FREDERICK ALEX CROES

ID: UD7171SNU13746

COMMUNITY NUTRITION IN ACTION

A FINAL THESIS PRESENTED TO

THE ACADEMIC DEPARTMENT

OF THE SCHOOL OF SCIENCE AND ENGINEERING

IN PARTIAL FULFILLMENT OF THE REQUIREMENT

FOR THE DEGREE OF DOCTORATE IN NUTRITIONAL SCIENCE

ATLANTIC INTERNATIONAL UNIVERSITY

HONOLULU, HAWAII

JULY 21, 2009

ACKNOWLEDGEMENTS

First of all thanks to Hashem

This project would not have been possible without the support of many people. Many thanks to my wife, Jackeline Croes who read my numerous revisions and helped make some sense of the confusion. Also thanks to my academic advisor, Isaac Kravetz, my friend Dr. Jose Mercado and the academic department, who offered guidance, and support. Thanks to the Atlantic International University who provided me with this opportunity to complete this project, and finally, to my son Moshe Isaac, My Mother, Father, parents, and numerous of friends who endured this long process with me, always offering support and love.

TABLE OF CONTENTS

Thesis:

The thesis dissertation analyses the issue of the community nutrition in action from a wide social perspective, involving relevant policies, program planning, resources, as well as nutrition issues particular to community nutrition. The analysis involves proper comprehension of establishing and implementing various nutrition programs for specific age groups (children, aged people, impoverished populations, students, etc).

On the basis of entrepreneurial approach, the research encourages us to learn how to improve public nutrition and make it healthier. At that, numerous solutions are offered to the community nutrition practices and health problems, including nutrition education and assessment, as well as nutrition interventions' planning. The range of case studies and community-based learning activities are provided to facilitate active learning and practical implementations in due respect.

Purpose:

The issues regarding community nutrition are analysed and investigated with both theoretical and empirical relevance.

Community Nutrition in Action

1. Introduction: literature review on the relevance of the community nutrition in the contemporary sources

The enablement of our normal functioning and health condition requires constant facilitation of the immune system by consuming right foods. The consumption of the variety of fruits and vegetables strengthen our body and enable to heal the diseases. Proper nutrition is vital for body defense, and therefore nutrition and human immune system are directly related to ensure healthy condition.

In order to receive optimal health, humans require well-balanced diet including complex mixture of macronutrients and micronutrients. Thus, well-balanced nutrition helps humans to attain proper health condition and decrease the risks of heart diseases, cancer, strokes, osteoporosis and diabetes (Schwartz, 2003).

Proper comprehension of an advanced nutrition as an essential part of nutrient metabolism enables us to take control over and sustain proper health condition. A well-balanced diet enables sufficient nourishment and energy necessary to survive, and remain healthy and in good shape as well as to provide our body with vital resources and fuels to attain perfect and healthy condition (Lysol, 2006).

The core materials that highlight the essential methods of chemical analysis of foods include the following sources: *Introduction to Food Analysis*. S.S. Nielsen, 1998. Aspen Publishers, *Food Analysis: Theory and Practice*. Y. Pomeranz and C.E. Meloan, Chapman and Hall, *Food Analysis: Principles and Techniques*. D.W. Gruenwedel and J.R. Whitaker, Marcel Dekker, *Analytical Chemistry of Foods*. C.S. James, Blackie Academic and Professional, *Official Methods of Analysis*, Association of Official Analytical Chemists etc.

Various academic works by contemporary nutrriologists much contribute to our comprehension of the advanced nutrition and metabolism and especially their role played for

our organisms. *Advanced Nutrition and Human Metabolism* by Sareen S. Gropper, Jack L. Smith, and James L. Groff (2004), for instance, is a genuine example of a sophisticated comprehension of digestion and metabolism, as well as the ways we absorb fat, protein and carbohydrates. Another example is the work by Carolyn D. Bernanier (2002) *Advanced Nutrition: Micronutrients* much concerned about the ways minerals and vitamins operate at genomic level. *Advanced nutrition, and human metabolism* by Sareen S. Smith and Jack I. Smith (2006) widely analyses functional aspects of integration between vitamins and minerals. *Community Nutrition in Action* by Marie A. Boyle and David H. Holben (2006) involve relevant policies, program planning, resources, as well as nutrition issues particular to community nutrition. The authors provide us with proper understanding of establishing and implementing various nutrition programs for specific age groups (children, aged people, impoverished populations, students, etc). On the basis of entrepreneurial approach, the authors encourage us to learn how to improve public nutrition and make it healthier.

Herewith, the thesis dissertation provides numerous solutions regarding community nutrition practices and health problems, including nutrition education and assessment, as well as nutrition interventions' planning. The range of case studies and community-based learning activities are provided to facilitate active learning and practical implementations in due respect. The thesis dissertation analyses the issue of the community nutrition in action, involving relevant policies, program planning, resources, as well as nutrition issues particular to community nutrition. The analysis involves proper understanding of establishing and implementing various nutrition programs for specific age groups (children, aged people, impoverished populations, students, etc).

With regard to the community nutrition, policymakers and nutrition professionals should take all relevant measures to ensure the improvement of the quality of food consumption. As is known, in many world countries undernourishment and hunger present

major problems affecting health discrepancies and child mortality. To this end, the community nutrition is regarded as a core theme and focal point on an international agenda.

2. Description: the contemporary comprehension of the community nutrition in action

Food is a significant factor to the maintenance, development, functioning and reproduction of life. During lifetime an individual consumes 30 tons of food on average in seemingly endless dietary varieties. According to De Vries (1997), however, digestion splits all the foods found in all this variety of diets into the same basic nutrients. Food, therefore, is chemistry, and the mixture of chemicals that are represented and divided into four basic categories: (1) nutrients; (2) non-nutritive naturally occurring components (including antinutritives and natural toxins); (3) man-made contaminants; and (4) additives. At that, the nutrients account for more than 99.9% of the food contents. The main classes of nutrients are: carbohydrates, proteins, fats, and vitamins, and minerals. The constituents of food are called macronutrients and micronutrients. Macronutrients are the major sources of energy and building materials for humans, while micronutrients are only required in relatively small amounts. Micronutrients can be found in vitamins, minerals and trace elements, and are still required in sufficient amounts to ensure proper functioning of all body cells. In addition, micronutrients, like water, do not provide energy. The majority of macronutrients are essential nutrients for life processes, produced by human body itself. Therefore, these essential nutrients can be received only from the food we eat. Most importantly, macronutrients are constituent and indispensable ingredients of our diets, found in: carbohydrates, fat, protein, water (Wilson, 2005).

There are various reasons set to analyze food products, the main are as follows: assessment of product quality, overall research and development, accordance with legal and labeling requirements, detection of adulteration, determination of nutritive value. Through the

application of relevant analysis methods, we gain scientific data about chemical composition, physical properties and structure of food ingredients.

Nutrition is a nourishing organic process by which an organism assimilates food and applies it for growth and maintenance. Well-balanced nutrition prevents various possible diseases and promotes healthy lifestyle. The consumption of important fruits and vegetables ensures lower level of mortality and reduces various degenerative diseases, for instance, cancer, cardiovascular disease, and immune dysfunction in several human cohorts. In addition to the vitamins and minerals found in fruits and vegetables, may contribute to these beneficially protective effects.

Nutritionists therefore suggest several guidelines of healthy nutrition, for example: (1) consuming various foods; (2) consuming plenty of fruits; (3) consuming food rich in fiber; and (4) consuming less alcohol. Overall, nutrition is deemed functional on condition that it beneficially influences various body functions. Functional foods mainly consist of vitamins and minerals normally consumed by humans. Overall, these additives are approved and recommended by most governments, and are well-known to everyone (Food Additives and Ingredients, 2007). To this end, Vitamins are components of organic origin present in food and necessary to our body. The most widely known vitamins are: A, B1, B2, and B3 (niacin), B5, B6, B7, B9, B12, C (ascorbic acid), D, E, and K. The B and C vitamins are soluble in water, while A, D, E, and K vitamins are fat-soluble, and accumulated in the body fat. In turn, minerals are important to our life because they are the main building blocks that create muscles, tissue, and bones.

Additionally, they are significant components of many important life systems, in particular, hormones, oxygen transport, and enzyme systems. At that, there are two types of minerals: the main (macro) minerals and the trace minerals. A body in considerable amounts requires Main minerals. Particularly, main minerals include sodium, potassium, sulphur etc,

required to build muscles, blood, nerve cells, teeth and bones. The main minerals and trace minerals are required in small amounts due to the fact that they are very significant to our body. These important minerals participate in the majority of chemical reactions run in a body. Additionally, they are important to produce hormones.

Calcium is one another important mineral. More than 99% of calcium is stored in body, mainly in bones and teeth to keep them strong. The rest is stored in blood, muscles and cells. It is important to get calcium from the foods rich in it, including: milk, cheese and yogurt, green vegetables etc. Those of us who do not consume enough calcium should take calcium supplements. The exact amount of calcium depends on age and other factors; however, children and teenagers need more calcium compared to adults. Aged women need calcium to prevent osteoporosis, which weakens the bones that are likely to get broken. Half of women and men under 50 get their bones broken due to osteoporosis. Therefore, a diet rich in calcium and vitamin D keep bones strong.

Carbohydrates are the body's main source of energy and should constitute the main ingredient of entire daily intake. In actual fact, there are two types of carbohydrates: simple carbohydrates, i.e., sugar and honey, and complex carbohydrates, i.e., grains, beans, peas or potatoes. Complex carbohydrates are more nourishing, yet, have fewer calories per gram compared to fat, and cause fewer problems with over-nutrition than fat or sugar. Additionally, diabetics prefer carbohydrates, since they allow better blood glucose control.

Fat provides energy and transport nutrients. There are two types of fatty acids considered as essential for the human body: omega-3 and omega-6 fatty acids. These acids are required by the body to ensure normal functionality. At that, they are received from cold-water fish, or fish oil, and any other components that comprise omega-3 fatty acids, and black current seed oil, which comprise omega-6 fatty acids. For example, the typical American diet often includes surplus of omega-6 fatty acids and insufficient amount of omega-3 fats. The

increased consumptions of omega-63 oils are highly recommended to decrease the risk of cardiovascular diseases, cancer etc.

Proteins provide amino-acids to build and support healthy body tissue. In fact, there are 20 essential amino-acids, and therefore a body should be filled with all of them to function properly. Normally, the body produces twelve of these amino-acids; however, the other eight are the result of appropriate diet.

Weight issues have always influenced society, involving health, psychological and socio-emotional considerations. Too much weight, obesity, skinniness, on the other hand, are those pressures that trouble every American since they include certain abnormalities at the time when everyone strives to achieve perfect shape. And, "when it comes to healthy diet and lifestyle choices, Americans are floundering. Approximately 127 million adults in the United States are overweight" (Izquierdo 1).

A well-balanced diet provides energy and nourishment necessary to survive, and therefore to be healthy and in good shape it is important to provide our body with all the necessary resources and fuels to be in good condition (Lysol 1). Hence, an unhealthy diet and physical inactivity can increase your chances of getting heart disease, cancer, stroke, type 2 diabetes, high blood pressure, breathing problems, arthritis, gallbladder disease, and osteoarthritis (HHS 1).

For instance, *The Food Intake and Energy Regulation Laboratory's (FIERL)* mission is to identify dietary, lifestyle, psychological, and physiological characteristics of individuals that influence food self-selection and weight regulation. A metabolic approach provides quantitative evidence of the extent to which individual characteristics, dietary components, environmental factors, and lifestyle contribute to the increasing incidence of overweight and obesity seen in today's society. The role of specific foods and energy sources are evaluated in

the context of food intake behaviour and metabolism to identify which of these factors play major roles in the ability of individuals to maintain a healthy weight (USDA, 2008).

According to the Office of Disease Prevention and Health Promotion and the U.S. Department of Health and Human Services (HHS), "40 percent of the American family food budget is spent away from home in restaurants, on fast food and on meals bought through food services" (Izquierdo 1).

Considering the results of Harris Interactive poll (2004), a huge majority (83%) of the public blames the increase on not enough exercise, and only 34 percent of surveyed Americans chose caloric consumption as a major reason why obesity has increased. As well as this, most Americans (89%) think that TV commercials encourage people to eat or drink more than is good for them (44% say 'a lot,' 45% say 'some') while a tiny seven percent say there is no impact at all.

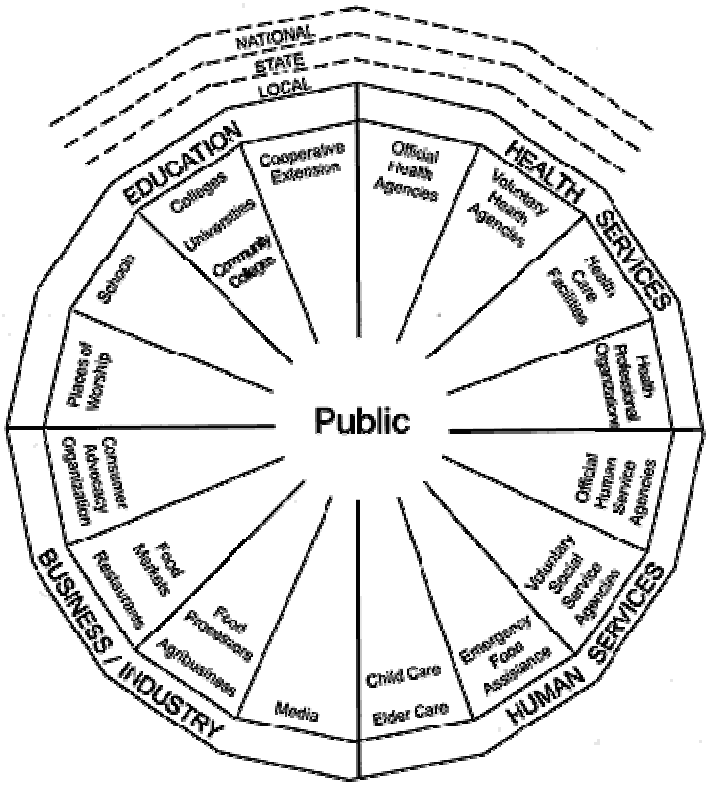
All in all, both obesity and skinniness demand right approaches, as the above evidence shows, so that statistical numbers of people with certain disorders have changed for better. Both diet and reasonable exercising remain universal recommendations to better the situation, so just try to find time and contribute own effort to this.

In addition to physical qualities any promotional campaign includes psychological impacts that enable marketers to effectively manage external communications on the competitive marketplace. Thus, media advertising and mass influence can now be hardly imagined without the application of viral marketing as an effective marketing approach of mass communication. Multi-channel dissemination of messages is regarded as the most persuasive way to advertise a company's brand and persuade consumers. At that, viral marketing serves a role of public relations' trigger that has once substituted the traditional ways of promotion.

Moreover, obesity and overweight alone cause various no communicable diseases; reduce the standards of life quality, life expectancy and life quality (WHO, 2006). To this end, WHO applies 'Technical Report Series 916 on Diet', to enhance nutrition and prevent chronic diseases', At that, in most countries dietary goals are not met by the average population due to over-standard fat consumption, low vegetable and fruit intake, as well as increasing obesity.

Nutrition professionals plan and evaluate food and nutrition initiatives and programs, develop and implement food and nutrition plans and policies, evaluate and implement disease prevention and health promotion programs and provide nutrition-related services to the various age groups within the community settings.

Graph 1: Community Nutrition in Action

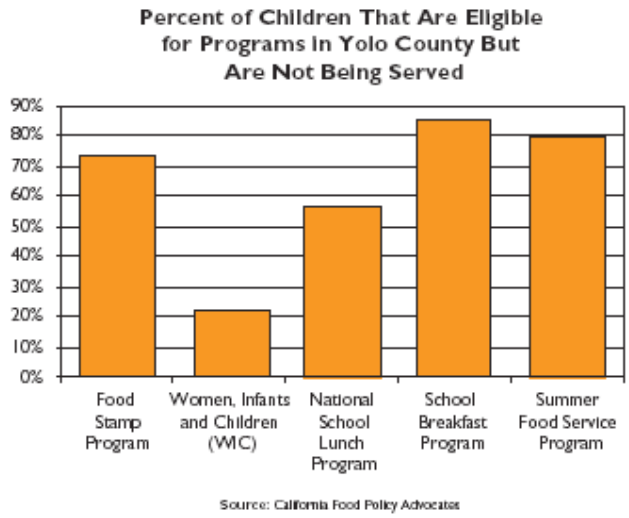


For instance, The Public Health/Community Nutrition Practice Group in the United States of America operates as a dynamic group comprising 1600 members actively involved

in education, consultation and direct care services, policy and research initiatives in the US and overseas. Along with other health professionals the group's members serve the communities by promoting optimal nutrition and health-care options. In particular, PHCNPG members provide various communities with the following services:

- Population-oriented education services on various levels.
- Promotion of primary care settings and community-based clinics.
- Consulting in child-care centers, school-based clinics, schools, colleges, universities, nursing homes, home health programs, and other health care facilities and programs.
- Elaboration and implementation of community nutrition programs, including planning, development, and evaluation.

Diagram 1:



In turn, the dietetic practice group designates nutrition criteria relevant for women's health, influencing public policy and legislation, setting standards for professional practice and care and developing projects promoting public health nutrition

The Beltsville Human Nutrition Research Center is the USDA's human nutrition research facility focusing on the program that spans health continuum and the human nutrition,

ranging from researching the role of food components and nutrients at the cellular level to investigating the influence of dietary interventions on health.

Beltsville Human Nutrition Research Center aims to define the role of food components in optimizing human health and reducing risks of nutrition-related disorders in iverse population groups. The ways dietary components interact with physiological, genetic, environmental, and sociological factors are scientifically investigated exploring the relevant effects on the health of the American population so diversified by ethnicity, gender, environment, and lifestyle. These assignments are completed in:

- Nutrient Data Laboratory
- Diet, Genomics, and Immunology Laboratory
- Food Composition and Methods Development Laboratory
- Food Components and Health Laboratory
- Food Surveys Research Group
- Food Intake and Energy Regulation Lab

The issue of the community nutrition in action should be widely discussed and implemented on all possible levels to enable all community members with proper nutrition and healthcare options. Proper nutrition should be accompanied with accessible programs in schools and other public establishments so that public overall can improve nutrition standards.

Table 1:

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 – 8:50					
9:00 – 9:50					
10:00 – 10:50		AM Political Thought		AM Political Thought	Community Nutrition
11:00 – 11:50					
12:00 – 12:50		Italian Literature		Italian Literature	
1:00 – 1:50					
2:00 – 2:50	Weight Training		Weight Training		
3:00 – 3:50					
4:00 – 4:50			Physics Lab		
5:00 – 5:50					
6:00 – 6:50					
7:00 – 7:50					
8:00 – 8:50					
9:00 – 9:50					

3. General analysis:

3.1. Food services industry: restaurant business and catering

Restaurants provide retail-based services offering customers the prepared food. The delivery of food assumes the diversity in cuisine and fine customer service. Restaurants vary from low-cost dining places to the luxury establishments. Restaurants are classified depending on the type of served food, for instance some customers prefer seafood restaurants, whereas others may opt for vegetarian ones. Depending on the origin of the served cuisine, restaurants vary in accordance with geographic classification; for instance, there are French, Thailand, Italian and Chinese cuisine restaurants etc. Restaurants are reviewed by restaurant guides that provide useful information on restaurant facilities, level of service, and type of food served etc. For example, in Western Europe the restaurants are guided by the Michelin system that offers ranking from one to three stars depending on the level of service and

cuisine features. Restaurant critics are in charge of dining guides to inform general public about the pros and cons of particular restaurant establishments (Spang, 2000).

The Michelin Star system is regarded as the most recognized one (see the following sub-section), however there are numerous concerns regarding its application. Many countries within the European community apply 'Red Guides' to award hotels and restaurants with Michelin stars depending on the variety and quality of services on offer (Le Guide Rouge, 2003). Each time of star-awarding restaurants increase their charges by up to 20% for the exclusive décor and particular spot surroundings. However, the quality of cuisine is not improved, which leaves the customers unsatisfied. Therefore, restaurants ranked in compliance with the Michelin system emphasize more on décor rather than actual quality of served food and drinks. Such approach makes the overall idea of ranking rather artificial aimed at exclusively well-off clientele (Bulmer, 2008). Therefore the rating system should coincide with the set market prices, and most importantly, consider the customers' expectations of food and service quality (Saravanan and Rao, 2007).

Recently, catering services have gained tremendous popularity since dining at the remote sites and outdoor events is both comfortable and convenient. The catering options vary in scale and quality of available offers. In addition to food deliver to the designated spot, catering assumes the caterers' services to serve the remote events, such as business meetings, corporate parties, conferences, weddings, concerts, conventions, workshops, banquets etc. All these and other events that involve food preparation and serving by caterers are referred too as the catered ones. Most importantly, catering has made the entire food service industry more mobile and flexible, and therefore accessible to the customers. In most instances, catering is an indispensable requisite of event planning, and therefore food serving is professionally combined with decoration setting, lighting arrangement, and guest entertainment. Compared to the conventional occasions, catered event are featured by the

unique atmosphere enriched with appealing spirit of admiration. Caterers and the relevant services are particularly demanded during the holiday seasons wherein the catering proposals are thoroughly planned months in advance. The related arrangements include opening and closing hours of the catering service, hours of meals and drinks service, entertainment time etc. Despite full-fledged catering services are universal, in each particular case there are local specificities regarding the type of food served, for example. Normally, the choice depends on the specificity of guest requests. In accordance with the applicable legislation, in most countries professional caterers hold health permit and business license to render catering services in a diligent and safe manner.

