low micronutrient content, exposing infants to states with high children morbidity, as well as the perpetuation of malnutrition.

Obesity in México: consumption of food without nutrients

The intake of food has a direct connection to fast calories ingest (complex carbohydrate) to maintain a rhythm of life caused by social inclusion under the neoliberalism development of this era. Whereby, obesity is inserted into a complex outlook of social margination and poverty, and not only nutritional abundance.

The current situation of feeding is based on those products that are affordable and on the environment of living place and consumption of the families. In this way the individual

and the society consume products that cause changes in eating habits.

Therefore, it can be considered that there is a dietetic transition of modernity, which has disrupted the social imaginary of Mexicans submitted by television marketing, by radio and by internet that conduct collectivity to consume food brought from elsewhere, which are inserted as a basic diet. Coca-Cola, Pepsi cola, Burger King, McDonald's, Krispy Kreme, Sabritas, Bimbo, Choco milk, Frosted Flakes, are mentioned as popular brands. These products are included into Mexican diet and with a high cultural status modifying Mexican diet.

On the other hand, accessibility to commercial establishments where fast food is sold, such as: cold cuts, instant soups, precooked meat, "tacos", pizza and frozen stew, among others. This kind of food is often cheap, easy to get at any time and available in work places and residence.

Consequently, overweight trends and obesity in the different national surveys show a steady increase in the prevalence of this health damage. Since 1980, the prevalence of obesity and overweight in Mexico has tripled reaching alarming proportions [18],[19],[20],[21], and they have become the most important modifiable factor of risk in the country. Nowadays, 71,3% of Mexican adults have this condition, with a slightly higher prevalence in women and by age group, obesity is more common in the fourth and fifth decade of life [22], 73 out of 100 women and 69 out of 100 adult men are overweight. That means, the sum of both categories, overweight and obesity. The *Encuesta Nacional de Salud y Nutrición*, ENSANUT-2012 reported the prevalence of overweight and obesity in the adult population by type of dwelling. For the overweight category, it was very similar in both types of locations: rural (39.1%) and urban (38.8%). For the obesity category, a difference of 7.5 percentage points higher in the urban one (34%) compared to rural found (26.5%), attributable to: 1) population migration from outside to inside by a centralist and semi-industrialized economic model, and 2) the social dynamics in nutrition characterized by a high intake of foods rich in animal fats, processed carbohydrates, refined flour and simple sugars (it is cheaper to eat a *Maruchan* soup than process a kilo of beans).

At structural levels, Mexico, under the implementation of neoliberal policies by inserting dependent the global food market, has completely dismantled field production because of lack of subsidy; in this way, basic food of traditional diet such as: beans, corn, milk, legumes and meat, are now more expensive than processed food. This situation led poor people to consume pasta and other low-price products, but with high levels of carbohydrates and sugars [23].

It is worth mentioning that obesity is the result of a nutritional status of years and decades, where the country cannot be exempt from cultural - social - political- economic analysis, due to food systems are completely linked to the

social system, where all cultural dynamics influences directly and indirectly in feeding practices of population groups and individuals.

In this way, for a decade, Mexico increased the purchase and consumption of food such as soda and refined carbohydrates [24], becoming one of the preferences in taste and customs of the Mexican collectivity, leaving aside products as meat, milk, fruit and vegetables. All this, also involves the slope of the per capita incomes, lower every day, with wage restraint since the national average perception of workers is just 8 dollars per day (when in other countries that is paid for an hour). The country suffers widespread impoverishment of its labor sector [25], which explains the consumption of cheap food highly energizing, so food is consumed to alleviate hunger and energy intake, and not for nourishment.

Now, if a fundamental pillar of combating obesity is a balanced, adequate, available and nutritious diet, it is worth noting that the food of each individual is conditioned by culture. This is an accessible and preferred diet. The first one is the set of available food and drinks in the near surroundings, either financially or by place of residence and work; the second one refers to all food and drinks chosen with no obstacle. In short, despite health policies aimed at tax punishment for companies producing food with high calorie content, among the population there is a cultural insert of favorite food consolidated over the years, which is very difficult to break, which has remained socially and reproduced.

Genetically modified (GM) foods, in search of feeding security?