3.2. Gaps in Michelin Star system

Despite being known as the most famous star system, the Michelin star system is raising more and more questions high on the current restaurant agenda. To a great extent, the evident gaps of the system make it rather artificial and remote from the real-to-life reality.

UK and Ireland belong to the countries of European community covered by the so-called 'Red Guides' that award Michelin stars to hotels and restaurants ranging from good ones to those offering an exceptional cuisine (Le Guide Rouge, 2003). At that, the Michelin awards are not perceived unambiguously by both restaurateurs and clients. This indicates that there are obvious gaps peculiar to the heterogeneous star-rated restaurants (Johnson et al, 2005). Once being awarded with a star, a restaurant increases a price up to 20% which is often perceived by diners as artificially added value for extra charge paid for a restaurant's décor and fine surrounding, though not a better quality of food. Such price gap naturally makes many clients think twice before dining in one of the Michelin fancy restaurants since the price of about £ 150-200 per dinner naturally provokes amazement.

Another gap peculiar to the Michelin rating system concerns the criteria which are applied to rank the restaurants. Save as three-star restaurants, restaurateurs tend to place more

emphasis on the quality of stemware, tablecloths, china, napkins and flatware rather than the quality of served food. Worse than that, even less attention is paid to the creation of the ultimate atmosphere in a restaurant to make a customer feel satisfied. Taking this into consideration, one may state that the awarding of stars and increasing restaurant ratings are often artificial processes since the genuinely fair criterion would be customer's satisfaction and his/her willingness to visit a restaurant once again (Levine et al, 2007). All these critical remarks make us think that the very functioning of Michelin star system is dubious. To solve the issue, the system should make ratings coincident with set prices and adjust them to the customers' expectations regarding the quality of food and service. On the one hand it is understandable that is requires restaurateurs great efforts to acquire at least a star, though, on the other hand, clients' priorities should be placed above the stars and inspectors' assessments since in the long run the overall success depends on every customer's impression once he/she leaves restaurant premises.

Overall, most restaurants have been lacking innovation since 1990's which made the whole star-awarding process more suitable to Michelin inspectors' expectations rather than to the clients' ones (Hickman, 2008). On the international scale Britain has the worst results per population compared to other countries covered by the Michelin star system. British three-star restaurants are mainly remote from large cities. Not surprisingly then, only 532,183 people are served with Michelin star service, which if compared to other European countries is below the average (Hickman, 2008).

Critics justifiably claim that Michelin rating system is full of outdated data which is often misleading and do not correspond to the real state of affairs. In many instances, restaurant entries are based on irrelevant press releases that mislead customers and make their dining choices limited to an extent. This gap obviously undermines the prestige of the whole star system as such since in the age of high technologies and advanced marketing it is

unimaginable to keep clientele without providing them with up-to-date information (Levine et al, 2007). Furthermore, there is an obvious lack of literature in UK on Michelin Stars even though new '*Michelin Guide'* arrives every year. Internet as the fastest source of information provides some critical reviews and articles regarding overall situation concerning Michelin star system, though it is hardly ever possible to find relevant data on a situation in a particular country, and UK is not exception fro the rule. Scarce notes and/or comments fail to provide general public with relevant choices of restaurants neither it is possible to analyze statistical data. Usually guided by subjective reviews or judgments, readers remain uninformed about the real state of affairs, and therefore UK Michelin star restaurants lose clientele. To prove this right, there is no single source in UK like the *New York Times* which would provide readers with trustworthy and credible bids of news, reports, commentaries and interviews equipping readers with the best dining choices. Even more specific is the *Zagat Survey* claimed by many as the most reliable source of restaurant information since the reviews are based on real diners' experiences (Levine et al, 2007). This proves that nowadays fine dining is unthinkable without the reliable sources of information.

To this end, the *'Michelin Guide Great Britain and Ireland 2008'* (Bulmer, 2008), for example, is not enough to persuade customers to choose between the restaurants that were awarded with stars. Restaurateurs and chefs should clearly realize that public needs weigh far more than just ordinary technical or statistical data covering restaurant entries. Overall, in spite of being regarded as the industry's bible for many years, Michelin Guides are more and more criticized for becoming outdated.

On the one hand, Michelin is the international system that tests and grades *haute cuisine* based on the assessments of a team of inspectors as a result of their dining out experiences; thus, restaurateurs and chefs refer to Michelin Guide as the source that builds reputation and attracts customers. On the other hand, however, Michelin has become old-

fashioned over the years full of restrictions mainly due to formal French cooking (Hickman, 2008).

All in all, the gaps outlined above indicate the enhancement of theoretical framework and its relevance with the real-to-date situation. It is evident that Michelin Guides are relevant due to their reputation, though the lack of innovation make them the subject to overwhelming criticism and scrutiny. In the foreseeable future the Guides should renovate in a way to recover its real prestige and serve as trustworthy sources of information compatible to customers' expectations. At that, theoretical estimations should ground on empirical estimates obtained in the course of permanent and mutually beneficial interaction between restaurateurs and inspectors, on the one hand, and restaurateurs and clients, on the other hand.

3.3. The etiquette of eating

Etiquette is not an overburdening restriction when dining in a restaurant, but an axiom of behavior. Etiquette makes even the most humble meal into something special. For example, if you try eating spaghetti with a knife or holding a champagne glass by its bowl, your chances of fitting into a cultured society will be slim to none.

Pizza is sliced into wedges with a special pizza-cutter and is considered hand food. It is also accepted to eat asparagus with the hands, though this requires extra training as the juice roping off your fingers is not the most aesthetic spectacle. The solution is to eat the soft end of an asparagus stem with a fork and the tough part with your hands.

Eating crispy bacon with your hands is also permissible. As a rule, sandwiches are also considered a hand-food only at picnics. Club sandwiches are traditionally cut into four diagonally cut sections.

If a sandwich is overloaded with mayonnaise or some other sauce, then it is acceptable to eat it using a fork and knife. If there is no silverware on had, a napkin can be a substitute. Soft and flaky pastry can be eaten with hands. Eating a slice of Napoleon cake is

the ultimate test. If the cake does not fall apart in your hands and you manage to not dirty the tablecloth, then a fork is not necessary.

When it comes to macaroni, vermicelli and noodles, a knife is not needed. Spaghetti is typically eaten using a fork and spoon. Italians show off their mastery of eating spaghetti without the help of a spoon. Omelets, vegetables, brains and puddings do not require a knife. You can use a knife when eating pancakes, crepes vegetable cutlets or dumplings, but eating them with a fork is a demonstration of a rare knowledge of old school traditions.

A knife is not used when eating hot or cold fish. If a fish dish is served without a fork and spoon, the two forks will do the job. If you only have one fork, then take a piece of bread in you left hand to hold the fish and pick out the bones with the fork. In restaurants the etiquette is eating oysters using a special fork. In oyster bars it is acceptable to slurp down the content of the shell without using a fork.

Knife and fork Contrary to a well-known proverb, people eat poultry using a knife and fork in the most conservative establishments. In more liberal restaurants one can gnaw on chicken wings. The same goes for drumsticks and frogs legs.

Cheese can be cut with either a knife or fork. Soft cheese such as Brie or Camembert is spread on bread with a knife. Though it is much tastier to take a bite out of a slice of watermelon and let the sweet juice run down your chin, do not give in to temptation.

According to the rules of etiquette, slices of watermelon are served on a plate in pieces without the seeds and then eaten with a fork. The formula is as follows. Take the spoon in your left hand and twirl the spaghetti on the spoon with a fork using your right hand. Certain deserts are also served with a fork and spoon, for example, ice cream with pastries. No holds barred The highest compliment to the chef is when people mop up the leftovers of the sauce with a slice of bread. Tasting a bit of the dish your companion ordered is absolutely normal, as long as you do it accurately.

In a non-official ambiance or at a family dinner cutting meat off a bone and chewing on it is permissible if the meat is fried or baked without gravy or sauce. You can decorate your dish with a maraschino cherry and olive or a marinated baby onion. If you don't have a toothpick, you can pick out the condiments with your fingers.

Biting off an entire chunk of bread is uncouth. Bread is traditionally broken up into small pieces, though larger than mouth size. A slice of bread is placed on the left-hand side of a bread plate and butter is spread using a special knife.

Using a knife to spice up a piece of food on a fork is not in good taste. Fresh vegetables should only be dipped in sauce only once. When vegetables are served, put aside those that you fancy, but don t eat them with the main meal.

Last, but not least, what should be strictly avoided. Immediately cut up everything on the plate that looks non-palatable and wipe off any lipstick stains on glassware or cutlery. Leaving a teaspoon in a cup is unbecoming and risky. It is rude to wipe cutlery with a napkin. If you have doubts about the cleanliness of your cutlery, simply ask the waiter or waitress to replace them. Putting your plate off to the side after finishing your meal is also a breach of etiquette. Leave it on your placement until the waiter or waitress takes it away. Using cutlery The variety of silverware and the difficulty in understanding how it is used is one of the favorite topics for filmmakers that specialize in comedies. Until the time comes to crack a lobster on your own, you can let three simple rules guide you.

If you do not know what cutlery is used for which dishes, don't worry. Cutlery is replaced with each change of course starting with the furthest from the plate commonly known as snack cutlery. If you take a fork from your left hand with your right hand, don't fret that you are breaking the rule of "fork in the left hand, knife in the right. You are simply using the zigzag style accepted in the U.S. or you are American. Once you've finished your meal you send a signal to the waiter by placing your fork and knife in the position of the

hands of a clock at half past four. If you want to take a break, cross your cutlery or place it off the edge of your plate (Anonymous, 2008).

4. Actualization: Specific case study on Conditional cash transfer (CCT) programs as relevant means to promote community nutrition

Conditional cash transfer (CCT) programs present valuable social sector interventions in the developing world. As an effective tool of social policy, CCT programs transfer resources to the poor families on the condition that they make active endeavours to transform their children into genuine human capital while enrolling them into schools, and ensuring that their sound health care.

In most instances, transfers are provided to women, while CCT are focused on the provision of poor households with minimal consumption floor, and encouragement of the human capital accumulation by making the transfers conditional. In such a way, CCT are empirically implemented to break a vicious circle wherein poverty is transferred across generations.

Hence, CCT programs are primarily aimed to combat one of the major global problems determined by the UN Millennium Development Goals Program (2000-20015) as poverty reduction. CCT make welfare programs conditional depending on the receivers' actions, while national governments transfer the money to persons who adhere to the set criteria, including: children enrolment in public schools, receiving regular check-ups and/or vaccinations at doctor's etc.

In accordance with the World Bank interpretation of CCT, owing to the conditional cash transfers, poor families are directly provided with money through social contract with the beneficiaries. For instance, children should be regularly sent to school or treated in health centres. In case of extremely poor families, the 'cash' ensures emergency assistance, while the 'conditionality' enhances long-term investments into human capital.

Today, CCT programs are actively operated in the developing world, in particular such Latin American and African countries as: Brazil (Bolsa Familia); Mexico (Oportunidades, 2002) Chile (Chile Solidario, 2002); Honduras: The Family Allowance Program, 1998); Colombia (Familias en Acción); Nicaragua: Social Protection Network, 2000; Jamaica: Programme of Advancement through Health and Education); Panama (Red de Oportunidades), as well as in Zambia, and Malawi.

Within the framework the World Bank panel (2009), the assessment of empirical implementation of the CCT programs produced mixed outcomes, however. On the one hand, CCT programs reduce the rates of the extreme poverty, whereas, on the other hand, CCT programs have failed to produce higher educational and health progress with children whose families receive CCT grants. Despite such tremendous progress of CCT empirical implementation, there are still a lot of unanswered issues on the CCT agenda that requires closer evaluation of the domestic peculiarities, sustainability, and welfare impacts in every individual country (Weddle, 2009).

Considering this, there is an urgent need for more socially oriented cash transfer programs to support and benefit impoverished households taking into account the ongoing economic and financial crisis as well as the recent fuel and food and crises. CCT should be therefore further viewed as safety tools to aid mothers and their children on condition the latter receive sustainable educational and health services. In 2009, the World Bank alone intends to back up the CCT programs with 2.4 b. USD in Colombia, Bangladesh, Macedonia, Kenya, Pakistan, and the Philippines (Fiszbein and Schady, 2009).

Empirically, the social roles of CCT programs vary from country to country, assuming that every case of the national CCT implementation is featured by the domestic peculiarities as well the contextual framework of actual programs operation. In terms of size, for example, CCT programs are quantitatively measured with respect to the absolute coverage of population. Namely,

CCT range from 11 m. families in Brazil to 215,000 households in Chile. In turn, some CCT pilot programs cover several thousand families in Nicaragua, and Kenya, for example. With regard to the relative coverage, the penetration of CCT programs ranges from 40% percent of population in Ecuador, for instance, to approximately 20% of population in Brazil and Mexico, and mere 1% in Cambodia).

With reference to budget, the CCT funds vary from 0.50% of GDP in Mexico, Brazil and Ecuador to 0.08% of GDP in Chile. Benefits generosity from CCT programs varies from 4% of household consumption in Honduras to 20% in Mexico, and even less percentage in such countries as Cambodia, Bangladesh, and Pakistan.

Most CCT initiatives in middle-income countries like Brazil, Mexico, Colombia, Jamaica, El Salvador, Turkey and Panama have pursued integrated approach to reduce poverty, while having balanced the goals of human capital formation with social assistance. In particular, CCT benefit newly-born children until they reach the mid-teen age on condition they are provided with proper nutrition, regular healthcare, and education.

CCT programs target their benefits to the poor by combining geographic and household means. Some of them are community-based targeting programs aimed at transparency increase. Overall, the overwhelming majority of CCT programs has driven the development of household targeting systems and poverty maps and therefore substantially improved the applied standards for the targeted programs in many countries of the world.

The CCT programs are usually administered by the social welfare ministries and freestanding agencies. As well as these, many CCT programs have been proactively managed in terms of their evaluation and monitoring owing to the vast application of the cutting-edge information and communication technologies. Overall, it is excellent technical systems, and high level of documentation and data flow transparency that positively feature most CCT programs. Namely owing to these characteristics, CCT generally outperform other social

policy programs and traditional socially-oriented practices. CCT are designed on the basis of their credible impact evaluations and vast application of experimental methods. The entire culture of CCT evaluation transmits among CCT programs as well as to other socially-oriented programs.

Meantime, the majority of CCT programs are currently facing serious challenges, including though not limited to:

(1) The complementation of the expansion of services supply with their quality improvement;

(2) The rationale of CCT conditions alteration to achieve more reward performance rather than actual use of the provided services;

(3) Compatibility of CCT outcomes with the assurance of further training and employment to the youth;

(4) Determination of balance while targeting younger and older participants of the program etc.

In some countries, these and related challenges are solved through the adjustments to the CCT basic design, whereas in other countries the changes are catalyzed in other programs.

4.1. Critical assessment of Bolsa Família implementation in Brazil

Bolsa Família has been an integral part of the welfare program 'Fome Zero' initiated by the Brazilian government. The program has formed a central idea of Luiz Inácio Lula da Silva's social policy, and had dramatically impacted his coming to presidency in 2006. For the time being, the program is regarded as the largest CCT program worldwide. Bolsa Família aids indigent and poor Brazilian families throughout the country with financial support on condition their children are vaccinated and attend school.

In such a way Bolsa Família is applied as an effective means of short-term poverty reduction through the direct cash transfers, as well as long-term poverty reduction through the

conditional cash transfers that lead to human capital formation among their recipients. Recently, the Economist featured Bolsa Familia as an anti-poverty scheme that had launched in Latin America and won converts worldwide. Experts overall regard Bolsa Familia among the core factors (including job market improvement and real gains on the minimum wage) that have so far contributed to the poverty abatement in Brazil, namely over 2003-2005.

Initially it was Cristovam Buarque who launched Bolsa Escola program which preceded Bolsa Família, and was conditional on school attendance only. Later on, states and municipalities adopted similar programs following which Bolsa Escola was federalized by the President Fernando Henrique Cardoso. Consequently, Bolsa Família occurred in 2003 on Lula's initiative who integrated Bolsa Escola, Cartão Alimentação, Bolsa Alimentação, and Auxílio Gas into unified program. The emergence Bolsa Família led to the creation of separate Ministry on Social Development in Brazil.

The holistic approach assumed by Bolsa Família primarily aimed at the elimination of bureaucratic complexity and administrative costs reduction. Eventually, over the six years of its effective implementation, Bolsa Família has become a success story of social policy model implementation to be followed by many countries around the world.

In accordance with Bolsa Família, on monthly basis every child (belonging to a family consisting of no more than three children which per-capita income is lower than 120 reais) that attends school receives approximately 10 USD (18 reais).

For those families whose per-capita income is lower than 60 reais (approximately 30USD) a month, regarded as an extreme poverty rate in Brazil, CCT allocates additional flat amount equal to 58 reais a month, which is regarded as the basic benefit and excludes any terms of conditionality. Those are adult females that receive cash through citizen cards applied as the debit cards issued by the government savings bank Caixa Econômica Federal. It is assumed by CCT program that cash can be withdrawn in more than 14.000 Bank

locations nationwide. Such transparent transferring mechanism enables to avoid corruption and separate the recipients' money from any influences of political forces.

According to 2006 estimates, Bolsa Familia was worth approximately 0.5% of the country's GDP and 2.5% of overall government expenditure, while having benefited more than 11.2 million Brazilian families.

Notwithstanding such dramatic progress in terms of social rate improvement and poverty abatement, Lula's political opponents extremely criticized Bolsa Família for the alleged use of CPMF tax revenues for electoral and political purposes at the cost of the detriment of the country's public health system. In addition to these criticisms, both progressive and conservative sectors of the Brazilian society and the Catholic Church have so far opposed the very idea of benefiting the poor by money transfers.

Thus, both controversy and oppositional resistance have so far become indispensable features of Bolsa Familia implementation in Brazil. In due context, the program's opponents pointed at the low educational background of Bolsa Familia recipients, assuming they would use money to consume more alcohol or purchase additional devices, like battery radios, for example. Among other reasons that altogether deter Bolsa Família from being universally accepted within the Brazilian society are socio-economic factors. For instance, many argue that the program eventually discourages poor people from seeking employment. To this end, the Catholic Church points out that Bolsa Família results in an accommodation of its beneficiaries.

Conversely, the World Bank assessment surveys have evidenced that the program has not adversely affected social ascension or employment. More than that, there is a widespread view among the Brazilians that Bolsa Família holds tremendous potential with regard to the absolute poverty reduction since it initially eliminates poverty transmission among generations. Ostensibly, the program abates extreme poverty while aiding the poorest

families with unconditional cash transfers. In terms of CCT economic rationale evaluation, this means that additional transfers eventually result in more money circulation, and subsequently more purchasing capacity and the domestic market growth, which altogether produce overall positive economic effects. So far, the program has dramatically combated absolute poverty, as well as improved school attendance rates and eliminated child labor.

In accordance with the recent governmental surveys on Bolsa Família's effects, the overwhelming majority of program's beneficiaries spent the received money on food, school equipment, and clothing. At that, the most part of funds is spent on food.

In June 2005, the World Bank launched its Bolsa Família Project to facilitate the Brazilian government the Bolsa Família Program administration. The very program is comparatively immature; notwithstanding many of its outcomes bear vital socio-economic significance in Brazil since the program has dramatically contributed to the improvement of food consumption and diet quality, as well as education rate and overall children's growth.

The recent international reports indicate that since 2001, there has been more than 20% drop in inequality in the country, as well as considerable decrease in child labor exploration. All these positive outcomes are mainly associated with Bolsa Família effectiveness. Along with poverty reduction, the program has abated the problem of hunger and undernourishment traditionally experienced by the poorest families in Brazil.

Under the framework of Bolsa Família, children enrolled in public school daily receive one free meal, while two free meals are provided in the poorest areas, which enable the poorest families to save on food spending. 82.4% surveyed Bolsa Familia recipients claimed they have improved their eating patterns, while the incomes of the poorer families have increased by 25%.

Consequently, through the provision of direct monetary transfers, Bolsa Familia has achieved its two core objectives, namely it has reduced current poverty and inequality in

Brazil by enabling poor families with direct monetary transfers, and alleviated future poverty and inequality by providing poor families with relevant incentives to build up their own human capital. The measurement of the program's quantitative conditions indicates that Bolsa Familia managed to actively involve its targeted population into the social safety net. In turn, qualitative measurement indicates the program's overall positive outcomes, social improvements, as well as the transparency of CCT process and implementation.

Furthermore, through the successful realization of Bolsa Familia objectives Brazil has better aligned its commitments to meet the Millennium Development Goals. Specifically, among other achievements, Bolsa Familia helped to reduce malnutrition; attain universal education; reduce child mortality; and improve maternal health. All these MDG were met through the increased demand in education investments, health, nutrition, and care for children and pregnant women (Ferreira, 2003).

In terms of implementation, Bolsa Familia targeted extreme poor families with monthly income less than 17 USD a month, and moderately poor families with monthly income ranging from 17 to 34 USD. The household's income and composition built the basis on which the program provided cash transfers approximately estimated at 24 USD per month. The CCT lending instrument evidenced a great deal of innovation since the World Bank provided Bolsa Familia program with a supportive loan consisting of three innovative design features.

A two-phase Adaptable Program Loan (2004-06) emphasized on solidifying the safety net effectiveness while the four conditional cash transfer programs were consolidated to reduce duplication and gaps in coverage, improve systems that identified target population, and develop effective evaluation and monitoring system. Subsequently, the second phase of the Adaptable Program Loan (2007-08) was designed to consolidate and advance innovations and technical improvements of the first phase.

In empirical terms, the achieved results are enormous. Since the date of its launch in December 2003, Bolsa Familia has exponentially evolved, and by January 2005 covered 26.6 million Brazilians. Further on, by the end of 2006, the program covered 44 million people. These statistical figures indicate that at least two-thirds of extremely poor families are currently receiving income transfers under the Bolsa Familia framework. Furthermore, at least 40% of transfers are directed to the poorest families that are in the bottom of income distribution. 80-85% of primary school children from the extremely poor families have already benefited by attending school. Finally, 95% of beneficiary children are regularly using health cards (Ferreira, 2003).

To become successful Bolsa Familia initially embodied critical lessons from the previously implemented social projects in Brazil as well as in the world. The program's design was initially built on the basis of SWAp approach that is program-based sector-wide approach to lending that assumes the provision of the financial support for social sector policies through quantitative and qualitative targets.

SWAp approach encompasses:

(1) The medium-term program led by government to match sources and utilize funds;

(2) Formalized process assuming transparent and regulated donor coordination;

(3) A result-based monitoring system for core outputs, inputs, and outcomes; and

(4) Shared system ensuring financial management and procedural reporting.

Owing to the extreme flexibility of SWAp approach, donors were able to de-emphasize fiduciary and procedural requirements to concentrate their funds and resources more effectively while providing effective sector-based technical assistance. Furthermore, SWAp approach encouraged donors to leverage their comparative advantage and financial contribution among agencies, which subsequently allowed them to achieve inter-sector impacts. While building on financial management experience and advancing borrower's

fiduciary framework, SWAp approach effectively responded to Brazil's frequent requests regarding absolute poverty reduction.

By now, Bolsa Familia has overall benefited from both broad public support and high-level political support. The consolidation of conditional cash transfers was perceived by wide public (including ordinary citizens, political parties, government branches, media, academic circles, and civil society) as an effective means to build on previous successes and ensure new level of their performance.

As a feasible approach to social assistance, Bolsa Familia proved that conditional cash transfers are both politically acceptable and operationally feasible. Brazil's commitment to and ownership of conditional cash transfers was enhanced due to wide acceptance among general public assuming that that integration would lead to the improvement of the equity and efficiency of such aiding mechanism.

Through the years of successful implementation, Bolsa Familia provided important insights on the design of a results framework and its implementation in the context of large-scale and complex socially-oriented initiative. At that the relevance of Bolsa Familia has become widespread and actual not only in Brazil, but in other regions of the world as well. The targeted population coverage and rapid nationwide expansion has made the program unique in terms of quantitative analysis.

In qualitative terms, the program has so far achieved unprecedented success in terms of systems development for beneficiary selection, evaluation and monitoring, scaling up and quality control. Originally, the program is based on the systems that might be applicable in other countries intending to implement similar decentralized programs and quality control reviews that will potentially achieve much-needed feedback for the locally implemented program from federal agencies.

As a lead player in Bolsa Familia realization, the World Bank proved its efficiency in terms of the applied SWAp approach that enormously supported and benefited the program's successful implementation. Since the practice proved that in the realization of similar projects there is no one-size- fit-all, the overall success of project fulfillment much depends on donor's ability to flexibly adapt to the particular needs of the project.

Eventually, the program's Results Framework and Reporting System managed to consolidate such core prerequisites of overall success as the advancement of the targeting system mainly through:

(1) Clarifying operational guidelines for the registry system;

(2) Running cross-system and internal cross-checks to eliminate duplications and validate eligibility;

(3) Accessing registry database; and

(4) Applying relevant instruments to implement eligibility criteria and overhaul the registry questionnaire.

The program's joint intergovernmental management was advanced through formal agreements between Brazil's central agency and sub-national entities. The impact evaluation survey was developed and launched to measure to which extent the outcomes impacted the program' progress. Enhanced program quality control and oversight were ensured owing to the development and launch of the advanced tools (Lindert, 2005).

4.2. Critical assessment of Oportunidades implementation in Mexico

Along with Brazil and Bangladesh, Mexico has been regarded as a pioneer of successful and wide-scale CCT implementation since 1997. The first CCT program launched in the country was named 'Progresa' (1997), which was subsequently substituted by the more advanced version named 'Oportunidades' in 2002.

The program reflected government's nationwide policy on social assistance in Mexico. Primarily 'Oportunidades' reflected the overall CCT philosophy while targeting poverty alleviation through the mechanism of cash payments provision to the poor families on the condition of regular health clinic visits, school attendance, and nutritional support. As a social-oriented aid program Oportunidades attained poverty reduction through health improvement and educational attainment. By 2006 the program covered 25% of the country's population.

Oportunidades is originally based on CCT principles and implementation procedures, including: targeting recipients among poor households (predominantly mothers being caregivers responsible for health decisions in their families); providing cash transfers from the government to the poor families directly so that to avoid corruption and overhead; applying the effective evaluation system based on statistical controls; selecting CCT beneficiaries on the basis of socioeconomic and geographical factors (Fiszbein and Schady, 2009).

Over the years of successful implementation, Oportunidades has become the feasible anti-poverty tool of the Mexican government. Geographically, the program is spread throughout both rural and urban communities while helping poor families by investing in their human capital through the improvement of nutrition, health and education standards for their children, in the short-term perspective, and achieving long-term economic improvements through poverty reduction.

So far, Oportunidades has become a true example of effective poverty alleviation, which results are evident. The program's philosophy and design were primarily grounded on the understanding that poor families failed to properly invest in their children's human capital and therefore created intergenerational poverty transmission.

Thus the program ultimately aimed to increase the awareness among the poor that the vicious circle might be broken providing they comprehend the long-term benefits of investing into their children. Thus, additional costs were granted to make poor families send their children to school rather exploit them as a cheap source of child labor (De Brauw and Hoddinott, 2008). Prior to the program implementation poor families used the income for their current consumption while sending their children to work rather than school. Such conventional approach once again proves the close relationship between education and poverty alleviation since these factors are interdependent, assuming that the lack of education is the prime cause of poverty.

Oportunidades envisages the provision of monetary educational grants to the beneficiary families for children aged less than 22 enrolled in school from the 3rd grade of primary school to the 3rd grade of high school. Geographically, the program has gradually evolved from the poorest rural areas to the urban ones.

More than 4 million of Mexican families currently benefit from the program with more than 2.5 million of families in rural areas, and about 1.5 million of families in urban areas. In terms of education aid, every child enrolled in the 3rd grade of primary school receives monthly amount of about 10.50 USD, while children in the third year of high school are granted approximately 60 USD.

In healthcare direction, the program is intended to provide basic health care services to all members of the beneficiary families, whereby the primary emphasis is placed on preventive health care. Finally, the nutrition component assumes the rendering of a fixed monetary monthly transfer worth approximately 15.50 USD to improve food consumption standard and nutritional supplements to the for children aged from 2 months to 4 years, malnourished children aged 2-4, and lactating and pregnant women (De Brauw and Hoddinott, 2008).

In the course of its vast implementation, Oportunidades applies proxy means tests and geographical targeting while carrying household surveys in the eligible communities. On the basis of the socio-economic information analysis performed at the central government level, the beneficiary families are rigorously chosen, while payments are provided to the adult females since it has been long proven that women make better use of funds compared to men. Overall, the program is widely supported by the government officials that represent various ministries as well as the country's president. Namely, there is close-knit interaction and cooperation between the health, education, social security, and finance ministries within the Mexican Government regarding the program's effective operation. As well as this, recently the program implementation was enormously supported by the International Food Policy Research Institute and Inter-American Development Bank (Ferreira, 2003).

Regarding Oportunidades impact analysis, the program proved to become a pattern of effectiveness and credibility. The actual outcomes evidence that poor Mexican children from rural areas have well-balanced their diets, increased school enrollment, received more medical attention, and comprehended that owing to education the future might seem much brighter than the past. So far, the overall school enrolment has increased by 20% of schoolgirls and 10% of schoolboys accordingly. Among the significant health and nutrition outcomes evidence that the incidence of illness has decreased by 12% with children aged 1-5 compared to those that are not subject to Oportunidades. Furthermore, the research data evidence that Oportunidades positively impacted the reduction of child stunting and increased child growth (De Brauw and Hoddinott, 2008).

5. Discussions: nutrition communication and education

Food is a significant factor to the maintenance, development, functioning and reproduction of life. During lifetime an individual consumes 30 tons of food on average in seemingly endless dietary varieties. According to De Vries (1997), however, digestion splits

all the foods found in all this variety of diets into the same basic nutrients. Food, therefore, is chemistry, and the mixture of chemicals that are represented and divided into four basic categories: (1) nutrients; (2) non-nutritive naturally occurring components (including antinutritives2 and natural toxins); (3) man-made contaminants; and (4) additives. At that, the nutrients account for more than 99.9% of the food contents. The main classes of nutrients are: carbohydrates, proteins, fats, and vitamins, and minerals. The constituents of food are called macronutrients and micronutrients. Macronutrients are the major sources of energy and building materials for humans, while micronutrients are only required in relatively small amounts (D'Mello, 1991). Micronutrients can be found in vitamins, minerals and trace elements, and are still required in sufficient amounts to ensure proper functioning of all body cells. In addition, micronutrients, like water, do not provide energy. The majority of macronutrients are essential nutrients for life processes, produced by human body itself.

Therefore, these essential nutrients can be received only from the food we eat. Most importantly, macronutrients are constituent and indispensable ingredients of our diets, found in: carbohydrates, fat, protein, water (Wilson, 2005).

Proper diet and digestion is vital for ones healthy and active life, though there are numerous distracters that prevent healthy nutrition and consumption of appropriate foods and products. One of the most serious global challenges is poverty followed by a lack of nutrition education.

On all levels the sufficient resources are needed to access adequate food, according to FAO Nutrition, and therefore to guarantee good nutrition and health the society needs to develop and implement educational and communication nutrition initiatives to cope with diet-related health problems. To this end, while meeting the Millennium Development Goals, the entire attention should be focused on the nutrition education as a key prerequisite for the

development and adoption of skills and right motivation to consume healthy diets and ensure healthy condition.

Though such incentive apparently depends on the availability of resources needed to eat well, and hence low-income situations necessitate the challenge of providing nutrition education. Insufficiency of trained personnel equipped with libraries, nutrition laboratory developments and updates, books, guidelines, and other data sources, and technological resources disable educating people about nutrition in a proper way.

To make the difference between knowledge and action, globally all the eligible and competent actors should strive to strengthen nutrition education activities by disseminating information, communication and educational materials through mass media channels. At that, various guides facilitate governments and non-governmental organizations to communicate, inform and motivate wide public in sense of adoption of healthy diets and lifestyles throughout their lives.

According to FAO Nutrition Education and Communication Group, "The Guide is a basic nutrition education tool that can play a vital role in promoting good eating habits, and can also be helpful to individuals or community groups who want to know more about nutritious family feeding" Thus, wide public access essential information about getting enough food, making nutrition family meals, storing food safe and clean etc.

Regarding education in primary schools it is necessary to designate more planning guides to develop appropriate curricula. The primary task of educators, as was already emphasized herein, is to establish effective nutrition education in schools. Everything from hands-on material, worksheets and a classroom curriculum charts should be applied as step-by-step guidance in the course of planning and redesigning nutrition education classroom curricula as well as related school-based nutrition activities.

Such approaches and initiatives should obviously gain external motivation on the part of governments, official authorities, healthcare institutions, businesses, investors, academia, mass media and the variety of NGOs concerned about the maintenance of high-quality nutrition agendas.

Nutrition-oriented agendas should develop within the appropriate and supporting environments created by school system involving active family and community participation (FAO, 2008).

Overall nutrition-oriented skill development, as is seen, starts on the initial stages of primary education, and subsequently afterwards such educated and well-informed people will make the situation with proper nutrition better.

Numerous communication and educational initiatives referenced above and the importance of their fast and effective implementation indicate global and national challenges in combating global malnutrition, hunger, poverty and lack of access towards nutrition-promotional resources.

Whenever theory is substituted by practical action, we can claim that one of the MDG problems is being efficiently and responsively solved with the primary emphasis on the developing world, considering national and individual and community peculiarities in each particular instance.

Summing up, nutrition communication and education places more challenges in the foreseeable future than one could possible expect. Therefore educational school system should be regarded as highly efficient environment that is capable to bring up the generation of nutrition-aware people that would further lead important solutions and help those in need.

6. General Recommendations on food and growth; relevant issues in baby & child upbringing

6.1. Breast feeding

Maternal breast milk has a unique composition that helps protect against childhood obesity, Crohn's disease, lymphoma, leukemia, and diabetes (Gregory, 2005). It also is associated with decreased incidences of diarrhea and necrotizing enterocolitis (NEC) (Cooke, 2000). Breast milk contains docosahexaenoic acid and arachidonic acid, two long-chain polyunsaturated fatty acids that play a role in visual acuity, growth, and cognitive development.

However, breast milk nutrients content is generally stable. It is made in the mother's bloodstream from nutrients. Woman who breastfeeds her baby uses 400-600 calories a day in producing milk. Breastfeeding has certain benefits for mother and infant: physical and psychological.

As a consequence, nutrients and other significant components pass to the baby, and beneficial hormones released into the mothers body. Brest fed infants have a lower risk of diseases, and its composition Include several anti-infective factors, for instance the anti malaria factor para amino benzoic acid. Additionally human milk involve protein, iron and prevent growth of bacteria: for example, Salmonella. Breast milk includes amount of the amino acids, cosine, methionine and taurine that are essential for development of nervous system.

Only you can decide whether to breast or bottle-feed. It is your body and your baby. Nobody has the right to pressure you either way or to criticize you whatever you decide. Breast milk is *physically* better for babies because it is the milk that nature intended for them. It even adjusts itself during a feed - so that the baby first gets 'foremilk', which he can gulp down to satisfy his thirst and desire to suck, and then the richer 'hind milk', which satisfies his appetite.

However, modern baby formula can be very nearly as good. Breast-feeding brings the two of you as close as it is possible for a mother and baby to get, but you can make close,

warm physical contact by using a bottle, too. So don't listen to partisan arguments. Instead, think about yourself, the baby and your whole family unit.

If you are looking forward to the physical relationship your baby will want to have with you, you will probably enjoy breast-feeding. There is an obvious, natural connection between the baby's hungry, seeking mouth and your full breasts. It feels very right and very pleasurable too. But if you find the whole idea embarrassing, you may not enjoy actually *doing* it. If you don't enjoy it, then it will not work very smoothly. Both you and the baby may be happier using a bottle. And if you have a partner who is against you breast-feeding - perhaps because he feels that your breasts are private to your adult sexual relationship with him — his lack of support may make it very difficult for you. Although it has to be your decision, you will need to try and bring him round to your way of thinking in advance.

If you mean to stay at home and make the baby's care your priority for a few months, either way of feeding will suit you. But at the *very* beginning you may need more extra help if you are breast-feeding than if you are bottle-feeding. Getting your supply of milk tuned in to your baby's demands for it can be time-consuming and tiring and, since stress and fatigue really can reduce your breast milk, you will need to be able to relax and rest.

Once the baby is a month or so old and breast-feeding has become second nature to both of you, it will give you far more freedom to get out and about with the baby. So if you have visits or holidays planned, or if you like to be able to go out and do things on the spur of the moment, breast-feeding will tie you down less than bottle-feeding, with all its preparation and paraphernalia.

If you plan to go back to work within a few weeks of the birth, bottle-feeding may seem an easier option and may indeed prove to be so. But it will still be worth your while to get the baby established on the breast. A new baby is extremely portable; you might be able to take him with you to the job at least for a couple of months. And even if you want to be

able to leave the baby with your partner or a caretaker, you may prove to be somebody who can express breast milk so easily that you might as well leave bottles of breast milk as bottles of formula. This also applies to partners or grandparents being able to feed the baby, for their own pleasure or to relieve you of some night feed. If you have a copious milk supply and can easily express in the evening what the baby will need during the night, you can take turns with somebody else without bothering with formula.

Are you still uncertain which you want to do? Keeping your options open while you make up your mind means starting off with breast-feeding. You can always wean a baby gently from the breast to a bottle but you cannot switch from formula to breast milk because, if the baby has not been sucking regularly from your breasts, they will not be making milk. The baby's sucking will get your milk supply established so that you have the option to go on breast-feeding or to change over to a bottle if breast-feeding does not work out for you.

While the baby is establishing your milk supply he will be getting the colostrums which breasts produce first of all. Colostrums gives the baby water and sugar (which he could also get in the form of "sugar-water" from a bottle if he was not to be breast-fed) but it also gives him just the right amount of protein and minerals *plus* many important antibodies from you that will protect his health while he is building up his own immune system. There is no artificial equivalent of colostrums, which is why even a few *days* at the breast give babies a head start.

If your baby should have any health difficulties in the newborn period -mild jaundice, for example - he will really wee/to be fed on human milk rather than formula. Babies whose mothers decide in advance against breast-feeding are often given breast milk from the hospital milk bank if they are unwell. Early feeds - perhaps complete with "after-pains" - speed up the return of your womb to normal, even if you do not go on breast-feeding long

enough for your figure to benefit from feeding your baby the extra fat you laid down in pregnancy.

Newborn babies don't need much food in the first three or four days of life. Breast-fed babies get colostrums. Bottle-fed babies may be given sugar-water first; when they are offered milk, the water part of that milk is what they need most. They probably will not take much, anyway. As we shall see, feeding is something babies have to learn.

Because they take little food, babies usually lose weight for four or five days before they start to gain. It is quite usual to lose 225g (8ozs) over five days and then gain it back over the next five. A baby's weight at ten days is therefore expected to be roughly the same as it was at birth.

When a newborn baby is thirsty or hungry he feels uncomfortable so he cries. But at this early stage he does not cry *to be fed.* He does not know that his discomfort comes from hunger; that sucking will bring him food or that food will make him feel better. He has to discover that sucking is both food and comfort.

Some babies are so ready to suck that this vital learning takes place quickly and easily. They may have been practicing sucking their fingers in the womb (we know that some babies do) and once they are born they suck anything that comes their way. Of course, when such a baby is offered the breast or a bottle he sucks that too. Sucking gives him milk. Milk makes him feel good. The feeding lesson is learned.

Other babies are not at all like this. They cry piteously with hunger-pain but when their mothers try to put a nipple or teat in their mouths they yell around it. Even a taste of colostrums or milk does not stop the crying. The connection between that taste and comfort has not been made yet. With a baby like this early attempts at feeding can be a struggle.

However, whether yours is a 'sucky baby' or not, you can be quite sure that he has been born with a set of sucking reflexes. If you use these reflexes, instead of trying to force

your nipple or a teat into his yelling mouth, he will suck. Once he has sucked a few times and discovered the food-comfort, all will be well.

So if you are holding him in the crook of your left arm, ready to feed him from your left breast or from a bottle held in your right hand, stroke his right cheek, or let your breast do so, and he will turn his head in towards you. As he turns his head his lips will purse. Both these maneuvers are reactions to your touch on his cheek, but once he has made them he is ready for a further cue; the touch of nipple, finger or anything suckable on his pursed lips. As soon as he feels it he will latch on and begin to suck. It sounds very simple and it is. But it is easy to give contradictory cues, by touching *both* cheeks, for example; to give them in the wrong order, by touching his lips first; or to spoil the timing, by not being ready with a nipple for that pursed mouth. Above all, it is easy to be too active. You cannot force him to suck. Give him the cues and trust him.

If a baby's sucking reflexes are respected and used in his very first feeding experiences he will quickly learn the lesson sucking = milk = comfort. But it helps him to learn and it helps him to get enthusiastic about the whole feeding business if the feeds are kept comfortable and peaceful. It is not always easy to arrange life for your baby exactly as you would like it, especially in a busy hospital, but these are some of the things you should try to avoid: Don't try to feed a baby who is really upset and screaming. He will not suck well. He is overwhelmed by his feelings. He cannot respond to your invitations to suck himself better. In a hospital this can be a problem. The staff may want your breast-fed baby to wait for his feed because they want you to get a reasonable amount of rest - especially at night. The bottle-fed babies on the ward may be fed on a schedule, with nurses making up all their feeds at certain hours. If you are breast-feeding make it clear to the night staff that you do want to be woken up whenever your baby is hungry. If you are bottle-feeding insist on an extra bottle if he seems really hungry at the 'wrong' times.

6.2. Bottle-feeding

We have no real alternative to the breast-fed baby's colostrums, so while the bottle-fed baby may start life with one or two drinks of sugared water, formula will be offered by the second day. This is much sooner than a breast-fed baby would find milk, so your baby may take very little. The water content is needed much more than the food content, so don't worry.