Diet is the food consumed by an individual or a group as part of a complex act framed by culture, politics, economy, life and social development of a country in a particular historical moment and conditioned by the sum and interaction of these factors. Even if the condition is given in the availability and accessibility of these foods, this is not a direct consequence of the fact feasible, it is necessary to meet the conditions to ensure guarantees of availability, access and consumption. The real access to food is limited by the per capita income of each family, even if in Mexico the minimum salary is about 150 dollars a monthly, real food accessibility is complicated by the expenses necessary for a decent life (housing, clothing, cultural consumption, etcetera), resulting in limitations on the factual fact of access to healthy, wholesome and fresh food.

Food production of transgenic origin, had explicit origin in combating famine billion people, receiving the name of green revolution, and was awarded the Nobel Peace Prize to Norman Borlaug in 1970 [26].

Initially hybrid corn and wheat (genetically modified) were produced with higher production per hectare, and nowadays food production is at the mercy of large transnational producers of food. In particular, the company MONSANTO, founded in 1901 in Missouri United States. This company has evolved since the discovery of saccharin to decipher the genetic code of rice.

In 2012 Dr. Gilles, a researcher at the University of Caen (France), stated that rats fed with the variety of maize seed genetically modified that contained NK603, died before those which were fed with a normal diet; besides presenting cancerous tumors [27]. In that moment the EFSA (European Food Safety Authority) asked the French scientist, professor of molecular biology, to provide more information to evaluate the study, which was rejected by US scientists, and endorsed by scientists from Europe. Although French university, under the leadership of Seralini, analyzed for two years the effects on 200 rats of transgenic maize NK603 and Roundup herbicide, the most used in the world, two products of Monsanto, the company expressed its readiness to sue legally the scientist and the University.

The results analyzed a second time showed that rats fed with genetically modified food had tumors up to 600 days earlier than in the rats not fed with these products. Given this, the scientific community took two ways: the journal "Food and Chemical Toxicology", belonging to the Journal Citation Reports (JCR), immediately asked Gilles retraction of his research [28],[29].

France announced on September 2012, the ban at European level of agricultural genetically modified organisms (GMOs), and Russia suspended the import of genetically modified corn from the US multinational. In Brussels, the French deputy Jose Bove, Green Party, one of the emblematic figures of the fight against genetically modified organisms (GMOs), called for the immediate suspension of authorization of cultivation of these products in France [30].

In Mexico and in other countries the same things happen. Monsanto plans to grow up transgenic corn and it is the same type that had provoked cancer and other health damage (liver and kidney damage, infertility, premature death) in laboratory rats according to the scientific study of Gilles [31]. That study has been the subject of many scientific awards and questions, but definitely has alarming results to account for any technical and political decision.

Mexico said yes, and considers that as a strategy to knock down hunger with the availability of genetically modified foods. Now these transgenic seeds, according to the firm authorized by the Mexican State and the Federal Commission for the Protection against Sanitary Risk (COFEPRIS), has approved the free consumption of 132 transgenic products, of which 50% is maize, the rest are cotton, soybeans and canola, among others[32].

The approach to improve the availability of maize seeds based on transgenic origin, especially for social groups with lower consumption capacity, constitutes a nutritional risk and not justified in any social setting planting and consumption of transgenic maize [31].

Conclusion

The feeding in Mexico is a right of every person and the State will guarantee it giving to each individual a nutritious, adequate and quality food according to 4 Constitutional Article [33].

Food security is the existence of conditions to enable humans to have physical, economic and socially acceptable access to safe, nutritious and consistent with their cultural preferences, diet to meet their food needs and live productively and healthy through: availability and physical access to food (acquiring appropriate foods for a nutritious diet), stability of access (right foods at all times, despite social crisis) and wellness nutritional (satisfaction of adequate food).

Well then, in Mexico, the inability of people to access food due to various reasons such as physical shortage of them, low purchasing power or the lower quality of food, conditions the Mexican population to food insecurity and the outlook for the country's population, inadequate moves between micronutrients with high rate of energy foods that reduce hunger, but they do not improve the health and fitness of collectivity; with ancestral conditions of poor nutrition and economic and social scene, where food availability solution based on GM, involves additional health problems.

Food security is not achieved to alleviate hunger of vast sectors of population; it is not enough to increase the availability of genetically modified foods with consequences for the fragile health, and with damage that already are alarming (cancer, diabetes, obesity).

Hunger ends up to tame the imagination of good nutrition by consuming products with high energy and cheap cost, as appears to be the official conceptualization of food security. Obesity and undernutrition are the edges of this chain of food insecurity, lack of inclusion and social inequality, perpetuating malnourished generations since its formation in utero and compromising its development bio-psycho-social, so nutrition is the essential part, basic sustenance and continuity of any social system.

Notes

From the editor

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