If your baby does take all the milk offered, weight gain may start from birth instead of after a few days weight loss. Although early weight loss often worries parents, don't be too enthusiastic about every ounce your baby gains; bottle-fed babies can get too fat.

Cow's milk is ideal for calves but it is not the natural food for babies. It contains too little sugar and the wrong kind of fat. Its protein makes indigestibly solid curds in the baby's stomach and it contains more minerals - especially sodium - than human milk. Babies under six months should not be fed on any kind of unmodified cow's milk or on goat's milk either, so ignore liquid, dried or evaporated milk from dairies, supermarkets or health food stores. Bottle-fed babies need a breast milk substitute, or formula.

Modern baby milks are based on cow's milk but are more or less extensively adapted to bring the made-up feed as close as possible to breast milk. In the UK such milks must meet the recommendations of the Department of Health and must constitute *complete* nourishment for the first months of life, requiring no additions other than boiled water.

Even the recommended baby milks do vary, though. Make your choice in consultation with your midwife or health visitor and read the labels of various brands so that you know exactly what you are feeding to your baby.

Whey-based milks are the most like breast milk, with similar levels of protein and minerals. Curd-based milks (sometimes suggested for especially hungry babies) may be slightly less easy for a young baby to digest.

Baby milks have added vitamins and iron so you should take your health visitor's advice about whether to give your baby the normally recommended multivitamin drops in addition to the particular formula you have chosen.

Baby milks vary in their convenience as well as their constituents. In powdered form most mix easily when they are simply shaken up in the bottle with the required amount of cooled boiled water. Try to avoid the few that make teat-blocking lumps unless they are carefully stirred. Some of the formulae are available as liquid concentrate, rather like ordinary evaporated milk. The cans are heavy to carry and must be refrigerated after opening but the formula is easy to measure and mix.

If neither the weight of your shopping nor storage-space is a problem, some baby milks are available in ready-to-drink form, rather like UHT long life cow's milk. And for the ultimate in labor-saving, though at a considerable cost, you can buy ready-to-drink formula sealed into pre-sterilized disposable bottles.

There are bacteria everywhere. We all carry them on our hands and our clothes. We breathe them, eat them and excrete them. Most of them are harmless. Very few types will make us ill unless we take in such a large number all at one time that our bodies' defences are overwhelmed.

A new baby, especially one who is not breast-fed, has few defences against common germs. It takes time for him to build up immunity to them. In an ordinarily clean home, he will cope with the germs that he sucks off his hands or breathes in the living room. But when he is feeding it is different. Milk, especially milk which is around room temperature, is an ideal *breeding ground* for germs. So while he might pick up a few off his own fingers and deal with them perfectly well, he will pick up an enormous, and possibly overwhelming number from a bottle which has been left standing around in a warm room. Gastro-enteritis is

still one of the most common reasons for young babies being admitted to hospital. To keep the baby's milk as free from bacteria as possible:

- Wash your hands before handling the milk or equipment, especially after using the lavatory or handling pets or their food. If you use liquid concentrate, keep a special tin-opener for those tins and sterilize the top with boiling water before you puncture it.
- Use sterile baby milk and keep the packet closed or the tin closely covered and refrigerated once it has been opened.
- Sterilize everything you use in measuring, mixing or storing the made-up milk. That means measuring spoons, mixing jugs and the water in the feed itself.
- Sterilize bottles, teats and teat covers. Provided that you put a sterile teat cover over the sterilized teat on your ready-filled bottle, that teat will still be sterile and safe when you take the cover off to feed the baby.

Bacteria which escape your precautions (by landing on the sterile teat as you put it on the bottle, for example) cannot multiply dangerously while the milk is boiling hot or while it is icy cold. It is the in-between temperatures that help them to flourish. To minimize the chances of bacteria breeding:

- Cool the made-up milk quickly, preferably by putting it in the refrigerator while it is still hot.
- Keep it cold until the baby wants it. Don't put a bottle to warm in advance of him waking up, or keep it warm for him if he drops off to sleep for more than a few minutes in mid-feed. *Never* put warm milk in a vacuum flask or electric bottle warmer.

- Throw away any milk the baby leaves. Don't try to save that half bottle for next time and don't pour the now non-sterile remains back into your jug of sterilized formula in the refrigerator.

When you combine milk powder or liquid concentrate with boiled water, you are constructing food and most of your baby's drink. If you do it in exactly the proportions the manufacturer suggests in the mixing instructions, you will end up with a feed that is as close to the composition of breast milk as it is possible to get with that particular formula. The baby will get the right amount of nourishment and the right amount of water.

Research workers have found that a great many bottles are not made up accurately. It is largely this inaccuracy which makes bottle-feeding unsatisfactory for many babies. *Follow the manufacturer's instructions exactly.* Making a bottle is not like preparing instant coffee. You cannot make it better by putting in just a little extra powder, or more thirst quenching by adding extra water. If you add too much powder, the milk will be too strong. The baby will get too much protein, too much fat, too many minerals, and not enough water. He will get fat because you are giving him too many calories, and thirsty because you are giving him too much salt. Because he is thirsty, he will cry, and because he cries you will give him another bottle. If that bottle is too strong, too, he will be even thirstier. So it will go on. The result can be a baby who cries a lot, does not seem terribly well or happy, puts on a lot of weight, and seems to need a lot of feeding.

Don't be afraid to offer extra drinks of plain, boiled water, but don't add anything to make formula "nicer" or "more satisfying". Never guess at quantities. Measure milk powder accurately by filling the scoop provided and slicing off the surplus at scoop level with a knife. Wiping the surplus off on the edge of the tin or smoothing it off with a spoon will not be accurate; you will almost certainly end up with a somewhat packed or heaped scoop. Shaking off the surplus may leave you with either too much or too little powder.

Measure liquid concentrate accurately by pouring it either directly into the bottle or into a marked-off measuring jug, and then hold it up to your eye level to read off the marked ounces. If you check the level with your eye above it, you will think there is less milk than there really is.

Measure the water accurately by boiling it (to sterilize it) *first,* and pouring it into your bottle or measuring jug when it has cooled. If you measure the water first and then boil it, some will be lost in evaporation.

If you really do make up your baby's bottles *exactly* as the manufacturer recommends, and as long as you resist the temptation to add a spoonful of cereal in the vain hope of a better night, you can treat the resulting milk exactly as if it was breast milk. The baby can have as much as he eagerly drinks, as often as he is hungry, and leave what he does not want. You don't need to carry your scientific accuracy in *making* the milk on into *feeding* it!

6.3. Food and growth

New babies need as much breast milk or properly made formula as they willingly drink and the offer of some cooled boiled water $_a$ couple of times each day. They do not need anything else until they are at *least* three months old.

Once the birth weight has been regained at around ten days old the baby will gain weight at around 28g (oz) per day. Of course there will be day-to-day variations, but he will average 170-225g (6-8 oozes) each week.

Many parents find it difficult to leave it entirely to the baby i_0 decide how much milk to take. They feel a great need to know exactly what he "ought" to have so that they can be sure he is having enough. But feeding a baby is not an exact science because babies vary just as much as older people in their food needs. A baby with a slow, efficient metabolism will have plenty of energy and grow well on fewer calories than a baby who burns his food up faster and less completely.

Most adults are bad at adjusting their food intake to suit their individual metabolisms. Our eating is mixed up with habit, social customs and pure greed. But a small baby's adjustment is almost always perfect, at least until we confuse it for him by introducing solid foods. Whatever quantities your baby takes, you can be quite sure that they are right for him provided he is offered as much as he wants whenever he wants it; he is contented most of the time and becoming more contented as he gets older and more settled; he is active whenever he is awake and becoming more so with age and he gains weight steadily at somewhere near that expected 170-225g (6-8ozs) each week.

If your baby is bottle-fed you may want to know approximately how much milk he is likely to want - if only so that you can organize shopping. It is usually reckoned that babies should have about 85ml (3ozs) of milk for each pound of their body weight *offered* to them during an average 24-hour period. That means around 595ml (21ozs) for a 3.2kg (7lb) baby and around 765mi (27ozs) for a 4.1 kg (91b) baby. But don't let those figures affect your feeding. The baby can have more if he wants it and will often take less. Remember that if he were breast-fed you would not know how much he'd had.

If you find yourself worrying about your baby's weight gain or you want a scientific way of supporting your own observations of his or her abundant good health, you need to understand the importance of the rate of weight gain we expect and therefore of your baby's *expected* or *ideal* weight.

Your baby's birth weight is his personal starting point for growth. Whatever that birth weight was, he will grow roughly the same amount and at approximately the same rate as all other babies. His overall growth follows a pre-set trajectory rather like a rocket which, once launched, follows a pre-determined pattern. You fuel his growth with proper food and adequate care and as long as you do so the upward growth curve will be steady. If illness, starvation, serious neglect or emotional disturbance should lead his weight gain to dip

downwards off that expected curve, he will need an extra boost of food-energy to put him back on course. If over-concentrated bottles or concealed cereals should lead his weight gain to peak upwards off his personal curve, he will need the milk reduced to its proper composition so that he can get back on course.

Naturally, a baby needs to be fed, always, according to his expected weight. If he has gained much less than average, feeding him as if he had gained normally will give him the chance to gain fast for a while. If he has gained very fast, feeding him as if he had not will give him the chance to slow his rate of gain for a while. Of course if he is being fed on demand, with neither restriction nor forcing, he will see to this for himself. But if his food is limited by a scanty breast milk supply or strict scheduling, or if it is pushed on him by an over-strong formula or too-early solids, he may not be able to make the adjustment for himself. Assuming that the weight the scales tell you that he *is* equals the weight he is *meant to be* could lead you into a vicious circle of mis-feeding.

Imagine that your baby was born weighing 3.2kg (7lbs) but was ill after birth, lost more weight than average and now, in his third week, is being bottle-fed and weighs 2.7kg (61bs). If you accepted that 2.7kg (6lbs) actual weight as normal for him you might assume that six times 85 ml (3 ozs) would meet his needs in each 24 hours, offer him that much, be pleased when he drank it all and then horrified to find that he was not gaining weight. The point is that that baby's *expected* weight is not 2.7kg (6lbs) but around 3.6kg (81bs) so that 510ml (18ozs) of milk could not possibly be enough. He needs to be offered around 680ml (24ozs) and to be allowed to drink as much of it as he wants.

Weight gain is not the only way to assess a baby's growth. Children are not meant to get fatter and fatter but bigger overall. Getting taller (or longer) matters too. Your baby's length will change much more slowly than the weight and it is far more difficult to measure

accurately, but whatever your baby's length at birth, approximately 2cm (fin) will be gained each month or just over 5cm (2in) in three months.

Just as there is an expected *weight* for a baby of any age, related to birth weight, so there is an expected *length* at any age, related to birth-length. A complete record of your baby's growth means charting both measurements together. YOU will find that if all is going well, they rise in a consistent relationship to each other.

Having said all this, babies do not continue to grow at the same rate as each other forever. We interfere with the regularity of growth by overfeeding or underfeeding, or introducing solid foods early ()r late. Life interferes too, making one child subject to many infections and another resistant to them. Eventually the child's own hormones interfere: the pre-puberty growth spurt takes place at different times and rates in different people. But for most babies the pattern will be the norm for at least the first year and often for the first three years.

The most common exceptions are pre-term babies. They may be very slow to get started with feeding and therefore with growing. They may do no more than hold their low position relative to average babies, for a long time.

Small-for-dates babies may make startling growth during their early weeks, especially if they were partly starved i the womb. With excellent care such babies may change positic from the very bottom of the lowest section of the chart to somewhere near the top of that 'small baby' section.

Babies who are ill immediately after birth, or in their first week may fail to start gaining weight or may lose it. Again excellent care may lead to a spurt of "catch up growth" so that the baby's personal growth curve shifts upwards and then settle down on the new, higher trajectory.

Babies who are bottle-fed from birth may lose no weight in th first days. They may even gain very fast from the beginning especially if the formula is made too strong or they are encouraged to take a set amount. An even greater rise in such a baby's weigh curve may be seen if solid foods are added early to the full quota of over-concentrated milk. It is in a case like this that the importance of recording length as well as weight becomes clear: a baby who i: gaining weight faster than nature intended will not gain length tc match it. The disparity is your cue that your child is getting obese rather than simply growing large.

Society is geared to average babies. If your baby was not of average birth weight you need to be aware of it and allow for the difference Baby clothes which are sized by age may mislead you. A stretch suit for "birth to three months" means 3.2-5.5kg (7-12lbs) and length to match. It will not last your ten ponder for long. Over the-counter medicines still occasionally advice dosage by age rather than weight and that can be extremely misleading. A small baby needs less of any medicine than a larger one.

Above all, don't be taken in by the various "sayings" about weight gain which you may hear quoted as gospel truth. This one for example: "A baby should double his birth weight by six month: and treble it by a year". Well, should yours? If you look at the char on page 518 you will see that the average birth weight boy in the middle will indeed double his birth weight in six months and treble it in a year, but the small baby at the bottom will almost double hi' in *three* months and treble it in six. If he gained "by the saying", hi would be half starved. As for the big baby at the top, while his birth weight may indeed double by six months it will be nowhere near trebled by a year. If he gained "by the saying", he would be grossly fat

Once past the first birthday your baby's weight gain will probably slow down to around 30~60g (l-2ozs) a week. A faster or slower rate of gain may, of course, be perfectly right for your baby because, as we have said, there is a wide variation around the "average" at all ages.

Unless the baby has been ill or has had major feeding troubles during the first year, there is not much point in going on with regular weighing now. To weigh every week would be absurd as the scales may not be accurate enough to weigh to the nearest ounce and simple things like passing a motion before or after the weighing will be enough to produce a false gain or loss. It is probably best to weigh and measure every three months, so that you can see your baby getting heavier and taller both at the same time.

The proportions of a newborn baby's body are quite different from those of an older baby. During this year they change even more. When a baby of around a year first gets up on his own two feet parents are often very worried by his appearance. His head is still large in relation to the rest of him and his neck seems non-existent. His shoulders and chest are thin, his belly sticks out, his legs seem bowed and his feet have no arches.

However, in the course of a year, all that will change. The year old baby is still the right shape for life on all fours. By the time he is two his proportions will have changed so that he is much better suited for life on his hind legs. A year later still he will probably have slimmed down and elongated, so that he develops the lithe and leggy elegance typical of an active pre-school child.

By the beginning of the second year your baby will be ready to share most of the foods which you serve to the rest of the family and ready to have meals at the times which suit the rest of you. If you are cooking fresh foods, you can make almost all of them suitable for a baby by a little last-minute adaptation. Any form of meat or fish, for example, can be cut into small pieces while you are serving. Vegetables can be pureed or cut into finger-sized cubes. Cooked fruits can be mashed, or sieved if they are pippy. Fried foods which might be too fatty for him can be grilled or dry-fried in a non-stick pan, while rich sauces can be replaced at the last minute with plain stock.

If you are not doing much cooking for the rest of the family, you may find that some of the commercially prepared baby foods are still useful. For example, if you do not provide a cooked breakfast for anyone else, a helping of baby cereal will provide your baby with much more nourishment than a similar sized helping of adult breakfast cereal. If you do not usually provide puddings, 'toddler desserts' or 'fruit varieties' will save you stewing half an apple or cooking a minute rice pudding or custard just for the baby.

Adult convenience foods need to be used with some care. Although most frozen foods have the same nutritional quality as fresh food, canned and dehydrated foods are often nutritionally poor. A bowl of canned tomato soup, for example, may fill your baby's tummy but it will not provide many calories or many useful nutrients. Dehydrated meals, soups and sauces usually contain a great deal of salt. Although the baby's ability to cope with salt does improve with age, too much will still place a strain on the kidneys Furthermore these foods usually contain a variety of preservatives colorings and artificial flavoring agents such as the ubiquitous monosodium glutamate. Although most countries have stringent regulations to control the use of chemicals in food, many people believe that we should all be better off if we ate fewer of them. So while there is no need to go to extremes - the occasional gravy made with a stock cube will not hurt your baby now - it is not a good idea to feed him a steady diet of these manufactured foods.

The same caution applies to adult soft drinks. If you read the small print on a bottle of fruit squash, you will probably find that it contains a variety of sweeteners, flavorings and coloring agents and very little real fruit. An occasional drink of one of these products will not do your baby any harm but for regular consumption and plenty of vitamin C, stick to fresh orange juice or to one of the vitamin C enriched fruit juices. Of course if the toddler is simply thirsty, there is no drink to beat plain water.

After being bombarded with detailed advice about feeding a baby, *eating* parents who seek help at the toddler stage usually find themselves ° fobbed off with the magical phrase 'a good mixed diet'. When they enquire what such a diet consists of they are told to 'give plenty of meat and fish; eggs; cheese; milk and fresh green vegetables'. Realizing that their toddler dislikes and refuses almost every one of those items, they wonder whether their child can be eating properly. The seeds of anxiety (and therefore of eating problems) are sown. So let us look a little more deeply into that good mixed diet.

6.4. Proper diet

A mixed diet is one which contains some of each of a wide variety of mixed foods, eaten in different combinations, every day. Its virtue lies in the fact that a person who eats it will quite certainly get everything his body requires under all circumstances. If what you need is not in one food, it will be in another. If you do not eat enough of one nutrient at breakfast, the deficiency will be made good at lunchtime. So if your child *does* eat a good mixed diet, you do not have to worry about his meals at all. You need not even try to work out what your child needs or is getting because day by day and week by week the two will match up.

This is a major advantage because working these things out is complicated. Total food needs and requirements for specific nutrients vary both from person to person and in the same person from one day to the next. Your own entirely adequate diet, for example, may suddenly fall short of the exceptional need for iron brought on by a series of heavy menstrual periods. Working out what you are getting from specific portions of food is even more complex. We know, for example, how much protein is in 170g (6ozs) of lean beef.

But how lean is lean? We know how much vitamin C is in 114g (4ozs) of freshly picked raw spring cabbage. But how much is absorbed by your body after the cabbage has been picked, transported, stored, cooked and kept warm? On a mixed diet these vexed

questions need not concern you. If you have some meat or fish, some cheese, eggs and milk and/or some beans, nuts and pulses you will be getting adequate protein. And if that cabbage does not contain much vitamin C, it does not matter; there will be plenty in your potatoes and fruit.

Advanced Nutrition is functional whenever it positively impacts various body functions. Thus, functional foods are those that consist of vitamins and minerals consumed by humans. For instance, vitamins are of organic origin: A, B1, B2, and B3 (niacin), B5, B6, B7, B9, B12, C (ascorbic acid), D, E, and K. The B soluble in water, whereas A, D, E, and K vitamins are fat-soluble, i.e. accumulated in the body fat.

Furhtermore, minerals serve as the main building blocks creating muscles, bones and tissue. Minerals are also vital for the core life systems, oxygen transport, hormones, and enzyme systems. At that, main minerals include potassium, sodium, sulphur etc, which are essential to build up muscles, nerve cells, teeth and bones, and enable blood circulation. Both main and trace minerals are rather significant to our body since they produce hormones and actively participate in most of chemical reactions inside a body.

One another vital feature of minerals and vitamins is their capacity to serve as antioxidants that protect human bodies from free radicals. Consequently, nutrients prevent cancer, heart disease, cataracts, arthritis, Alzheimer's disease etc.

Thus, antioxidants protect cells against free radicals. Such molecules are produced when a body breaks down food, disabling radicals to damage cells and/or cause heart disease, cancer etc. Antioxidants are presented in a form of beta-carotene, lycopene, lutein, selenium, as well as vitamins A, C, E, found in vegetables, fruits, grains, nuts, fish and meats (Medline Plus, 2007).

Subsequently, a well-balanced diet provides sufficient energy and nourishment enabling us to lead normal life and keep fit (Schwartz, 2003). Maintaining good health

condition therefore permanently requires necessary resources and fuels (Lysol, 2006). Conversely, unhealthy diet as well as physical inactivity led to heart diseases, cancers, strokes, high blood pressures, type 2 diabetes, breathing problems, gallbladder disease, arthritis, and osteoarthritis etc (HHS, 2007).

Thus to enable normal functioning and health condition, we should constantly facilitate our immune system by consuming right foods. The variety of fruits and vegetables strengthen our body and enable to heal the diseases. Proper nutrition is vital for body defense, and therefore nutrition and human immune system are directly related to ensure healthy condition.

Considering the aforementioned, it is evident that in order to receive optimal health, humans require well-balanced diet including complex mixture of macronutrients and micronutrients. Thus, well-balanced nutrition helps humans to attain proper health condition and decrease the risks of heart diseases, cancer, strokes, osteoporosis and diabetes (Schwartz, 2003).

Overall, the consumption of vital foods such as bread, grains, potatoes, fruits, vegetables, milk, meat and fish disable malnutrition. Nutritionists therefore assume several recommendations regarding healthy nutrition: consuming various foods; consuming plenty of fruits; consuming food rich in fibre; reducing the consumption of alcohol (British Nutritional Foundation, 2003).

Otherwise, humans are prone to malnutrition, causing high risk of illness, lack of energy, dizziness, reduction of immunity which leads to such infections as diarrhea and dysentery. As well as this, prominent dietary experts assume that proper diet bears close relation to mental health (McCulloch, 2007).

By proper comprehension of an advanced nutrition as an essential part of nutrient metabolism, we are able to control and sustain proper health condition. Protein, lipids and

carbohydrates should be contained in our daily diets to satisfy hunger and keep fit and healthy (Jegtvig, 2007). A well-balanced diet enables sufficient nourishment and energy necessary to survive, and remain healthy and in good shape as well as to provide our body with vital resources and fuels to attain perfect and healthy condition (Lysol, 2006).

At that, we should beware of various misconceptions and myths surrounding the correlation between an advanced nutrition and exercises. To this end, relying on such foods as caffeine, sugar, and fat woul not be appropriate to maintain healthy condition. At that, losing weight is interdependent with the process of losing muscles.

As was mentioned above, there are four calories per gram of carbohydrate and protein, and nine calories per gram of fat. Thus the consumption of carbohydrates and proteins are essential to fueling our muscles. Whenever we consume fat, we should beware that our body easily converts fatty foods to body fat, though the body burns a significant amount of calories to convert proteins and carbohydrates into body fat.

Therefore, dieticians offer two main components to enable us maintain a healthy eating program. First, we should try to avoid consuming excessive amounts of calorically dense food within the course of a single meal. Second, we should reduce the consumption of processed foods, breads, pastas, and cereals while sitting.

At that, scientists warn us of being aware of various supplements that can cause serious health problems in the long run. Thus, human metabolism should be increasd due to eating frequently and making physical exercises. At that, the increase of taken exercises should coincide with the increase of calories' consumption. Thus, the main source of energy is food itself, not vitamin pills (Seabourne, 2002).

Therefore, wide variety, i.e. 'good mixed diet', is the safe and easy way to feed any child well. Aim at it, by all means, as you gradually accustom yours to ordinary family meals, but don't feel that without it he must be poorly nourished. Your child's diet can be both good

and mixed enough without having to include normal quantities of all the foods that are conventionally considered "good for him". The value of any one food lies in the use which the body can make of its constituents. No food is magically good-in-itself; it is only as good as the sum total of what is in it. There is therefore no single food which is absolutely necessary, because anything which is in one food will also be in some others. Milk is an excellent example because it is often described as "necessary" for children. This is nonsense. Milk is an exceedingly valuable food and a very convenient package of the nutrients children need in an easy-to-take form. But even milk is not unique. The valuable proteins, minerals and vitamins it contains are in other foods too.

This argument carries over into the way in which you present foods to your child. Eggs (in moderation) are good for most children. But they do not have to be presented in the shell, or gazing one-eyed off a plate, in order to be nourishing. The egg in the pancake your child enjoys is just as nourishing as that breakfast egg would be if it was eaten.

So if your child does indeed eat a conventional good mixed diet, you are fortunate. He will certainly be getting everything he needs and you need not think any further about his food. Don't even bother with the rest of this chapter. But if he does not, don't worry. If you read on, you will almost certainly find that, whatever individual foods he rejects, he is getting enough of everything important from the combinations he likes.

6.4.1. Calories

Whatever foods you offer your child will contain calories. He needs calories to keep his body's functions ticking over, to fuel his activities and to provide a surplus for growth. However little he chooses to eat, it is enough if he is well, energetic and growing.

Foods vary in the concentration of calories which they contain. Those rich in fats contain most of all. One slice of bread thickly spread with butter gives the child more energy

than two slices eaten plain; one French fried potato yields as much as three boiled ones. A child who seems to eat very little food may be eating it in a high-calorie form.

Sugar is pure carbohydrate, but most of the carbohydrate foods are bulky ones like bread (and other flour products) and potatoes, pasta and rice. We get most of our energy from carbohydrate foods because we eat a lot of them.

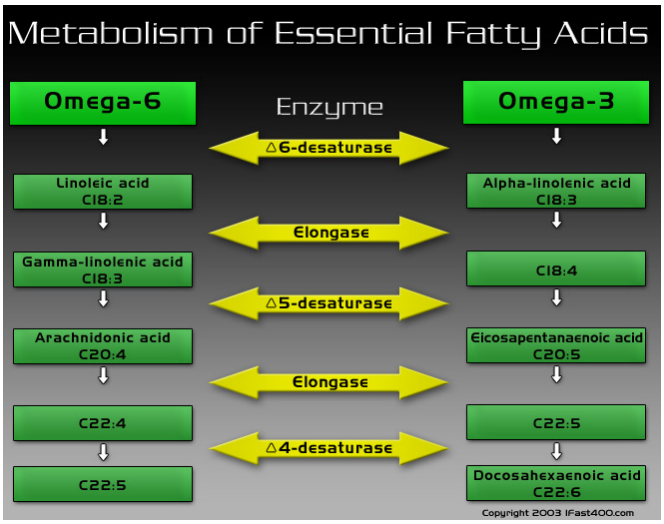
If your child is eating at all, his appetite will see to it that he gets all the carbohydrate foods he needs for energy and bulk. Introducing him to whole-meal bread and other minimally processed carbohydrate foods will help to ensure a sensible diet later on, but he does not need a 'high fibre' diet at this early age. Although too many *sweet* foods will be bad for his teeth and/or his figure, don't dismiss all these *starchy* foods as "just fattening' Potatoes and bread, for example, are excellent items of diet.

6.4.2. Fats

Functionally, fat transports nutrients and provides energy. Fatty acids, essential for the human body, are: omega-3 and omega-6 fatty acids, required by human body to enable appropriate functionality. These fatty acids are obtained from fish oil, cold-water fish, as well as any other components comprising omega-3 fatty acids, and black current seed oil comprising omega-6 fatty acids.

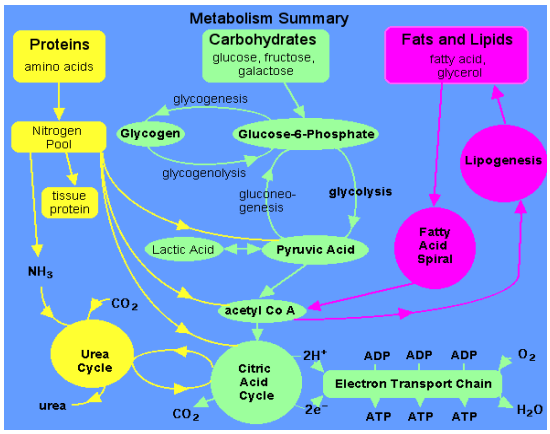
In terms of advanced nutrition, the excessive consumption of omega-63 oils decreases cardiovascular diseases and cancer etc.

Figure 2: Metabolism of Essential Fatty Acids (Fahy, 2005).



Regarding the issue of lipid metabolism, its major aspects are involved with Fatty Acid Oxidation in order to produce energy (the synthesis of lipids). Lipid metabolism bears close relation to the carbohydrate metabolism subsequently converted to fats.

Figure 3: Metabolism Summary



Many families now rightly try to keep down the consumption of animal or saturated fats. Provided your child has some milk, cheese or other dairy products, it does not matter if he eats no visible fats at all. He will get the minute traces of 'fatty acids' his body requires from invisible fats in commercial foods. If he eats no dairy produce, though, he could go short of the fat-soluble vitamins he needs. Make sure that he goes on having his daily dose of multivitamin drops.

6.4.3. Protein

Proteins serve as significant class of biological macromolecules in mainly all biological organisms consisting of carbon, hydrogen, oxygen, sulfur and nitrogen. Together with fats, carbohydrates, minerals and vitamins, proteins comprise the major classes of nutrients. As well as this, proteins provide with 20 essential amino-acids to build up and facilitate healthy body tissue to enable proper functioning of human body.

The body itself produces 11 of those amino-acids, while the remaining ones depend on an appropriate diet. At that, protein is regarded as an essential component of eggs, low fat meats, soy hunger, and beans (Jegtyig, 2007). Furthermore, proteins are polymers of amino acids (King, 2006).

In terms of scientific discourse, proteins are regarded as large organic compounds composed of amino acids organized in a linear chain and joined by peptide bonds between

amino groups and the carboxyl. Proteins function together to attain a certain function and form stable complexes.

Proteins, therefore, present essential components of organisms actively participating in every cell process. Proteins function in the form of enzymes vital to metabolism by catalyzing biochemical reactions. Proteins paly significant roles in the cell cycle, immune responses, cell signaling, and cell adhesion. Proteins are necessary for the diets of living organisms by breaking down ingested protein into free amino acids used in metabolism.

Regarding the role of proteins in an advanced nutrition, it is worthy to note that the majority of plants and microorganisms are able to biosynthesize 20 amino acids, whereas animals and humans should also obtain amino acids from their diets, as it was mentioned above. Thus, the amino acids which cannot be synthesized by the organism are known as essential amino acids. Providing that amino acids are in the environment, microorganisms conserve energy by gaining amino acids from their surroundings and biosynthetic pathways.

Animals, for example, obtain amino acids by consuming foods that contain protein. Furthermore, the consumption of protein as a fuel of energy is especially important while organism is starving, since the body's own proteins maintain life and functioning of muscles.

Proteins break down in the stomach over the digestion digestion process by proteases into polypeptides that provide organism with amino acids, including those amino acids that cannot be biosynthesized by the organism itself. In addition to facilitating the process of protein synthesis, amino acids serve as essential sources of nitrogen.

Within protein biosynthesis, the liver and the kidneys convert amino acids used by cells into glucose through gluconeogenesis. However, the process has exceptions regarding the amino acids known as leucine and lysine.

Dietary sources of protein are: meats, grains, eggs, milk, cheese, and legumes. Out of 20 essential proteins, 9 amino acids cannot be created by the body and thus are received from

dietary sources. At that, the majority of vegetable and animal sources contain the complete complement of these 9 amino acids. At that, it is not necessary to consume some particular food source that contains all theses amino acids. Thus appropriate diet is the core of an advanced nutrition (Schwartz, 2003).

Further on, various proteins have various levels of biological availability for the human body. At that, scientists apply a multitude of methods to measure protein retention and utilization rates in human organisms: biological value, Net Protein Utilization, and Protein Digestibility Corrected Amino Acids Score as a substitute method for the previously applied the Protein Efficiency Ratio method. Owing to these methods, scientists are able to examine those proteins that are used by the body most efficiently. To this end, animal complete proteins contain all the necessary amino acids, including eggs, milk and meat, as well as the essential proteins of vegetable origin like soy.

For instance, egg whites have the standard biological value of 100, suggesting that most of the absorbed nitrogen from egg white protein is used and retained by the body. The amino acids of plant origin biologically differ from those of human and animal origins, though their biological value is significantly lower: corn has a BA of 70, whereas peanuts' BA is 40.

To avoid a protein deficiency, the most recent studies have concluded that women (19–70) should consume 46 grams of protein daily, while men (19–70) should consume 56 grams of protein daily. This is because male bodies have more muscle mass compared to those of females, thus protein consumption directly depends on body weight (Kerstetter, 2005).

Human body permanently breaks down protein from tissues, thus protein consumption is essential in human daily diets. Otherwise, in case of protein deficiency, the body will use protein from the muscle mass to comply with the energy needs. Though, such process

subsequently causes muscle wasting. At that, it is generally suggested that 0.8 gram of daily protein consumption is needed per kilogram of bodyweight. As well, as this the doze of protein consumption also depends on overall energy intake, as well as the body's requirements of nitrogen and essential amino acids consumption.

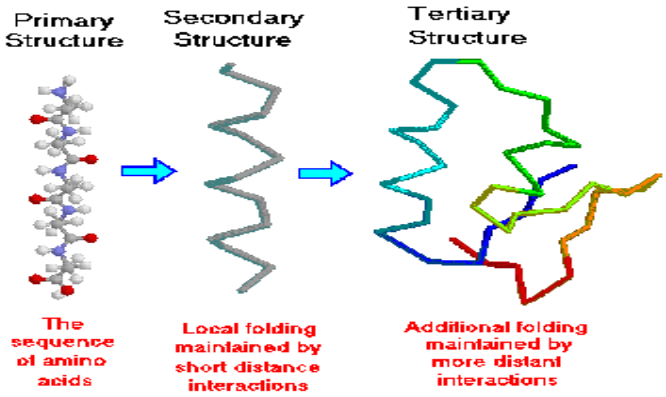
The need for more protein consumption is also explained by exertion and physical activity that enhance muscular mass increase. Furthermore, over the childhood period, proteins are essential sources for growth and development. Suchlike, during pregnancy and breast-feeding period's proteins are important sources to adequately nourish babies. Proteins also allow bodies to better recover from various post-operation traumas as well as malnutrition.

Due to human body inability to store in the form of protein, proteins consumed excessively are broken down and are then converted into fatty acids and sugars. At that, liver removes nitrogen from the amino acids, and the latter are burned as fuel, while nitrogen is incorporated into urea which is excreted by the kidneys. In accordance with popular belief, an excessive intake of protein leads to an increased excretion of calcium. Under the excessive intake of protein, a regular intake of calcium stabilizes, and even increases which is rather beneficial for older women (Kerstetter, 2005). In addition to the abovementioned advantages, the intake of proteins is important to deter allergies and allergic reactions in foods.

Proteins are considered to serve as significant class of biological macromolecules found in virtually all biological organisms, which consist of hydrogen, carbon, oxygen, nitrogen and sulfur. Along with carbohydrates, fats, vitamins and minerals, proteins compose the main classes of nutrients. The majority of macronutrients are essential nutrients for life processes, produced by human body itself. Therefore, these essential nutrients can be received only from the food we eat. Most importantly, macronutrients are constituent and

indispensable ingredients of our diets, found in: carbohydrates, fat, protein, water (Wilson, 2005).

Foods of animal origin such as milk or eggs often contain all these essential amino-acids, while a great number of plant products should be consumed in a certain combination to provide all these necessary protein components. In due respect, it is noteworthy that protein is also a component of low fat meats, eggs, beans, and soy hunger (Jegtyig, 2007). In addition to this, proteins are known as polymers of amino acids.



Protein is important in your child's diet as his body needs it to build new tissues. But the amount needed and the difficulty of providing it has both been overplayed by food manufacturers. 'High protein' has become an advertising point. In fact a shortage of protein in a child who is offered as much of a variety of foods a[1]-he wants to eat is extremely rare.

The use of the terms 'first class' and 'second class' protein is partly responsible for this confusion. Protein is made up of a number of amino acids. Your child has to eat some of these in ready made form because his body cannot manufacture them out of the others. These vital amino acids are present in the correct balance in animal foods like meat, fish, milk and other dairy produce and these have therefore been termed "first class" proteins. But there are amino acids in other foods too.

The vegetable proteins in bread potatoes, beans, nuts and grains can complement each other so that a careful mixture results in a complete protein intake for an adult. Vegetarian

diets are not inferior to diets which include meat and fish but for growing children the imbalance in the amino acid composition of these "second class" proteins does need to be corrected by the addition of very small quantities of animal protein from dairy produce.

Bread (which contains vegetable protein) with cheese (which contains animal protein) would provide the child with a protein intake just as "first class" as that highly recommended, much-disliked slice of meat.

On this basis most toddlers get an ample supply of protein. They may refuse eggs, but they eat puddings and cakes with egg in them. They may refuse meat but they eat luncheon meat or ham, bacon or sausages, fishcakes or hamburgers. They may live in families where no meat products are served but they eat a range of bean, pulse and nut dishes and some cheese or yogurt. The protein they are getting is not as concentrated as it would be in butcher's meat, but balancing the sum total of other vegetable proteins it is ample.

If your child does not eat enough foods to make a good mixture of vegetable proteins or like any of the less concentrated forms or animal protein, don't forget milk. As long as he gets as much as one pint of milk per day, either as a drink or in cooking, he will not go short of protein whatever else he does or does not eat.

Your child needs an adequate calcium intake both for the proper development of growing bones and teeth and for the correct functioning of muscles and blood clotting. There is a useful amount in bread, flour and other cereals, but a more concentrated source than this is needed. The obvious source is milk. A pint a day will ensure calcium intake. Even if your baby does not appear to *drink* that much milk, you can (and probably do) "lose" it in ordinary cooking.

Try cheese too, remembering that this is also a superb source of protein. Given the chance many small children develop a passion for cheese; in cubes to eat in the fingers, grated over vegetables, in sauces, or spread on bread. If your family eats a vegan diet, so that

no milk, cheese or other dairy produce is available to your child, take advice from your health visitor or your doctor. Some mineral and vitamin supplementation may be advisable.

6.4.4 Minerals and

The other minerals your child needs are either so widely distributed (like phosphorus) that he is bound to get plenty, or, like iron, they are used and re-used by the body so that daily supplies are unnecessary, provided his stores are adequate.

Nutrition is deemed functional on condition that it beneficially influences various body functions. Functional foods mainly consist of vitamins and minerals normally consumed by humans. Overall, these additives are approved and recommended by most dieticians, and are well-known to everyone (Food Additives and Ingredients Association, 2007).

Overall, vitamins are components of organic origin present in food and necessary to our body. The most widely known vitamins are: A, B1, B2, and B3 (niacin), B5, B6, B7, B9, B12, C (ascorbic acid), D, E, and K. The B and C vitamins are soluble in water, while A, D, E, and K vitamins are fat-soluble, and accumulated in the body fat.

In turn, minerals are important to our life because they are the main building blocks that create muscles, tissue, and bones. Additionally, they are significant components of many important life systems, in particular, hormones, oxygen transport, and enzyme systems. At that, there are two types of minerals: the main (macro) minerals and the trace minerals. A body in considerable amounts requires main minerals.

Particularly, main minerals include sodium, potassium, sulphur etc, required to build muscles, blood, nerve cells, teeth and bones. The main minerals and trace minerals are required in small amounts due to the fact that they are very significant to our body. These important minerals participate in the majority of chemical reactions run in a body. Finally, they are important to produce hormones.

Therefore it is now understandable how vitamins and minerals boost our immune system, help cells and organs function, and support normal growth and development: for example, carrots are full of carotenoids converted into vitamin A within the body which prevents eye problems, vitamin K makes blood clot, while calcium adds to maintaining strong bones etc.

In addition to carbohydrates, proteins, lipids, nutrients also involve vitamins and minerals. The food we consume consists of macronutrients and micronutrients enabling life processes (Wilson, 2005). Specifically, micronutrients consumed by humans in small amounts are naturally found in minerals, vitamins and trace elements.

Overall, nutrition is a nourishing organic process by which an organism assimilates food and uses it for growth and maintenance (Elook Dictionary, 2007). Good nutrition can help prevent disease and promote health (Medical Encyclopaedia, 2007). Consumption of important fruits and vegetables ensures lower level of mortality and reduces various degenerative diseases, for instance, cancer, cardiovascular disease, and immune dysfunction in several human cohorts. In addition to the vitamins and minerals found in fruits and vegetables, may contribute to these beneficially protective effects (Chun, 2005).

Thus to enable normal functioning and health condition, we should constantly facilitate our immune system by consuming right foods. The variety of fruits and vegetables strengthen our body and enable to heal the diseases. Proper nutrition is vital for body defense, and therefore nutrition and human immune system are directly related to ensure healthy condition. In order to receive optimal health, humans require well-balanced diet including complex mixture of macronutrients and micronutrients.

Thus, a well-balanced nutrition helps humans to attain proper health condition and decrease the risks of heart diseases, cancer, strokes, osteoporosis and diabetes (Schwartz, 2003). By proper comprehension of an advanced nutrition as an essential part of nutrient

metabolism, we are able to control and sustain proper health condition. A well-balanced diet enables sufficient nourishment and energy necessary to survive, and remain healthy and in good shape as well as to provide our body with vital resources and fuels to attain perfect and healthy condition (Lysol, 2006).

Like fats, carbohydrates and proteins, minerals and vitamins comprise the major classes of nutrients. Functional foods mainly consist of vitamins and minerals normally consumed by humans. In order to receive optimal health, humans require a various, well-balanced diet that includes a complex mixture of both macronutrients and micronutrients. At that, in terms of nutrient metabolism nutritional support is worth special consideration since it has several definitions, specifically: artificial feeding, artificial hydration and nutrition, hyper alimentation, parenteral nutrition, tube feeding (American Academy of Family Physicians, 2007).

The attainment and maintenance of appropriate health condition is due to nutrient metabolism that covers essential nutrients and dietary compounds to support human health condition (Kohlmeier, 2003).

Basically, vitamins and minerals make our bodies function in a proper manner. Thus, it is of vital importance to consume foods rich in vitamins and minerals. Regarding vitamins, there are two main categories: fat soluble vitamisn and water soluble vitamins. The fat-soluble vitamins are known as vitamins A, D, E, and K dissolving in fat and stored in human body. In turn, the water-soluble vitamins known as C and the B-complex vitamins (B6, B12, niacin, riboflavin, and folate) are dissolving in water before we absorb them.

In terms of classification from the point of functional foods the latter are those consisting of vitamins and minerals: "vitamins are of organic origin: A, B1, B2, and B3 (niacin), B5, B6, B7, B9, B12, C (ascorbic acid), D, E, and K. The B soluble in water, whereas A, D, E, and K vitamins are fat-soluble, i.e. accumulated in the body fat".

Overall, vitamins are organic substances produced of plant or animal origin, whereas minerals are inorganic elements originating from water and soil and are absorbed by plants or consumed by animals. Like vitamins we need large supplies of some minerals like calcium, for example, to maintain growth and healthy condition. Conversely, human organisms do not need much of trace minerals like copper, chromium, iodine, selenium, iron and zinc, for example.

However, it is noteworthy that many minerals are serving as the building blocks that add up muscles, bones and tissue. Most minerals are vital to support the major life systems, hormones, oxygen transport, and enzyme systems. In particular, potassium, sodium, sulphur etc, ere essential to build up nerve cells, muscles, teeth and bones, and maintain blood circulation. Finally, main and trace minerals produce hormones and actively participate in most of chemical reactions within our bodies.

Both minerals and vitamins are serving as antioxidants protecting human bodies from free radicals. At that, nutrients prevent heart disease, cancer, arthritis, cataracts, and Alzheimer’s disease.

As was mentioned above, antioxidants protect cells against free radicals. When body breaks food down, it disabes radicals from damaging cells and prevents heart diseases, cancer etc. Antioxidants are found in beta-carotene, lycopene, lutein, selenium, and vitamins A, C, E present in vegetables, fruits, nuts, grains, meats and fish (Medline Plus, 2007).

Most vitamins are widely distributed so that your child automatically gets plenty. Giving the three vital ones as daily multivitamin drops or tablets ensures adequate intake, however peculiar the child's eating habits.

Vitamin A: The main sources in the diet are liver, then milk, butter or fortified margarine. Carrots yield "carotene" from which our bodies can make their own vitamin A. A child will probably get enough from these sources but a supplement is a safety measure.

Vitamin D: The only concentrated food sources are egg yolk and fatty fishes. Pale skins make their own in sunlight; but a supplement is essential, especially in winter and for black children.

Vitamin C: Widely available in fruits and green vegetables, this vital vitamin is nevertheless quite difficult to provide in adequate daily quantities because it is destroyed by both light and heat. Green vegetables displayed outside the greengrocer's in the sunlight, cut up ahead and then boiled in water will have lost most of their vitamin C by the time they are eaten. Quick cooking, instant serving and use of the cooking water, with its dissolved vitamin content, in soups or gravies, help, but it is still difficult to know how much has reached the child. Potatoes have plenty 0f vitamin C just under the skin. Served in their jackets some is lost because of heat; peeled and then boiled, even more vanishes.

Vitamin	***Food sources***	***Function of vitamin***
Vitamin A	Liver, dairy products and margarine.	The maintenance of good vision and healthy skin, nails and hair.
Beta carotene	Carrots, butternut, pumpkin, green leafy vegetables, apricots, pawpaw and ripe mangos.	An anti-oxidant vitamin which protects against cell damage by free radicals.
B vitamins	Oily fish, meat, bread, wholewheat cereals, fortified cereals, pulses, nuts and yeast extracts.	Involved in energy - producing reactions in cells.
Vitamin B12	Only found in food of animal origin – meat, poultry, fish, eggs, dairy products.	Assists in the formation of red blood cells. Contributes to the health of the nervous system.
Folate	Yeast extracts, fortified cereals, wheatgerm, pulses, sugarbeans, broccoli and green leafy vegetables.	Aids in the formation of red blood cells.
Vitamin C	Fresh and frozen vegetables, citrus fruit, guava, strawberries, broccoli, kiwi fruit, parsley and peppers	An anti-oxidant. Plays a role in the body's defence system. Helps keep bone, gums and blood vessels healthy.
Vitamin E	Vegetable oils, wholegrain cereals, wheatgerm, nuts, seeds and margarine.	An anti-oxidant, helps to prevent oxidation in cell membranes and other tissues.
Minerals	***Food source***	***Function of mineral***
Calcium	All milk and dairy products, canned fish with bones, green leafy vegetables and sesame seeds.	Builds strong bones and teeth and keeps them strong.
Iron	Lean meat, offal, chicken, egg yolk, green leafy vegetables, pulses and iron fortified cereals.	Needed for the development of healthy red blood cells for transportation of oxygen.
Selenium	Meat, fish, avocados, Brazil nuts and lentils.	Anti-oxidant mineral : protects against cell damage by free radicals.
Magnesium	Wholegrain cereals, wheatgerm, pulses, nuts, sesame seeds, dried figs and green vegetables.	Needed for healthy transmission of impulses along nerve and muscle cells.

Vitamin A promotes a healthy immune system, prevents eye problems, and is overall essential for the growth and development of cells, and keeping skin healthy. Vitamin A is basically found in eggs, milk, liver, darkly colored orange, fortified cereals, carrots, pumpkin, sweet potatoes and kale), and cantaloupe, peaches, apricots, mangos and papayas.

Vitamin C is essential for forming collagen - a tissue that holds cells together. The vitamin is necessary for maintaining healthy bones, gums, teeth, and blood vessels. Vitamin C helps the body to absorb calcium and iron and contributes to brain functioning.

Vitamin D solidifies our bones since it helps us to absorb bone-building calcium. The vitamin is obtained when our skin gets sunlight. As well as this, vitamin D is found in egg yolks, milk, and fish oils.

Vitamin E is considered an antioxidant protecting cells from damage. The vitamin also facilitates red blood cells. The sources are vegetable oils, green leafy vegetables, nuts, avocados, whole grains, and wheat germ.

Vitamin B12 makes red blood cells, and is necessary for the functioning of nerve cells. The sources of Vitamin B12 are fish, poultry, red meat, cheese, milk, and eggs.

Vitamin B6 supports normal functioning of brain and nerves. The vitamin facilitates the body to make red blood cells and break down proteins. The vitamin can be found in various foods such as potatoes, beans, bananas, seeds, red meat, nuts, poultry, eggs, fortified cereals, fish and spinach.

Thiamin supports the body to convert carbohydrates into energy and is applied for the prper functioning of heart, nervous system, and muscles. Thiamin is obtained from fortified breads, pasta, cereals, meat and fish, soy foods, dried beans, peas, and wheat germ.

Niacin supports the body to convert food into energy, as well as maintains healthy skin and facilitates nerve function. Niacin is actually found in red meat, fish, poultry, fortified hot and cold cereals, and peanuts.

Riboflavin isimportant for producing red blood cells and converting carbohydrates into energy and. As well as this, the vitamin facilitates visionary function. Riboflavin is found in meat, peas, lentils, eggs, dairy products, nuts, fortified cereals, broccoli, green leafy vegetables, asparagus.

Folate helps facilitates the in making red blood cells and DNA. Folate is found in dried beans, legumes, asparagus, green leafy vegetables, citrus fruits, poultry, enriched bread, cereals, and noodles.

Calcium is essential for building strong teeth and bones. The mineral is found in milk and dairy products like yogurt cottage cheese and cheese. The mineral is also found in dark green, leafy vegetables and broccoli, foods fortified with calcium, soy foods, soy milk, and orange juice.

Iron provides our body with oxygen through red blood cells. Iron-rich foods are red meat, fish and shellfish, pork, poultry, beans and soy foods, lentils, raisins, and green leafy vegetables, flours, rain products, and cereals.

Magnesium supports the functioning of muscles and nerves, keeps bones strong, steadies the heart rhythm, and helps the body to make proteins and create energy.

Phosphorus helps to form healthy teeth and bones, as well as to make energy. The phosphorus is required by all body cells to function properly. Phosphorus is mainly found in dairy foods, fish, and meat.

Potassium facilitates the functioning of muscle and nervous systems, and also facilitates the body to maintain the balance of water in body tissues and the blood. Broccoli, green leafy vegetables, potatoes with skins), bananas, citrus fruits, peas and lima beans, and dried fruits are good sources of potassium.

Zinc is an essential component of normal growth, strong immunity, sexual development and wound healing. Mineral zinc can be foun d in red meat, oysters, poultry, nuts, soy foods, dried beans, dairy products, fortified breakfast cereals, and whole grains.

Fruit is a better source because it is either eaten raw or with its cooking water served as juice. Citrus fruits, which are naturally packaged against light and always served raw, are an ideal source. One orange or its juice will give your child all the daily vitamin c which is needed. A daily serving of one of the commercially prepared vitamin C enriched fruit drinks serves the same purpose. There is no harm in giving this as well as the dosage of vitamin C which is in the multi-vitamins. Try not to let your toddler get into the habit of drinking "baby juices" ad lib, though. Even the brands labeled "no added sugar" contain enough fruit-sugar to put teeth and figures at risk.

Table 1

Drug Interactions with Vitamins and Minerals

Vitamin/ Mineral Supplement	Affected Medication	Effect of Interaction	Management of Interaction
Vitamin A	Retinoids (isotretinoin and acitretin)	Risk of toxicity; nausea, vomiting, dizziness, blurred vision, poor muscle coordination	Avoid concomitant use
Pyridoxine (Vitamin B_6)	Levodopa	Decreased efficacy leading to parkinsonian symptoms	Recommend carbidopa/ levodopa combination
	Phenytoin	Risk of seizure	Discontinue pyridoxine or increase phenytoin dose
Vitamin E	Warfarin	Risk of bleeding	Avoid doses ≥800 IU/day of vitamin E
Vitamin K	Warfarin	Decreased efficacy; risk of thromboembolism	Maintain consistent intake of vitamin K
Niacin	HMG-CoA reductase inhibitors	Risk of myopathy or rhabdomyolysis	Avoid self-treatment with niacin
Folic acid	Methotrexate	Prevents adverse events or toxicities from methotrexate	Recommend supplementation in patients taking methotrexate for rheumatoid arthritis or psoriasis
Calcium	Fluoroquinolones and tetracyclines	Decreased efficacy; risk of antibiotic failure	Avoid concomitant calcium supplementation
	Levothyroxine and bisphosphonates	Decreased efficacy; risk of hypothyroidism	Separate doses by at least four hours
Aluminum and magnesium	Fluoroquinolones, tetracyclines, bisphosphonates, and levothyroxine	Decreased efficacy of affected medication	Separate doses by at least two hours
Iron	Fluoroquinolones, tetracyclines, digoxin, and levothyroxine	Decreased efficacy of affected medication	Separate doses by at least two hours
	Methyldopa	Worsening of hypertension	Avoid concomitant use
Potassium (including salt substitutes)	ACE inhibitors, angiotensin receptor blockers, digoxin, indomethacin, prescription potassium supplements, and potassium-sparing diuretics	Hyperkalemia	Avoid concomitant supplementation without physician supervision

ACE: angiotensin-converting enzyme.

According to the National Academy of Sciences' Institute of Medicine (IOM). In terms of daily intake and vitamin and minerals consumption it is noteworthy that m multivitamin labels indicate how much of each vitamin and mineral we require to get every day (from foods plus supplements). At that, The IOM's recommendations slightly depend on age and gender. Most often, such labels list the Daily Value (DV) for each nutrient. The Daily Value for each vitamin or mineral is the Food and Drug Administration's advice on how much to shoot for each day (from food and supplements combined). In some cases, the numbers date from 1968 and don't reflect the latest research.

VITAMIN A (retinol). The Daily Value 5,000 International Units (IU) is outdated. Normally we need only 3,000 IU of vitamin per day. Too much retinol (typically listed on labels as vitamin A palmitate or vitamin A acetate) may increase the risk of hip fractures, liver abnormalities, and birth defects. Beta-carotene, which the body converts to vitamin A, doesn't cause those problems, but very high doses (33,000 to 50,000 IU a day) may increase the risk of lung cancer in smokers. The essential recommendation in due respect is not to consume more than 4,000 IU of retinol or 5,000 IU of beta-carotene. Instead, load up on beta-carotene-rich fruits and vegetables like carrots, cantaloupe, sweet potatoes, and broccoli, which may help prevent some cancers.

VITAMIN D - helps us to absorb calcium and reduces the risk of cancer, diabetes, and falls. Many people get too little vitamin D from sunshine (especially in the winter) or from their food. The Institute of Medicine recommends 200 IU a day for adults 50 and under, 400 IU for people 51 to 70, and 600 IU for anyone over 70.

Some vitamin D experts say that everyone should get at least 1,000 IU a day. Those amounts include what we get from the sun, from salmon and other fatty fish, and from fortified foods like milk, breakfast cereals, and some brands of yogurt, margarine, and orange

juice. They also include the vitamin D that is added to many calcium supplements. Most multivitamins have 400 IU of vitamin D (the DV).

THIAMIN (B-1), RIBOFLAVIN (B-2), NIACIN (B-3), B-6. The higher than DV levels in many multivitamins are harmless. Two exceptions: More than 100 mg a day of vitamin B-6 can cause (reversible) neurological damage. And as little as 50 mg a day of niacin can cause flushing. Super-high doses of niacin (3,000 mg a day or more) may cause liver damage, though you won't find that much in a multivitamin.

IRON - many people, especially premenopausal women, are deficient. But taking too much can cause constipation or iron overload if you're susceptible. Men and postmenopausal women should look for a multivitamin with no more than 10 mg of iron or should take a multi for premenopausal women every other day. The DV (18 mg) is fine for premenopausal women.

VITAMIN B-12. Most multivitamins have at least 6 Meg (the DV). That is more than the 2.4 Meg the Institute of Medicine recommends for adults, but it's perfectly safe. (So are the higher doses-600 to 800 Meg-that are found in a few multivitamins.) Ten to 30 percent of older people are unable to absorb the B-12 that's found naturally in food. So if you're over 50, get at least some of your B-12 in the form that's added to supplements and fortified foods. A B-12 deficiency can cause irreversible nerve damage and may masquerade as Alzheirner's disease.

SELENIUM - many multis have less than the DV (70 meg) or the Institute of Medicine's recommended level (55 meg). A large study is under way to see if high doses (200 Meg a day) can lower the risk of prostate cancer. But a few studies have suggested that taking 200 Meg a day may raise the risk of skin cancer and diabetes, so it's safest to take no more than about 100 Meg a day.

MAGNESIUM - Americans get too little from their food (among the best sources: whole grains and beans). A deficiency may increase the risk of diabetes and colon cancer. Look for a multi with at least 100 mg, just for insurance. The Institute of Medicine recommends 320 mg a day for women and 420 mg for men. More than 350 mg a day from a supplement may cause diarrhea.

IODINE, MANGANESE, MOLYBDENUM, CHLORIDE, and BORON – there is no evidence that people need more than what they get from their food.

VITAMIN C - the DV (60 mg) is lower than the Institute of Medicine's recommendations (75 mg a day for women and 90 mg a day for men). Roughly 250 to 500 mg saturates the body's tissues, so more than that is probably excreted in the urine. Taking more than 1,000 mg of vitamin C at one time in a supplement may cause diarrhea.

VITAMIN K - the Institute of Medicine recommends 120 Meg a day, yet most multivitamins have much less than the DV (80 meg). In recent studies, taking extra vitamin K didn't strengthen bones, as earlier studies had suggested. You can get K from leafy greens, some calcium supplements, and vitamin K supplements. Vitamin K can interfere with blood-thinning drugs like Coumadin, so people who take them should check with their doctor before taking a multi with vitamin K.

VITAMIN E. Doses of 30 to 800 IU a day haven't protected against heart disease or stroke, and 400 IU a day or more may slightly raise the risk of dying. Studies are under way to see if 400IU a day prevents prostate cancer. To play it safe, stick to no more than 100 IU.

ZINC, COPPER - getting more than 40 mg a day (from pills and foods like meat, poultry, beans, nuts, dairy foods, and fortified cereals) may make your body lose copper. And in one study, men who took more than 100 mg of zinc a day for at least 10 years were more than twice as likely to be diagnosed with advanced prostate cancer as men who took none,

CALCIUM - may help prevent colon cancer and (with vitamin D} may reduce the risk of osteoporosis. Shoot for 1,000 mg a day (if you're 50 or younger) or 1,200 mg (if you're over 50). But men should get no more than around 200 mg from their multi, since 1,500 mg a day or more may raise prostate cancer risk.

PHOSPHORUS. Unnecessary to take in a multi. Too much may impair calcium absorption, and we already get more than we need from our food.

POTASSIUM - the amounts in multivitamins are low. And while the potassium chloride that's used in supplements may lower blood pressure and the risk of stroke, it won't help prevent kidney stones and bone loss like the potassium citrate that's found in fruits and vegetables

CHROMIUM - the Institute of Medicine recommends only 20 to 25 meg a day (women) or 30 to 35 meg a day (men). Many brands have closer to 120 Meg {the DV), which is safe (Anonymous, 2008).

More specifically, there are interesting facts concerning some vitamins and minerals on the contemporary nutrition agenda. The scientists have recently eported vitamin D deficiency in all age groups (Kimball, Fuleihan, and Vieth, 2008).

6.4.5. Mealtime

If you have done everything you can to set your minds at rest about *your* toddler's diet but you still find yourselves worrying, you may be worrying more about eating *behavior* than about actual food intake. Refusal of food, which has cost money and which has been prepared with care and love, is hurtful. The mess he makes as he plays with food he is not going to eat seems wasteful and goes against everything adults have been taught about 'good manners''.

His anxiety to get down and get on with life after a few mouthfuls disrupts the family meal and prevents it from being a peaceful social occasion. But understandable though these

feelings are, it is a mistake to get them mixed with worries about the child's actual *diet.* You are trying to feed him so that he can grow healthily. You are also trying to teach him to be socially acceptable. These are separate tasks: both important, but totally different.

When you insist that your child eat cabbage, is it for vitamin C or discipline? As we have seen there are many better sources of vitamin C. There are better issues for discipline too. When you say that he ought to eat everything on his plate, are you thinking of him having enough to eat or of not wasting good food? As we have seen, he is the one who knows whether he has had enough or not. As to wasting food, isn't it just as much of a waste to force it down a reluctant child as to feed it to the cat?

When you say that he "ought" to eat his main course before he can have any pudding, is it because you really think the first course contains more important foods, or is it because you know he likes sweet things better and you think he ought to pay for them by ploughing through his meat and vegetables?

Of course it is up to parents to choose how and when to discipline their own children, but if you choose mealtimes you may pay a high price. I have talked to families who had got themselves into such a vicious circle over their toddlers' meals that the whole family's life was ruined by it, often for months at a time.

Some families banned all mealtime conversation except stories and nursery rhymes designed to distract the toddler while mother ladled in some food. Others refused all invitations to visit friends for meals because the toddler would only eat at home. Some mothers regularly spent two hours over every meal and a great deal of time and money in between devising tempting little dishes for the next battle.

It is curious that we get ourselves into this situation, because toddlers get hungry just like everybody else. When they feel hungry their bodies are telling them to eat, and eat they do. Most toddlers with serious "eating problems" are actually rather fat. Very few are thin.

But trouble begins because the child does not eat what you offer, when you say or in the way that you approve.

The more you try to impose rules and regulations on eating and table manners, the clearer it becomes to the toddler that the meal table is a marvelous place for a fight. Soon your child knows that it is one place where he can always get your attention and concern.

That situation is irresistible to the child's growing sense of his own power and independence. You are much cleverer than your toddler. If you foresee the possibility of mealtimes becoming a battleground, you can stay one jump ahead by resolutely refusing to become involved. It takes two to make a quarrel. The first steps are to do with your own feelings. Believe that your child will never starve, if he is offered adequate food. This statement is not a careless generalization. It applies to all children and that includes yours. Somehow you have to persuade yourselves to believe it or you will not be able to follow the rest of the programme for avoiding problems.

It might help to check your child's weight so that you can see that it is still following a steady upward curve. If that does not convince you, it might be wise to have the child checked over by your doctor so that you can be authoritatively assured that he is healthy and well-nourished. Go on seeking reassurance until you honestly believe that your job is only to offer good food, not to force it down your child.

A long time ago a research study showed that year old babies who were offered a wide range of foods three times each day selected for themselves, with no adult assistance, persuasion or instruction, diets which, while they were wildly unbalanced day by day, were perfectly balanced in the longer term. Like them, your child may have a bread jag and then a meat passion and then may eat almost nothing but fruit for a day or two without doing him any harm at all. Trust him to know best. Once you have got yourself to this point the rest of the prevention programme follows naturally:

- Encourage your toddler's independence in all areas, especially at meals. Present his food in a form that is reasonably easy tc manage, and don't help him unless he asks or gestures for help. Ii he does, doesn't scoop food straight from the plate into his mouth.
- Load the spoon for him and let him take it in his hand and put it in his mouth. Let him feel, always, that eating is something active which he does because he wants the food, not that being fed: something he accepts, passively, from you.
- Let the child eat by any method. He needs to feel that getting this food he wants is the important thing, not getting it by tidy use of, spoon. If fingers are easiest for him, let him use them.
- Let the child eat in any order or combination. If you will no give him pudding until he has eaten his first course, he will quick! realize that you care more about the main course than the dessert. By the laws of toddler contra-suggestiveness that will instantly make the pudding seem even more desirable. If you will not let him dip bacon in his cereal, he may well decide that he will not eat either of them. Just don't watch if you cannot stand the idea of the combination.
- Let the meal end when the child has had enough. If you have accepted that what he eats and how he eats it is up to him, it follows that not eating any more or not eating anything at all is up to him too. You will ruin the effect of your whole campaign if you weaken at the last moment and try to feed him just a few mouthfuls to finish his meal.
- Try to keep mealtimes enjoyable. Remember that sitting still is his least favorite occupation and that he still finds it difficult to join in a general family conversation which is not especially directed at him or his interests. Trying to make him sit up to table for a whole family mealtime is bound to lead to trouble.

If you want him to feel part of a family group at table, let him sit up with you, eat what he wants and then get down playing. For a while he may keep coming back for one more mouthful but he will soon learn that once he has got down his meal is over.

If you do not feel able to allow him to leave a family table before others have finished, feed him on his own. At three or thereabouts, he will be delighted to join you and will be able to ‘behave nicely’ in order to earn the honor.

Many families will find that a compromise between these two positions works best. Perhaps you all have breakfast informally together before members of the family leave for work or school; lunch might be with mother and/or older brothers or sisters, while supper might be served separately to the toddler so that the older members of the family can enjoy a peaceful meal once he has been put to bed.

Don't take an unreasonable amount of trouble over your child's food. Of course it is vitally important that he should be offered a good diet but the more money, time and trouble you take buying and preparing attractive and delicious food for the child, the more maddening you will find it when he is unappreciative.

Keeping the child's meals simple often helps to keep the emotional temperature down. Why cook minced liver, three vegetables and a rice pudding when you know he will not eat them? Think what he is likely to eat. If the answer is ‘bread and butter and ham – again’, give him that. It is perfectly adequate food; if he eats it, fine. If not, you will not have wasted much.

Don't use food as reward, punishment, bribe or threat. Remember that you are trying to keep the child's eating completely separate from his discipline. If he is hungry, he should eat as much as he wants of whatever is available. If he is not hungry, he should not eat. Food should be neither a treat nor a duty, and it should never be offered as a bribe or kept from him as a punishment. If he has ice cream, it should be because that is the pudding on today's

menu, not because he has been a good boy. If he cannot have ice cream, it should be because it is not available today rather than because he has been naughty.

If you do not eat sweets yourselves and your child has few older friends, you may be able to prevent him from even finding out what a sweet is until around the second birthday. It is probably worth trying. If the rest of the child's diet is sensible, even this period without sweets will help those first teeth to get a good start.

But however careful you are, you are bound to meet the sweet problem by the time of that second birthday. Children see the pretty packets in shops, see the advertisements so cleverly aimed at them on television, see other children munching and sharing. Your child will want to know what they have got. Once sweets are known and recognized, he will demand to have some too.

There is no doubt that sweets are bad for your child's teeth. But carefully selected, they do not have to be worse than many other foods; sensibly handled, sweets do not have to become a major issue. Highly refined sugar makes enamel-attacking acid in the child's mouth. Every time sugar is eaten teeth are at risk; the more times per day they are put under attack and the longer the sugar remains in the mouth, the more holes there will eventually be for the dentist's attention.

But this applies to *all* sources of refined sugar, not only to sweets. A bottle filled with fruit syrup and sucked over a long period will do just as much harm as the worst kind of sweet while a slice of cake will produce as much acid as the least deplorable kind of sweet. To strike a moral pose and impose a ban on all sweets while feeding the child the rest of a normal Western diet is foolish. It is much more sensible to take reasonable care over all sweet foods.

Sweet food which is eaten quickly will do little harm because the acid which is produced is gone from the mouth before it has time to eat into the tooth enamel. A slice of

cake or a piece of chocolate is therefore much less harmful than a lollipop which the child sucks all afternoon. Chewy cakes and sweets are usually worst of all since fragments tend to stick between the teeth and stay there until the next thorough brushing. This may also apply to many of the 'healthy' foods which are often suggested as alternatives to sweets; raisins, dates and other dried fruits - whether loose or in 'health bars' - can cling tenaciously and although their sugar is not refined, it can do considerable harm.

Some dentists even regret advocating finishing every meal with an apple as small pieces of sweet apple skin wedged between the teeth can do as much harm as the sugary film the apple was intended to remove.

So, when your child reaches the stage when he must have sweets or feel conspicuously different from other children, select the particular sweets carefully and control the manner in which he eats them. Choose types which dissolve quickly, such as chocolate or fondant sweets. Encourage him to eat all that you are going to give him in one short session, so that he eats a ration of six sweets in a quarter of an hour rather than one every half hour throughout the afternoon. Try to arrange for him to have a drink of water as soon as possible after he has finished them, and make sure that his next tooth cleaning session is thorough.

Along with this kind of practical approach it is also important to monitor your emotional approach to sweets because it is the emotional aspects of sweet-eating which tend to make so many problems later on. Almost every human being likes sweet things.

Research has shown that even newborn babies can distinguish between plain and sweetened water and that most of them suck longer on the sugared bottles. But instead of calmly accepting that sweet foods are pleasant, we, with our copious supplies of cheap refined sugar, have made the buying and eating of actual sweets part of our pleasure *rituals.* In many families boxes of chocolates are an accepted part of any outing and an expected purchase on any feast day. Sweets are bought as presents, sent as 'thank you", hidden as

surprise, given to make banged knees better or disappointments bearable. They are used to convey or to stand in for love, and it is in this light that children yearn, whine and badger for them.

If you use sweets as rewards and treats during the toddler period, your pre-school child is bound to place an emotional value on them as well as liking the taste. If, when he grazes his knee, he gets a chocolate drop along with your hug, that chocolate drop will come to seem comforting to him.

He will want sweets whenever he is miserable or hurt and tired. If, when you are especially pleased with him, you buy him sweets, he is bound to see those sweets as being part of your loving feelings. He will want you to buy him sweets to show that you love him. If, when he has to face something unpleasant like an injection, you pay him with a sweet, he is bound to see those sweets as something he is owed whenever anything nasty happens. He will want payment in sweets every time you make him do something he dislikes.

If you can keep sweets out of the emotional arena and treat them as coolly and calmly as you treat other particularly nice-tasting things such as strawberries or honey, none of this trouble will arise. Many children passionately enjoy strawberries and will eat as many as they can get during their short season. But how many of those children whine and cry and throw tantrums for strawberries?

6.4.6. Snacks

Many toddlers genuinely need to eat between the day's main meals. A mid-morning and/or a mid-afternoon snack may improve your child's temper as well as giving a welcome structure to the passing hours. And something to take the edge off hunger may prevent a late meal from becoming a major disaster. So try not to take a moralistic attitude to snacks. Food is food and there is no dietary law which says that it is better to eat three times a day than

twice or six times. It is all a matter of commonsense and convenience mixed with social convention.

Part of the trouble over snacks arises from the vast market in fun-foods which has grown up during the last ten years. Like sweets, fun-foods are heavily advertised and attractively packaged. Almost all children want them but many families react against them in ways which are really quite irrational.

Snack foods are said to be "all rubbish; no goodness in them". In fact these foods are neither more nor less likely to be nutritionally valueless than any of the manufactured foods you serve at table. A pizza, for example, is a nicely balanced item of diet. Dairy ice cream from a reputable manufacturer is an excellent food, at least as good for your child as a home-made custard or milk pudding. Even the lowly potato crisp (although too salty to be good for babies) is only potato, with the water removed, and fried in vegetable oil. As such it is a surprisingly good source of vegetable protein and in no way worse for a child than a helping of French fries.

Snack foods are said to be "fattening". Of course all food is fattening if it is food in excess of the amount the child needs. A child who eats adequate meals *and* a lot of snacks will certainly get fat but a child who eats snacks *instead* of part of his meals will not. There is nothing devilish about snack foods which makes them more fattening, calorie for calorie, than the same kind of food which is served on a plate.

Snacks are said to fill children up so that they "cannot eat 'real' food". Again, this can happen, but it need not. If a child eats a non-nutritious snack when he was not really very hungry, he may well refuse that ‘good dinner’ and indeed he ought to refuse it or he risks obesity. But the child who eats a nutritious snack and then refuses his meal may not be losing anything. It depends what the snack and the meal consisted of. So don't tar all snack foods

with the same moralistic brush. As with sweets, the real problem with snacks is an emotional one.

Snack foods are usually eaten under circumstances which are enjoyably different from sitting up to table. Even the process of buying them is more fun for the toddler than the complex processes of supermarket shopping and kitchen food preparation. It is not surprising that many children would rather have that packet of "sesame crunchies" than their lunch, even if both are available simultaneously.

The answer is to treat snack foods as *food* (which is what they really are) rather than as *treats* (which is what will make trouble). A child should not get potato crisps because he has been good any more than you would offer him cabbage for this reason. His ice cream should not be withheld because he has been tiresome any more than you would refuse to serve him meat. As with sweets, if you keep the emotional temperature down in this way, remaining problems over snacks should be easy to handle.

The trick is to make sure that you offer the child the kinds of food he likes best as occasional parts of his regular meals, while keeping simpler foods freely available for eating between meals when he is genuinely hungry. Instead of waiting for him to nag you for chocolate while you are out shopping, serve him a couple of squares, with an apple, as a sweet course at lunch. Instead of taking a moralistic attitude to pleas for potato crisps, serve them occasionally in place of that boring mashed potato.

Your child will still get hungry between meals from time to time. When he does, offer him something plain like bread and butter. If he is hungry enough to accept it, he is hungry enough for a snack to be sensible. He will not eat bread and butter from greed, and the sweet biscuits he might have eaten from gluttony are coming up on the supper table to be eaten or left as he thinks fit. The whole situation is emotionally de-fused.

A toddler can be plump without being fat. A lot of children are meant to be big; they are big babies, big toddlers, big children and eventually big adults. You cannot always judge whether your toddler is getting too fat just by looking. At this age faces are often very round and tummies almost always stick out.

If you think your child is getting too fat, look at the upper arms and at the thighs. If there are rolls of fat in those areas, so that the sleeves and the legs of the clothes strain tightly around them, then the child probably is too fat.

If you have been keeping up the weight and height chart, you can make a proper assessment by looking at that. Your child's ideal weight will go up in strict relation to height. If weight is being gained much faster than height, the child is bound to get fat.

6.4.7. Losing weight

Growing children should never be put on a diet which is designed to make them *lose* weight. You should aim to slow down your child's weight gain so that his height can catch up with his weight. If you try to diet a toddler more actively than this, you may actually distort his growth.

The fat toddler is almost certainly eating a diet which is high in carbohydrates. But that does not mean that the answer is to put him on the kind of low carbohydrate/high protein diet you might adopt if you were slimming. He needs his carbohydrate foods to satisfy his appetite and give him energy. He also needs the useful range of proteins, vitamins and minerals they contain.

Look first at your child's consumption of fats. You can cut a small child's calories very substantially without him noticing the difference at all or going without anything useful, if you just cut down his table fats and fried foods. A 28g (loz) slice of bread contains about 70 calories. If you add a normal spreading of butter you add another 70 calories with no extra value except some vitamin A which he is having in his multi-vitamins anyway. Roast

potatoes have about twice and chipped potatoes about three times the calorie value of boiled ones.

Look at your child's consumption of snacks. You don't want to make him unhappy by suddenly forbidding all food between meals, but if he eats high calorie snacks all day he may actually be getting as many calories in the form of extras as he is getting from a complete diet of meals. See whether you can substitute dried or fresh fruit for sweets, jelly for ice cream, plain rusks or water biscuits for sweet ones, bread for cake or buns.

Look at your child's sugar consumption. If he is a thirsty child who gets through a large bottle of concentrated vitamin C fruit syrup in a week, he will be getting far more vitamin C than he needs and the sugar in those drinks alone will be giving him a lot of extra calories. Fresh orange juice, even with a little sugar added if it is very sour, will be better for him. Provided he gets enough vitamin C from multi-vitamin drops or tablets, an ordinary fruit squash, very well diluted, will be less fattening still, while water is the best of all drinks for fat children.

Does he have a lot of convenience baby fruits and sweets? Many of them are made extremely sweet; home-cooked or raw fresh fruit would be less fattening. Does he eat a lot of sweets? If so, try giving them to him as part of his meals (an apple with some chocolate or a few smarties, as a sweet course for example) and then just not having any available between meals. If you want him to have some sweets but he always insists on having a whole packet rather than just a few at a time, you can fool him by taking the trouble to split a 113g packet into eight tiny cellophane bags. Once he has eaten the contents of one he will accept that they are ‘all gone’.

Look at your child's milk consumption. If he is still drinking more than, say, 0.8 litres, it is worth trying to cut him gently back to somewhere nearer 0.5 litres (lpt) - though not below this. If he is still having bottles, put 50ml (2ozs) less in each. If he drinks milk from a

cup just give him a bit less each time but remember to offer him plain water to make up the fluid.

Most of the calories in milk are in the fat of the cream while the valuable protein and calcium are in the milk. As we have seen skimmed or semi-skimmed milk is not usually recommended for children under five, but if your toddler is really overweight and you cannot reduce his milk consumption without upsetting him, check with your health visitor. Provided he has his multi-vitamins and the rest of his diet is good, she might think it sensible to change his milk for a few months.

Look at your child's daily life. Does he get the opportunity for all the exercise he wants? Is there somewhere for him to play actively? Do you let him push the buggy some of the way when you go shopping, or does he just sit in it? Is he free on the floor when he is at home and awake, or does he spend a lot of time in his pram or playpen? Given the chance he will be constantly on the go, and the more exercise he takes the less chance food will have to settle down in his fat cells: it will be needed to give him energy.

6.4.8. Pre-school children

Pre-school children who have not got food and eating mixed up in their minds with love and discipline is often real trencher-people. They use up an enormous amount of energy in their daily lives and they eat to match it. Provided there is enough food available, a child like this will certainly take in enough calories. Hunger will see to that. If the offered food is adequate in proteins, vitamins and minerals, the child will also select a diet that is well-balanced for his needs.

As we have seen, refusal of particular, valuable foods like meat, eggs or green vegetables will not matter provided that the child can get their value from other sources such as cheese and fruit. As a useful 'rule-of-thumb', a child who is eating as much as he wants of

an ordinary family diet and is having a pint of milk and a correct dose of multi-vitamins every day will be getting everything needed.

So you need not push particular foods, but neither need you hold back. There is no food which is ordinarily served to your family which your child should not have. If he likes curry and you like serving it, let the child have it too. A few foods may still disagree with him, but unless your doctor confirms an allergy to one of them you need not worry unduly even about these. The child will not 'eat himself sick' either. A child who always eats enthusiastically will stop where greed ends and gluttony begins.

Your child is enthusiastic about food because you have not spoiled the natural relationship between feeling hungry and enjoying food. He is ready, now, to start to fit in with the social aspects of mealtimes. But go easy. If you suddenly change your attitudes, refusing to cook alternative dishes, or insisting on a vast improvement in table manners overnight, you could still spoil eating for the child and make problems for yourself.

Teach table manners by example rather than by exhortation. On the whole he will come to behave as the rest of the family does, so if you are suddenly irritated by his eating with his fingers and leaning his elbows on the table, make sure he is not watching the rest of you doing the same thing!

Promote the child to eating arrangements like your own. He will imitate adults more readily if he sits on an ordinary chair (or a small but extra-tall version specially made for young children) rather than in a high chair, and if he has a place setting like everybody else. He cannot learn to take care of china and glass and to manage a fork, spoon and eventually a table-knife, if he is only given plastic.

Help your child to acquire a sense of occasion. Few families can have every meal together, elegantly served at a perfectly set table Life is not long enough. He is bound to "let

you down" when you most want him to behave nicely. In a busy household it may be a good idea to make one weekend meal deliberately more formal.

The child could be involved in making the table look pretty - perhaps picking flowers for the middle or folding paper napkins - and he could change into clean, tidy clothes for the meal. If the grown ups have a drink beforehand, a special drink for him adds to the fun. During the meal food is served on dishes and everyone, including the child, helps themselves and each other. It is obviously an occasion for something especially nice to eat and for at least some conversation which will particularly interest him.

In this kind of atmosphere the child will not feel nagged at if you show him a more conventional way to manage a fork or get peas to his mouth. He will feel honored that you are letting him in on the grown up world. It is realistic too. Why shouldn't he eat potato chips with his fingers when he is having supper alone in front of the television? What matters is that he should be able to behave inoffensively at table when the occasion demands it.

Help the child to acquire new tastes. If your pre-school child knows, from bitter experience, that he will be made to eat anything that is put on his plate, he will probably refuse even to try new foods, in case he does not like them. He will feel much more adventurous if you allow him to taste before the meal or to have a tiny bit of the new food on a teaspoon and decide whether he wants to be served with it or not.

Get the child used to foods which will make life easier for you. A child who is generally enthusiastic about food will accept new foods if you start off by introducing them as part of ordinary family meals. Accustom him to whatever will be available on camping trips, picnics or in restaurants. Above all, try to get him used to eating cheese. Bread or biscuits with cheese and an apple is a perfectly balanced meal which takes 30 seconds to prepare and another 30 seconds to clear up. It is easily portable and available in any roadside

pull-in in any western country. If he will happily eat that combination you need never interrupt a day's activities in order to think of something for his meal.

Real eating problems now are almost certainly a hangover from the toddler period and need handling similarly. But a lot of pre-school children get labeled 'faddy' or 'difficult eaters' when they are only trying to exercise the same rights to personal taste and appetite which adults take for granted. In our well-fed society most of us would rather stay hungry than eat what we dislike. Yet because we are adult we seldom face the choice. We buy and/or prepare what we do like. Only young children are faced with food chosen and prepared by someone else and are then expected to 'eat what is put in front of them'.

So allow for the child's dawning tastes in food. Where those tastes are similar to yours they will be accepted without question; it is when a child's tastes differ from everyone else's that he tends to be called 'faddy'. If no member of the family eats bacon fat, the child's rasher will be trimmed without question; but if other people eat the whole rasher, the child may well be labeled 'fussy' when he leaves the fat.

While every family will work out its own attitudes to individual food tastes, there is a reasonable middle-road which will go a long way to avoiding mealtime trouble for all concerned:

- It is unreasonable to serve a meal or dish you know the child dislikes and then be irritated when she leaves it. Make sure you serve something she normally eats, even if it means substituting an egg or some cheese for the family main dish. Remember that you will never help her to like a particular food by forcing her to eat it. Many adults still cannot face foods which were forced on them because of war-time or other restrictions.
- It is unreasonable to insist that the child eat all the food on her plate if you put it there. Let her say how much she wants or help herself. She may then come back for more. It

is unreasonable to insist that the child eat at all if she says she is not hungry. She may be sickening for something or having an non-hungry day. She has the right not to eat, just as you have.

- It is not reasonable to pander to momentary whims. The child must make her meal out of whichever items she normally eats that are available today. If the menu is liver and bacon which she normally enjoys, she does not have the right to demand egg and bacon instead. If she does not want liver today she must make do with the bacon.
- It is not reasonable to allow the child all of the best part of a family dish. If she only wants the crisp brown top of her helping, fine. Don't give her any underneath. But don't feel that you have to give her the crisp brown top of everyone else's helping too. It is not reasonable to let the child spoil food. If there are iced cakes and she does not want any cake but only icing, she has the right to the icing off one cake - she has simply eaten what she wanted of it - but this does not give her the right to nibble the icing off a plateful.

Most pre-school children genuinely need to eat more often than the adults in the family. If you are using up that much energy, it is a long time from breakfast to lunch and from lunch to supper.

Children who are hungry at other times need food-fuel. A formal mid-morning and mid-afternoon snack will almost certainly be routine, but problems arise because hunger gets confused with greed. Usually it is our fault. The child says he is hungry and we give him a chocolate biscuit. Next time, he does not say he is hungry, he says he wants a chocolate biscuit. Hunger or greed^ The easiest way to keep out of this kind of dilemma, once your child is old enough to understand, is to have certain foods which the whole family knows are available at any time they want them.

There might, for example, be a biscuit tin which is kept filled with plain biscuits, and a fruit bowl with apples and bananas. Equal] there might always be bread and butter for the asking or a piece < cheese or a handful of raisins. Different families with different tastes and budgets will find their own basics, but for all families the point is the same. These are "I'm hungry" foods. Anyone who cannot wait for the next meal can have some.

If you do follow this idea, other foods which the child asks ft between meals can be seen as being asked for from greed rather than need and you can decide for yourself whether you feel indulgent or not. If you have just baked a batch of buns and the smell is driving the child mad with greed, you may decide to give him one at its warm best or to make him wait until teatime. Either way you are not depriving him of food when he is hungry.

If you have managed the kind of approach to sweets which WE outlined in the previous section, they will probably never be a major issue in your household. But sometimes, children get older, spend more time with other children and are able to compare what they get with what others get, sweet-trouble does begin. If you have to formulate a sweet 'policy', remember that it is usually the parents who try for the strongest and mo; righteous line who have the most trouble. Strict rationing, for example, tends to focus attention on what is *not* allowed. Thos who can stay coolest about the matter suffer least.

The policy which most often seems helpful is the simple one c never keeping sweets in the house. If you have not got any sweet you can say so, calmly and honestly, when the child asks. Willingly buying the child a small packet of the least damaging type of sweet at some regular times (such as on the way home from shopping) also gets you out of a lot of difficulties. The child knows there will be some sweets then, so your refusal to buy any right now will probably be accepted quite calmly. You can also make sweets seem nice-but-ordinary by occasionally using them as par of meals - serving chocolate with pudding or using jelly beans ti decorate a cake. When your child does have some sweets, you can reduce

the damage they do both by banning the most damaging; types (such as toffees and lollipops) and by encouraging him ti finish what he wants of them all in one go just as he would finish with a slice of cake.

Your whole attitude to especially-nice-things-to-eat will have aid effect on the ease or difficulty with which you handle the sweet problem. If you want him to regard sweets as just one more nice thing in a life full of nice things, some of which are foods, encouraged him, sometimes, to buy himself a different kind of food-treat. The actual shopping is half the point. Many small children only get the chance to shop for themselves from the sweet shop, but being allowed to choose and buy a beautiful red apple from the greengrocer or a shiny brown bun from the baker can be just a: much fun.

The natural growth pattern tends to slim children down now, so obesity becomes less usual and fat children all the more conspicuous. Really fat children are often made a butt by others, so try to produce a slimmer contour before it is time for your child to start infant school.

The aim of slimming fat children should be to slow their weight gain down so that as they grow upwards, less and less of them bulges out. Over the next eighteen months or so your child will get about 13cm (5in) taller. If you can hold the weight gain over that period down to only 1-1.5kg, you will end up with a much thinner-looking child.

It may be a good idea to start your "slimming campaign" by taking your child to the doctor. Take the growth chart with you so that he can see whether the obesity is new or part of a long-term pattern, and so that he can help you to work out by how much the weight gain is outstripping the gains in height.

The principal ways in which you can help a pre-school child slim down are similar to those suggested for toddlers. But the child's greater age makes some differences.

Fat consumption has probably gone up because the child now shares family meals which may mean more fried foods and more bread and toast. Remember that almost all foods you normally fry in butter or oil can be dry-fried with no extra fat at all if you use a non-stick pan. Frying by this method is better for everybody. Remember, too, that many foods which your child likes crisp can be made that way by being dry-baked in an oven. Crisp bacon cooked by this method actually *loses* most of its fat.

Not everything that is spread on bread need be fatty and fattening. The child is old enough to experiment with spreads that need no extra butter such as peanut butter or cottage cheese. Although the child may drink less milk than before it might be sensible to give him semi-skimmed now. He may be drinking a great many fizzy drinks, too. Serve plain water at meals. If fizz is the point of treat drinks, mix squash with plain soda water. Ice cubes often make simple drinks seem fun.

Obviously you will try not to let a child who is already fat eat a great many sweets and fattening snack foods which are extra to meals. But cutting down on these sweet and enjoyable foods takes tact if the child is not to be made miserable. A very useful trick is to buy, make or serve miniatures. Ten tiny sweets seem more to a child than three big ones. Three finger biscuits seem plenty yet will not contain the calories of one full-sized one. You can even make home-made cakes in paper sweet cases.

By the time fat children are three or four years old, they may have fallen into a vicious circle over exercise. They do not run about much and this is partly because they are fat, but they are fat partly because they do not run about much. Where a *toddler* will normally be very active provided he is allowed physical freedom, a *pre-school child* may have grown out of running for its own sake - and have become addicted to television. Your child needs people to run with, after and away from. When he must play alone, encourage kicking a ball,

rolling a hoop or skipping rope. Even indoors he can dance to music and learn to turn somersaults.

7. Conclusion

The thesis dissertation analyzed the issue of the community nutrition in action from a wide social perspective, involving relevant policies, program planning, resources, as well as nutrition issues particular to community nutrition. The analysis involved proper comprehension of establishing and implementing various nutrition programs for specific age groups (children, aged people, impoverished populations etc).

On the basis of entrepreneurial approach, the research encouraged us to learn how to improve public nutrition and make it healthier. At that, numerous solutions were offered to the community nutrition practices and health problems, including nutrition education and assessment, as well as nutrition interventions' planning. The range of case studies and community-based learning activities are provided to facilitate active learning and practical implementations in due respect.

In terms of community nutrition wide encouragement the particular attention should be drawn at nutrition education and communication initiatives are widely applied to adequately inform the society and ensure adequate provision of healthy and well-balanced foods as the prerequisite of sustainable nutrition consumed by humans (Bajaj, n.d.). Food educational and communication initiatives overall 'bears significant international importance since more than 800 million people worldwide experience food deficiency and therefore are unable to adequately satisfy their essential nutritional needs.

Mainly all communication and educational initiatives are therefore directed towards the development of well-balanced diet programs that provide energy and nourishment necessary to live, and keep in relevant shape and health state.

Adequate communication and educational initiatives should be developed in accordance with the existing legislation, regulations, medical, nutritional and healthcare recommendations and requirements.

Such agenda is primarily aimed to enable proper action plan, ensure food insecurity and enable the nutritional stability of international community. In particular, within the framework of global partnership, national governments should actively cooperate with civil society, business sector, financial institutions, intergovernmental and NGOs to promote educational and communication programs to achieve food consumption sufficiency and overall nutritional security.

In accordance with the objectives outlined within the framework of 1996 and 2002 World Food Summits and the 1992 International Conference on Nutrition on a national level, there are national nutrition plans and policies that consist in the implementation of nine core strategic action areas aimed at:

1. Inclusion of mainstream nutrition goals in development programmes and policies;
2. Improvement of household food and nutrition security;
3. Protection of consumers through improved food safety and quality;
4. Prevention and cure of infectious diseases;
5. Promotion of breastfeeding;
6. Caring for the nutritionally vulnerable and socio-economically deprived groups
7. Prevention and control over specific micronutrient deficiencies
8. Promotion of healthy lifestyles and appropriate diets
9. Assessment, analysis and monitoring of nutrition situations.

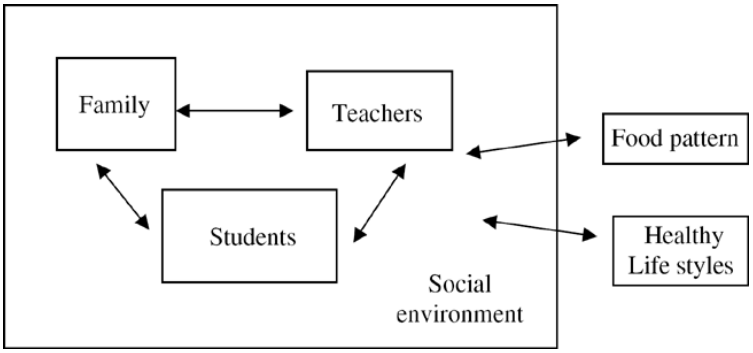
Another example is that of the International Alliance against Hunger that intends to raise awareness of the problems of hunger and seeks long-term solutions to ensure sufficient food for all. At that, national governments, international community, civil society

organizations, and business sector, as well as all interested parties and individuals should jointly cooperate and unite common efforts to mobilize technical expertise, political will, and financial resources required for the improvement of food security.

Further on, the Special Programme for Food Security (SPFS) intends to support people living in the developing world with low-income rates and food deficiency to advance food awareness and security by means of rapid increases in food productivity. Particularly, in compliance with the 1996 World Food Summit Plan of Action, the program aims to improve human access to food (Global Education, 2007).

The relevant initiatives should widely consider the needs and concerns of all those involved, including: students, teachers and parents.

Figure 1 School-based nutrition education: interactions between actors and environmental conditions



At that, the primary objective of educational strategies is to advance health awareness, communication and skill building as far as possible.

There is vast amount of available literature sources identifying educational strategies that concern behavioral focus and theory-driven strategies conducive to successful programmes. Alternatively, there are also programs specifically developed to gain effectiveness and provide required time and intensity to intervene, involve families, especially children, and incorporate self-assessment and feedback in interventions for older participants. One of the

means that provide a valuable opportunity for nutrition education, for example, is school meals.

Health promotion should begin at the early life stages through fostering healthy eating practices as well as regular physical activities bearing enough potential for principal impact on health and overall well-being (CDC, 1996).

At that, it is important that children progressively adopt eating habits and practices in the course of their growth and development. At that, the family plays a vital part within the process by setting feeding responsibilities and setting appropriate norms within the family while acting as role models to encourage sufficient behaviors, punishments and rewards (Birch & Fisher, 1998).

While at school, the social environment of children is highly diverse and therefore a child is surrounded by a multitude of both positive and negative influences, and therefore more references to guide proper nutritional behavior are needed. With gaining more independence, children normally tend to make their own food choices set their minds up regarding what they consume. Thus, the initial family's impacts are overwhelmed by friends, peers as well as social models they follow regarding eating practices (Story et al, 2002).

To this end, there is enough scientific evidence that the prevailing food patterns followed during infancy and childhood mostly effect growth and development, impact health as well as risk and protective factors that bear relation to various chronic diseases (Nicklas et al, 1993). Furthermore, during childhood nutrition is an essential contributor to maintain health and optimal learning capacities.

In addition to this, food habits followed and maintained during adolescence largely predetermine our health conditions during adulthood (Kelder *et al*, 1994).
Thus, workplaces, public areas and hospitals are valuable environments that influence health. In particular, schools provide the most effective and efficient information that enables to

communicate with a large segments of public, including but not limited to young people, families, school staff, and community members etc (Aldinger & Jones, 1998; Dixey *et al*, 1999).

At that, the general public should be aware that school-based nutrition education should widely refer to the needs and interests of students, teachers and parents. This indicates the importance of open meetings to involve as much public as possible to enhance sufficient food enablement projects.

In this regard, policy strategies serve as formal and informal rules adopted on a collective basis to determine individual and group behaviors. In turn, environmental strategies are perceived as appropriate measures to alter and control legal, social, economic and physical environments so as to facilitate health and well-being by creating opportunities for action and eliminating any possible barriers on the way of healthy diet (Aldinger & Jones, 1998). According to ADA, (1999) and Aranceta (2001), the provision of food at schools in the form of highly-nutrition meals plays the vital role.

Overall, Dixey et al, 1999 point out that educational strategy consists of efforts intended to raise health awareness, and most importantly, communication and skill building. The properly developed strategies should be relevant to program goals and consider the knowledge and skills adequate to children's perception, taking into account age, gender, background, social, behavioral and upbringing peculiarities in each particular case.

At that, experts deem that particularly cultural relevance plays a vital role. Therefore, for instance, the nutrition-related messages should be addressed in a form mostly comprehendible to children to teach them skills required to advance and strengthen their healthy eating habits.

To support these views, there is a variety of literature reviews that identify educational strategies relevant to a behavioral focus, as well as theory designated to cover the elements conducive to successful programs.

On the other hand, the features that positively affect the gaining of effectiveness are adequate time resources and intensity for the intervention, particularly for younger children, involvement of families, and incorporation of self-assessment, as well as feedback in interventions with older children. The effective interventions are those that include actions that modify school environment, as well as those that involve the larger community (Birnbaum *et al*, 2002).

Table: Characteristics of successful school-based nutrition education program

Behavioral focus
Theory-driven strategies
Adequate time and intensity
Family involvement
Multicomponent strategies
Developmentally appropriate
Considers needs of students, teachers and school
Self-assessment elements (older children)
Self-efficacy. Strengthen skills, influence attitudes, behavioral capability
Adequate teaching methods
Modify school environment: access to healthy food; school food policies; school meals
Teacher training opportunities
Cultural relevance
Evaluation

The above considerations necessitate the inclusion of health promotion regarding physical activity and dietary practices within the school framework as well as global educational programs and initiatives.

Further on, nutrition education should comprise an indispensable part of the school curriculum. In due context, national curricula should include contents and evaluation criteria related to food, educational objectives, as well as nutrition and adequate diet.

In this strive it is important to avoid vagueness and generality in interpretations and most importantly following actions to be performed in this direction. At that, the degree of implementation will depend on the willingness of teachers to further develop the educational achievements attainments and perform related activities within curricular projects.

Within diverse communities the effective programmes should be tailored to the peculiarities of community needs and take into account individual factors, including equity aspects and cultural backgrounds.

In empirical perception, experts justifiably claim that any act of implementation is an overall complex and slow process. The individual traits of teachers, as well as quality of educational materials and additional support should be provided by program leaders to properly determine the level of implementation of the curriculum.

Overall, physical activities and nutrition education within primary and secondary schools should be reinforced internationally, most intensively in the developing world. At that, the vast application of self-assessment instruments in schools will enable schools to monitor their individual circumstances as the further basis for effective action.

References:

1. ADA (1999): *Statement. Promoting Healthy Eating Behaviors: The Role of School Environments*. Washington, DC: USDA, Food, Nutrition and Consumer Services.
2. Aldinger CE & Jones JT (1998): *Healthy Nutrition: An Essential Element of a Health-promoting School*. WHO Information Series on School Health. Document four. Geneva: WHO.
3. American Academy of Family Physicians. 2007, 'Nutritional Support', Retrieved July 15, 2009 from www.nlm.nih.gov/medlineplus/nutritionalsupport.html
4. Anonymous, 2008 Need A Boost? Al Bawaba. London.
5. Anonymous, 2008 Obesity; Research from University of Aberdeen reveals new findings on obesity, Medical Devices & Surgical Technology Week. Atlanta: Jun 8, 2008. pg. 640
6. Anonymous. 2008, Diet and Nutrition; New findings from N.W. Solomons and co-researchers in the area of diet and nutrition described, Health & Medicine Week. Atlanta: Jun 2, 2008. pg. 1783.
7. Anonymous. 2008, HOW TO READ A MULTIVITAMIN LABEL, Nutrition Action Health Letter. Washington: Jun 2008. Vol. 35, Iss. 5; pg. 6, 2 pgs
8. Aranceta J (2001): *Nutrición Comunitaria*, 2ª edición, pp. 1–284. Barcelona: Masson.
9. Bajaj, S. NUTRITION SECURITY SYSTEM AT HOUSEHOLD LEVEL - POLICY IMPLICATIONS, Retrieved July 25 2009 from http://www.unsystem.org/SCN/archives/npp06/ch18.htm
10. Bernanier, C. *Advanced Nutrition: Micronutrients*, 4th edition, 2002.
11. Birch LL & Fisher JO (1998): Development of eating behaviors among children and adolescents. *Pediatrics* 101 (Suppl), 539–549.

12. Birnbaum AS, Lytle LA, Story M, Perry CL & Murray DM (2002): Are differences in exposure to a multicomponent school-based intervention associated with varying dietary outcomes in adolescents? *Health Educ. Behav.* 29, 427–443
13. Brug J, Steenhuis I, van Assema P, Glanz K & de Vries H (1999): Computer-tailored nutrition education differences between two interventions. *Health Educ. Res.* **14**, 249–256.
14. Bourguignon, F., F. Ferreira, and P. Leite. 2002. Ex-ante Evaluation of Conditional Cash Transfer Programs: The Case of Bolsa Escola. Policy Research Working Paper No. 29_6, World Bank, Washington, DC.
15. Boyle, M. and Holben, D. (1994), *Community Nutrition in Action*, Delmar Publishers.
16. British Nutrition Foundation. 2003, 'Healthy Eating: A Whole Diet Approach', [Retrieved July 19, 2009 wwnutrition.org.uk/upload/Healthy%20Eating%20A%20Whole%20Diet%20Approach.doc
17. Bulmer, D. *The Michelin Guide Great Britain & Ireland 2008*, 25 January, 2008
18. Chun O.K. Science Food Agriculture: 2005. Vol.85, p.1715-24
19. De Brauw, A., Hoddinott, J (2008), Must Conditional Cash Transfer Programs Be Conditioned to Be Effective? The Impact of Conditioning Transfers on School Enrolment in Mexico, Retrieved July 22 2009, from http://www.ifpri.org/pubs/dp/ifpridp00757.pdf
20. Dixey R, Heindl I, Loureiro I, Pérez-Rodrigo C, Snel J & Warnking P (1999): *Healthy Eating for Young People in Europe. A School-based Nutrition Education Guide*. Copenhague: European Network of Health Promotiong Schools.
21. D'Mello, J.P.F. & Duffus, C.M. (eds.), 1991. Toxic Substances in Crop Plants, the Royal Society of Chemistry, Cambridge

22. Fahy E, (2005). A comprehensive classification system for lipids, J Lipid Res 46 (5): 839-61.
23. FAO (2008) Better nutrition education helps reduce malnutrition, Retrieved July 25 2008 from http://www.fao.org/newsroom/en/news/2005/1000152/index.html
24. Ferreira F, (2003) The Role of Conditional Cash Transfers in the Process of Equitable Economic Development, Retrieved April 29, 2009 from http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2003/09/30/000094946_0309160409264/Rendered/PDF/multi0page.pdf
25. Fiszbein, A. and Schady, N. (2009) Conditional Cash Transfers: Reducing Present and Future Poverty World Bank Publications, Retrieved April 30 2009, from http://siteresources.worldbank.org/INTCCT/Resources/5757608-1234228266004/PRR-CCT_web_noembargo.pdf
26. Food Additives and Ingredients Association. 2007, Retrieved July 12, 2008 from http://www.faia.org.uk/functional.php
27. Harris Interactive. "Too Little Exercise, Rather Than Eating Too Much, Seen as Biggest Cause of Obesity" (2004): 2 pages. Retrieved July 19, 2009 http://www.harrisinteractive.com/news/allnewsbydate.asp?NewsID=787
28. HHS. "Obesity And Weight Loss", Retrieved July 19, 2009 from http://www.4women.gov/faq/weightloss.htm
29. Hickman, M. The Big Question: How does the Michelin guide award its stars- and they still matter? *The Independent*, Consumer Affairs, 2008, Retrieved July 19, 2009 www.independent.co.uk/extras/big-question/the-bigquestion-how-does-the-michelin-guide-award-its-stars-ndash-and-do-they-still-matter-773848.html
30. Izquierdo, M. (2005) "Pump It Up, AMERICA!" Retrieved July 19, 2009 from http://www.livingwithout.com/2005/feature_spr05_pump_it_up.htm

31. Johnson, C., Surlemont, B., Nicod, P., & Revaz, F. Behind the Stars, 2005, *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 46, No. 2, 170-187.
32. Kelder SH, Perry CL, Klepp KI & Lytle LL (1994): Longitudinal tracking of adolescent smoking, physical activity and food choice behaviors. *Am. J. Public Health* 84**,** 1121–1126.
33. Kerstetter, J. (2005) "The impact of dietary protein on calcium absorption and kinetic measures of bone turnover in women". J Clin Endocrinol Metab (2005) Vol 90, p26–31.
34. Kimball, Fuleihan, Vieth. Vitamin D: A Growing Perspective, Critical Reviews in Clinical Laboratory Sciences. Boca Raton: Jul 2008. Vol. 45, Iss. 4; pg. 339
35. Kohlmeier, M. (2003) Nutrient Metabolism ISBN-13:978-0-12-417762-8) Hardbound, 840 pages, publication date: OCT-2003 ISBN-13: 978-0-12-417762-8.
36. *Le Guide Rouge*: Paris 2003. Paris, France: Michelin Editions de Voyages, p. 16.
37. Levine, E. *Michelin, Yelp, Zagat: Who Can We Believe?, 2007,* Retrieved July 19, 2009, http://newyork.seriouseats.com/2007/10/michelin-yelp-zagat-cant-anyone-here-play-thi.html
38. Lysol. 2006, Healthy Eating, Retrieved July 22 2009 from from http://www.lysol.com/topic_eating.shtml
39. Lysol. 2007, 'Health Eating', Retrieved July 12, 2009 http://www.lysol.com/topic_eating.shtml
40. McCulloch, A. 2006, 'The Impact of Diet on Mental Health', The Mental Health Review, vol.11, Iss.4; pg. 19, 4 pgs
41. National Institute of Mental Health. 2007, 'Eating Disorders' [Online]: Available at: http://www.nlm.nih.gov/medlineplus/eatingdisorders.html

42. Nicklas TA, Webber LS, Srinivasan SR & Berenson GS (1993): Secular trends in dietary intakes and cardiovascular risk factors of 10-year-old children: the Bogalusa Heart Study (1973–1988). *Am. J. Clin. Nutr.* 57, 930–937.

43. Sareen S. Gropper, Jack L. Smith, James L. Groff Advanced Nutrition and Human Metabolism Wadsworth Publishing; 4 edition, 2004.

44. Sareen S. Smith and Jack I. Smith, 2006, Advanced nutrition, and human metabolism Brooks Cole, 5th edition.

45. Schwartz, J (2003). The cultural feast: an introduction to food and society. Belmont, CA: Thomson/Wadsworth.

46. Smith E, Morowitz H (2004). "Universality in intermediary metabolism". Proc Natl Acad Sci U S A 101 (36): 13168-73.

47. Story M, Neumark-Sztainer D & French S (2002): Individual and environmental influences on adolescent eating behaviors. *J. Am. Diet. Assoc.* 102 (Suppl), S40–S51

48. USDA, 2008, Nutrient Database, Retrieved July 12 2009 from http://fnic.nal.usda.gov/nal_display/index.php?tax_level=1&info_center=4

49. Weddle, R. (2009). World Bank's Conditional Cash Transfer Programs Show Signs of Success, Retrieved July 22 2009 from http://www.devex.com/blogs/17/blogs_entries/58917t

50. WHO (2006) Obesity in Europe, Retrieved July 22 2009 from http://www.euro.who.int/obesity

51. Wilson, A. 2005, 'Macro-micro Nutrients', Retrieved July 12, 2008 from: http://www.burgerman.info/www-nursing/macro-micro-nutrients.htm

52. World Food Summit (1996) Rome Declaration on World Food Security, Retrieved July 25 2009 from http://www.fao.org/docrep/003/w3613e/w3613e00.htm